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A.S.O.

A SOCIO-ECONOMIC STUDY OF AN  
AFRICAN DEVELOPMENT SCHEME.

NORMAN REYNOLDS.

A THESIS SUBMITTED TO THE UNIVERSITY  
OF CAPE TOWN IN FULFILLMENT OF THE  
REGULATIONS GOVERNING THE DEGREE OF  
DOCTOR OF PHILOSOPHY IN ECONOMICS.

JULY, 1969.

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TO THE FARMERS OF NYAMAROPA  
THAT THEY MAY NOT SUFFER ALL  
THE CHANCES.

## PREFACE

This thesis is the result of fourteen months fieldwork during which the author lived amongst African farmers on an irrigation settlement scheme in Rhodesia. Every aspect of life on the scheme and of the scheme's relations with the surrounding area was examined. The method of fieldwork, pioneered a generation ago by anthropologists, enabled the author and his African assistants to delve below popular assumptions and to discover that the farmers were sophisticated and rational within their effective management field, but that they faced numerous barriers to their and the community's progress which were, in the main, not of their own making. The study contributes towards a fuller understanding of the relationship of social change and economic development in the context of Central Africa, of difficulties Africans encounter when entering cash farming and of Government's developmental role.

## ACKNOWLEDGEMENTS

The fieldwork was supported by the Massey-Ferguson Research Foundation (South Africa) and the Rhodesian Ministry of Agriculture. I twice received the Smart Memorial Scholarship which enabled me to analyse the data and to write up the thesis.

I wish to express my appreciation to my supervisor, Dr. Francis Wilson, for his encouragement, guidance and friendship and to Mr. Michael Hart and Miss Hazel Baker for the work they undertook to programme two of the sets of data.

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## INTRODUCTION

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*"Studies are necessary of course, to a point.  
But studies that do not have action as their  
basic purpose are sterile."*

David E. Lillienthal.

Economics as it relates to the process of change from subsistence to cash farming is still immature. The intensification of African agriculture has received little attention from economists so that, "..... agricultural research has been directed only by scientists and technicians, whose economic training has until recent years generally been very inadequate or at any rate poorly suited to the realities of rural Africa."<sup>1</sup> The place and role of agriculture in development has only recently been recognised.

Economic research and teaching has emphasized the long-run and the macro-economic aspects of under-developed economies so that today the position, despite a few notable studies, is unbalanced. As a result several cases of "parlous economic advice" by Western experts have appeared which may well have done immeasurable harm to the progress of millions of peasant farmers.<sup>2</sup> Economists are often called upon to help in the formulation of policy and it is difficult to decline to give advice merely because the relevant knowledge is scanty. Understandably, therefore, many of the theories that have been advanced for stimulating agricultural productivity are poorly conceived.

Most studies of African farming have treated the subject too narrowly. Their authors have concentrated, at the farm level, on the allocation of existing resources, usually with the aim of arriving at a solution of the optimum resource combination.<sup>3</sup> Sociological and institutional factors have been largely ignored.

1. Dumont, R. : "African Agricultural Development"  
U.N./F.A.O. New York. 1966 P. 72.
2. Nicholls, W.H. : "The Place of Agriculture in Economic  
Development" reprinted in Agriculture in Economic  
Development edited by Eicher, C.K. and Witt, L. McGraw Hill. 1964.
3. Johnson, R.M.W. : "The Labour Economy of the Reserves."  
Occasional Paper No. 4. U.C.R.N., Salisbury, 1964.  
Clayton, E.S. : "Economic Planning in Peasant Agriculture."  
Wye College, University of London, 1963 and "Agrarian  
Development in Peasant Economics." Pergamon Press, London, 1964.

At the national level, these studies have investigated the marketing of crops or the response of farmers to price changes. Economists working on the problem of underdeveloped countries have seldom probed, "... very far into the organisation of the production of the crops and the earliest stages of their marketing and related activities. With rare exceptions, it is as though they have allowed themselves to become interested in local indigenous economic activities at the point where their output has moved out of the local and into the international economic sphere, and that they have declined to pursue this output back to its source along a route which to them would be progressively less familiar and without the accustomed landmarks".<sup>4</sup>

Given the existing body of knowledge and experience and the variety of institutions studied, it should be reasonable to expect that with careful planning, proper consultation, a sympathetic institutional environment and the right incentives, successful development should occur more frequently than it does. Several economists who have become concerned with the failure of present policies have begun to undertake detailed studies of representative communities to attempt to discover why they have or have not progressed.

The present emphasis is on research of a micro-economic character. The economic, social and even the psychological relationships at the village and inter-farm level have been the subject matter of several recent studies. The focus has been on short term change in response to altered environmental conditions of an economic, social, political or institutional nature. Their value lies mainly in the understanding that they seek to gain of the relationship between the short and long term and of that between different sectors in greater detail than has hitherto been attempted. Once more studies have been completed it should be possible to review the plausibility of the macro-economic development theories on which policy in under-developed countries is of necessity reliant.

4. Yamey, B.S.: "The Study of Peasant Economic Systems", in Firth, R. and Yamey, B.S. (Editors): "Capital, Saving and Credit in Peasant Societies". George Allen and Unwin. 1964. p.378.

The shift in emphasis towards a more qualitative approach raises several methodological problems which are related to measurement and theoretical issues which concern the role of social or cultural forces in the process of economic development. How valuable are orthodox economic tools in the analysis of the economies of under-developed countries at either the national political or the grass-roots level? What practical obstacles to the implementation of policy are likely to present themselves? What are the economic, social and personal barriers that hinder development? and What form or forms should the institutional and legal framework take if people are to move from the security of their traditional society into one in which change is cumulative and development sustained?

The shift has given the impression that economic development theory is marking time and that it is awaiting a major contribution which will break through into new and more productive ground. However, the nature of the shift, into a "progressively less familiar" area would suggest the likelihood of a period of piecemeal progress before any significant consolidation into a general theory will take place. The whole body of economic development theory will be gradually reappraised from within the underdeveloped economies and the relationship and role of the other social sciences to the furtherance of development ascertained.

Moreover, the ability of economists trained in the Western tradition to work effectively in underdeveloped areas has been questioned. Professor Seers concluded a discussion of this problem by stating that, "economists are of very little use working on the problems of underdeveloped countries until they have done so for some years, and then only if they are unusually adaptable." Professor Seers added that, "Economics is the study of Economies".<sup>5</sup> However, the impatience for development and the forces and fears of East-West competition cannot wait.

The considerable resources locked within Africa must be mobilized and this presupposes the adaptation of traditional institutions and relationships to meet the needs of the modern world. No longer is the impact of changes originating from without African society significant: the present emphasis is on the transition of indigenous patterns from within. "Inquiries into

5. Seers, D.: "The Limitations of the Special Case" in The Teaching of Development Economics edited by Martin, K. and Krapp, J. Frank Cass, London. 1968 p.5.

the nature of economic adaptability, and the significance of social mobility, should, I believe, form the basis of economic studies.... They can throw much needed light not only on the causes of the rise and decline of civilizations but also on the problems of all under-developed societies".<sup>6</sup> Frankel went on to stress that, "in every society the process of economic and social growth rests upon the emergence of new economic and social structures. These incorporate new patterns of personal relationships, new habits which co-ordinate the actions of individuals for the attainment of other ends - even if these ends be but dimly comprehended by the individuals linked together in the new productive structure."<sup>7</sup>

Frankel was one of the first authorities to stress the role of social or cultural forces in the process of economic development. Others writing at the time believed that their role was marginal if not negligible and some did not discuss the issue. More recently several authorities have regarded social and cultural factors as causal and decisive. Balogh in "The Economics of Poverty" went so far as to claim that social factors prevent the profit and price mechanisms from operating with anything like their effectiveness in developed societies.<sup>8</sup> Consequently, he concluded, any economic model assuming an efficient price mechanism will be misleading. Kindleberger, along with a few others, has sought a position which remains practicable in terms of policy and planning: "sociocultural determinism is no more likely an explanation of the course of economic development than is economic determinism in social history."<sup>9</sup>

The implications of the controversy for both policy and planning in the under-developed world are clearly significant. The majority of economists working in under-developed countries have accepted that development is not determined only by economic forces. They are increasingly prepared to pursue lines of inquiry that cross over into the traditional territory of other disciplines. Most of

6. Frankel, S.H.: "The Economic Impact on Underdeveloped Societies". Oxford 1953. p.10 and 11.

7. Ibid.

8. Balogh, T.: London.1966.

9. Kindleberger, C.P.: "Economic Development". New York.1966. p.38-9.

the social facets of development are capable of analysis in economic terms, if only because they manifest themselves in the form of market and regional imbalance, shortages of capital, underemployment, debt, security, or the lack of suitable complementary factors.

The staggering economic growth of much of Southern Africa has been made possible, in great part, by the entry of African labour into the money economy and by the expansion of the market that their entry has created. Without going into the costs and benefits of migrant labour and the restrictions placed on African participation in the money economy, it can be stated that one cost of great importance has been the fairly uniform depletion and in some cases even destruction of the ability of the Tribal or Bantu areas to support that part of the African population whose livelihood is not secured by or through employment in the towns.

More specifically, and dealing only with Rhodesia, the inability of the Tribal areas to offer employment opportunities commensurate with the expectations of African school leavers has increased the pressure on the slowly expanding job opportunities in the towns. The small internal market in Rhodesia has little prospect of providing the sort of growth that Rhodesia's future well-being will depend upon - both economic and social. Aside from any political significance bestowed on such areas, the necessary growth of the home market in Rhodesia must largely come from the increased agricultural productivity of these areas.

Before any dramatic improvement in the agriculture of these areas can be expected, the lack of farm management and farm economic studies will have to be tackled. Throughout Africa, Government extension and other efforts to promote agricultural development have met with little success largely because of the lack of relevant knowledge. The immediate need is for such studies to be undertaken in areas where there appears to be a considerable potential relative to the existing output if established and recommended farm practices are adopted. If the reasons for their failure to achieve something like the known potential can be revealed, dramatic rewards should be forthcoming in the short term

and areas of Government action which may help to improve the use of agricultural resources elsewhere could be suggested.

The disappointing performance of the irrigation settlement schemes for Africans in Rhodesia offered a clearly defined and accessible field for a study of this nature. The historical complications of the older schemes made their particular ills appear somewhat irrelevant to the aim of the study and a more recent scheme, Nyamaropa, was chosen. It was considered advisable, within the limits of resources available for the study, to concentrate solely on this scheme and to undertake a detailed though wide ranging enquiry.

In undertaking the thesis, my aim was to provide a study based on scientific fieldwork that combined both economic and social factors so that it would be more substantial than either a quantitative analysis alone or one supported by the impressions of experienced and interested persons whose views, while helpful, are certainly not enough and are often contradictory. Clearly, some of the social aspects were less accessible to scientific analysis than were others. However, the scope of the social study was limited to those areas which the collection of economic data and close daily contact with the farmers suggested were salient and germane to the material performance of the scheme.

The purpose of the study was threefold:-

To produce a quantitative economic analysis of an irrigation settlement scheme in Rhodesia.

To assess the forces of change in the community and their relation to any cumulative economic and social changes that the creation of the scheme set in motion; to reveal economic, social and institutional barriers to further progress and areas in which Government and other agencies can expect potentially dramatic rewards. A more qualitative approach.

To evaluate the method of fieldwork as an aid to a greater understanding of the economic life of the scheme and of the individual farmer; as a control over measurement and as an aid in the interpretation of the quantitative data.

It was in the spirit of Professor Tawney's injunction to economists to acquire "a stout pair of boots" that the fieldwork of the thesis was undertaken. I, an economist, went to live amongst my subject matter - African farmers and their families on an irrigation settlement scheme in Rhodesia - much as an anthropologist would have done. One pair of boots was not enough - I walked through three.

THE HISTORY AND POSITION OF IRRIGATION  
SETTLEMENT SCHEMES IN RHODESIA.

*"For I am all the subjects that you have,  
Which first was mine own King: and here you sty me  
In this hard rock, whiles you do keep from me  
The rest o' the island."*

*Caliban. The Tempest.*

There have been two phases in the history of African irrigation schemes in Rhodesia: the first phase was implemented in the 1930's and 1940's by Government and was aimed at providing a source of food in areas frequently hit by drought; the second was aimed at providing additional settlement areas for Africans removed from European areas in the 1950's under the implementation of the Land Apportionment Act.<sup>1</sup> Subsequently there has been a mixture of approaches centred on demands that irrigation schemes be evaluated on economic grounds. The failure of the existing schemes to cover current expenditure in the form of rent, or to service the capital expended let alone repay the capital cost, initiated this reappraisal.

The first Director of the Department of Native Agriculture in Southern Rhodesia, Emory D. Alvord, advocated the construction of irrigation schemes in the Sabi valley in 1928. As a former Missionary in the area he had promoted small-scale projects built by local African cultivators for their own use. Difficulties surrounding the allocation of water under Tribal arrangements prevented these efforts from materialising on any scale.

Initially the Department expanded these individual efforts to provide the wider area with a source of food supplies in years of drought. The costs of construction were intended to be offset by the alternative cost of transporting relief supplies from outside of the area. Roder found little data on the extent to which these schemes relieved food shortages and nothing to indicate the effect of the schemes on the region nor on the economic relationship of the plottolders to the dry-land cultivators.<sup>2</sup> Almost certainly migrant labour attracted the plottolders, though perhaps not to the same degree as among the dry-land farmers. Neither could Roder discover the relative importance of the

1. The Land Apportionment Act became law in 1930. See Brown K: "Land in Southern Rhodesia". Africa Bureau, London 1959.
2. Roder W. "The Sabi Valley Irrigation Projects," University of Chicago, Illinois 1965.

cattle. Plotolders generally had no more than two acres each and they invariably farmed on the dry-land as well. It would seem that the irrigated plots served as little more than insurance against drought for the plotolders and indirectly for the region.

Crops grown by the plotolders found no ready market except in times of drought and therefore a two acre plot could be no more than a form of security. It could not offer alternative employment since in normal or good rainfall years it would not be the source of a cash income. Migrant labour remained the only reliable and regular source of cash income. The plotolders were expected to farm as if every year would be a drought! As with farmers everywhere, African farmers share an optimistic view of each coming season and their failure in the Sabi valley to conform is understandable.

Policy changed in 1936 and pressure was put on the plotolders to devote their time exclusively to their plots on the projects and not to seek work in the towns as migrants. Wheat and beans were introduced into a compulsory rotation to promote cash cropping. Both rulings were difficult to supervise and enforce. The second ruling was soon abandoned as the results did not always justify the enforced costs. However, the rules had the effect of reducing the number of applications for land and a number of single women were given plots to justify the current expansion of several schemes.

In the second phase, the schemes gained prominence as a means of implementing the Land Apportionment Act. Amendments to the Act required that Africans resident in areas designated European be removed to tribal areas by 1955.<sup>3</sup> Irrigation projects were extended and a new project built to provide more attractive homes than did the available dry-land, characterized as it was by poor soil and unreliable rains.

A typical policy statement was, "It is considered that a very great increase in irrigation works intended for settlement by natives should be planned for. There is no other way of settling agricultural communities at sufficient density for a large population to be absorbed in a limited area".<sup>4</sup>

Roder quotes three other government reports in the period 1950-55 that reveal the willingness of the Government to ignore economic criteria in their determination to implement the Land Apportionment Act. Consequently those who settled in the period from 1950 to 1958 did so predominantly in order to secure land. The growing population allied

3. Chief Native Commissioner Report. 1950. p.1.

4. Report of Director of Irrigation 1949. (Sby Govt. Printer 1950) P.6 cited in Roder p.116.

to the forced resettlement of Africans in the tribal areas taxed the land and soil resources of those areas considerably. A plot on an irrigation scheme rose in value as an alternative to settlement in a dry arid region. This did not imply any desire to farm cash crops nor any willingness to improve one's lot beyond security. 38% of those settled on the Sabi schemes in 1960 had previously lived on land since designated European,<sup>5</sup> and undoubtedly many joined the schemes as a result of increasing pressure from over-crowding on the dry-land.

Until the introduction in 1958 of cotton and seed beans as commercial crops, the percentage of output by weight of cash crops sold never rose above 8% during the 1950's.<sup>6</sup> Wheat had rapidly become a staple food used in bread making and little was sold off the schemes. Maize had remained the major crop, seldom below 70% of all crops by weight. High yields should have given farmers a surplus of maize and wheat for sale, but it would appear that few farmers reached these levels of productivity. The figures for cash sales may be distorted in that the prices received by African producers from the official agents of the Grain Marketing Board (G.M.B.) were lower than those received by European producers as transport, handling and levy charges were deducted at source. There may therefore have been a small but not unimportant local "black market" operating at prices above the official price. There is a complicated history of attempts to find suitable cash crops so that Government could free the schemes from subsidy. The biggest problem for most of the crops attempted remained the dearth of local markets. Improved seed of a hybrid variety increased maize yields after 1950. This progress was not exploited by the farmers on every scheme, nor by all the farmers on any one scheme.<sup>7</sup> However, it did ease the pressure on the land for food crops and must have facilitated the successful introduction of cotton and seed beans in 1958. The introduction in 1959 of the first Producers Co-operative Society similarly facilitated the introduction of new cash crops.

In 1961, the Report of the Irrigation Policy Committee for African areas was presented.<sup>8</sup> The Committee's terms of reference related almost solely to the value of irrigation schemes as a means of accommodating the increasing African population in the existing Tribal Areas.

5. Op. cit. P. 118.

6. Ibid. Table for Nyanyadzi P. 127.

7. Of the nine schemes in the Sabi valley for which Roder compiled tables, two had yields above 18 x 200 lbs. bags of maize per acre, four of above 13 and three schemes between 5 and 12 bags per acre in 1961. The table was a collection of available information and not necessarily a correct average. Table 13, p. 132.

8. Ministry of Native Affairs. S.R. January 1961. Salisbury.

The report is important for it is the first official document that tackles the issue of subsidy or touches on the principles of tenure and the need to gain the acceptance of any future schemes by the settlers. The report rings with the then current optimism that Rhodesia's future lay along industrial lines. The report concluded that public capital must be used in the most productive areas first and that these were almost certainly in the industrial sector. Irrigation for African settlement must therefore be limited to cases where its returns would be higher than that of other forms of investment in African farming. The Committee felt that there was sufficient land in the tribal areas to support "all those who want to make a living from the soil to do so at advancing living standards without the need of subsidised irrigation".<sup>9</sup> This overall assumption presumed that employment opportunities on European farms would rise. In fact the break-up of the Federation and the effects of U.D.I. have emphasised the difficulties of providing increasing employment opportunities without a strong home market, in particular jobs within the range of African school-leavers aspirations.

There was no suggestion in the Report that irrigation schemes can have a demonstration effect on the region if the differences on and off the schemes are not too great to prevent improved methods from being adopted. Nor did the Report indicate whether the position in 1960 was a short term equilibrium or not. The Committee relied largely upon an Economic Investigation carried out in 1957/58.<sup>10</sup> The conclusion of this investigation was that the value of the output from most of the schemes was insufficient to cover either their maintenance costs or the depreciation on their capital cost. In other words, schemes were subsidised. The limited reasons for the occupation of the Sabi schemes, security of food supplies in an area frequently visited by drought and the later population pressure on the same arid land, make such results expected. Moreover, the difficulties surrounding the establishment of any permanent cash crop limited the great bulk of the schemes output to supplying subsistence needs. The earlier settlement of many widows and other single women on half-sized plots must have strengthened the subsistence orientation of the schemes.

There has never been any criteria applied to determine the size of a holding on an irrigation scheme. At Nyanyadzi in 1961 Roder found that half his sample had less than 3 acres and that half had from 3 - 6 acres. The women had either 1 or 2 acres.<sup>11</sup> There is no clearcut statement as to what size plots should be and why. The size of plot that has become "standard" over the years is 4 acres and for widows 2

9. Op. cit. p. 15.

10. Manicaland Irrigation Schemes, Economic Investigation. Salisbury. Dept. of Native Agriculture June 1958.

11. Op. cit. p. 169.

acres. It would appear to be an "historical accident" which seemed to meet both the requirement to achieve a high density of population and to encourage the adoption of more intensive methods than would have been necessary on larger acreages, certainly for subsistence crops. The Committee, being concerned that the schemes achieve a more productive level, suggested that the land should be allocated to the "greatest benefit" of the plotters once existing claims had been met. They suggested that better farmers gain the use of more land than poorer farmers, but they failed to discuss the form of tenure or the process by which a farmer may extend his holding.

The Committee held that the existing schemes had been built to settle landless Africans and therefore the onus of subsidising them fell on the Government, certainly until the schemes should become economically viable. The Committee was critical of the fact, as it understood the situation, that the schemes had been imposed on the former land users without their consent having been obtained. They stressed that future schemes should be built only after the land-users had consented. This presupposed that the majority of settlers would come from the immediate area. Further, the Committee recommended that no projects should be undertaken unless there was evidence that they would soon be capable of covering the maintenance costs and of servicing the capital. Economic criteria in the form of a simple input-output analysis was to be the basis of such decisions.

Roder concluded his survey of the Sabi schemes by referring to the effects that the changing goals and policy of Government towards the schemes had had on the settlers. "After resettlement the provision of irrigation in the typical case took several years, so that Africans had to carry on dryland farming on the four acre irrigation plots.<sup>12</sup> This served as a major deterrent to confidence in the possibilities of irrigation development. From the beginning of government development overestimates of resources were almost habitual. Such overestimates applied to the amounts of water available for irrigation, the safety from flooding, the suitability of soils, and the speed with which construction would proceed. Increasing control of the projects by government administrators as well as the enforcement of cropping systems and farming practices placed the peasants in a situation in some respects analogous to that of tenant farmers, without, however, the owner's financial interest in their success."<sup>13</sup> He also wrote, "To the extent

12. Without the right to additional land on the dry-land.

13. Op. cit. p. 137.

that understanding of Government aims was achieved by the better educated it did not tend to foster economic and social stability, since primary aims in the past pointed to objectives other than the cultivators' welfare."<sup>14</sup>

The Irrigation Policy Committee was thus forced to base its recommendations on a limited approach to irrigation development in terms of settlers, tenure, crops and marketing. The advent of successful cash crops and the beginnings of Producers' Co-operatives occurred simultaneously with their survey. The immediate benefits were dramatic. Cotton and seed beans occupied 7% and 19% of the land at Nyanyadzi in 1961,<sup>15</sup> the second season of their introduction and a year after the Committee's report. Roder concluded for the 1961/62 season that it may be assumed that incomes in fact rose (by an unknown magnitude but which may have been on the order of £30 p.a.) as a result of the introduction of new cash crops.<sup>16</sup> This was an increase of approximately 22%. The Producers' Co-operatives must have eased the sale of the cotton and bean crops and reduced the costs involved. They also provided a source for loans for farm materials. Along with their educational function in terms of enlarging the peasant farmers' understanding of and ability to tackle successfully the problems of marketing and of planning ahead the necessary inputs, their real impact must take some years to reach full realization and prove its significance. The gathering momentum of Producers Co-operatives in the service of African farmers attests to the vacuum that they have filled. It would appear reasonable, therefore, to state that the report of the Policy Committee on Irrigation appeared at a time when basic changes in the economic ordering of the irrigation schemes were taking place, the effect of which could not then have been taken into account.

Shortly after the Committee's Report and Roder's survey, the wave of nationalist feeling and activity reached a peak in several areas of Rhodesia.<sup>17</sup> The Sabi schemes, and particularly the older and more developed scheme, Nyanyadzi, were affected. It is sufficient for our purpose to state that there were incidents in which farmers who followed government extension advice were intimidated and a few suffered physical damage to themselves, their crops and their property. A promising start with burley tobacco was practically halted in this manner. Successive African nationalist parties were banned so that legal activities were possible for a few short periods only. In January 1966 when I visited Nyanyadzi conditions had improved. The main legacy of the

14. Ibid. p. 205.

15. Ibid. p. 130.

16. Ibid. p. 171.

17. Roder had some difficulty in gaining the co-operation of plot-holders, particularly on two of the schemes.

earlier disruptions was a more wary peasantry. They had been caught between co-operation with the extension and other services in attempts to further their own ends and the sympathy of some and the need of all to comply with politically virulent leaders, and the atmosphere was strained. The Producers' Co-operative Committee was dominated by "local politicians" who cared little for promoting its business functions. A year later the farmers at Nyanyadzi voted in a predominantly "farmer" committee. The election result was more than just a reflection of the quashing of the opposition movement by Government. The election of the "farmer" committee was heartening to Government extension workers as a demonstration of the ability of individual farmers, by use of the vote, to alter unsatisfactory conditions.<sup>18</sup>

Up until the survey in 1966/7 the Co-operatives were the only avenues for contact with Government and as such their elected committees reflected the current situation. In this respect the policy of establishing Local Boards under the Community Development programme must be approved since it will free the Co-operatives from business that is not theirs and leave them to cater to the farming interests of their members.

It was in this context then that an irrigation settlement scheme was built in the Nyamaropa Tribal Trust Area. The Nyamaropa Tribal Trust land lies on the eastern border of Rhodesia just north of the Inyanga mountains. The Nyamaropa may be likened to an arm-chair that faces north, the high back of which is the Inyanga complex. The eastern arm lies inside Mocambique. The Nyamaropa begins just before the escarpment that marks the abrupt end of the Inyanga mountains - the back of the chair - and falls into a broad valley that runs between the arms. The valley is broken by successive groups of hills that run west/east until they eventually form kopjies in the north. The southern half of the Nyamaropa is arable only along the sides of rivers, in small pockets and in a few minor valleys.

In the south, up against Inyanga, the land rises to nearly 6,000 feet. It falls quickly with pockets of arable land at 5,000 to 4,000 feet, then gradually slopes northwards until, after some ten miles, it drops to 2,777 feet at the site of the irrigation scheme.




On the escarpment the annual rainfall lies between 36 - 40 inches. At the top of the valley proper it is between 32 - 36 inches and on the scheme the rainfall borders that of the next belt, 28 - 32 inches.<sup>19</sup>

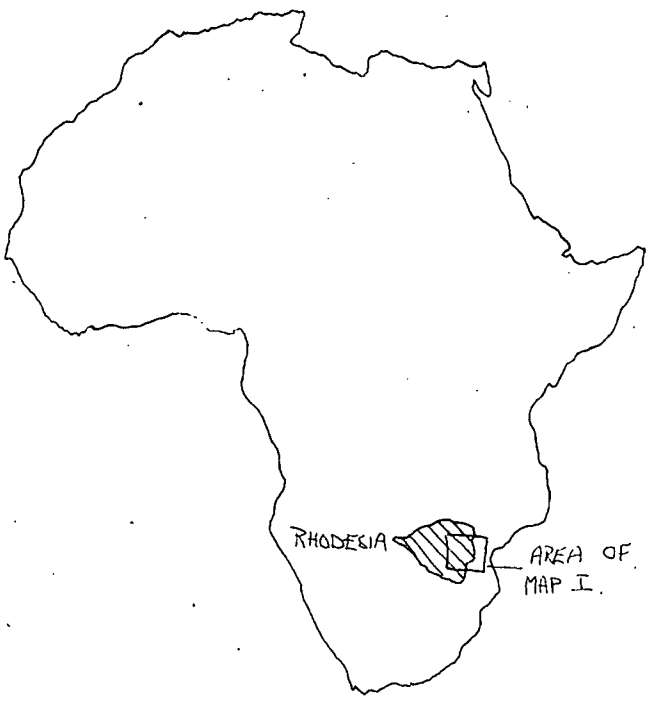
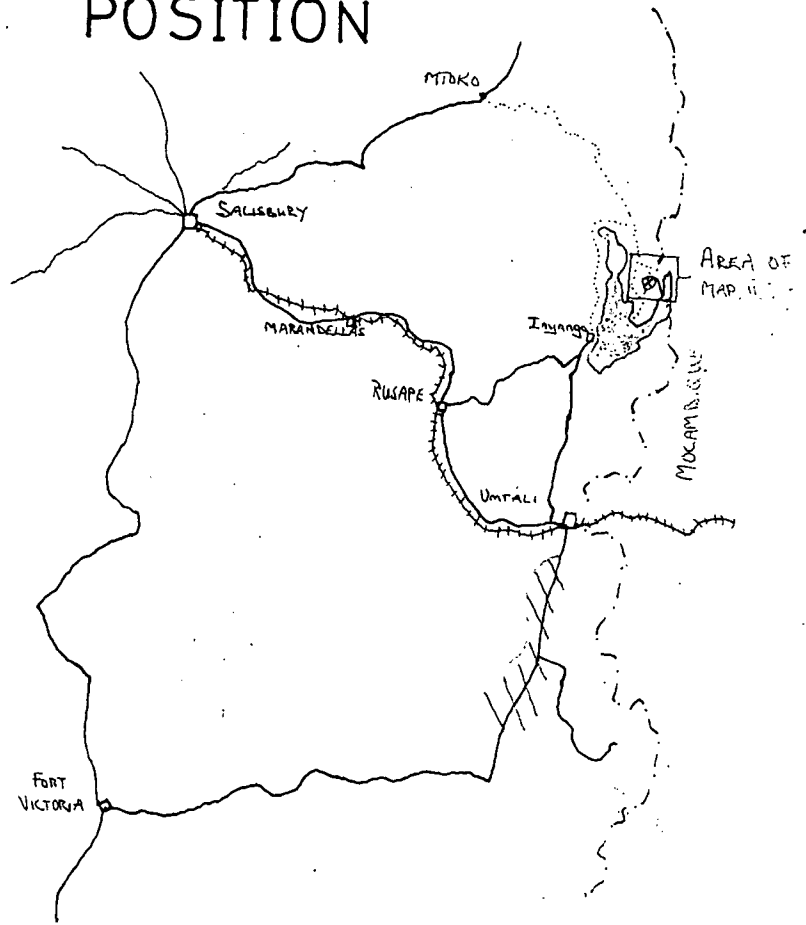
18. Such movements at the bottom of the Co-operative structure must be given encouragement at the National and Regional levels when the African Chairmen of the Co-operative Societies deal with Government.

19. Data: Average Rainfall map of Rhodesia. Government Printer Salisbury.

# MAP 1: THE SCHEME'S POSITION

## LEGEND

- MAIN ROADS ———
  - GRAVEL ROADS ·····
  - INTERNATIONAL BOUNDARY - - - - -
  - MOUNTAINS 
  - NYAMARIPA SCHEME 
  - AREA OF SABI SCHEMES 
- 0      50  
MILES



Just north of the scheme, the valley is classified as, "Area II  
B : intensive crop production supported by livestock. Cash crop tobacco production with strongly supporting intensive animal production on pasture (dairy, beef, sheep)." <sup>20</sup> This description does not fit the area surrounding the scheme. It refers to higher land which has large flat tracts of suitable grazing. The rough broken nature of the Nyamaropa has forced the people to grow food crops on areas more suitable for grazing. Cattle thus browse on the hill-sides, on small patches next to the rivers and, after harvesting, amongst the maize stalks and the stubble of other minor crops.

The area in which the scheme falls is composed of Paragneiss and Umkondo sediments. Mainly under highly deciduous mixed bushland (a combination of shrubs and trees - usually poorly grown - with grass, often of annual species, a fairly conspicuous part of the vegetation). Temperatures are generally hot, 70° - 75°F. On basic gneisses: brown, slightly reddish, sandy loams. The low altitude of the scheme and the warm winter days means that there is little or no frost and crop germination can be expected to be good except in late May, June, particularly July, and August.

The valley has one main river, the Gairezi, and three tributaries, the Nyanambue, the Morosi and the Nyaruwaka. The Gairezi rises on the slopes of the Inyangani, the highest mountain in Rhodesia and the centre of a high rainfall area, and flows down the eastern edge of the Nyamaropa where it forms the border with Mocambique. The Gairezi flows strongly all year round and the greater part of its course through The Nyamaropa is along narrow fertile valleys which are fairly heavily populated. The three tributaries rise in the range of mountains to the west and flow eastwards across the valley to join the Gairezi. Their catchment area is quite small and consequently they tend to dry-up in the months October-December. Villages are concentrated along the sides of these rivers. The encroachment of crops to the edge of the river banks and cattle grazing in marsh land has caused the tributaries to flood readily and has weakened their flow during the dry-season.

Until the end of the Second World War Inyanga had been little developed and The Nyamaropa beyond it had had virtually no contact with the outside world. The earliest settlers were Tongas, descendants of whom still live in the area and form the majority of the people. They came into Rhodesia from Mocambique before the end of last century. Stories are still told of raids into The Nyamaropa ("place of slaughter")

20. Agro- Ecological Survey of S. Rhodesia.  
Govt. Printer Salisbury

by Manica chiefs from round Umtali and Rusape and by a tribe who lived on the other side of the mountain range inside Mocambique. Until the mid-1940's only police patrols and other government agents visited the area and as there were no roads they travelled on foot or on horseback.

Soon after the war The Nyamaropa became of interest to government as an area in which to resettle Africans moved off "white" Inyanga under the Land Apportionment Act. A rough road was built down the escarpment and north through The Nyamaropa to meet a similar road south from Mrewa/Mtoko. The Nyamaropa was then sparsely populated. The people who were moved off Inyanga settled first on the high ground bordering Inyanga in the Southern corner of The Nyamaropa valley. Others moved to new homes close to Regina Coeli, a Carmelite Mission, and St. Lukes, an Anglican Mission, both established in the early 1950's. Consequently the area was divided into pockets according to the origin of the inhabitants. Government guided Africans seeking to open stores and mills to The Nyamaropa in order to provide the new settlers with facilities. As a result the majority of stores were owned by recent settlers.

The original inhabitants and the new settlers differ in certain significant respects. The settlers have histories of contact with the "modern" sector of Rhodesia, while the original inhabitants have little or none. Until the 1950's few had left home to seek wage employment. Since then the number has greatly increased, but their lack of education and experience confined most of them to lower paid jobs on European farms and homes or to employment as labourers. Few stayed in wage employment for long, though there were exceptions. Two exceptions that I observed were Sanyamaropa and Myros, the Headman and Messenger of the villages that surround the scheme, both of whom worked in South Africa for 12 and 18 years respectively. Myros never returned to visit his home even though he had married before leaving.<sup>21</sup> Neither their huts nor their possessions offered evidence of their long sojourn in the money economy. In fact Sanyamaropa told me that he had worked for what money he then had and that his savings plus his monthly allowance as Headman were to be spent on himself, mainly for drink. The separation of income for the benefit of the earner was common amongst the original inhabitants who until recently had neither supported education nor sought to satisfy felt needs to the extent that the new settlers had. Traditional forms of wealth - cattle, other animals and the subsistence crops - were distributed according to custom. Sanyamaropa regarded the division as perfectly sensible. However, one important result was that the women in the villages sought work on the scheme when not busy on their own

21. On returning, he found that his wife had six children. Myros explained to me that under tribal law her progeny were his children; besides, he queried, had he not been away for so long?

farms in order to earn cash that they could control themselves. The villagers were mainly descendants of the early Tonga inhabitants of the area, though two or three Manica men had married and settled amongst them. The village was really one large family, held together by numerous marriage relationships which extended back several generations. Few had had any contact with the Missions so that their traditional religious life remained virtually intact and few of their children had been to school for more than two or three years. Roughly 45% of the adult men worked in town and of these few earned above £8 - £9 per month.

The Nyamaropa irrigation settlement scheme was planned in the mid 1950's and constructed from 1956 to 1959. It thus falls just outside of the era of constructing irrigation schemes for the settlement of Africans forced off European land. The decision to build the scheme was not easily taken for the failure of the Sabi schemes to free themselves from subsidy was a matter of concern. It would seem that the decision to build hinged on the opinion of certain officials that this particular scheme would be worth-while. Engineers of the Department of Water Affairs, were impressed by the near perfect valley for irrigation and by the good soil.

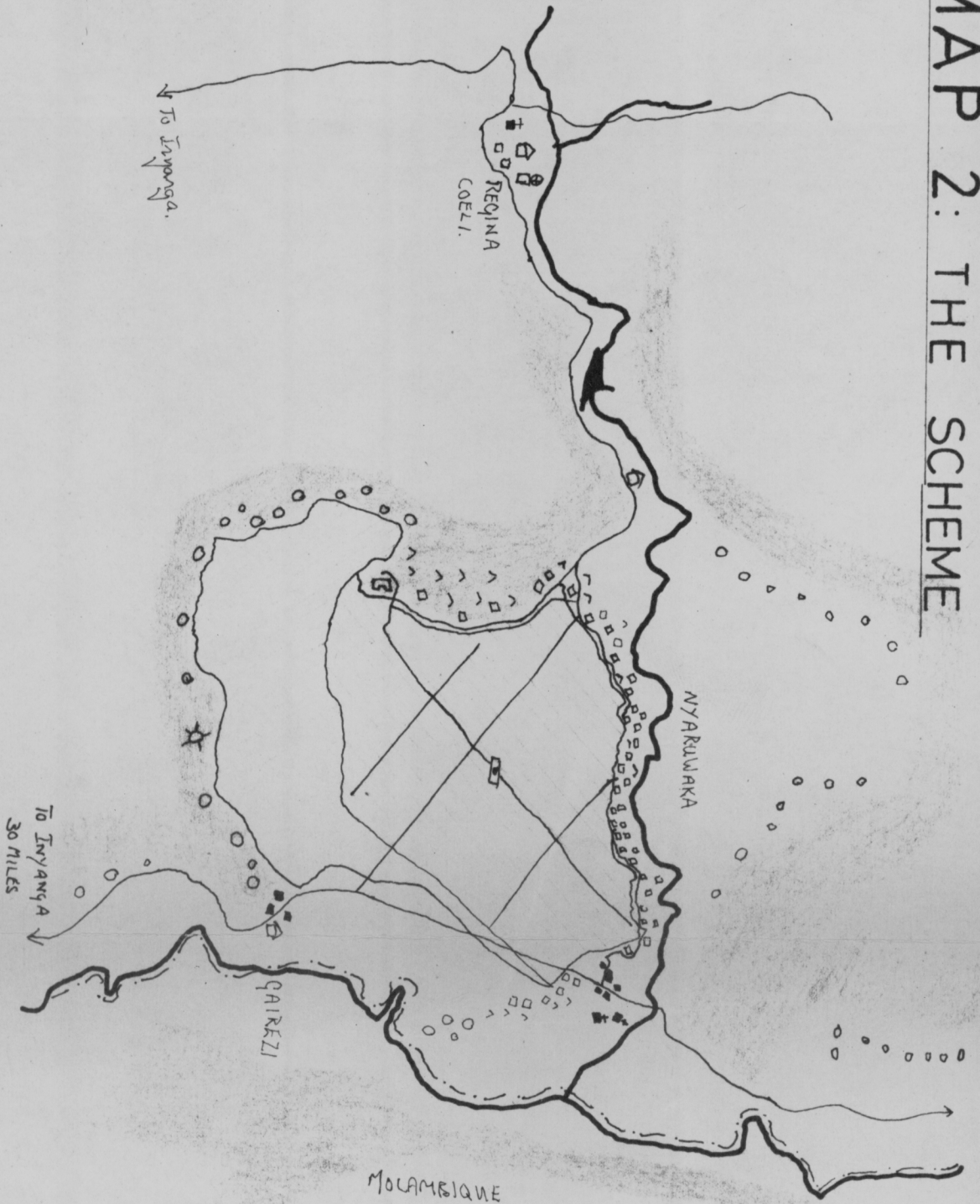
Many officials were sceptical as to whether the scheme would ever be able to pay for itself. Their argument was based on the experience of the Sabi schemes and bolstered by the fact that the farmers would have to meet high transport costs as Nyamaropa is 110 miles from the nearest railhead or from towns of any size - Umtali and Rusape. More than that, the road was not at that time macadamized for more than a small fraction of the distance from either town and during the rains the section that traverses Inyanga was often impassible to heavy traffic. From Inyanga down to Nyamaropa, a descent from 6,800 feet to 2,777 feet, the road had not been constructed for heavy traffic and additional expenditure would have to be incurred for re-construction if a decision was taken to build the scheme. Opposition was overcome largely as a result of the Chief Engineer's enthusiasm for the site.

The scheme filled a valley the land of which formerly belonged to one village. This village, whose Headman is traditionally called Sanyamaropa, consisted of a line of huts which ran along the side of the hills to the south and south-west of the valley. The kraals were situated there because the northern half of the valley had been forested and not used for cultivation.

#### The History of the Nyamaropa Irrigation Scheme.

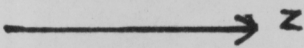
The following account of the first five years of the scheme's life prior to the survey is based on a large number of conversations with Government personnel, the tribal authority and the farmers. It aims only at presenting the major forces which shaped the pattern of

# MAP 2: THE SCHEME



- LEGEND.**
- VILLAGERS' KRAALS.
  - ☉ SANYAMARUPA'S KRAL.
  - ▨ VILLAGERS' FIELDS INSIDE THE SCHEME.
  - ▧ AREA OF SCHEME SETTLED.
  - BRICK HOUSES
  - △ HUTS
  - STORE
  - ⊕ CHURCH.
  - ⚪ SCHOOL
  - ⚪ HOSPITAL
  - ⚪ Co-operative
  - ⚪ RIVER
  - ▴ DAM
  - ▭ HILLSIDE.
  - ⚪ L.D.O.'s RESIDENCE.

ONE MILE



settlement, the relationship of the scheme to the surrounding villages<sup>22</sup> and of the farmers to the administration.

The early development of Nyamaropa is the story of individuals: much as the early years of the Gezeira scheme as related by Gaitskell were dominated by individuals. It was an African Demonstrator who first noticed that the valley was suitable for irrigation. His initiative and enthusiasm carried the idea through successive hierarchies until it was adopted by the senior Irrigation Engineer of the region. This man headed the team which built the scheme and he lived for many months on the site. He had a strong, likeable personality and he gained a large measure of co-operation from the local villagers whose land was to be affected. Many of the villagers worked as labourers on the scheme. A few villagers were promoted to the position of "boss-boys" and received more pay and enhanced status. The village headman, Sanyamaropa, was, for a time, a boss-boy.

The completion of the scheme in 1959/60 coincided with a period of more active African nationalism in Rhodesia. At Nyamaropa the nationalists whipped up opposition to the scheme as a "government" project and therefore an easily identifiable object. By this time the first settlers had been established on the scheme. Among these were several of the villagers who had worked on the construction of the scheme and a few of the more qualified builders, peggers and boss-boys who had been brought in from outside. The engineer's enthusiasm for the scheme and his close identification with its existence and initial progress played a major part in the decisions of members of both these groups to join. To encourage further settlement Government took fifteen local village leaders and store-keepers from the wider tribal area to visit Nyanyadzi in order to see what an irrigation scheme could become. Twelve or thirteen of these men decided to join the scheme and with the other two groups became the founding settlers.

The following year Nationalist activity grew but it did not affect life on the scheme. The first Land Development Officer (hereafter L.D.O.), the extension and administrative officer, for the scheme was chosen by the engineer. As the hand-picked successor to the "father" of the scheme, the L. D. O. quickly won the confidence and friendship of the farmers. Certain facts of his tenure at Nyamaropa stand out. He settled in what was a remote area with his wife and young children: this several farmers described as a sign of his commitment to the scheme. He spoke Shona. He was willing to dirty his hands to demonstrate what he preached. He

22. Village and villagers are used throughout in the generic sense. In fact while each household lived separately, together they formed a residence unit, more accurately termed a kraal, in which was grouped the extended family. On the scheme, without exception, the families were elementary and they are referred to as the farmers.

was friendly and approachable and happy to wander on his own around the scheme and among the stands on which the farmers' houses were built. In a young and still small community this treatment of the African farmers as individuals and at a personal level by a European officer made a big impression and was influential in causing the early settlers to encourage their close relatives and fellow church-members to join them on the scheme.

The results of the main crops, maize, cotton and seed beans, were generally good largely because the Extension staff were able to draw on experience gained on the Sabi schemes. Some farmers reached optimum levels in terms of yields and grades and the scheme's cotton crop in the years 1962-5 was comparable with the best in Rhodesia. The virgin soil and the comparative freedom from disease and pests helped to promote the satisfactory results. As on all the Sabi schemes there were distinct groups of farmers in terms of standards of farming. A few progressed little beyond subsistence farming and showed a lack of interest in and an inability to manage their cash crops. The majority of farmers achieved satisfactory results and the results of a few were outstanding. While most farmers' standards improved, some farmers dropped recommended practices for no apparent reason. Officials and even the African Supervisor began to fear that the level of wants and the value on leisure were such that many farmers were prepared to forsake income for leisure.

Inherent in the ideal conditions and good seasons which marked the first years of the scheme were two dangers. The farmers had no demonstrable reason to concern themselves with replenishing the soil and practices relating to disease prevention were not, apparently, essential and so were not readily appreciated or followed. Unlike the Sabi schemes where a nominal water rate of £1.5.0d. per acre had been charged for some years, at Nyamaropa in order to induce people to join no fee was charged. This policy decision was affected by the Nationalist activity. It was felt that water rates would provide ammunition for the Nationalists who may have smeared the plottolders as dupes giving money to Government for the use of land which belonged to the people. As many of the settlers had come from outside of the immediate tribal area they could be termed "agents" of Government in that they were utilizing the land of people to whom they did not belong but who were, in national terms, brothers or fellow-people.

The local headman, Sanyamaropa, had acted as a boss-boy and had favoured the scheme at the time of its construction. He died just after the scheme's completion, when Nationalist feelings were growing in the area. The man who by customary law had the first claim to his office was known by the Government to be a Nationalist. In the area he was identified by the people as a leader of the opposition group to the

scheme. The group had, apparently, contacts with Nyanyadzi and the other Sabi schemes. From them they learnt of the vagaries of government policy over the years, in particular the provision under the Native Land Husbandry Act that destocking be enforced until the density of cattle and other livestock equalled the carrying capacity of the area. The policy was only implemented on some of the Sabi schemes. On other schemes it proved impossible to obtain the co-operation of the plot-holders.

Grazing has been the most difficult problem to solve on the Sabi schemes and remains a source of friction between the administration and the plot-holders whose interests differ, and even between the plot-holders and the people occupying the surrounding dry-land whose land is invaded and grazed by cattle belonging to the plot-holders. At Nyamaropa the threat of de-stocking and the invasion of cattle into grazing areas beyond the confines of the scheme added a real fear of the consequences that might flow from the new scheme.

Government exercised its prerogative and appointed as the successor to the office of headman, "Muchinda", the major claimant's brother. The action thwarted the people in their right to selection and, while the brother acceded to the office, the major claimant enhanced his leadership of the opposers of the scheme and of their cause. In this he was supported by several Kraalheads, three of whose village land had been absorbed into the scheme.

In 1962 the leader of one of the two African Nationalist parties, Joshua Nkomo, visited The Nyamaropa. Everywhere he went he was accompanied by the Police and from all accounts he said little that was directly inflammatory. He had a private meeting with Sanyamaropa. However, his visit gave impetus to the Nationalist movement which till then had had no general following.

The settlers on the scheme were thus placed in an uncomfortable position. As Africans the rising tide of Nationalism demanded that they either abandon the scheme or at least refuse to work with the administration. Reactions to the situation differed among the settlers. Those whose original homes were in the surrounding villages sought to gain support from friends and relatives for the scheme. In 1960 and 1961 they continued to follow the round of beer drinks and ceremonies of the villages. From their accounts this was not always easy. As voices rose and excitement grew with the beer and dancing, so a careless word or two might start an argument. Occasionally it got out of hand, and the plot-holders had to beat an embarrassing retreat. The stigma of turncoat was heard and, though muffled, it wounded. This group of settlers were forced to adopt a negative attitude to the benefits that the scheme offered. Their predicament forestalled any radical improvement in their physical well-being that would demonstrate their positive affiliation to the scheme.

The majority of the settlers, who had come from outside The

Nyamaropa, chose to have little or nothing to do with the villagers. They justified this in terms of their being church members, which few villagers were, and in that they were too occupied on their plots to afford the time. Among them were three men who professed to being Nationalists but who found their settlement on the scheme a hindrance to their full acceptance by nationalists off the scheme. Their predicament is remembered by some plot-holders as amusing and their final affirmative stand in favour of the scheme is regarded as a proper reconciliation.

The plot-holders feared physical and other violent acts. The physical they sought to avoid by keeping to themselves on the scheme. Their real fear was that their thatch homes would be set alight at night. Against such activity there was little that they could do. Two houses built at the time, one by a store-keeper, had asbestos roofs. They were in imitation of the houses built by the Public Works Department for the Demonstrators which were constructed with asbestos walls and roofs on a concrete base using steel pillars. However, the expense involved excluded most from taking the same precaution.

The administration became concerned for the safety of the L.D.O. and his family and he was transferred. In his place they appointed a bachelor who adopted the practice of "camping" in the L.D.O.'s residence during the week and living up at Inyanga over weekends. Many of the plot-holders doubted that anything would happen, and from their accounts there was a short period in which tension declined. The people were generally becoming bored with the nationalist's boldness of speech and the initial compliance with their demands was weakening in favour of a return to normalacy.

The Nyamaropa differed from many tribal areas in Rhodesia in that it was not as yet over-populated and did not yet face serious problems of erosion and low productivity. In the more heavily populated southern area the rainfall is such that an irrigation scheme held no great appeal to the inhabitants in terms of security. Few had knowledge of the Sabi schemes or of African cash farming in general, and did not regard the scheme as a possible source of cash income. They therefore had no interest in it except that it occupied land that belonged to one of the villages with whom they had both blood and political affiliations.

Throughout the lull in hostility towards the scheme the nationalist leaders in Salisbury maintained pressure on the local nationalists to act against the scheme. By doing so the local leaders felt that they would reinstate themselves and demonstrate their seriousness as nationalists. The Unilateral Declaration of Independence on the 11th November 1965, sparked off the attack on the scheme.

The "attack" involved a small group of men from three villages adjacent to the scheme and one farmer from the scheme. The most notable feature was that they did not intend to do more than destroy public or

government property. They fired the wooden construction at the market place in the centre of the scheme and they rather half-heartedly attempted to burn down the L.D.O.'s residence on a night when they were certain that he would not be there. The "attack" was thus more of a demonstration, the mildness of which seems to have been dictated by the lack of widespread support for such violence. The lack of support was confirmed by the comparative ease with which the Police obtained knowledge of those who were responsible. Among them was the major claimant to the position of headman of the village most affected by the scheme.

Territorial troops were sent into The Nyamaropa to prevent any further incidents and as a show of Government's ability to provide law and order. The presence of the troops was generally welcomed as they brought stability to the area. Those responsible for the "attack" on the scheme and other "agitators" were arrested and detained under the Emergency Laws operating at the time. I found that the African police constables enjoyed friendly and even constructive relations with the inhabitants of the area: a testimony to the inhabitants general support for their action. One unhappy incident marred the whole operation, but did not rouse any lasting ill-feelings. A white trooper, while cleaning his rifle, accidentally triggered it off, killing the mother of the headman, Sanyamaropa. Everyone feared a nasty reaction, but nothing followed.

The situation in The Nyamaropa at the start of the survey in March 1966 can be summed up as follows. Since 1961/62, settlers on the scheme had become increasingly wary of their relations with the adjacent villages amidst growing fears of the nationalist opposition to the scheme. Settlement after 1961, by the inhabitants of the adjacent villages was hindered. It is doubtful that many would have wished to settle as the scheme appeared to them to offer nothing substantially better than did their holdings, except more work and closer supervision by government personnel. Those who had settled in the first year of the scheme's life had done so through contact and identity with the scheme from having worked on its construction and through knowing and liking the Chief Engineer.

The settlement of the scheme proceeded without any significant falling off of the early joining rate because, through family and church initiative, settlers came from outside of The Nyamaropa. These settlers came to the scheme for reasons, to be elaborated later, which were more promising for the scheme's future than the limited reasons of security of water and the pressure of population on arid soils that induced people to settle on the Sabi schemes in the 1940's and 1950's.

The opposition had somewhat crystallized the two major groups of settlers, the locals and those new to the area, and had made communal cohesion difficult, even in the face of what would appear to have been a mutual problem.

The plot-holders at Nyamaropa looked to Government to continue to

support the scheme in the spirit of the early administration. At the same time they shared some of the widespread uncertainty concerning Government's true intentions regarding the scheme.

They tended to consider themselves as being superior to the villagers and continued to refrain from actions which would recognise the jurisdiction of the local tribal authority over the scheme. In this they adhered to their church membership which taught them a dislike for pagan practices, and, for members of three denominations, a denial of traditional medical practices and an abstinence from liquor. The absence of any local political or administrative board, except the Producer's Co-operative which was formed in 1964, left a vacuum which the Kraalheads resident on the scheme partially filled. The Kraalheads, who had a minimal jurisdiction over the farmers living near their homes, were the junior representatives of Sanyamaropa. Though they were treated with the respect due to both their office and their age (they were all over 50), their hold over their "people" covered only a few infringements of traditional custom that the churches or the administration did not regard as their rightful concern. The Kraalheads' ability to provide leadership was severely limited by their indentivity with the "opposition" tribal political structure and their difficulty in resolving their position. The kraalheads' potential value to the scheme, should the split between the villagers and the farmers be resolved, lies in their acceptance on the scheme as fellow farmers and the place they occupy in the tribal structure which could bridge the boundaries of the scheme to the wider political unit. They should represent a development out of the traditional order.

Only half of the scheme was taken up. The southern half, lying under the village of Sanyamaropa and his people, remained farmed by them as before. Their land could quite easily and quickly be serviced by the canal system and brought under irrigation. It is not clear that they ever agreed to join the scheme; in fact the Irrigation Policy Committee which reported in January 1961 - just after the start of farming at Nyamaropa - stated that all the existing schemes "were undertaken either without consulting the land users or without giving the land users opportunity to confirm or reject the scheme."<sup>23</sup> Nyamaropa had been under construction for some years previous to 1960 and since no mention is made to the contrary, their statement may be taken as applying to Nyamaropa. Certainly the villagers never replied to my enquiries other than that they disagreed with and disliked the scheme. The early settlement of boss-boys drawn from outside and the waving aside of regulations limiting settlement to local tribesmen registered under Inganga suggests that those responsible for the scheme in 1959/60 realised the need to attract settlers from further afield. The villagers regarded the farmers on the scheme as foreign-

ners. The loss of their grazing land remained their main bone of contention. The District Commissioner had tried on several occasions to persuade the villagers to join. During the survey a new "push" was attempted which failed: it ended in a final threat that if the villagers had not chosen to join by the next season they would be moved off and, since no land remained on which to settle whole villages, they would have to find alternative land themselves. There was no sign that they would budge. However, some may have joined the scheme if the threatened water rates and rent had not been introduced and if they were satisfied that they would not become tenants subject to the will of Government. If a few had joined it would have been likely that the bulk of the remainder would have followed, leaving a few to move elsewhere. However, water rates and rents were introduced in a low first instalment in 1968, and the change to administration by a full time manager under Internal Affairs (1968) may well lead to a tightening of both the rules and their enforcement.

#### The Choice of Nyamaropa for the survey.

A vast potential for irrigation exists in Rhodesia. Most of the potential will have to be realised in the form of large schemes served by expensive capital construction works. Experience with irrigation schemes for Africans in Rhodesia, after thirty years, offers neither a clear nor an optimistic picture as to the part Africans may fulfill in harnessing the potential. The Sabi valley schemes cannot provide a useful basis for future decisions as their evolution has been founded on non-economic criteria, subsidy, a lack of tenure arrangements and an inadequate institutional framework. Economic and social transformations in progress in Rhodesia suggest that schemes built in the late 1960's and 1970's will attract settlers with different needs and aspirations from those attracted by the Sabi schemes between 1930 and 1955. Nyamaropa, completed in 1961, promised to approximate more closely the social and economic milieu which could be expected to govern schemes to be built in the near future.

The pattern of settlement at Nyamaropa holds promise as a significant precedent. The settlers were "self-selected" in that they surmounted a barrier to settlement that local opposition created. It seemed probable that a study of the aims and abilities of the farmers at Nyamaropa could offer pointers to future patterns of selection and could outline the administrative and institutional framework required to assist schemes to reach their potential.

Unlike the Sabi schemes where relations with squatters and with the surrounding villagers were complex, life on the Nyamaropa scheme retained a fair measure of independence from the surrounding area. The measurement and description of activities on the scheme seemed therefore likely to be less complicated at Nyamaropa.

Nyamaropa had begun with two successful cash crops, cotton and seed beans. There was therefore no legacy of a "limited" past which still affects the Sabi schemes. Moreover, by the time of the survey the initial teething problems of the scheme had been solved. The scheme was then six years old and coming of age. Restrictions on its development were emerging that were more intractable. Among these were the limitations of the institutional framework, the lack of any tenure, the strength of groups relative to any communal cohesion, the difficulties surrounding labour, the relations with Government and with the surrounding area, the uncertainty over the supply of water and the frustrations of some in not seemingly being able to realise their aims or even meet their needs. The long run success or failure of the scheme seemed to be hanging in the balance. This study sets out to address itself to these factors inside the framework of a quantitative economic survey that in its method aimed at enabling a qualitative element to be included so that the forces operating to further or to hinder the development of the scheme may be identified and given their due weight.

THE FIELDWORK AND ANALYSIS.

*"I like the way things add up. Five shacks make one street. Four streets make one block. Ten marbles made one pocketfull. Wild figs made Ma smile. Two feet make me run. I guess if you can add, you can make sense out of most anything."*

*Runyararo Chirewa (schoolboy)*

The introduction of the survey to the plot-holders caused some apprehension in view of the recent "attack" on the scheme and the occupation of the area by the army. The first task was to establish that the survey was not a Government affair and that none of the fieldworkers had any connection with Government. Rhodesia at the time was in a state of emergency and entry to Tribal Areas was by permit.

Through the University College in Salisbury I met Mr. Cornelius Bganya who had worked under R.W.M. Johnson on a similar survey.<sup>1</sup> Cornelius joined me. His previous experience and his acquaintance with the tribal court and its procedures through his father, who is a chief in the Charter district, made him invaluable.

We first visited Chief Sawunyama under whose authority The Nyamaropa falls. His village is on the Western side of the hills that run North from Inyanga and he is geographically somewhat cut off from The Nyamaropa which lies on the Eastern side of the same hills. Consequently his influence in The Nyamaropa is not great and the Headmen there enjoy a larger measure of autonomy than is usual. He listened to our explanation as to who we were and what our purpose was. After asking a few questions and reminding us that Sanyamaropa must approve both us and our purpose before we could begin the survey, he agreed to send a message to Sanyamaropa to say that he found the project acceptable.

The next day we motored down to the scheme and went to Sanyamaropa's village. We were both a little tense since, according to many accounts, he was difficult and, in line with his villagers, opposed to the scheme. His wife informed us that he was nearby and that a child would be sent to call him. We waited a while looking down on the scheme that half-filled the valley below with neatly ordered strips,

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1. R.M.W. Johnson. An Economic Survey of Chitowa Native Purchase Area, Mrewa District, Southern Rhodesia. Technical Paper No. 18 University College of Rhodesia and Nyasaland. Dec. 1964.

the hope that we, coming from the University, could help them with problems related to their individual farms and to the scheme. The committee members were particularly keen, and two of them, the Chairman and Vice-Chairman put themselves in the position of near-sponsors of the survey. In the preceding three days we had seen a lot of these two men and had begun what were to become real friendships. They saw in our particular interest in the scheme an opportunity to further, not themselves in office, but the scheme in directions that as yet no group had been able to steer it.

The decision as to what procedure should be followed in selecting the sample proved fairly easy to make. The Supervisor had a map of the scheme which we borrowed. We then walked with the Vice-Chairman round the stands on which the houses were built. He knew the owner of nearly every house and usually when the owner had joined the scheme, where he had come from and, if a church member, to which church he belonged. The plots were strung out along two sides of the scheme and so it was not difficult to jot down the details in a long list with three columns: when joined; home area; church. The list showed that in each column there were distinct groupings. This assured us that a random sample of every fifth plot would be representative. The Supervisor informed us that nearly 20% of the plot-holders were widows. This was a fairly high figure and was similar to the position on the Sabi scheme. It seemed wise to include widows in the sample since they were clearly important to both the level of operation of the scheme and to family and even community life. At the time of the survey every available plot had been taken up and the population since the year before had stabilised at 250 families, 50 of whom were widows.

The biggest sample that could be satisfactorially handled by one fieldworker and two assistants was considered to be 50 families. If a third assistant could be employed store-checks and other field activities could be included in the survey. <sup>2</sup>

The one concession to personal choice that was made was to include in the sample the Chairman and Vice-Chairman. They expected to be included and their championing of the survey made it sensible in order to win the support of the others. These two men lived near each other,

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2. At the time, the application for a grant from Government was being considered. Had it not materialised the two additional assistants could not have been employed and the survey would have had to be drastically cut, particularly the size of the sample.

access roads and canals. To our consternation Sanyamaropa appeared carrying a shot-gun. He went up to his main hut, talked to his wife who went off, and then sat down some distance from us, the shot-gun resting across his knees. He remained thus for some minutes. Fortunately, Cornelius was able to explain that we had to wait for Sanyamaropa's messenger before the meeting could begin. When the messenger arrived, a man with a disarming smile, the meeting began. The first twenty minutes were spent in polite pleasantries and an account by Cornelius of our visit to Chief Sawunyama. At the end of this exchange the atmosphere was cordial. We then stressed our independence of any organisation save the University, and explained our purpose. From our knowledge of the recent history of the area we expected that Sanyamaropa would be suspicious of a survey that brought recognition and an interest in its permanence to the scheme. However, he appeared flattered that we should have sought the acceptance of the Tribal Authority first and, content that the survey was not concerned with his villagers, he recommended that we approach the plot-holders and promised to send them a message announcing his support of the survey.

Cornelius was distantly related to one of the Demonstrators, and was able to stay with him. I drove the six miles to the Carmelite Mission, Regina Coeli, and introduced myself. As I had hoped they invited me to stay there for as long as was necessary.

The next day we began a series of meetings. First with the Chairman of the Producer's Co-operative, then with the Co-operative Committee, and two days later with all the farmers at a general meeting convened by the Co-operative Committee. At each I explained the need for such a survey and the benefits that would flow from it. I stressed our independence and the confidence with which the information would be treated. Cornelius then recounted the surveys on which he had worked and explained in more detail what information was wanted and how we proposed to collect it. The general meeting went on for some time until the farmers were satisfied on most counts. Our explanation that a sample would be used helped them to reach an agreement that the final decision must rest with each family selected. There was a proposal by some farmers to allow those prepared to co-operate to sign up. In reply we explained the aim of a sample and that, while working with the most willing would be easier, it would defeat our purpose. The final trump card in gaining their agreement to our planned procedure was our explanation that we could go to another scheme. We stressed our belief that Nyamaropa was unusual and more useful for the purposes of a survey which we hoped would contribute towards the success of irrigation schemes in Rhodesia. At this the farmers showed increased interest and several pressed for a quick agreement from the meeting. Hindsight suggests that the farmers were motivated by a desire to gain recognition for the scheme and for several farmers

and so the selection of every fifth house began at their stands. On the completion of our walk round the stands we had the 41 families wanted, but only six widows. On retracing our steps we found that many widows lived so close to their families that it was not always clear that the buildings in fact occupied two and not just one stand. Three widows were selected at random by stopping farmers on their way home that evening in three parts of the scheme and asking them to introduce us to a widow.

The next two days were spent trying to contact the families whose stands had been selected and discreetly marked with a chalk x so that we could find them again.

During the first week we had kept an eye out for a suitable site on which to build houses. The little money that could be used for the venture in the end determined the site. There were two sites amongst the farmers houses that could have been used. To build on either of these would have meant building a brick house comparable to their own and which this would have taken time and cost up to £40. Besides each assistant would have required a house and the final figure would have been considerably higher. If a market for housing had existed so that at the end of the survey I could have sold and recouped some part of the outlay I would have built on these sites. No such market existed. The site chosen was at the end of the farmers' houses, just over a small hill overlooking the Gaerezi River which formed the border with Mozambique. The problem of water was thus solved. Unlike the Nyaruwaka which flowed past the other two sites as a murky slow flowing stream, the Gaerezi was a large mountain river, clean and fast flowing. On the site three very rough huts were built for £21.

Our decision to live at the end of the farmers' houses added to the distance that we had to travel each day, particularly when working on the western side of the scheme. We each had a bicycle and I frequently used the car. To save unnecessary travel each assistant looked after families whose houses were in one area. During the year I worked with the majority of the sample for some period. A few families preferred to remain with a particular assistant and this was allowed. To collect general data as for example on property and capital equipment, we worked together as a team.

Cornelius spent the next two weeks in furthering his acquaintance with the members of the sample and in enlarging on what was required of them and why. I returned to Salisbury to collect the forms from the printer and to find a second assistant.

The second assistant, Mr. Casper Chorume, left Salisbury within a few days to travel to Nyamaropa and was introduced to the farmers by Cornelius before any real work began. The period of growing acquaintance was important and paved the way for a successful start to the survey.

To balance the "foreign" element that I and the first two assistants formed as we all came from near Salisbury, it was decided to try and find a suitable local to help with other parts of the survey. On the advice of the Missionaries I chose Mr. Cosmos Manyau, a young ex-teacher whose lack of qualifications had debarred him from teaching under recent legislation. His home was twenty miles from the scheme, but he knew it fairly well as he went to school at the Mission and had friends among the farmers. He had also taught farm subjects to the school-children which was a useful bias. Moreover, the loss of his job through no fault of his own lent a chivalrous atmosphere to his joining the survey. Cosmos worked for most of the year on the survey. Cosmos began by working with the farmers in the sample who opposed the other assistants as Africans foreign to the area. He worked so well with this group that he handled them for most of the year and the other assistants undertook the bulk of the odd-jobs that Cosmos had been engaged to do.

#### THE FORMS.

Only the Income and Expenditure forms were issued in the first week of the survey. The response to which was good, though a few families exaggerated accounts of their spending. The method of checking such exaggerations was contained in the format of the form, that of a Balance Sheet with provision for opening and closing balances. Each worker was left to decide when he would broach the matter of the cash-in-hand of each farmer. With over a quarter of the sample it presented no problem and they retained an interest in checking whether the balance carried forward on the forms agreed with their cash-in-hand at the end of each week. It took a month for most farmers to give a figure for cash-in-hand. The figure acted as a check on exaggerated accounts of spending, and since few had more than £5 - £10 cash-in-hand the check became operative fairly quickly. Total cash resources proved difficult to establish for most of the sample, and a few never yielded the information. Total cash resources were not vital to the survey, though of interest. With the majority of the farmers recording of deposits, withdrawals, and the borrowing and lending of money was satisfactory, certainly within the limits of the check. The use and extent of credit obtained from the Co-operative was easily learnt both from the farmers and from the statements they received. Goods obtained on credit from the stores proved more difficult to ascertain. Most farmers preferred to run up credits with the stores, even if the annual total was small, and so keep cash in reserve. For several farmers credit was necessary to tide them over periods of little or no income. When goods were obtained on credit this was appropriately marked on the form. Later, when working with the stores, an overall picture of the use and extent of credit was obtained, as was a check against the credit granted to members of the sample,

although the system was not infallible. The store checks were incomplete as no store kept a proper creditor's ledger and the records were difficult to sort out. One store-keeper revised his system on my advice, but the revision took so long to accomplish that his efforts were of little benefit to the survey.

#### THE LABOUR RECORD SHEETS.

The Labour Record Sheets were issued in the second week on the strength of the successful introduction of the Income and Expenditure forms. During the first week, several farmers had copiously recorded the daily activities of their families either on the back of the Income form or in their note books. They had not been asked to do this and had obviously not realised that a special form on which to record their activities would be issued later. We could not have asked for more co-operation than that.

The first problem was to gain a reasonably accurate assessment of the time taken on each activity and of the length of the working day. A check on only a few of the forms revealed that two of the assistants, the two who had worked on previous surveys, had no proper judgement of time and had recorded astonishing hours, from 14 to 18 hours fieldwork a day. None of the assistants had watches. The third, who had been a teacher, had recorded periods similar to those that I had. The problem took a month to straighten out satisfactorily. Each assistant was allowed to order a watch from a store-keeper who took ten days to 'import' the model each wanted. Ten farmers were identified as having a fair idea of time in terms of hours and were used as checks in the beginning. Of those ten, five had transistor radios and each listened to the six o' clock news before leaving home for their fields. On their return home in the evening we asked that they "switch on" and jot down the time. Two of the others had watches which we re-set to synchronise with ours when necessary, and the last three had gained an intuitive sense of time during their life in town. Among the other families and the widows we devised two systems. When we came across them on the way to their fields or already at work we would record the time in our notebooks, always telling them what it was, and asking where the sun had been when they had begun to work. The range of hills across the Gairezi to the east of the scheme provided a very useful "clock". Each month we "fixed" the time when the sun appeared over the hills and when it disappeared behind the hills to the west in the late afternoon. We familiarized the farmers with this concept and asked them to remember how soon before or after they had begun to work or had stopped working the sun had risen or set. We checked the farmers calculations against our recordings of their activities during the day. By the end of the first month the position had improved remarkably and the length of time that the farmers stated for each

activity was realistic and, from our checks, as accurate as could be hoped for. Our experience in the first month enabled us to evaluate the accuracy of their statements and to query when necessary according to a system that they understood.

An interesting point was that our concern with time in hours and half-hours did not cause one watch to be bought. Two store-keepers stocked two or three watches all year round one of which they occasionally sold to returning migrants. The farmers on the scheme had little or no interest in watches. The few, under 10%, who had watches, had acquired them while working in town and did not always wear them. The farmers gained little advantage from using their watches and most preserved them for social occasions. Quite possibly several watches did not work.

The basic assumption underlying the method of fieldwork that we employed was that, for a quantitative study to be able to point to and verify qualitative data, a great deal of detailed data would have to be collected. This meant that the sample employed had to be limited so that I or an assistant could visit each family at least twice a week. Obviously we would have to be wary of infringing on the plot-holder's time and patience in order to avoid driving him to give "suitable" answers just to get rid of the interviewer. We hoped, however, that the survey, carefully explained and fully accepted, would interest each family and so hold their attention. The two main forms, the Income and Expenditure and the Labour Record Sheet, were designed to facilitate entries by literate farmers who felt so inclined. The entries for the week could be balanced enabling us to check that all relevant information had been entered. Nine of the thirty-eight farmers in the sample filled in the bulk of their forms themselves, though only two went right through the year. The collection of the forms at the end of each week meant that any lapse on their part was of little or no consequence as the assistant could quickly enter the week's activities.

When devising the forms it was thought that school-children might be persuaded to fill in some for us. Assistance of this kind was almost negligible. The children in senior school were all boarders and so away from home for the greater part of the year. Only a few of the young children helped their parents. One example was the daughter of a widow who recorded her activities in a note-book.

All the members of the sample were given six-penny note-books and good pencils with an eraser attached. Nearly a third used the note-books fairly regularly, usually for notes on expenditure. We encouraged the farmers to write on the back of the forms if they had lost the note-book and a few did so until their note-book was replaced. These notes eased the retention of detail and their entry onto the forms.

After the first two weeks it was decided to drop one family; not because of any refusal to co-operate nor any technical difficulty, but because the daughter of the house persisted in soliciting the fieldworker. A neighbouring family took their place in the sample. Only one member of the sample dropped out during the year. She was a widow who, after five months, begged to be withdrawn because her family who lived six miles from the scheme disliked her working with Government.

To record the activities, the income and expenditure of a family over three days took roughly half-an-hour. However, the total time taken to find the farmer at a time which was convenient for him, to exchange the customary and often useful pleasantries, and to drink the tea or beer proffered extended each session to nearer a hour or an hour and a half. Our reliance on the farmer's patience and the amount of detail we sought precluded any hurry. With most families there were five or more labour sheets to complete, one for each member of the family and for each labourer, and the often quite sudden coming and going of casual labourers to track down and evaluate. Group work presented problems as to who was there and what the relationships or reciprocal ties were.

Many of the members of the sample chose to keep their forms in their houses and elected for us to visit them in the evening. The arrangement was convenient for us so long as not too many preferred it as the farmers, having risen at daybreak, grew sleepy and went to bed soon after 9 p.m.

Several farmers were persuaded to carry their forms to the fields on certain days and we visited them there. If on that day they chose to do something else, we simply called at their homes that evening or the next. The usual practice was to deal almost solely with the husband, though he often asked his wife, children or labourers for information on their activities and expenditure. Husband and wife worked closely together and the husband invariably controlled all expenditure. Wives had greater freedom with exchange of gifts and with vegetables and other small purchases from neighbours.

Data on the family, the buildings and farm capital, relationships on the scheme, church membership etc. were only collected half way through the survey. Two farmers avoided questions relating to their work histories and they were left till near the end when I called to say goodbye. On both occasions I had been invited to a specially prepared meal and had taken the opportunity of asking for basic information without upsetting their willingness to co-operate further since the survey was over. Both farmers had complicated histories of marriage and both were church leaders. We had guessed that this was the reason for their reticence and so it was not difficult to explain that this part of their lives was private and of no concern to the survey. Once this was clear they were happy to answer the questions.

There was, as suggested earlier, a desire on the part of most of the farmers to promote the scheme and to improve both their ability as farmers and their understanding of Government's aims regarding the scheme. The most frequent questions put to us, and particularly to me as a European and as head of the survey were, "What do you think of the scheme?" and, "Should I (the farmer) stay?". They were very wide ranging questions and certainly not easy to answer. My reply to the first question is this thesis. The second question no one at the time could answer as it depended on the outcome of debates in Salisbury on the future administration of the African irrigation schemes.

In the first two months of the survey nearly twenty farmers approached us and asked if they could join the survey. Some said that they were experiencing difficulty in making a living on the scheme, some wished to learn from us, and perhaps one or two desired to be "in" rather than "out". We explained the necessity of the sample and that the survey would help everyone. Five insisted that we could help them and these farmers I visited. Two had problems that rightly belonged to the Extension staff and I referred them to their Demonstrator. The farmers at Nyamaropa believed that I was an agronomist and repeatedly I had to explain that I could not advise on farm practices. The other three had more intractable problems involving heavy debt, what I took to be debilitating illness and worry over issues that are covered more appropriately elsewhere in the thesis. Their desire to join the survey showed that something was missing in the relationship of the individual farmer to the Administration and that the farmers were not able on their own or through the Co-operative to fill the gap.

The blue folders that each family in the sample was given in which to keep the forms were often to be seen carried on the back of bicycles or tucked under arms. For all but one group of farmers, those whose previous homes had been in the villages surrounding the scheme, membership of the survey carried prestige. From the start the former villagers had agreed to co-operate but with an initial reserve that suggested they would withdraw if their relationship with the villagers became too strained. Co-operation with us was not easy for them. The presence of Cosmos Manyau eased the tension. The eight families in the group reported that they were closely questioned by both the villagers in the surrounding area and those who had joined the scheme as to what the survey was about and why they entertained Cosmos. Soon after the start of the survey I worked with Cosmos among them and on my own with two who accepted me. The presence of a European at first increased the suspicion of the outsiders and hardened their tone. We found a leader among the group in the sample who was a young man with more education than any of the others. Mr. Augustine Sadindi and I worked closely for some months. We became friends quite quickly, but not without a period of appraisal and rather

grudging co-operation. I appealed to his status as a builder and by visiting him frequently, both in his field and at his home, appealed to his personality which was one of friendliness and inquisitiveness. After a month or so he rather delightedly told me that he had been questioned at a beer drink in a nearby village as to what "this European is visiting you for?" and instead of trying to explain had simply said that "he is my friend" ! Thereafter the position improved and the data we received from this group of farmers was reliable.

#### STORE-CHECKS.

The assistants spent five periods of from two to eight days each recording data at the four stores and two grinding mills in the shopping centre above the Nyaruwaka. It alone was used as it attracted the majority of the families on the scheme. The other shopping centre, in the south-east corner, was considerably further from the stands and from most of the plots. It contained smaller stores with a smaller variety of goods. The main aim of the store-check was to record who shopped, where they came from, what they bought, how much it cost, and to gauge the impact that the scheme had had on the pattern of spending in those stores and to compare it with the pattern of spending amongst the villagers. The store-checks were also designed to show the roles of the women and children in the purchasing of goods. The store-checks consumed a considerable amount of time - from 7 a.m. until 5 p.m. for a total of 70 man days for the year. The checks were not held on consecutive days as this would have interfered with the recording of family data.

I inspected whatever records the stores kept and tried to glean from them their financial position and performance. Unfortunately only one store kept systematic records, though not up to accounting standards. This store, the largest, was well run and an African book-keeper from Rusape was employed to write up the records to Profit and Loss Account and Balance Sheet for taxation purposes. The store owners willingly allowed me to see their books and final accounts, but even then it was difficult to judge their performance. I was surprised that the Inspector of Taxes knew how to assess them from the final accounts he received. All that can be said is that great, and perhaps necessary, latitude must be given such stores. However, the owners and the Department of Revenue would benefit by the introduction and instruction of simple book-keeping procedures for African store-keepers.

#### THE CO-OPERATIVE.

We established cordial relations early in the survey with the Co-operative Committee. It was a natural development that my interest in the Committee's work should lead to invitations to attend meetings in a non-official capacity. I did so on several occasions. The

Committee met whenever necessary: at busy marketing and distribution periods one, two or three times a week, otherwise roughly once a fortnight. Committee meetings started an hour or two after the announced time, from 7.30 to 8.00 p.m. and lasted at least till 11 p.m., often till midnight and occasionally later. Around ten o'clock, tea and bread spread with margarine would be served. The meetings were exhausting and twice I excused myself after the tea. At each meeting one or two members would begin to nod and fall asleep, usually to be left in peace until the tea arrived or a vote had to be taken.

Towards the end of the survey the Chairman became Manager and he allowed me to sit in on the day to day running of the Co-operative. On a few occasions I was asked to draft a letter or to explain a letter received. The insights into the workings of the scheme, both physical and social, and into their relationship with Government were invaluable and provided a large number of topics to raise in conversations at all levels. Not all the topics could be discussed with Government officers for several held the standard views of Africans long current in Rhodesia and, moreover, they reacted strongly to anything that smacked of criticism.

#### THE CREDIT UNION.

During the year I learnt much from the founding of a Credit Union to serve the scheme. To engage in an activity such as this is not part of the strict code of fieldwork as it could alter the status quo. In fact the Credit Union had barely been established by the end of the survey and so did not alter significantly rates of saving etc. The idea of introducing a Credit Union arose from the difficulties which many farmers experienced in managing money and from the area not having any facilities. The stores granted credit, but only in the form of goods purchased and the Co-operative only for farm materials. Besides, the community lacked any real cohesion, a lack which the Credit Union could help to amend. The process of explanation, of gaining the farmers' acceptance, of meeting the store-keepers' suspicion that it would provide a means for the farmers to avoid payment of their debts, of organising the introductory meeting and then supervising the elected committee was highly instructive as to individual aspirations and problems, group dynamics and communal co-operation of the farmers. The daily contact with the members of the sample rooted the experience and lessons that we learned from working with the Credit Union and the Co-operative to the purpose of the survey.

#### MEETINGS:

A feature of life on the scheme was the number of meetings convened

during the year. The Extension Staff held a regular meeting every Wednesday morning to remind the farmers of suitable current farm practices and the Co-operative Committee frequently felt the need to inform members of marketing procedures or to seek support for proposed action. Attendance varied according to the import of the meeting and the degree to which the farmers were occupied on their farms. In general, attendance suffered from altogether too many meetings, particularly as meetings invariably started late and lasted too long, from three to four hours.

#### THE CHURCHES.

Church membership and church activities influenced the farmers' lives and attitudes and played a large part in filling their leisure time. Our access to the Catholic church through the Missionaries was open and their interest in the scheme made our friendship fruitful. The head of the mission became an ex-officio member of the Credit Union at its founding and later took over its supervision.

The most interesting churches from the viewpoint of the survey were the five administered by the Africans themselves. The Anglicans and Methodist churches were delighted to receive us at their services and to provide information. The Watchtower were not so amenable to me, but one of my assistants attended their meetings and I relied on him for information. The other churches active on the scheme were founded by Africans, one the "Apostles" or "W'Aposturi" founded by John Maranke was centred at Umtali and the other, the Mai (Mrs) Chaza had been founded near Headlands. The first of these two had a large following and the members were closely knit. After a few months of the survey I realised that many of the best farmers belonged to this church and I devoted some time to its study, even to the extent of growing a beard to attend their meetings and up-setting many non-members who had heard a rumour that I had joined the Apostles.

#### SYMPOSIA.

On four occasions we held evening "symposia" in my hut. On each occasion I invited five or six farmers, a store-keeper and a teacher. Some days before, I gave them a short list of topics to consider in preparation for discussion. The symposia were fun and those who came enjoyed them. Two difficulties arose, one of which was solved. My limited ability to understand Shona would not allow me to follow conversations on God or other esoteric subjects while not all the participants spoke English and none were fluent enough for the purpose. Cornelius took charge and when lost I would nudge him and he would explain briefly.

Afterwards Cornelius and I discussed what had been said. The problem of chairing the debate so that each could expound his view without interruption proved insoluble. What was lost in order was made up by the attacks and counter defences that flew across the table. Fortunately humour was abundant, and the farmers rose to the occasion with friendly raillery so that nothing serious developed. To the majority the form of discussion was novel and once they realised the acceptability of choosing to differ all waded in. While not very instructive they raised many issues and highlighted areas in which the groups differed.

#### THE TRIBAL AUTHORITY.

Throughout the survey we took pains to accord respect to the Tribal elders and to inform them of all that we did. I met Sanyamaropa frequently and we often called on each other. At times it was difficult to bring him to discuss the scheme or related matters, at others not. On several occasions I gave him a lift in my car to attend special events at the nearby schools or ceremonies in villages which fell under his jurisdiction. We frequently met Sanyamaropa's representatives on the scheme and one kraalhead was a member of our sample. Occasionally we were invited to beer drinks in the surrounding villages. Although most participants concentrated on drinking the maize / rapoko beer many were illuminating on attitudes towards the scheme, the people on it and the likelihood of their joining. On only one occasion did I try to work with the Tribal Authority - to start a library for the schools, an idea that came out of a conversation with Sanyamaropa - and many of the difficulties and barriers to decision-making were demonstrated.

Originally it was thought that the survey would benefit in breadth and possibly in depth if we were to record data for a few households in the surrounding villages. It took some time for the hostility of the villagers towards our presence to diminish sufficiently for us to consider working with them. Two cautious preliminary meetings were held with one village and then a full-meeting. The younger men, of whom there were few, were willing, even eager, to co-operate, but the older men remained uncertain. As misunderstandings were cleared up the likelihood of acceptance improved and I thought that we would gain the consent of the village.

However, during the meeting a very well dressed man arrived on a bicycle and rode past the Headman flaunting propriety. He immediately began to address the meeting saying that we were Government Spies, that we were part of the ill-famed Land Husbandry Act and that dire consequences would result if the village accepted us. Presumably he was a

Nationalist and certainly he did not belong to that village or any nearby. Cornelius replied, most effectively attacking his lack of respect for the Headman, for his standing to harangue the meeting when the discussion had been informal and seated and for his complete lack of knowledge as to our purpose. The man left before Cornelius had finished, somewhat cowed. His visit unsettled the villagers. They feared some reprisal if they chose to co-operate and asked us to leave the matter for the time being. In effect they fobbed us off with "Don't call me, I'll call you."

Soon thereafter we tried to analyse the traffic of persons between The Nyamaropa and Inyanga, Umtali and Rusape. If successful the investigation would have given information on migrant labour, the movement of people and goods, the market for certain products and the power of attraction of the towns in relation to the local stores. To begin with we questioned the passengers on the two buses that passed through the scheme each day, one from and one to Inyanga. Although we knew the driver and conductor on each bus and had their consent to question the passengers, few passengers were prepared to answer the simple questions and we felt that some of the answers were manufactured. The hostility of the passengers to any queries proved too great to overcome and after a week we dropped the survey. The farmers on the scheme travelled fairly frequently, details of which we recorded on the labour forms.

There is no interdict in orthodox economic opinion that limits the scope of economics to the exclusion of sociological factors. As Marshall stated in his Principles, "..... each economist may reasonably decide for himself how far he will extend his labour over that ground." <sup>3</sup> I considered that my presence, and not just that of the field-assistants, was essential if the thesis was to contribute to our understanding of the process of development and to be a useful diagnosis of the strengths and weaknesses of the Nyamaropa irrigation scheme. Economists concerned with development have come to realise that the factors they attempt to measure and analyse are dependent upon and interact with a complex social nature. "Both for empirical and theoretical research and for counsel on developmental policies, identification and analysis of the 'factors' in economic growth clearly require crossing conventional disciplinary boundaries." <sup>4</sup> The value of many social studies in rural communities is

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3. Marshall A: "Principles of Economics," 8th Editor. MacMillian, 1956, P. 643.

4. W.E. Moore. "The Social Framework of Economic Development," in "Traditional Values and Socio-Economic Development" Edited by Braibarti R. and Spergler J.J., Duke U.P., Durban 1961, P. 57.

reduced by the wholesale transference of attitudes and methods from the sophisticated environment of the academician to the unsophisticated environment of the people who are the subjects of the study. Part of the problem is that sufficient time for careful observation and accurate collection of data is seldom accorded field studies. Preference is given to the manipulation of big aggregates. The manipulator is not always aware of the circumstances which surrounded the collection of the data nor can he vouch for its reliability. At one point in the preparation of the survey it appeared that I might have to find employment nearby and visit the scheme every week-end or fortnightly to supervise and check my assistants. Few officials deemed my presence to be valuable beyond what was necessary to ensure the progress of the assistants' work and they did not envisage a widening of the scope of the survey as being useful.

The need for a wider approach, for a more dynamic element that took cognizance of the social and the institutional structure as well as the factors usually regarded as economic, demanded the presence of both the assistants and myself at Nyamaropa. Three doctrines of social enquiry governed my approach. They are illustrated by Leibritz's belief in the unity of science: Max Weber's belief in the need for empathy, for an intuitive understanding of the behaviour of groups which I hoped to achieve by living with the farmers: and F.A. Hayek's belief in the need for reduction, for the replacement of statements about categories of persons by statements about individuals.

Bert F. Hoselitz has underlined the need for an integrated approach in greater detail. Discussing the many surveys (conducted in India,) he wrote, "..... the data which have been assembled in these various surveys are the best and most comprehensive we have: and if we reject them as being subject to error, we have no data whatsoever. At the same time, however, these considerations again point to the fact that more knowledge in depth is required." <sup>5</sup>

As yet fieldwork procedures are not capable of what Myrdal suggests is necessary, "..... an inter-connected set of quantitative equations, describing the movement and the internal changes of the system studies under the influences which are at work. That this complete, quantitative and truly scientific formulation is far beyond the horizon does not need to be pointed out." <sup>6</sup>

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5. Hoselitz, B.F. : "Capital Formation in Indian Agriculture Society" in "Capital, Saving and Credit in Peasant Societies" P. 372. edited by R. Firth & B.S. Yamey. George Allen & Unwin. 1964.

6. Myrdal G. : "Rich Lands and Poor." P. 12, New York. 1957.

The most comprehensive measure we have is that of productivity, for its level depends upon both economic and social factors. Productivity is also the most useful measure for it tests the success of projects in relation to their initial goals and allows comparisons to be made for investment purposes. However, productivity measured in one period does not provide the data Myrdal sought in his "interconnected set of quantitative equations". Productivity must rise both within the project as narrowly defined and in the areas of human activity that it affects. If it does not, then the project cannot be termed successful. While the use of available historical data adds a dynamic time element and helps to explain many of the current attitudes and weaknesses, as with Roder's work on the Sabi schemes, it alone will not reveal the influences at work and the changes taking place. A series of surveys is needed to measure the increase in productivity and all the related administrative, financial, marketing, institutional and social aspects to determine what forces and bottlenecks affect success.

In effect the method that must be used is akin to the extended-case method that the social anthropologists have recently pioneered in order to understand the process of change in society. Max Gluckman in his Introduction to "The Craft of Social Anthropology"<sup>7</sup> wrote: "Many of the problems that are emerging, and that involve the basic problems of the endurance, stability, and different types of change in a social system existing in space-time, can only be tackled through the use of the extended case method."

Unless a deliberate plan for many of the subsidiary investments to service projects such as Nyamaropa is undertaken by Government the use of a series of surveys may have little benefit. This was particularly so at the time of the present survey as the administration of African farming and even its role - the development of Rhodesia was peculiarly subject to political and other non-technical forces. What is required first is a survey to establish the present position and to point out areas in which administrative action can rectify current weaknesses advancing towards a more 'model' situation which could then become the subject of a series of surveys. These surveys could, if the community recognised the benefits that flowed from earlier co-operation, be carried out on a small scale using small samples and time periods to seek specific information. They could also utilize extension and other resident personnel.

The present survey is intended to be a benchmark towards a 'model' situation. Its contribution to methodology is that the fieldwork was undertaken by an economist who lived amongst his subjects, a people of a

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7. P. XVII, edited A.L. Epstein, Published Tavistock. London, 1967.

different culture and with different levels of need and aspiration from those of his society. While it is not an anthropological study, the inclusion of social data and qualitative elements based on the basic economic survey have led to many of the insights and conclusions presented herein.

As the author, I attempted to do more than just 'interest' myself in the community with which I became friendly. I openly sought avenues that led close to the heart of the community, of a group or an individual.

Many of the problems that the farmers faced were not revealed by the quantitative data. The hospitality of the farmers and in particular those in the sample with whom I ate most evenings, allowed for an exchange of views and a range of topics to be covered which gave me insight into many areas of difficulty or misunderstanding. There is no reason why administrative and other officials should not attain the same level of relationships with and interest in the farmers.

#### MEASUREMENT.

Raymond Firth in his study of the Malay Fishermen used economic categories to compartmentalise his discussion: such as division of labour, income, capital, distribution. Firth showed, however, that these economic activities were conditioned by positive forces in the society: chieftainship, kinship, magic and prestige. Marketing and credit lent themselves to technical economic analysis, but production and the supply of labour were largely governed by familial religions and other non-economic variables.<sup>8</sup>

At Nyamaropa economic activities were significantly conditioned by social forces in only three spheres: labour, credit at the stores and church. The farmers who had joined from the surrounding villages, the Locals A, maintained an intricate relationship with their former fellow villagers through the employment of casual labour: most farmers on the scheme had close ties with the store-keepers who provided a significant measure of security through credits and sometimes loans: and the churches, in varying degrees, identity and group security.

The measurement of the conventional inputs created few difficulties. Seed, fertilizer and insecticides were purchased through the Co-operative, though nearly 40% of the farmers used their own maize seed and only a few farmers purchased wheat seed. Fertilizer was ordered against the proceeds of cotton and/or beans but was frequently intended for use on other crops as well. The farmers informed us as to their use of fertilizer and this we checked against their original stock and purchases. The data that we collected was not always reliable, especially as some exchange of fertilizer took place amongst the farmers. By tallying the

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8. Firth, R. The Malay Fisherman: Their Peasant Economy.  
K. Paul, Trench; Trubner & Co. London, 1946.

the farmer's stock with his book we were generally able to approximate the true picture.

Manure was measured by the size and type of vehicle in which it was transported - scotch-cart or truck - and the data is satisfactory but no more. Some farmers took a fair degree of care in the conservation of their kraal manure retaining much of its value. However, most of the farmers failed to do so and many of the minerals in the manure must have been lost due to leaching. Consequently the effectiveness of the manure differed appreciably from farm to farm. We have taken no account of this in costing manure. A small local market for manure existed. Manure was purchased from off the scheme by the farmers on the scheme, but as so few transactions took place and the supply was dependent on factors in the villages of which we knew little, the differences in the three prices reported were not treated as significant.

The valuation of farm equipment, of farm and homestead buildings and of their depreciation raised a few problems. Implements were valued at "standard" prices for part of the analysis, and valued more accurately for farm performance purposes. "Standard" prices for most types of building were not difficult to arrive at as we based them on the materials used. Actual costs varied considerably depending on the type of labour employed. Most farmers relied on family and farm labour to do most of the work involved, but several of them hired builders, carpenters and thatchers for part or all of the work. The valuations used in the farm accounts and for performance figures are therefore only roughly accurate, but as family labour has been given a value the resultant figures are fairly close to the "market" value.

The recording of labour hours has been dealt with. Labour proved to be the most important input as a determinant of farm performance. The use of labour is a management function and the problems of measurement, of which there were many, are discussed fully in the chapters on Labour and Farm Performance. The measurement of non-conventional inputs - education, improved management ability, technological advance, previous farm or business experience - is only possible if within the sample there exist improved and non-improved farms and if the use of conventional inputs in relation to output is significantly different between the two groups. Even then the non-conventional inputs can only be measured in toto. Individually they can only be described. At Nyamaropa the use of labour was governed by social relations and this further complicated its measurement. In fact one group, the villagers who joined the scheme, shared their increased income with their former neighbours by employing them on their farms at an expensive rate compared to other categories of available wage labour. A not unimportant degree of acceptance of their membership of the scheme was "bought" in this manner.

Examples abound of the need to exercise great care in both the measurement of performance in peasant farming and in the use of such data. One example appeared in the American Economic Review of March, 1968.<sup>9</sup> R.L. Bennett and M. Paglin arrived at strikingly different results using the same data. The different policy decisions and theory that emanate from their treatment of the data are significant. In the use of data based on large samples and of necessity limited to basic information little weight can be given to the influence of subsidiary data. From our experience at Nyamaropa it would seem that large scale studies have limited value unless the data collected takes cognizance of the more important secondary factors.

The evaluation of rent, imputed wage costs, capital and depreciation charges raise problems when dealing with farms geared to the money economy. When the farmers trade and purchase infrequently in the market the problems are magnified. However, if sufficient data is collected, values may be established by linking labour hours employed in construction to the calculated opportunity cost of labour in crop or other activities if there is a sufficient degree of competition for labour at the time. At Nyamaropa some farmers chose to drop poor paying winter crops in order to devote their time to farm or homestead construction. The valuation of these farmers' labour was thus effectively low. The usual alternative of working on other farms for money remuneration did not exist at that time of year. However, illustrated between farms were considerable in that some farmers had the knowledge, the capital and the means to market subsidiary crops during winter which in several cases brought good returns. Those farmers who foresook a winter crop for construction had not, with one exception, previously harvested a "paying" winter crop. The farmers who grew "paying" winter crops also engaged in construction work, often with the help of hired labour used both on the farm and on construction. Clearly the opportunity cost of family and hired labour was significantly different on these two farm categories. Should this difference be reflected in the valuation placed on the capital goods constructed?

One problem when attempting to keep the two categories separate, was that some farmers in both categories hired builders, carpenters and thatchers while some in both categories did not. Moreover, some farmers who had training or experience as builders, hired builders while they engaged in building work elsewhere or undertook a few general farm jobs - winter ploughing, levelling, cleaning of the canals, maintenance - interspersed with visits to friends and family. A large number of farmers,

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9. P. 194-209. "Surplus Agric. Labour and Development".

often with their wives, left the area for periods of three to ten days to shop in Umtali or Salisbury, to visit their former homes or to attend a church meeting. This suggests that many farmers placed a positive value on freedom from farm work during the quietest period of the year.

If family labour employed in construction were evaluated separately for each farm the resultant capital value of identical structures on the scheme would differ considerably. Clearly such practice would create problems in the analysis of the data.

The solution to the problem was made possible by the different behaviour patterns of the two major groups. Nearly all the capital construction was undertaken by farmers who joined from outside of the area. As a group their activities during the slack season - building, tending winter crops, maintenance and travel - placed a positive value on their time. I decided, therefore, to value their family labour employed on construction at the same rate as I employed for their labour on crops - the rate for daily labour that ruled on the scheme, 3/- a day. Most of the other group, those who joined from the surrounding area, became involved in the long round of beer drinks and ceremonies in the villages and were "lost" to their farms except for maintenance to their huts and occasional fieldwork. The correct valuation on their labour as determined by their activities on the scheme was thus close to zero. However, as we shall see, the Locals faced many difficulties farming on the scheme. The low, almost zero value of their labour in the slack season that these difficulties might have determined was countered by the significance that these same obstacles lent to the maintenance of their relations with the villagers. The locals' participation in the round of beer drinks had a positive value related to the continuation of their farming on the scheme. If it were possible to place a value on the locals' activities during the slack period it might be less than the 3/- a day ascribed to the newcomers. I was able to avoid such a weighting of tenuous values on the grounds that as a group they undertook little capital construction. The only valuation used for family labour of either group employed on crops or capital construction was 3/- a day: the opportunity cost of employment on other farms. The calculated values of improvements correspond quite closely to the few hints of market values that existed.

LANGUAGE:

Before going to Nyamaropa I could not speak Shona, the principal language of the area. My childhood in Rhodesia had equipped me with "household Shona". I was warned by several authorities, both academic and official that I must abandon my household Shona as its colonial affiliations would undermine my relationship with the farmers. For the first week I relied heavily on Cornelius and restrained myself from uttering anything that would prejudice my standing. Every morning I studied a textbook and strung together sentences to practise later in the day. I was quite soon able to follow conversations on farming and family life, but throughout the survey I could only converse in Shona on limited topics that occurred regularly. Half the men spoke quite good English and a few had a good command of the language. The routine of collecting the data forced me to work initially with them and to use my assistants to work with the others. Later I gained confidence and worked with all the members of the sample. My experience did not altogether confirm the warning about the use of household Shona. I slowly fell back on it when stuck for words or expressions and found it helpful. The farmers and their families wished to communicate and this eased the situation. Far more important than language was my attitude to the people. Once accepted, any means of further communication could be utilized. This is not to suggest that a good knowledge of Shona at the onset would not have been an asset. It would have. Rather, the inability to speak the peoples' language need not be a real handicap if the research worker has good assistants and gains the trust of the people while learning the language. Had Nyamaropa been a primitive community in which no one spoke English, the initial total personal block to communication might have necessitated my learning the language before beginning the survey.

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## THE PEOPLE

The construction of the irrigation scheme at Nyamaropa created an economic opportunity. The settlers on the scheme represent the response to that opportunity. An assessment of the performance of the scheme and of the individual farms must include an analysis of the quality of that response.

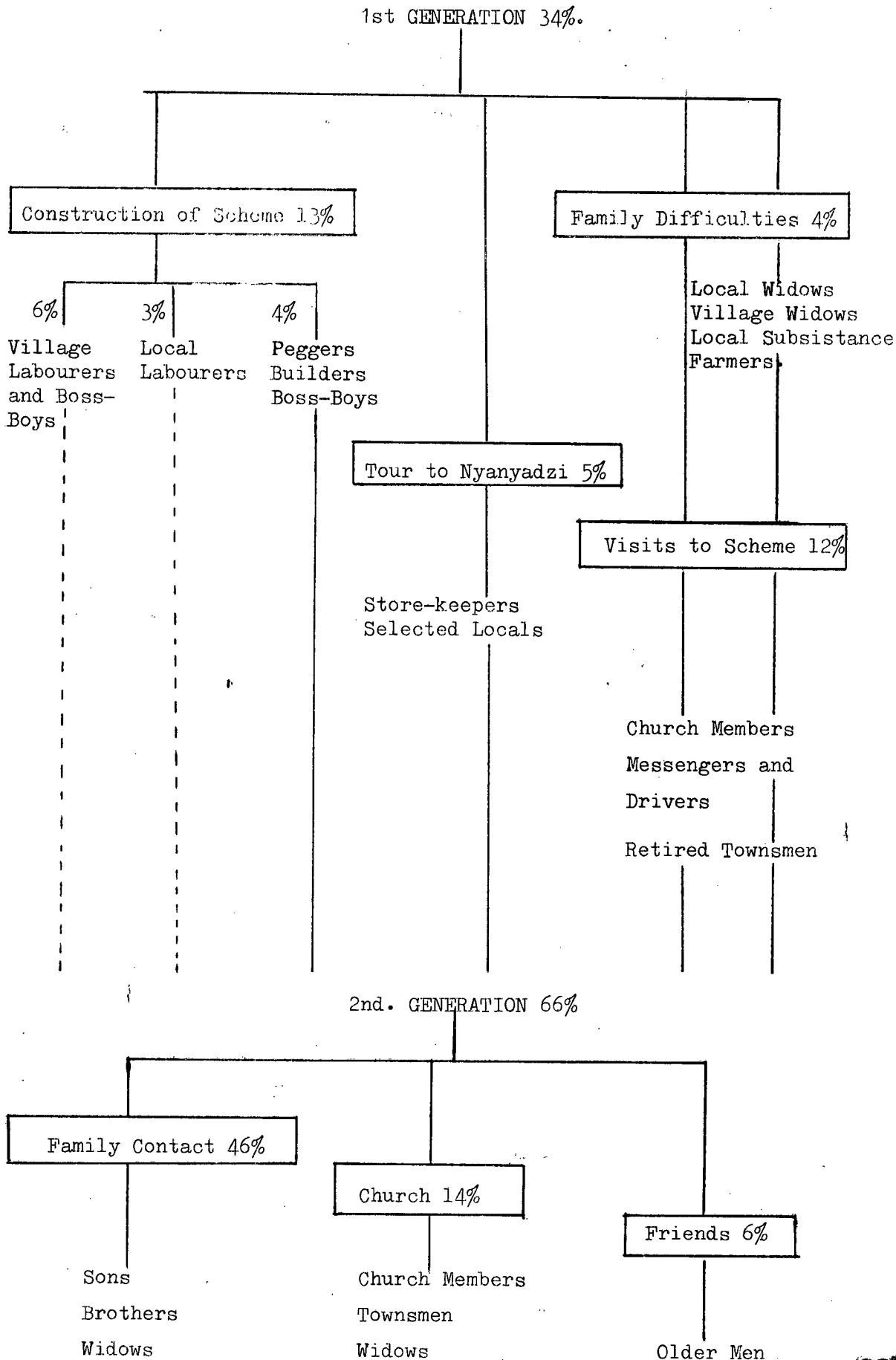
Nyamaropa attracted people from four distinct geographical areas. The first group were those from Sanyamaropa's villages, most of whom had worked on the scheme's construction before joining. The second group came from homes within the wider valley of The Nyamaropa, some of whom originally lived outside The Nyamaropa but who had moved into The Nyamaropa ten or more years previous to joining the scheme. The second group have therefore been termed locals. The third group of settlers were those who had to move off Inyanga and other "white" areas and who, disliking the heat and the more primitive people and conditions of The Nyamaropa, remained on the highland on the perimeter of The Nyamaropa where it borders Inyanga. Several of this group were included in a tour to Nyanyadzi organised by Government in an attempt to promote settlement. The fourth group of settlers joined the scheme from homes outside of The Nyamaropa. Most of these settlers had no family or tribal connection with The Nyamaropa. The first of the fourth group to join were the peggers, builders and boss-boys who stayed behind after the completion of the scheme. Most came from Umtali, Rusape and the southern part of Inyanga. A few came from areas south of Umtali and were Shangaans and a few from areas towards Marandellas and Wedza, not far from Salisbury, and were Shonas.

Sanyamaropa's villagers and the locals, groups one and two, I have termed Locals A and B. Those settlers who lived on the highlands bordering Inyanga and those who went to live in the valley of The Nyamaropa only a few years prior to joining the scheme, I have termed Newcomers A. Newcomers B are those settlers from geographically and tribally distinct areas. (See Map I)

Diagram I depicts the process by which the settlers came into contact with the scheme and who they were. The relative numerical importance of each process is shown as a percentage of all the settlers.

DIAGRAM 1.

THE PROCESS OF SETTLEMENT.



At the time of the survey, when all the irrigated land was occupied, there were two hundred and forty three registered plot-holders of whom fifty were widows. Just over a third of the plot-holders were first generation settlers. In other words they joined the scheme on their own volition. Most of them joined in the first two years and could be termed the founder members of the scheme.

The first group of settlers to join the scheme were those who had worked on its construction. Nearly half, fourteen families, were members of Sanyamaropa's village; seven other families had lived in surrounding villages and ten had been brought in as specialist workers by the various Departments which took part in the scheme's construction. Shortly after the completion of the scheme Government organised a tour of Nyanyadzi for a group of local "leaders", half of whom were store-keepers. Twelve of the twenty-three men who went on the tour joined the scheme. Most of them had moved into the Nyamaropa in the previous ten years. The case study of one of these men appears below.

Mr. Ernest Mapfurira.

Ernest Mapfurira, after working for nine years as a messenger at the Salisbury Post Office, started a grinding mill at Nyamaropa in 1954. The site had been suggested by the District Commissioner. He opened the mill for very limited hours on only three days a week. The area was still an isolated corner of Rhodesia and many women used to arrive at the mill carrying their sack or basket of maize to be ground on their heads without knowing which day of the week it was nor whether or not the mill would be working. A store-keeper told me that the women from further afield would wait for a day or two for Mr. Mapfurira to open the mill. They slept under a rough shelter nearby and during the day bought a penny worth of sugar every few hours which they ate very slowly and ruminatively while sitting under a shady tree outside the store. As the first miller in the area he found that he could cope with the demand for milling by working his plant for only eighteen hours a week. Mr. Mapfurira exploited this excess capacity and his monopoly position for his own benefit in the form of leisure and in order to be able to devote part of his time to the care of his subsistence farm near Tombo, twenty miles from the scheme.

In 1959 he sold the mill plant to a European farmer who dismantled it and carried it away. Mr. Mapfurira told me that he could not make the mill pay as he had to split his time between the mill and his farm. Instead he built a store near his home which he ran for two years. The store was situated four miles off the road in broken hilly country. Once a week either he or one of his wives trundled a wheelbarrow to the nearest bus-stop to collect new stock. Mr. Mapfurira was invited to visit Nyanyadzi on the Government sponsored tour because, apart from being a store-keeper, he was a church leader. He was impressed with Nyanyadzi and on his return applied to join Nyamaropa. He sold his store plus stock for £375. He bought a scotchcart, a young ox and a cultivator, total value £61, when he joined.

The third group of the first generation of settlers were those who decided to join the scheme after visiting it once it was functioning. The thirty families in this group, 12% of all the plottolders, came into contact with the scheme through the Church, Government and private busi-

ness. Over half the group visited the scheme while attending a church meeting in the area.

Mr. Itayi Hondo.

Mr. Hondo and his wife Easter were staunch Methodists. Mr. Hondo attended a church meeting on the scheme in 1963, which had by this time a young vigorous Methodist congregation. He was impressed by the scheme as a "place where one can build a civilized life for one's family." As Methodists they opposed traditional religious and medical practices and were attracted by the scheme's "freedom from tribal influence."

Messengers from the District Commissioner's Office and other Government Departments visited the scheme on official business and four joined. Drivers of Government vehicles, of travellers' vans and of trucks hired by the farmers to transport timber from Inyanga, visited or passed through the scheme fairly frequently. Five drivers, one self-employed, resigned and joined the scheme.

Other chance visitors saw the scheme as a suitable home for themselves or for their parents, as did the son of Mr. Siwa Mautsa.

Mr. Siwa Mautsa.

Although seventy, Mr. Mautsa was still an active man. He had retired after thirty years in domestic service in South Africa. During his absence he had lost his right to land in the upheaval during the implementation of the Land Husbandry Act. On his return he found that he had to make his home in a hot dry area far removed from his homeland. This area was thirty miles to the north of the scheme. In 1962 one of his sons, a university graduate living in Zambia, came to visit his parents in their new home to see if he could help them to move to a more favoured area. His journey took him through the scheme, where he met a few of the farmers whose enthusiasm impressed him and whom he regarded as being progressive and friendly. He brought his parents back to investigate the opportunities with him and saw to the completion of their application forms. He paid for the construction of a two-roomed brick house. One of Mr. Mautsa's daughters came to teach at a local school and later married the headmaster. Since Mr. Siwa Mautsa joined, she has paid £2 every month for a permanent labourer to remain in her father's employ. At the time of the survey the labourer was twenty-eight and had been with the Mautsa's for four years. The graduate son and another son working in Salisbury had undertaken to pay for the education of the youngest child who lives with his parents. Mr. Mautsa employed a second labourer, a girl of nineteen for £1. 5. 0. per month.

The achievements of his children, particularly the graduate, have accorded Mr. Mautsa a special authority in local affairs which his age and success in farming have bolstered. Somewhat gregarious, and freed from long hours in the field by his labourers, he attends most meetings and many beer drinks. I heard him on several occasions admonish, with a twinkle in his eye, other settlers who complained of the difficulties of farming.

A small group of settlers, mostly widows, joined the scheme in order to avoid difficult family situations. Age, grand-children and widowhood bestow seniority and a large measure of independence on African women. One woman who utilized her status to escape an unhappy family situation was Mrs. Mandiydza Nhenderere.

Mrs. Mandiydza Nhenderere.

Soon after her husband died in 1957, Mrs. Nhenderere's two eldest sons married, "spending" most of the cattle that they had inherited from their father to marry. Mrs. Nhenderere disliked both her daughters-in-law and found her dependance on them irksome. Two years later her daughter married "a man of no use" and brought him home to live in the family village so exacerbating the situation. To escape, she insisted on joining the scheme which her sons opposed. They finally allowed her to join and helped her to build a hut. Her youngest son, Peter aged 16, went with her. Neither he nor her other sons had attended school.

Mrs. Nhenderere owned only three hoes and five chickens, two of which were sent to her by another daughter married and living some distance away. She relied on a neighbouring farmer to plough for her on credit until she received her cotton and bean crop payments. During the survey year she used most of her savings to build a three-room brick house that cost £27. Peter, her son, had applied for a plot of his own but was not very hopeful as the available land was taken up. He and his mother wanted to save more money to buy two oxen, a plough and a cultivator. Peter talked of going to town to find a job while being replaced on the farm by a permanent labourer. They could then save more quickly. However, his lack of schooling would prove a serious handicap to finding all but the most menial and lowly paid of jobs.

The most striking fact related to the process by which the first generation of settlers joined was that the existing irrigation schemes in the Sabi valley played no direct part in bringing settlers to Nyamaropa. Not one of the settlers had contemplated joining a scheme prior to their contact with Nyamaropa. A small minority of the men reported having heard of the Sabi schemes before they had learnt of Nyamaropa, but that this knowledge had not interested them in terms of possible settlement.

Having settled, however, the first generation of settlers became active salesman of the scheme to family, fellow churchmen and friends. Two-thirds of those who came to live at Nyamaropa joined through the good offices of first generation settlers. Particularly active in this regard were the entrepreneurs and skilled workers amongst the settlers - represented by the solid lines on diagram I.

Mr. Willard Mapara.

Mr. Willard Mapara's elder brother joined the scheme in 1961. He wrote to Willard soon afterwards and suggested that he should join, there being "water for and cash from new crops". At the time Willard worked as a cook in a Salisbury hotel where he earned £12 per month. In 1962 Willard took a month's leave and went with his wife to Nyamaropa. He decided to join the scheme, obtained a plot and, with the help of his brother, built a single hut and cleared his field of stumps left by the bulldozers. Willard returned to his job in Salisbury leaving his wife to tend the crops. In 1964 Willard resigned from the hotel, his earnings having helped to capitalize the farm, and returned to Nyamaropa with a symbol of his trade - a second hand Dover stove. A third brother also joined.

Mr. Ebson Magoshe.

Ebson's father, Dzimai Magoshe, joined the scheme while Ebson was working in his first job after leaving school with a standard 4 pass. Dzimai, who had saved "over £300" after seven years as a

salesman for a large horticultural seed company in Johannesburg where he had earned £22 per month, joined the scheme in order to secure a cash income and to be with his large family. He undertook to capitalise Ebson if he settled on the scheme. Ebson spent the little money that he had saved while working as a "tea-boy" in Salisbury on clothes for his wedding. He and his bride, Eneya, lived for a year with his parents. Ebson and Dzimai worked the two lots jointly while Ebson erected two huts and fenced his own stand. Ebson called his first year on the scheme his "apprenticeship".

The scheme offered widows a more comfortable livelihood than they would normally have been able to wrest from the dry-land of their traditional homes using primitive methods. Sons, daughters and other family settled on the scheme were able to help them more easily if they too lived on the scheme. The small size of the plots, four acres, meant that the farm equipment of a family served the needs of the two acre plot allocated to widows with little or no open cost to the family. Consequently, a widow with family on the scheme was in a position to be assisted to become self-sufficient and so avoid being a burden to her family.

Most widows had been left cattle by their husbands and so were able to contribute to the capitalization of the family farms when they joined the scheme. Mrs. Makufa Muhonde had inherited two trained oxen from her husband. They were used with her two brothers oxen to plough all three farms and, with her cow, were herded with their cattle. Another widow, who had been left four oxen and a plough, Mrs. Lilian Ruwende, joined the scheme with her son, John. Since joining in 1963, John has continued to rely on his mother for most of his farm equipment and for traction. They have pooled their savings to build a brick kitchen for Mrs. Ruwende and a tobacco barn for John.

Many of the early settlers were church-members and the scheme quickly developed into a focal point for church activities in the area. Several farmers became church leaders and through their work on committees and equivalent administrative boards the scheme acquired a favourable image in church circles both within and without the Nyamaropa.

The Rev. Chadambuka, the priest in charge of the Anglican mission which is six miles from the scheme, told me that the scheme had had a favourable impact on the area and had eased his missionary and school management work. Many of the members of his Church Committee were farmers on the scheme.

Three-quarters of the families professed membership of one of the six Churches that held regular meetings on or near the scheme (Table 1). Over half the Locals maintained their traditional religious beliefs, though their children were frequently members of a church. The relatively high proportion of Locals who were Catholic, mostly the younger men, is explained by the proximity of the Carmelite Mission and their management of the schools that served the scheme. The almost complete abandonment of traditional beliefs by the Newcomers was striking. However, nearly a third of the men seldom or never, attended church, though their wives and children did.

TABLE I.

CHURCH MEMBERSHIP : FAMILIES.

As percentage of Groups and of Scheme.

	<u>Locals</u>	<u>Newcomers</u>	<u>Scheme</u>
Catholic	20	16	18
Anglican	2	21	13
Methodist	2	24	15
Apostle	8	25	17
Jehovah's Witness	7	9	8
Mai Chaza	5	4	5
Traditional Belief	56	1	24
	100%	100%	100%

Thirty-five families joined the scheme after having come into contact with it through fellow church members settled on the scheme. Two of the churches canvassed fairly openly for members and the competition among the churches led to their recruiting existing church members from outside to join the scheme.

Mr. Cahipa Mwanaka and Mr. "Brown" Masaya Taponariwa both visited the scheme at the invitation of fellow Apostles whom they met at a church meeting near Inyanga and who lived on the scheme. At the time Mr. Mwanaka held a hawkers licence at Inyanga and Mr. Taponariwa worked as a cook in Salisbury. Neither had family on the scheme when they joined but at the time of the survey both had a brother on the scheme whom they had persuaded and assisted to join.

A small group of older men joined through the offices of friends, some of whom were not of the same village.

Mr. Hazviurai Feshete.

Mr. Hazviurai Feshete moved off Inyanga to a holding on the border of the Nyamaropa in 1950. A year later, after ten years in domestic service, Mr. Feshete settled there permanently. He sold fruit and in particular tzenza (or "white chocolates", a vegetable rather like turnips which is eaten uncooked and which only grows in the colder areas of Rhodesia) to passengers on passing buses. In good years he sold a little surplus maize. The income provided the family with a few luxury items from the stores and with clothing, but only allowed each child to attend school for a few years. In 1962, two of Mr. Feshete's friends, Mr. Nyagomo and Mr. Mawadza, joined the scheme. The next year Mr. Feshete travelled the thirty odd miles to Nyamaropa to visit them. He found them both happy and earning more than he did from their cotton and beans. Mr. Feshete was struck by the effort that Government was making to market the farmers' crops. He joined a year later with his eldest son.

The influence of family, church and friends in the process whereby Nyamaropa was settled affected the Newcomers more than it did the Locals. As a result there was a steady increase in Newcomers A and B who settled in the first three years (Table II). By the end of 1964 all the land open for irrigation had been settled.

TABLE II.

	<u>WHEN JOINED</u>						<u>TOTAL</u>
	As percentage of all settlers.						
	<u>LOCALS</u>			<u>NEWCOMERS</u>			
	<u>A</u>	<u>B</u>	<u>TOTAL</u>	<u>A</u>	<u>B</u>	<u>TOTAL</u>	
1961	6	4	10	6	4	10	20
1962	2	4	6	11	8	19	25
1963	2	6	8	13	9	22	30
1964	-	5	5	8	9	17	22
1965	2	-	2	1	-	1	3
	12	19	31	39	30	69	100%

The first intake of Locals A and B in 1961 was mostly of men who had worked on the scheme. Subsequently, the rate at which Locals A joined fell to only 2% per year, nearly half of whom were widows, while that for Locals B increased slightly. The villagers who joined the scheme failed to initiate amongst their fellow villagers in the dry-land a desire to join. The growth of hostility towards the scheme which began in the second year of settlement, and centred on Sanyamaropa's villages, must have prevented possible candidates for settlement from joining. Just what weight can be accorded the hostility is uncertain. By the time of the survey the position had eased but the shortage of land for settlement on the existing scheme made it difficult for villagers to join.

Sanyamaropa told me that if a villager wished to join he would have to select four acres of his present village holding to be served by the canal system. This would not be difficult as the canal system for the whole scheme had been laid out. Individual decisions to join were hindered by the uncertainty as to what would become of the balance of each holding above the four acres that formed the plot. Sanyamaropa realised that it was possible for the villages to arrange the distribution of holdings so that those who wished to join had little or no land above four acres and that their holdings were conveniently sited and shaped. However, one of the Government's aims in inducing the villagers to join was to utilize the balance of the holdings to settle others on the scheme. Sanyamaropa thought that Government would insist on claiming the balance of each villager's land and would not be deceived by any pre-arrangement of the holdings. Individual decisions to join were thus open to serious charges if, as was likely, Government settled outsiders on the balance of each holding. Each decision to join involved the loss of village land to outsiders. The problem was a group problem.

Nearly half the Locals (49%) were over fifty years old at the time of the survey (Table III), and 15% were over sixty years old while 33% of the Newcomers were over fifty and 8% over sixty. 29% of the Locals and 46% of the Newcomers were under forty years old. The age dispersion of

the farmers on the scheme was notable for the fair proportion of men over sixty, 10%; for the few under thirty, 6%; and for the even spread from thirty to fifty-nine years of age.

TABLE III.

<u>AGES</u>	20-29	30-39	40-49	50-59	60+	
% of Locals	7	22	22	34	15	= 100%
% of Newcomers	4	42	21	25	8	= 100%
% of Scheme	6	34	21	29	10	= 100%

POLYGAMOUS MARRIAGES

% of Locals	-	5	3	29	7	= 44%
% of Newcomers	-	8	5	-	-	= 13%
% of Scheme	-	6	2	9	3	= 20%

AVERAGE NUMBER OF  
DEPENDENT CHILDREN  
PER FAMILY

3	3.9	5.5	5.3	2.5
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A fifth of all marriages on the scheme were polygamous. Nearly half of the Locals' marriages were polygamous (44%), while only 13% of the Newcomers' marriages were. The great majority of Locals with more than one wife were over fifty and a few much younger of whom one was a member of the Apostles which was one of two African churches which approved of polygamy. The Newcomers were all under fifty and all belonged to the same two churches.

It was striking that monogomous marriages took place when the husband was several years older than the age at which men in polygamous marriages generally first married. The women appeared to enter into both forms of marriage at much the same age. The difference between the women was that those in monogamous marriages had more education than those in polygamous marriages and more of them were church members.

Nearly every family on the scheme had young children. Many of the men in monogamous marriages had only married after they had turned thirty and then frequently to a girl ten or more years younger. The second wife of polygamous marriages was somewhat younger still than her husband. Consequently, it was usual for men over forty to have infants and their wives were likely to produce more children.

The highest average number of dependent children (5.5) belonged to the group aged forty to forty-nine and only slightly fewer belonged to those aged fifty to fifty-nine (5.3 children).

Several men over fifty supported grand-children, frequently with little help from the parents of the children. One farmer supported three grand-children, the illegitimate children of two of his four daughters.

Both daughters had been spurned by society and neither had married. One helped on her father's farm and the other worked as a domestic servant in Umtali.<sup>1</sup>

TABLE IV.

	<u>EDUCATION AND LITERACY - SAMPLE</u>					
	<u>Schooling</u>			<u>Skill</u>		<u>Literacy</u>
	<u>4 years +</u>	<u>1-3 years</u>	<u>None</u>	<u>Builder</u>	<u>Driver</u>	<u>%</u>
% of Locals	10	19	71	4	2	19
% of Newcomers	59	23	18	10	14	54
% of Sample	42	22	36	8	10	40

Table IV shows the considerable difference in the education of the two groups. Until after the Second World War when two missions were established in the area, no school served The Nyamaropa. Only those Locals who were under thirty at the time of the survey had been able to receive education near their homes: the few over thirty with schooling had had to travel some distance to attend school. Six times as many Newcomers as Locals had attended school for four years or more; three times as many had been trained as builders and seven times as many could drive. Under half the men in the sample were literate, 40%; with three-times as many Newcomers literate than Locals. UNESCO regards six years education as being the minimum necessary to ensure literacy.<sup>2</sup> The results of a simple test - reading a passage in Shona and writing a short note - suggested that both Locals and Newcomers had acquired a greater proficiency while working in town than their period in school may have been expected to indicate. This was particularly so for the Locals.

The Locals' comparative lack of education and the isolation of their homes until recently was reflected in their earning ability in the money economy prior to their joining the scheme. Three times as many Newcomers (66%) than Locals (22%) had earned £10 or more per month. Although few Newcomers had completed primary school, seven years education, nearly a quarter had trained as builders or held drivers licences - two passports to comparatively good jobs.

1. W.C.J. Cooper, the Medical Superintendent of the Victoria Hospital at Lovedale in the Cape, S. Africa, reported that 50% of babies delivered in the hospital were illegitimate. These children are usually not wanted and are generally ill-cared for. The mortality rate is considerably higher than for legitimate children. Cooper claims that malnutrition "is as much a moral and sociological problem as it is a matter of nutrition". S. African Outlook Feb. 1969. p. 26.  
At Nyamaropa parents feared the increasing incidence of illegitimacy particularly because the girl and the child would remain in their charge as there was little hope of her making a good marriage.
2. UNESCO "Literacy Work and School Education in Economic Development." World Campaign for Universal Literacy. Paris 1953. p. 59.

TABLE V.

	WORK HISTORIES			
	<u>Under £5</u> <u>per month</u>	<u>£5 - £9</u> <u>per month</u>	<u>£10 - £15</u> <u>per month</u>	<u>£15 +</u> <u>per month</u>
% of Locals	28	50	22	- = 100%
% of Newcomers	4	30	50	16 = 100%
<hr/>				
% of Sample	13	27	40	10 = 100%
<hr/>				
% of above who -	<u>had been</u> <u>self - employed</u>		<u>were in</u> <u>retirement</u>	
% of Locals	14		50	
% of Newcomers	46		21	
<hr/>				
% of Sample	36		33	

A surprisingly high proportion of both Locals and Newcomers had been self-employed (14% and 40%). A characteristic of these men was that they had spent long periods in employment before opening businesses of their own, usually after they had turned forty. Not all were very strenuous or businesslike. For almost half of them, their business represented a use of their savings while in semi-retirement to gain a small cash income and to maintain a position of status. One Local who had been self-employed was Mr. Matema.

Mr. Mandishamira Matema.

From 1914 to 1934 Mr. Matema worked in five different jobs in Rhodesia - as herd-boy, clerk, groomsman at Government House and cook. In 1937 he and two relatives opened a store. He left the venture in 1940 having lost £40. He then bought a second-hand truck with which he did contract work for four years before the truck finally broke down. Mr. Matema estimated that the truck had resulted in his losing £100. He returned home to build up his herd of forty-five cattle and fifteen goats. Soon after this, Conex demonstrators began to peg the fields of local farmers and Mr. Matema worked with them for six years.

In 1958 he opened a butchery ten miles from the present site of the scheme and bought a truck for £350. He still has the truck although it does not work. On joining the scheme with three of his sons, Mr. Matema left the butchery and the herd (except for two oxen that he took with him) in the care of a fourth son. A short while before the survey year, he had "chased the son away" for having pocketed the money that should have been used to buy beasts for the butchery and for having drawn on the herd instead. The venture failed not only because of the serious depletion of the herd and loss from natural causes, but because of the small local demand for meat.

To-day Mr. Matema is poor and sickly. He lives in three simple huts and relies on the help of his sons.

The work history of a Newcomer who opened a butchery in the Nyamapropa illustrates greater success possibly because he was younger and had more education and a more vigorous experience in the wage economy.

Mr. John Chimbadzwa.

At the time of the survey, Mr. Chimbadzwa was still self-employed. He was the local butcher. Having passed standard six and having spent a year as a waiter in a Salisbury hotel, he went to Johannesburg where he found employment as a wine steward in a leading hotel. He stayed there for nine years and returned home in 1957. Mr. Chimbadzwa went to the District Commissioner at Wedza, his home, and asked where he could open a butchery. The District Commissioner enquired for him and advised him to go to Nyamaropa, which he did.

He opened the butchery in 1958 and joined the scheme in 1963. His delay in joining was, he said, due to the good money which he had been earning farming maize on four and a half acres of dry-land which the Headman had given him when he had arrived. In 1960 he sold £100 of maize, averaging sixteen bags per acre. This yield is about three times higher than is usual on subsistence farms in Rhodesia. Mr. Chimbadzwa was able to achieve this because, as a butcher, he stall-fed his beasts for a week or two prior to their slaughter and was thus able to collect a large amount of manure which he used on his fields. However, with the gradual erosion of the price of maize in Rhodesia which was accompanied by a sharp drop in areas distant from the main centres when the policy related to transport was altered from an average cost to a fixed rate per mile, Mr. Chimbadzwa decided to join the scheme and grow other, recently introduced, cash crops.

In 1964 he acquired a stand for a store at Wedza, two hundred miles away, and during the survey year he visited Wedza several times to supervise the building of the store and to find a man to manage it for him.

Half of the Locals and one fifth of the Newcomers were in retirement from the money economy just prior to joining the scheme. Locals who had retired previous to working on the construction of the scheme have been listed as retired. Most of the men in retirement were over fifty at the time of the survey. It is unlikely that many of them would have sought wage employment again if the scheme had not offered them work on its construction and an opportunity to farm cash crops. Major factors in their decision to join were the large numbers of dependent children of the men over fifty and the widespread demand for education.

Retirement, in the form of subsistence farming on a holding in the tribal areas, provided little more than basic security. The Newcomers, in particular, reported that they found the narrowness and the backwardness of their traditional tribal homes stifling and their inability to alter it by themselves frustrating. As church members they had frequently adopted positions opposed to traditional practices. Nyamaropa appealed to them because it was young and they could mould it and because it combined both a home and a source of cash income in a healthy setting.

The men who had worked in town prior to joining the scheme all talked of town life as being exciting. Most considered Salisbury to be the best town in which to work and several went there on "holiday" to visit old friends and re-experience its atmosphere. However, they were all critical of the difficulties which an African faces should he attempt to establish a home in town. The men who left town to join the scheme were generally

ten to twenty years younger than those who joined from retirement or self-employment. They were mostly second generation settlers who came into contact with the scheme and were assisted to join by their fathers, older brothers or fellow church-members. A few of them reported that they thought they would earn more on the scheme than in wage employment. It is interesting that most of the men from town had just married or had children who were just starting to go to school when they joined. The desire for family life and the additional expense of education must have prompted many decisions to join.

At the time of the survey there were sixteen grass-widows on the scheme - women who had been left to tend the farm while their husbands worked in town. They made up 6% of all the settlers. The three grass-widows in the sample were married to men who were employed as drivers of commercial vehicles. Transport in Rhodesia has paid Africans higher salaries than has any other industry for many years. In other words the husbands of the three grass-widows were earning far higher salaries than had any of the other settlers prior to joining the scheme, from £30 to £50+ per month.

The three couples were attracted to the scheme because, as one of the grass-widows put it, they aspired to a "modern life" and they viewed the scheme as an ideal home in which to mould their lives towards "western culture". The grass-widows were younger and better educated than were the great majority of women on the scheme. They were amongst the very few women who had worked in the money economy. One had been a teacher, one a maid and the third a shop-assistant in Umtali. None of them particularly liked the scheme. They found farming irksome and disliked the social life which they thought was narrow and unexciting. All three preferred to live in town and each frequently left the scheme to visit Salisbury or Umtali where their husbands lived. All three were ambitious for their children and it was this factor that held them on the scheme. One grass-widow with four children under six reported that they were going to become "a nurse, a clerk, a teacher and a driver".

The three grass-widows came from areas distinctly separate from The Nyamaropa and two settled having no close family living on the scheme. None could predict when their husbands would retire and settle on their farms. Before settling the husbands intended to utilize their salaries to build up the farm and the homestead and to accumulate savings so that their children's education would be provided for. The grass-widows disinterest in the farm and their frequent absence meant that the farms were carried by their husbands.

The willingness of the grass-widows to live at Nyamaropa demonstrates the preparedness of Africans to seek new homes outside of the present limitations of traditional homes and the African townships. The scheme appealed to their husbands as it offered them a source of cash

income after their retirement. Particularly gratifying was their acceptance of farming in an alien community as the precondition to this opportunity.

The reasons for the settlement of the Nyamaropa irrigation scheme differ considerably from the more limited reasons which governed the settlement of the Sabi schemes. Although the movement of Africans off areas designated "white" by the Land Apportionment Act had affected most of the people who joined the Nyamaropa scheme, land hunger and the security offered in the form of water were important in only a few cases. With the loss of rights to land during the implementation of the Land Husbandry Act in the late 1950's, a number of Africans had moved into Mocambique in search of land. The few Nyamaropa settlers who joined for reasons of land shortage and insecurity came from amongst these people.

Local opposition to the scheme resulted in settlers being drawn from a far wider area than had originally been contemplated by Government. Many of the settlers moved into the area despite the fact that it was administered by a foreign and, at the time, hostile tribal authority. Many did so to escape the limitations of tribal life and extended family groups upon which they had been unable to have any impact towards progress. The role of family, church and friends in the process of settlement underlies the mobility of Africans in their search for greater opportunities.

The historical and social factors that determined the settlement of the scheme led to the formation of a community composed of distinct groups. In sentiment and in aspiration, the main fissure between the people was that of tribal and non-tribal allegiance. Although the villagers who had joined the scheme displayed a growing frustration with their ties to the villages, they remained intricately involved in village and tribal life. The Newcomers enjoyed independence from tribal affiliations having left their traditional homes. Amongst the Newcomers, family and church loyalties replaced the growth of a sense of community and common identity in a situation which was inimicable to the exercise of strong leadership. The scheme, not fully accepted by the villagers whose traditional land it occupied and settled by a majority of people over whom the tribal authority held little sway, represented an unusual development in rural Africa.

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THE HOMESTEADS.

Fitted so snugly into the floor of the valley, the irrigated area of the scheme left little room on which the farmers could construct their homes and farm buildings. This plus the need to reserve land for common grazing made it necessary to limit the size of each stand to one quarter of an acre and to string the stands out along two sides of the scheme, the north and the west (Map II).

The character of the stands to the north and the west differed considerably. Those to the north lay just below the scheme and above the Nyaruwaka River towards which a number of canals drained through the stands. The stands to the west were above the canal system and they spread up onto the lower levels of the hills. Whereas the farmer had rich easily worked soil, the latter were on poor soil or on the rocky slopes of the hills which, apart from small pockets of soil, were unsuitable for any form of cultivation.

The better situated stands to the north of the scheme were settled by the Newcomers and a few Locals B. The Locals A, the former villagers, settled on the hills to the west. A few in the south-west still lived on sites which they had occupied before the scheme had been built. The other villagers had moved along the hillside to sites within the developed half of the scheme, maintaining their traditional preference for elevated ground.<sup>1</sup> The Locals A had retained a link with their relatives in the villages by extending the original line of kraals further to the north along the hillside where previously the forest had prevented the villagers from cultivating.

The Newcomers were able to derive substantial material benefits from their stands. The proximity of a canal to most of the stands relieved the women of the task of carrying water up from the river, usually every morning and evening, unless all the nearby canals were closed. Water could be channeled along crude canals made with a hoe to irrigate fruit and small vegetable crops during

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1. The preference for elevated land is not just a relic from the not so distant past when a defensible position was essential. Living on the hillsides eases the problem of drainage during the summer rains, it is cooler during the hot months and warmer during the winter nights when the cold air flows first into the valleys. With the increasing pressure on land in the African Reserves, this habit has been strengthened as it leaves untouched arable land in the valleys.

the dry winter and early summer and to ease the making of bricks, a process which required abundant water if the soil, which was ideal for the purpose, was to be well mixed. Nearly every stand had a pit, the soil from which stood regimented nearby in the form of a house, a kitchen or a lavatory.

The Locals A, living on the hillside, had to carry water for domestic use up from the main canal and their stands were noticeably lacking in fruit trees and vegetables. However, all the farmers utilized from 1/14 to 1/7 of an acre of their plots as vegetable gardens. The homes on the hillside had a barren atmosphere that was only partly explained by their physical environment. A few stands had large indigenous trees which provided shade and a splash of green in the dry months, but not enough to hide the sharp contrast of their buildings with those common to the Newcomers.

Few of the former villagers had begun to build homes of brick, and then, apart from one who built a four-roomed house, only round brick duplicates of their traditional pole-and-dagga huts. The huts, usually fifteen feet in diameter, served as kitchens, in which most family activities took place, as bedrooms and as granaries. With very few exceptions all the Newcomers' buildings were brick and half of them owned houses.

Table I shows the type, number and value of domestic buildings owned by the families in the sample; divided into Locals, Newcomers, Grass-Widows and Widows. Standard values were used as all the buildings except the houses were fairly uniform in size and in their construction. The cost of the houses varied greatly depending on the material used, particularly for the roof. The members of the sample built a number of each type of building during the year and, in the absence of a market, I used their experience to compile the standard values.<sup>2</sup>

The standard values were:-

House	...	...	...	...	...	£50.
Brick Bedrooms, Kitchens, and Granaries	..					£15.each
Pole-and-Dagga Kitchens, Bedrooms, Granaries and Field Huts	...	...	...	...		£3
(this is less than a builder would charge, about £6, as these huts have short lives of from four to seven years).						
Lavatories	...	...	...	...	...	£9
(these were all brick built with a concrete slab over the pit)						

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2. see discussion under Method.

Fencing around the Stand ... ..	£15.
Substantial Chicken Houses . . . . . (brick with wired yards)	£8.
Small Tree Houses ... .. (in which the chickens could roost)	£1.
Fish Ponds ... ..	£5.

TABLE I.

HOMESTEADS : BUILDINGS, TOTAL AND AVERAGE VALUES.

	NOS. OWNED BY:-		VALUE		NOS. OWNED BY:-3 GRASS-WIDOWS	VALUE 3 GRASS-WIDOWS	NOS. OWNED BY:-9 WIDOWS	VALUE 9 WIDOWS
	14 LOCALS	24 NEW-COMERS	14 LOCALS	24 NEW-COMERS				
HOUSE	1	12	£50	£600	2 <sup>+</sup>	£100	2	£100
BEDROOM-BRICK	5	10	£75	£150	1	£15	5	£75
BEDROOM-HUT	23	7	£69	£21	1	£3	4	£12
KITCHEN-BRICK	4	15	£60	£225	2	£30	3	£45
KITCHEN-HUT	17	16	£51	£48	1	£3	6	£18
GRANARY-BRICK	1	10	£15	£150	-	-	1	£15
GRANARY-HUT	16	16	£48	£48	3	£9	9	£27
LAVATORY	4	17	£36	£153	3	£27	2	£18
FIELD HUT	3	6	£9	£18	-	-	-	-
FENCED STAND	1	9	£15	£135	3	£45	2	£30
CHICKEN HOUSE - BRICK	3	12	£24	£96	1	£8	5	£40
CHICKEN HOUSE-HUT	5	9	£5	£9	1	£1	1	£1
FISH POND	-	2	-	£10	-	-	-	-
TOTAL VALUE			£457	£1663		£241		£381
AVERAGE VALUE			£33	£69		£80		£42

+House being constructed: estimated cost, £90+.

The Locals and Newcomers may be compared directly as they numbered almost 1:2 i.e. 14:24. The Locals owned very few brick buildings; including lavatories, they owned an average of one brick building each.

The Newcomers owned an average of three brick buildings each. Although the Newcomers still owned a number of pole-and-dagga huts these were being replaced with brick buildings when they became delapidated. The Locals continued to replace most of their huts with huts. One Local owned a house, two brick kitchens - one for each wife - and a lavatory and was the only Local to have fenced his stand. He was, perhaps significantly, the L.D.O's messenger and earned a non-farm income of £132 per annum. The average value of the Newcomers homesteads was over twice that of the Locals: £69 & £33.

The marked difference in the type and value of the buildings owned by the Locals and the Newcomers was partly explained by the difference in the sites on which their stands stood. The Locals, living on the hillside, could not produce bricks with the same ease and convenience as could the Newcomers. Nor could many of them dig a fifteen foot lavatory pit without difficulty as they soon encountered rock. However, they were under great pressure to build lavatories. Resident on the scheme was a Health Demonstrator, part of whose job was to persuade the people to build, and then use, proper pit latrines on their stands. He was an insistent character with an annoying way of defeating one's reasons for not building a proper lavatory. This he did to me.

At the time there was a lot of talk among the white population of Rhodesia about "maintaining standards". A month after my arrival he asked if he may come and inspect my lavatory. To his surprise, I told him that as yet I had not built one as I was still completing my hut and the rough garage for my car.

"Oh," he muttered, screwing up his face in puzzlement, "but you are a European!"

"Yes", I replied, a little amused at his surprise and seeming concern that I had let my side down. "I am. However, a place to sleep, a place to cook and a shelter for my car come first. There is no hurry for a lavatory."

"No, you are wrong", he went on in more confident and measured terms. "As a European you must maintain standards, and here at Nyamaropa where we are trying to teach the people to build and use lavatories you must have one or else our work will be hard."

"Alright", I conceded, feeling thoroughly ashamed of my inadequate standards. "I will build one this week".

And so I, with the help of my assistants in what they termed "community development", spent the next three days digging a pit and another day to fell suitable poles and rig-up what must have been the roughest lavatory at Nyamaropa.

Two of the three grass-widows in the sample, all of whom were Newcomers, had only been settled on the scheme for two years and the third for three years. The average value of their homesteads, £80 (Table I) was higher than that of any other group. In part it reflected their husband's ability and willingness to support a faster rate of capitalization in terms of domestic comforts, and in part the grass-widows' aspirations to own homes. Two had brick houses and the third had engaged a builder to construct a house that would cost £90 or more. All three had lavatories and fenced stands to protect their fruit trees and vegetables from stray cattle.

The average value of the widows' homesteads was higher than that of the Locals; £42 and £33. Six of the nine widows were Newcomers. All six had family on the scheme and each of their families had subsidized one or more buildings. Although only two of the six had lavatories, three of the other four had the use of a lavatory belonging to family on adjacent stands. The three widows who were Locals owned no brick buildings.

The comparative meanness of the Locals homes was surprising in view of the fact that most of them had been farming on the scheme for longer, on average, than had the Newcomers. Their hesitancy in building more substantial homes must have been affected by their attitude towards the scheme. The construction of a brick house represented a large permanent investment and signified a close identity with the scheme by the owner. The L.D.O's messenger, Mr. Jim Nyaguse evaded this predicament. As a Government employee he was expected by the other farmers to have a home of a similar standard to those which Government provided for the African Extension staff.

The Locals retained a close identity with the villagers which, aggravated by the political opposition to the scheme, appeared to hinder their emulation of the Newcomers. As a result they appeared to be wary of departing too markedly from their previous way of life.

The predicament which the Locals faced and which may have played some part in retarding their movement into brick buildings is best illustrated by a case study.

Mr. Augustine Sadindi.

Augustine Sadindi was the best educated of all the Locals and one of the youngest. After completing secondary school he trained as a builder. He was then engaged to construct some of the out-schools for the Carmelite Mission at Regina Coeli, his alma mater. When, in 1965, the demand for new school buildings was satisfied the Mission had to let Augustine go. He joined the scheme and, with his wife Susan, went to live with his father whose kraal, although he had not joined the scheme, was just above the L.D.O's residence. Augustine built a pole-and-dagga kitchen and bedroom. His father, recently widowed, ate with them.

Augustine persuaded his father to join the scheme and undertook to manage his father's plot. He also suggested to his father that they move their home down to a site nearer the main canal and on better soil so that they could grow fruit and vegetables. Augustine wished to build a brick house, a task that movement to a new stand would greatly facilitate, and Susan to be relieved of the chore of carrying water up the hill about one hundred and fifty feet above the canal and a distance of three hundred yards. Another reason for Augustine's wish to move was that with cash farming there was far more than the traditional food crops to haul up the hill to grade and store before marketing. Augustine hoped soon to enter tobacco, a crop which would considerably increase the load to cart up the hill and the barn for which required a level site.

Augustine's father refused to consider moving. He and his ancestors had lived on their present site for generations and he would not leave it. Augustine, an educated man and a Catholic, accepted his father's decision though he did not submit to his beliefs. He applied for another stand on level ground near the main canal. His father, once he and Susan moved, would have to come down the hill for his meals and a young girl relative would have to be approached to go and live with him to see to his needs and to keep his kraal clean.

Augustine explained that his father's refusal to move to a site suited to the demands of cash farming on the scheme was not based entirely on religious grounds. Several of the other former villagers had moved their homes along the hills towards the north in order to be closer to their plots and a few had settled on more suitable sites at the bottom of the hill. His father, he thought, would move once his huts were in need of rebuilding if he felt assured that continuing membership of the scheme was worthwhile. As a village elder

and a confidant of Sanyamaropa's, Augustine's father was careful not to demonstrate his full acceptance of and commitment to the scheme by abandoning his traditional home until he felt prepared to burn his bridges.

The farmers jokingly named two distinct parts of the ribbon of stands above the Nyaruwaka, "Industrial Sites" and "New Highfields". The former is the common expression for areas zoned for industry in Rhodesian towns which are invariably adjacent to the African townships, and the latter is the more prestigious of the two African townships in Salisbury. The "Industrial Sites" was characterized by the number of tobacco barns which earned it its title. The tall, oblong, oddly asymmetrical structures with their preponderance of thatched roof dominated the skyline. Most of the families were members of the Methodist, Watch Tower or Catholic Churches.

"New Highfields" contained a higher proportion of better buildings. Nearly every stand had a two, three or four roomed house, a brick kitchen and a permanent brick latrine. The fruit trees were more mature than elsewhere and gave the quarter an established air; the paw-paws and bananas competed with the roofs for sunshine. The families were predominantly Apostles and there were few tobacco barns as their church prohibited any contact with tobacco.

Many of the farmers in both quarters were disappointed with their brick homes and few had been able to draw much satisfaction from living in them. The houses had been inadequately designed, practically and aesthetically, to facilitate the move from a traditional to a Western style of living. The families were finding it difficult to marry old modes to new surrounds. Two case studies illustrate particular facets of their predicament.

Mr. Dzimai Magoshe.

At the beginning of the survey year, Mr. Magoshe had only a pole-and-dagga kitchen and two granaries on his stand, one of which he and his wife used as a bedroom. Their six youngest children and a girl cousin lived, ate and slept in the kitchen. Mr. Magoshe decided to build a house in the months after cotton picking when there was less work to be done and no rain to hinder building. During the months beforehand, the family and the two labourers moulded and fired the bricks with the help of their neighbour who was a builder. The design of the house and the simple drawings were left almost entirely to the builder, a man from off the scheme who had earned a reputation at Nyamaropa for being reliable and reasonable.

The builder put up the walls, working with two assistants. A carpenter, who runs a shop on the scheme, put on the roof for £5 and the builder and his assistants thatched it, charging £15 for all their labour. The gum poles for the roof cost £4.5.0d. and their transport from Inyanga, £7. The grass for thatching cost £2.15.6d. and its transport, £4.10.0d. for the twenty miles from Nymanambgwe. Cement for the foundations and walls cost £6.5.0. and to finish the floors and plaster a few inside walls, the same. Sand was carried up from the Nyaruwaka River by the family using their scotchcart. The window and door frames were made by the same carpenter for £5.13.6d. Altogether the house cost £57.4.0. If Mr. Magoshe had employed others to make the bricks it would have raised the cost by about £10. He spent £14.19.0 on furniture for the house: four chairs, a table, a cupboard, a paraffin pressure lamp and a four gallon can, all second hand.

Though four roomed, the house was not big. The largest room was ten foot square, two were six foot and the fourth, which was a store-room for implements, was six by five foot. The verandah was sixteen by five foot. The house was attractive with its tall steeply peaked thatch roof under which one had to duck to enter. In summer the high roof, no ceiling and small windows which extend beneath the overhang of the roof made the house cool and the family members enjoyed sleeping in it on their mats. In winter it was difficult to heat, particularly as the kitchen remained a separate building. Everyone slept wrapped in a blanket or two on a reed mat near the fire in the kitchen.

The limited use of the house, as a dormitory in summer and for formal entertaining, was common at Nyamaropa. There were several reasons for it: the custom of sitting around the open fire; the difficulty of moving the fire into the new house as the draught from doors and windows cause the smoke to drift about the rooms rather than rise slowly above the fire; the fact that any roof other than thatch will not allow the smoke to escape unless a proper chimney is constructed and this, by definition, does away with the open fire. The use of a Dover or similar wood burning stove would involve a complete break from the customary preparation of food and the sociability that goes with sitting around an open fire.

Mr. Magoshe was disappointed because the rooms had turned out to be so small. The possession of a house had neither significantly altered their manner of living nor its standard. His plan to build a separate brick kitchen the following year could only cement the traditional pattern and entrench his dissatisfaction. The house proved to be an excellent store-room being brick with concrete floors. It also served as an extension of the tobacco barn when the crop overflowed the barn, and for three months the family happily went back to the old granaries and kitchen although it was summer.

Some of the farmers were conscious of the disappointment experienced by those who had recently built brick homes. The following case study illustrates a farmer's awareness of the problems involved and his inability to translate his ideas into a workable solution.

Mr. Ernest Mapfurira.

Ernest Mapfurira's stand was in "New Highfields". It was dominated by two large indigenous trees in whose shade small groups of Biblically clad Apostles occasionally met. The neat rows of citrus and mango trees, planted in between with yams, and the rythmical spacing of his three round, red brick buildings with their conical thatch roofs lent the stand a homely atmosphere. Two of the buildings were bedrooms, though it would have been more accurate to call one a store-room-cum-office as half of it was piled high with bags of maize, wheat, fertilizer and seed. The other half had a table and a chair at which Ernest's eldest son did his school work. The other bedroom held Ernest's bed, a better table and three chairs. It could thus serve as a dining room in which to entertain men friends or as a suitable place for a Co-operative Committee meeting of which Ernest was Chairman and later became Manager, or for a meeting of the "elders" of the Apostles of whom Ernest was the leader and bore the title "Baptist". The third building, somewhat larger, was the kitchen where the rest of the family lived. It had a stable door, two small windows on either side curtained by simple boxwood shutters hinged to the frames and a narrow built-in seat which ran a quarter of the way round the wall from the door in traditional fashion, denoting hospitability as it started at the point of entry to the room.

Towards the end of the survey year Ernest asked if I would look at the plan for a house that one of the Demonstrators had drawn for him. The design could have been neither less interesting nor less suited to the site. The road would have run within feet of the front entrance and windows. In the hot dry months the dust from passing vehicles would have forced their closure. The centre room was no more than a cross-roads and the whole had no design beyond four exterior walls. Ernest was disappointed with it. He wanted four bedrooms for his three wives and himself, a bedroom for his daughters, an office for himself, a large family room and possibly a proper kitchen which he might later equip with a Dover stove. The plan had all these rooms, but it in no way reflected his desire for a home of which he could be proud. Mr. Mapfurira wanted rooms with individual character and an overall design that was pleasing and that fitted his stand.

At my suggestion Ernest measured his stand and drew a sketch showing his existing buildings, trees and pond. We discussed the problem of the road and how to keep the dust out; the passage of the sun in summer and winter; the need for privacy and the area on the small stand that could be devoted to the house. We both sketched designs, being concerned particularly with how best to fit the large eight roomed house to the stand. Ernest found sketching very difficult. He had no conception of how to draw nor how to depict relative distances on paper. Though Ernest insisted that I design the house because I "know about houses", when discussing it with him I found that he had a definite though ill-formed idea of what he wanted. With a sketch of his stand and of the proposed house we went to see Mr. Samuel Chibonda, a close neighbour, and asked him in his capacity as a builder to draw the design.

In the resultant plan, the house fits the stand, it makes a courtyard with the three existing buildings and it shields off the road. It has a verandah to increase the area of shade and to cool the rooms it fronts. The house runs lengthwise across the path of the sun in summer and catches the sun in its arms in winter. The main body of the building would be two steps higher than the arms and the whole building would be thatched. Long, and with a low browed roof, particularly in the courtyard, it would be most attractive. What appealed to Ernest most was that it had an element of design.

The design of the farmers' houses reflected several weaknesses in their approach to house building. Their model was the sterile design common to the majority of African townships. At Nyamaropa the farmers were fortunate in that they were able to retain their traditional hut and open fire as the family room although this frequently left the house unused. Even the few farmers who had included the kitchen in the house and had installed Dover stoves, found that family life was split. The women spent most of their free time in the kitchen and, as the floors were made of concrete and there were no ceilings, the kitchen remained the only comfortable room in which to sleep. Until the house is fully furnished, which could cost as much as the house had cost to build, the inclusion of a kitchen will not add much to the satisfaction to be derived from ownership of a house.

There appeared to be a need for development in housing in which customary patterns of family life could remain intact, while allowing for the introduction of Western comforts and convenience. The preparation and cooking of food must remain socially and, therefore, geographically an integral part of family

life. Although the men at Nyamaropa played no part in the preparation of food and occasionally ate apart from their wives and children when male guests were present, the hearth was the centre of family life. The tight circle of flickering light and warmth bound the family together and yet allowed each member to leave the group at will: not only by stepping outside of the hut, but even by lying down in the shadows and going to sleep. A house centred on a large family room from which smaller rooms lead off to provide the privacy that the older members of the family seek, would preserve the essential pattern of family life. To ease construction in areas where builders and carpenters are not employed, the use of the traditional circular design would suffice and be aesthetically satisfying. Construction would be similar to that of the existing brick kitchens and bedrooms and the inner walls would act as pillars to support the roof trusses. The same locally available materials would be suitable. An alteration that would add considerably to the comfort of the house would be terra-crete floors (earth stabilized with cement) rather than concrete floors. Terra-crete floors would be more equitable in temperature and overlaid, as is customary, with reed mats would obviate the immediate need for chairs and beds. The women would have less sweeping to do as the cement would stabilize the mud.

A Dover stove in place of the open fire would, particularly if fitted with a tubular iron chimney, effuse sufficient heat to warm the house. However, its main advantage would be its liberating effect. Tables and chairs could then be introduced into the main room which previously smoke had precluded. With furniture the room would of necessity have to be bigger, a fact anyone called in to give advice would have to remember. The woman's role would change dramatically. From her previously limited means of preparation she would suddenly have an oven and a number of plates so that she could increase the variety of food she could cook enormously. Moreover, the oven would free her from the time consuming task of watching her pots as they balance on the crude metal frame under which she builds her fire. She would be freed to undertake other tasks around the home for which the daily work

in the fields and the preparation of food left little or no time.<sup>3</sup>

The most sophisticated group on the scheme were the members of the Extension staff. The Demonstrators had prefabricated asbestos houses which had been designed and erected by the Ministry of Works. The homes had four rooms, a bathroom, a kitchen and a store-room, all with cement floors. They were oppressively hot in summer, cold in winter, noisy and uncomfortable, and they cost almost £350 each - 7 times that of a locally built brick and thatch house or  $3\frac{1}{2}$  times a house under an asbestos roof. Part of the reason for having them was that the asbestos was a protection against any malicious firing of Government personnel's homes. The concern for the safety of personnel and their families was understandable. However, an asbestos roof over locally built brick walls would have sufficed and been more practical. The houses represented an uneconomical use of departmental money and, because their inhabitants disliked them, they did not provide a model to which the farmers might have aspired.

Had Government employed local craftsmen to build the houses it would not only have saved several hundred pounds, it would have acted as a public relations move and injected money into the community.

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3. The most exciting township development project for Africa that I have seen or heard of was designed by a young Nigerian, David Olatunde Aradeon. His project concerns the development of a remote village in Eastern Nigeria called Agbaja into a large community of over 30,000 people servicing an adjacent iron ore operation. Aradeon's concern was "precisely how can iron ore mining activities be integrated into a traditional society without bulldozing the pattern of life?" The principle element of his plan is the neighbourhood colony and its subsidiary units. The neighbourhood is so planned as to be socially and economically integrated and, according to Aradeon "help generate more easily a feeling of neighbourliness." Construction would be monolithic terracrete and major roofs would be bamboo reinforced terracrete found on site. Aradeon has combined the best of American experience with his own intimate knowledge of Nigerian social patterns to create an exciting, aesthetically whole development in accord with the needs and aspirations of the people. His project was written up in "Progressive Architecture," September 1967. p.172-175.

## CAPITAL EQUIPMENT ON THE FARMS.

Without a market for land, it was difficult for a farmer to optimise the relationship of his stock of capital goods to his land holding. This was so for most of the more lumpy investments, ploughs, harrows, scotchcarts, spraying machines, and for any form of traction. Particularly was it so seeing that the area of the farm was only four acres and that other inputs were fixed, such as family labour.

At Nyamaropa many farmers shared implements and oxen with one, or occasionally more, family members. It was a means of reaching an optimum by extending the area on which an implement was employed. While it was a rationalization of a particular set of conditions, it arose from the pattern of settlement. Many later settlers were initially supported by fathers, brothers or fellow church members who had settled previously. The sharing of capital goods proved to be advantageous to most parties and many families continued the practice. However, the value of the capital goods that each partner held was slowly being adjusted towards more equitable figures as the minor partner was able to buy his own implements. Until such time, the minor partner usually gave labour to the major partner as a form of payment, though never with any formal accounting of what was owed. Rather, labour was given when surplus to the minor partner's farm needs.

Inside a family, particularly between father and son, the disproportionate sharing of the costs of implements and cattle was often carried happily by the fathers if it allowed their sons to marry, move into tobacco, or otherwise improve their farms and homes. Nevertheless, once the minor partners' basic needs were satisfied, they were keen to use any surplus towards becoming independent, even though this may have run counter to purely economic rationalization. To have the sole use of an implement so that care in its employment and maintenance devolve on oneself is an understandable desire. At the time of the survey, many minor partners had moved partially or completely towards independence. Independent ownership of capital goods did not lessen the labour and social benefits derived by families working together, but it did allow greater freedom of choice as to with whom they chose to work.

Table I, column one shows the percentage of Locals and Newcomers who owned specified items of farm equipment at the time of the survey. Column two shows the percentage of each item of equipment which had been purchased by Locals and Newcomers since they had settled on the scheme. Column three gives the same information for the sample, that is Locals and Newcomers combined.

TABLE I. CAPITAL EQUIPMENT ON THE FARMS

	OWNED BY % OF:-		% ACQUIRED SINCE JOINING BY:-		S A M P L E	
	LOCALS	NEWCOMERS	LOCALS	NEWCOMERS	% OWNED	% ACQUIRED
TOBACCO BARN	14	56	100	100	38	100
TRUCK	-	20	-	34	12	34
SCOTCH CART	56	36	62	66	48	65
SLEDGE	42	9	33	50	22	28
PLOUGH	84	110	21	36	96	34
CULTIVATOR	63	68	78	65	66	63
HARROW	56	76	100	78	70	88
WHEELBARROW	56	80	87	90	73	89
SPRAY MACHINE	28	56	100	100	46	100
HAND IMPLEMENTS	450	380	30	30	408	490
HOES	530	470	35	30	490	32
BICYCLE	91	52	16	40	69	26
HAND-MILL	35	-	-	-	12	-
AVERAGE VALUE	£57	£125	£38	£76	£98	£62

A far greater proportion of Newcomers owned tobacco barns, trucks, harrows, wheelbarrows and spray-machines than did Locals: items that denoted more intensive farming. It is significant that more of these items had been acquired since the farmers joined the scheme than had any other items. Nearly half the members of the sample owned either a scotchcart or a truck. The six trucks were owned by Newcomers, two of which were temporarily out of commission. The average value of the trucks was £180. Sledges were also used to carry materials. They were simple triangular frames of heavy timber which were dragged along the ground by teams of oxen. They were particularly useful for dragging large tree trunks through the forest to the road. However, they break the surface of the earth and cause erosion to start, which occurred most rapidly on hillside paths.

Two Locals and a Newcomer did not own ploughs. The Locals borrowed from family and the Newcomer hired a plough. The 110% figure for the Newcomers results from the inclusion of three ridge ploughs which belonged to three tobacco farmers. The greater proportion of hand implements owned by Locals reflected larger families and their liking for working in communal groups.

Bicycles have been prestige items in African society for some time, and remained so at Nyamaropa. All but one Local family had a bicycle. Of these thirteen bicycles four were not in working order and eleven had been acquired by the farmers before they joined the scheme. Each of the eleven had been bought with cash earned in wage employment and were the most expensive items that the families possessed. By the time of the survey their wants had increased in several directions, principally towards education and the need to capitalize the farm; old bicycles were kept going until major repairs involving some cash outlay proved necessary. Three of the four not in working order could have been resurrected at a cost of £3 - £5. The Newcomers' figures were very different. Only half of them owned bicycles, though theirs were less aged than those of the Locals, 40% of them having been acquired since the owners joined the scheme. Three bicycles belonged to Mr. John Chimbadzwa and were used to deliver meat from his butchery.

The five hand-mills were owned by Locals who used them occasionally when they wished to save the cost of milling at the stores.

Standard values were used to estimate the average value of the implements owned by each group. They were:-

One acre tobacco barn	£50	<sup>a.</sup>
Truck		<sup>b.</sup>
Scotchcart	£35	<sup>c.</sup>
Sledge	£ 1	
Plough	£ 5	<sup>c.</sup>
Ridge Plough	£ 7	<sup>c.</sup>
Cultivator	£ 7	<sup>c.</sup>
Harrow	£ 5	<sup>c.</sup>
Wheelbarrow	£ 5	<sup>c.</sup>
Spray machines	£26	<sup>d.</sup>
Hand implements		5/- <sup>d.</sup> each.
Hoe		
Bicycle	£ 5	
Hand-mills	£ 1	<sup>e.</sup>

- +a. A one acre tobacco barn usually holds a good crop off 5/7 of an acre and was the size that had become common on the scheme under the existing quota system whereby farmers were allowed to market 2,000 lbs. as new growers of burley tobacco. Two Newcomers owned barns more than twice this size; they are included as having 2 x £50 barns each.
- +b. Trucks were valued according to rough estimates of their market prices at the end of the year.
- +c. These values are the same as those used by R.W.M. Johnson who surveyed the Chitowa Native Purchase Area in 1964.<sup>1</sup>
- +d. Cost price as each of them was bought at the end of 1966.
- e. Johnson gave hand grinding mills a standard value of £10. At Nyamaropa, mechanical milling operated by the stores had superseded hand milling and no hand mills had been bought by the farmers since the scheme had begun.

The average value of the capital equipment owned by the Newcomers was over twice that owned by the Locals and they had purchased nearly three times as much since settling.

Nyamaropa may be placed in a wider setting by comparing the farmers' average value of farm capital with that of the farmers of the Chitowa Purchase Area as estimated by Johnson.<sup>2</sup> The mean size of the farms in the Chitowa survey was 152 acres with a mean cultivated acreage of 39.9 acres. The scale of farming at Chitowa was therefore ten times greater than at Nyamaropa where all but two farms were 4 acres. At Chitowa the average number of ploughs per farm was two and nearly all farms had ox drawn planters. Harrows and cultivators averaged roughly one each per farm. Using the same standard values as Johnson used, the average valuation of implements per farm at Chitowa was £99; at Nyamaropa it was £53 (excluding tobacco barns and trucks).

The farms at Nyamaropa had been settled for a shorter period, all under six years and on average four years, than at Chitowa where the period of occupation, though not in the survey, can be guessed from the years in which the bulk of the farms in the area were

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1. Johnson, R.W.M.: "An Economic Survey of Chitowa Native Purchase Area, Mrewa District, Southern Rhodesia." Part I Technical Paper in Agricultural Economics No.18, Dec.1964. U.C.R.N.

2. *ibid.* p.13.

occupied, 1948 - 1955. A difference of from five to twelve years longer. Entry to Purchase Areas has only been open to Africans holding Master Farmer Certificates and has always had minimum stipulations regarding the applicants' possession of cash and capital goods. The regulations have altered from time to time, but for our immediate purpose we may take it as having been £300 in cash or kind.

Amongst the forty-one farms in the Chitowa sample there were seven trucks, seven tractors and one car. The fifteen vehicles were owned by fourteen farmers. At Nyamaropa, where tractors were impractical and where the bulk of farm transport was handled through the Co-operative, the thirty-eight families in the sample owned six trucks. Although the trucks may have done less work than those at Chitowa, the comparison was favourable.

Unfortunately, Johnson did not value the buildings owned by members of his sample and there is no descriptive passage on them. Only one farmer grew tobacco.

Table II shows the number and value of cattle and other livestock owned by the Locals and Newcomers. The Locals owned an average of 5.7 head of cattle per family and the Newcomers, 3.7 head per family. Trained oxen and young oxen made up 75% of the cattle population on the scheme and cows just over 12%. The Newcomers' herds had smaller proportions of cows than did the Locals' herds and no Newcomer in the sample owned a bull. The Locals' herds, therefore, had greater reproductive potential than did those of the Newcomers. The average value of the cattle owned by the Locals was £72 and that of the Newcomers was £50 (Table II).

TABLE II. LIVESTOCK OWNED BY THE FAMILIES IN THE SAMPLE.

	NOS. OWNED BY:-		VALUE	
	14 LOCALS	24 NEWCOMERS	14 LOCALS	24 NEWCOMERS
<u>CATTLE</u>				
TRAINED OXEN	45	59	£675	£885
YOUNG OXEN	10	11	£100	£110
COWS	19	20	£190	£200
HEIFERS	2	2	£16	£16
BULLS	3	-	£36	-
TOTAL CATTLE	79	92	£1017	£1211
AVERAGE PER FAMILY	5.7	3.7	£72	£50

TABLE II. (continued)

LIVESTOCK OWNED BY THE FAMILIES IN THE SAMPLE.

	NOS. OWNED BY:-		VALUE	
	14 LOCALS	24 NEWCOMERS	14 LOCALS	24 NEWCOMERS
<u>OTHER LIVESTOCK</u>				
CHICKENS	210	486	£52	£121
GOATS	15	27	£30	£54
SHEEP	-	13	-	£32
PIGS	4	23	£16	£92
DUCKS	-	32	-	£10
DONKEYS	-	3	-	£18
TOTAL VALUE			£98	£327
AVERAGE VALUE			£ 7	£14
<u>AVERAGE VALUE: CATTLE &amp; OTHER LIVESTOCK</u>			£79	£64

The dispersion of trained oxen across the families is shown in Table III. Over half the Locals and only a fifth of the Newcomers owned more than three trained oxen. Three of the five Locals who had five or six, used them to assist family members settled on the scheme. Each of the five was a former villager and had been able to retain his original herd. Less than half the families in the sample owned two or less trained oxen (44%) and nearly four-fifths (87%) no more than four trained oxen.

TABLE III.

CATTLE DISPERSION

TRAINED OXEN

OWNED BY:-	HEAD OF TRAINED OXEN						
	0	1	2	3	4	5	6
14 LOCALS	2	-	2	2	3	3	2
24 NEWCOMERS	4	-	9	6	5	-	-
SAMPLE	6	-	11	8	8	3	2

17%      -      27%

44%

87%

TABLE IV.  
ALL CATTLE

OWNED BY:-	HEAD OF CATTLE						
	0	2	4	6	8	10	12
14 LOCALS	1	3	1	4	1	3	1
24 NEWCOMERS	3	7	4	8	2	-	-
SAMPLE	4	10	5	12	3	3	1

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50%

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81%

Table IV shows the dispersion of all cattle across the families. It is interesting that the largest herd owned by a member of the sample consisted of only twelve animals and that 50% of the families had no more than four cattle while over 80% owned no more than six cattle. One Local and three Newcomers owned no cattle. The herds belonging to the farmers of Nyamaropa were working herds with small reproductive or market potential.

The values used in Table II are the standard purchase prices for healthy animals with reasonable frames. All animals at Nyamaropa exchanged at varying prices around an accepted norm. Trained adult oxen were normally £15 but did sell for as little as £12 or £11 if the beast had suffered in times of poor grazing or if, in the small usually inactive market, a family wished to sell quickly to secure cash for school fees or to meet a family crisis. Should the seller not have to sell immediately, he could push a determined buyer up to £18 for a good beast. Similarly, the price of a goat varied from £1.5.0. to £2.5.0 depending on size, age and sex; a sheep from £2 to £3; and chickens from 4/-d. to 5/6d. for a hen and from 5/-d. to 6/-d. for a cock. The standard values used in the Table were:-

Trained oxen	£15
Young oxen	£10
Cows	£10
Heifers	£ 8
Bulls	£12
Chickens	5/-.
Goats	£ 2
Sheep	£2.10.0
Pigs	£4
Ducks	6/-.
Donkeys	£6

The Locals and Newcomers owned similar numbers of chickens and goats while the Newcomers owned far more of the other livestock, the average value being twice that of the Locals', £14 and £7 (Table II). When the value of Other Livestock is added to that of cattle, it can be seen that the average value of all the Locals' livestock was only slightly higher than that of the Newcomers, £79 and £64.

TOTAL INVESTMENT ON THE SCHEME.

The average total investment on the scheme by the Locals was £169, that is 65% of the Newcomers' average total investment, £258 (Table V). The Newcomers had invested considerably more in brick buildings, tobacco barns, trucks, farm implements and livestock other than cattle. The average annual rate of investment by Locals was £42 and by Newcomers, £78; the average length of settlement being 4 years for the Locals and 3.3 years for the Newcomers.

TABLE V.                    THE AVERAGE TOTAL INVESTMENT BY CATEGORY

	<u>HOMESTEAD</u>	<u>FARM</u>	<u>LIVESTOCK</u>	<u>TOTAL</u>
LOCALS	£33	£57	£79	£169
NEWCOMERS	£69	£125	£64	£258
GRASS WIDOWS	£80	£73	£27	£180
WIDOWS	£42	£27	£33	£102

In his study of the Sabi Irrigation Schemes, Roder used a wealth index which, while neat, has hidden the composition of the farmers' wealth.<sup>3</sup> The only direct comparison that can be made between his study and this is therefore of the average total wealth of the schemes. Nyanyadzi, the most developed of the Sabi schemes, had a median wealth figure of £212, £46 less than the average figure for the Newcomers at Nyamaropa (Table V) and £43 higher than the average figure for the Locals. The median wealth per farmer on all the Sabi Schemes was £120, considerably below the Newcomers, Locals and Grass-Widows, and comparable to the Widows at Nyamaropa. Two factors in the comparison deserve closer consideration. The average number of cattle per farmer at Nyanyadzi was 5.2 and at Nyamaropa 3.7. The difference represents a rough value of £17. At the time of Roder's survey, 1962, there were no tobacco barns at Nyanyadzi. At Nyamaropa in 1967 the average value of the tobacco barns per farmer was £19.

3. Roder, W.: op cit Table 22, p.166.

The two factors, cattle and tobacco barns thus cancel each other out in terms of value, though as productive assets the tobacco barns are undoubtedly of greater significance. Since 1962 burley tobacco has been introduced to the Sabi-Schemes, though on none of them was it as popular a crop as at Nyamaropa. Quite possibly the acquisition of tobacco barns by some of the farmers has raised the average total investment on these schemes and cattle or other livestock may have been sold to pay for the farms.

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THE ADMINISTRATIVE STRUCTURE OF THE SCHEME

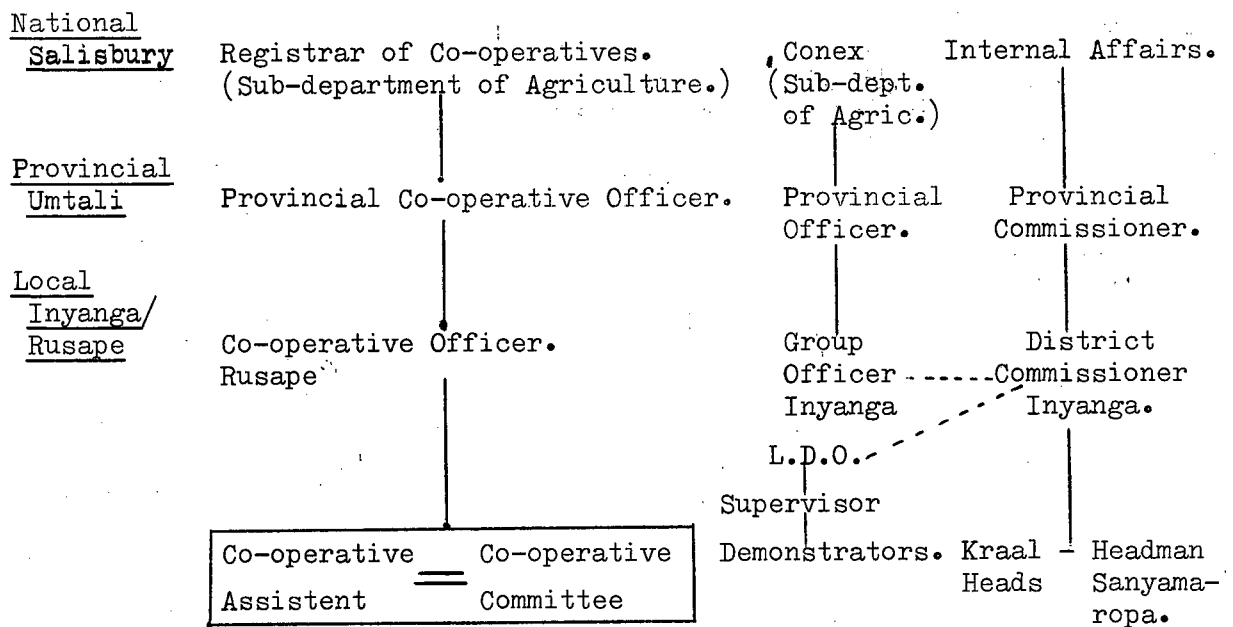
*"It is only things indirectly connected with economics that can change. Droughts and human nature do not."*

Herman Charles Bosman.

African Irrigation schemes in Rhodesia were administered by the Department of Conservation and Extension (Conex) until just after the survey at Nyamaropa was completed. Their administration was then taken over by Internal Affairs.

The irrigation schemes for Africans are sited in Tribal Trust areas and the farmers on them are therefore subjects of the Tribal Authority. The Department of Internal Affairs, the successor to the Native Affairs Department, administers the tribal areas through its own officer, the District Commissioner, and through the Tribal Authority. Internal Affairs has enormous powers over the lives of the people in the tribal areas. Until recently, therefore, irrigation schemes were anomalies within the tribal areas in that Conex., whose officers held advisory positions in the areas, administered the schemes. Internal Affairs were forced to consult with Conex. in dealing with issues relating to the schemes. The position and influence of these two administrative bodies in relation to the Nyamaropa scheme are shown in the diagram.

Administrative Structure Related to Nyamaropa.



During the survey year, the key figure on the scheme was the Land Development Officer (L.D.O.) employed by Conex. The L.D.O. was both the administrative and the extension officer for the scheme. He was a European, though a few Africans held equivalent positions elsewhere in Rhodesia, and had under him an African staff of five Demonstrators headed by a Supervisor. The L.D.O. worked under a Group Officer stationed at Inyanga who

in turn came under the Provincial Officer in Umtali. The Sabi irrigation schemes were administered under the same Provincial Officer. Their administrative structure was the same as that at Nyamaropa.

The Tribal Authority acted as both a body which represented the people to Government and as the representative of Government amongst the people. The department of Internal Affairs have long realised the incompatibility of the two roles and under the recent Community Development Programme plan to leave the Tribal Authority with its traditional role of representative of the people; Government will now work down to the people through community and regional (elected) Boards. At the time of the survey the "Indirect Rule" structure operated at Nyamaropa. On the scheme the four kraalheads safeguarded traditional rights, judged petty disputes, sent more complicated or important cases to the Headman's court and collected taxes for payment to the District Commissioner's office. The Headman, Sanyamaropa, attended the regular Headmen and Chief's meeting with the District Commissioner and forwarded cases that his court was not competent to deal with to either the court of the Chief or of the District Commissioner.

The split between the scheme and the villagers had severely reduced the effectiveness of the farmers link with Government through the Tribal Authority. Although Government has bolstered the offices of Chief and Headmen as simple civic authorities, the majority of farmers had little connection or concern with Sanyamaropa and his office. The refusal of Sanyamaropa's villagers to join the scheme and his acceptance of outsiders as settlers upon a consideration to himself (reports varied from 15/- to 60/-) ensured that distinction between the scheme and the villagers be more pronounced than would necessarily have followed the technical conversion of the land into an irrigation scheme. Much as A.L. Epstein found on the Copperbelt,<sup>1</sup> the majority of farmers at Nyamaropa regarded the traditional authority, and with it a number of traditional habits and customs, as being irrelevant to their work and lives on the scheme. Sanyamaropa's charge of a fee before endorsing applications to settle on the scheme was regarded by the farmers as an abuse of his office. The farmers considered that they had bought "rights" to their plots with the payment and that the Tribal Authority accordingly lost much of its jurisdiction over the scheme.<sup>2</sup>

There was, therefore, no body on the scheme which could represent the farmers to Government. Internal Affairs had two channels of access

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1. A.L. Epstein; "Politics in an Urban African Community". Manchester Univ. Press 1958.
  2. The spread of cocoa production in West Africa allowed the chiefs to "enrich themselves by selling tribal lands, a practice contrary to customary native law".  
V.D. Wickizer: "The Smallholder in Tropical Export-crop production". Food Research Institute Studies II Feb. 1960. Stanford. p. 59.

to the scheme. Orders could be passed down from the District Commissioner to the Headmen and then to the Kraalheads who were all older men concerned with the preservation of the status quo. The poor calibre of some of the Headmen and Kraalheads made this an ineffective form of administration except for limited purposes. Direct relations with the farmers could be established through meetings addressed by the District Commissioner or his staff. Though frequently preferable, meetings took time to convene, sometimes aroused emotions and were seldom conclusive. The complexity of issues makes forthright administration difficult unless conducted in some isolation!

The L.D.O. as an administrator within an area administered by Internal Affairs had to maintain contact with the District Commissioner's Office. In fact, at Inyanga Conex and Internal Affairs shared a small complex of offices and, as in most country districts, their personnel played a leading role in the small European community. The entré the L.D.O.'s office gave Internal Affairs to the scheme was important though in most respects informal. This relationship is represented in the diagram by a broken line. The importance of the relationship was that it strengthened the administrative function of the L.D.O. without his office becoming an avenue through which the farmers had access to Government.

The structure of administration related to the Co-operative is shown on the diagram. The Co-operative officer in Rusape visited the Committee on the scheme several times during the year. The officer would have liked to have devoted much more of his time to working with the Committee and the members of the Co-operatives under his jurisdiction but office duties and a shortage of staff prevented this. An Assistant travelled frequently to Nyamaropa and worked with the Committee and the Manager. The Co-operative was the only institution and the only effective contact that the farmers had with officialdom. However, the limited functions of the Co-operative rendered it incapable of representing the farmers to Government.

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## ADMINISTRATION

African irrigation schemes in Rhodesia have been the responsibility of the Department of Agriculture since the 1930's. Inherent in this situation is a split in the function of the European Land Development Officers who administered the schemes: the L.D.O.'s were charged with both an authoritative and an advisory role.

The history of the Sabi irrigation schemes, as we have seen, is one of unremarkable development until the late 1950's; when cotton and seed-beans were introduced. The L.D.O., throughout the first 20 years of the Sabi schemes, had therefore little opportunity to provide an advisory service which could open real prospects to the plot-holders. Rather, the L.D.O. and his staff of African Demonstrators were tied, in the main, to an authoritative role of overseeing the implementation of conservation laws and the various regulations as they were introduced. The short-lived enforcement of several of the harsher regulations is an indication of the incompatibility of the two roles: some L.D.O.'s were not prepared, at the time, to adopt so complete an authoritative role at the possible expense of their advisory relationship with the plot-holders.

The degree of incompatibility of the two roles has grown over the years and reflects the changing emphasis away from conservation towards more active extension. The present Department of Conservation and Extension (Conex) - a sub branch of Agriculture - began as a specialist Department concerned solely with conservation. Rhodesia has been praised for her conservation work by numerous authorities who rate her performance in this field with the best in Africa or in the underdeveloped world. Later, research and extension services were added to the role of Conex, much of it initially geared to European farming. Until the 1960's Conex retained a technological approach that allowed heavy capital expenditure aimed at conservation in the Tribal areas to go un-serviced. The paltry return on this expenditure went unnoticed while the pressure on the land and the needs of the African people rose.

To the African villagers and plot-holders the twin roles of the L.D.O. and his staff were neither always understood nor separated. The extent to which this duality lessened the effectiveness of the L.D.O. and his staff is difficult to assess. Roder reported that not all plot-holders recognised that the L.D.O. represented a system of law and was not the final authority. Roder also noted that suggestions made by the L.D.O. were frequently presented to the farmers by his African staff (Demonstrators) as commands. <sup>1</sup>

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1. op. cit. Page 172.

It would seem, according to L.D.O.s. and senior officials whom I met, that an L.D.O. who retained an authoritative approach was understood by the people, achieved more in his area, mainly based on conservation practices, and was happier in his job than an L.D.O. who "played it soft" in an advisory manner. The latter frequently found that he destroyed much of his ability to work with the people by being forced to act tough and send repeated conservation offenders to the District Commissioner's court.

The dual role of the L.D.O., at least on the irrigation schemes, has been abolished under the 1967 Tribal Trust Land Act. Under this Act the Ministry of Internal Affairs has taken over the formal management of the schemes. The L.D.O., now given the more appropriate title of Extension Officer, and his staff are thus freed of their authoritative duties. The change is intended to increase the effectiveness of the Extension service on the schemes. One short-term difficulty remains and that is the re-orientation of the staff, both European and African. It is part of a wider problem which also involves the changing role of the District Commissioner's office under the recently adopted Community Development programme. Many of the older staff will find it hard to drop their authoritative approach and accept that of a humble advisor.

The administration and extension structure at Nyamaropa during the survey was that under the old arrangement whereby both roles were vested in the L.D.O. Most L.D.O.s have had a formal training in agriculture equivalent to a bachelor degree. Others entered the service before such training or compatible experience was required. However, the lack of either suitably qualified men or of qualified men prepared to accept such posts when remuneration outside Government service is far higher has forced the lowering of entrance standards. The dual role of the L.D.O. demanded qualities other than pure technical knowledge: qualities which forces in Rhodesia and the greater success of authoritative personnel made rare. The ambiguous and expedient position of the L.D.O. on the schemes left them unprotected from the often complicating or contradictory actions of personnel from other Government Departments. The rise of Nationalist feeling and activity in the late 1950's and early 1960's made everyone on the schemes sensitive to any apparent personal fiat on the part of the L.D.O. with the result that several authoritative roles were quietly dropped; some with and some without official agreement.

Nyamaropa began its life just as the authoratitative approach was being back-pedalled to avoid possible clashes with the Nationalist elements. The close identity of the engineer with the scheme, the genuine friendliness and ability of the L.D.O. and his African staff and their personal contact with the earlier settlers, and the desire of the majority of the farmers to progress ensured a halcyon beginning.

In fact the scheme's development was heartening and some of the individual crop yields and grades were outstanding. The whole sum of experience of rural development in Africa and elsewhere in the underdeveloped world points to the crucial significance of possessing the right personnel. Kimble has stressed the same point, "It is becoming clear also that what, in the long run, determines the success or failure of a farm improvement plan is not so much its agronomic merits, or its timeliness, or even its financial feasibility, but the personal qualities of the African and European men who are in charge of it." <sup>2</sup>

However, even good personnel must work within a clearly defined and structured relationship with their wards. At Nyamaropa the first L.D.O. was able to work effectively with the farmers because in the absence of any sense of community he and his staff worked with the individual farmer. There was an element of paternalism when it came to decisions affecting the community since no corresponding body existed to represent the farmers. With the development of the scheme the issues that had to be tackled became more complex, more fundamental and all of them increasingly involved vested interests and group feelings based on church, family and other affiliations. The satisfactory solution to any issue, therefore, had increasingly to be formulated and accepted within some arrangement agreed to by all the farmers. Such an arrangement has not come about; though the Co-operative Committee is able to handle many of the issues concerning marketing.

Gaitskell regarded paternalism and the subsequent difficulties it created as "the biggest weakness" in the development of the Gezira scheme. "At first the needs of the scheme demanded careful supervision from the officials and obedience from the tenants. This, however, did not encourage initiative or lead to maturity. The routine of managing other people, who were ignorant of the techniques involved in a process, became hallowed with an air of permanence and our attitude to public relations tended to be a mixture of aloofness, touchiness and conviction of rectitude. It was not easy to disengage from paternalism and replace it by a new tie of genuine participation." <sup>3</sup>

Gaitskell goes on to stress the major redeeming feature of the administration of the Gezira that eased the later "hand over" to the Sudanese. "One of the most relevant features (to the development problem

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2. George Kimble. "Tropical Africa." Volume 1. Page 143. 20th Century Fund. New York. 1966.

3. A. Gaitskell. "Gezira: a story of Development in the Sudan." London Faber and Faber 1959. Page 285.

of our time) was the deliberate mixture of economic and social planning which went into its origin ..... they were much more concerned to establish equitable and practical principles of development than to hasten its pace." 4

The change of L.D.O. occurred before the growing complexity of social and political life on the scheme and the lack of any institutional framework had clearly hindered the effectiveness of the staff. The change also occurred just before the climax of the nationalist inspired local opposition to the scheme. The second L.D.O. thus took over at a time when the scheme had grown out of its baby stage and when it had to be guided towards maturity in a more formalised manner within which the farmers could develop into and express themselves as a community. The farmers sensed this need but realised that inside Government's paternal relationship with them they could not initiate any move. They were also divided into groups and the local opposition had produced a hesitancy on their part towards any new affirmation of their separation or superiority from the villagers and the tribal authority.

The farmers at Nyamaropa may well have presented a picture of a passive people unable or unconcerned to mould the form which the development of the scheme took. Individually and in their groups they were concerned. Their dependence on Government and Government's indecisive attitude at the time - the Rhodesian Front had recently assumed office, a Unilateral Declaration of Independence was in the air and the country seemed to be waiting to see where and how for it was going to go - rendered them unable to either act to represent themselves or to understand what Government sought from them. The outstanding issue remained the refusal of Nyamaropa's villagers to join. Clearly, Government alone had the ability to act on the situation. Any move on the part of the farmers was likely, in the prevailing circumstances, to be misinterpreted by the villagers against them. Unable to do anything the farmers kept to themselves and waited to see what would happen.

One of the most vexing problems affecting the co-existence of the farmers and the villagers was that of grazing. Unlike the Sabi schemes, the farms at Nyamaropa kept small herds closely related to the traction needs of their farms. Of necessity the farmers had to graze their cattle on the hills surrounding the scheme which was an encroachment on grazing which had previously been the sole preserve of the villagers. The

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4. Ibid. Page 286.

farmers avoided grazing their cattle on land close to the villages. In the dry months when grazing was scarce, the villagers followed the usual routine of allowing their cattle to graze the stubble of maize and other crops in their fields. Once the stubble was depleted the villagers either left their cattle to wander into the green crops on the scheme or, as the farmers insisted, drove them into the scheme at night. Several farmers caught the villagers' cattle eating their crops and impounded them. They then went to Sanyamaropa's court and demanded payment for damages. On each occasion that was reported to us, Sanyamaropa dismissed the case on grounds that the scheme was the traditional grazing area of his people. He suggested that the farmer approach the owner of the cattle himself. A few farmers did this and one, who had lost half-an-acre of green maize, received £5. However, most of the farmers did not dare to search out the owner and challenge him on the issue of grazing and crop rights. The farmers most affected, those whose plots bordered the lands of villagers, were mainly Locals A. As ex-villagers they remained passive over the issue. They simply did not grow crops at that time of the year.

The farmers asked the Co-operative Committee to meet with the L.D.O. to see if some legal or physical protection could not be arranged to protect their crops. The farmers hoped to settle the issue through the office of the L.D.O. and to find a solution by going round and above the tribal authority. The L.D.O. refused to act on the issue. He told the Committee that they must deal directly with the D.C. The farmers turned this suggestion down on the grounds that a direct representation to the D.C. would thwart the tribal authority and worsen relations with the villagers. The farmers could not understand why the administrator of the scheme would not handle the problem. The result was a stalemate that left a real grievance untended and which neglected an area of life on the scheme which offered an opportunity for Government and the farmers to work together. To find their own solution, several farmers, whose fields were most seriously affected, began to fence their fields. This solution was costly. To fence a four acre farm cost £15 for barbed wire and involved roughly twenty-five man/days labour. As farms near the villagers' fields are fenced, so crops further onto the scheme will become vulnerable. In the end up to a third of the farms on the scheme may have to be fenced. The alternative, to fence off the scheme from the villagers land, almost a straight line, would cost the community less than £1 each. The community could not undertake this on its own as the fence would infringe the villagers "free entry" to the scheme and the tribal authority would never agree.

There is an illusion, to which many authorities have referred, that indigenous people are a passive element in the form development takes. The illusion allows bold statements concerning "civilized" government and standards to be made and lends support to policies which are often detrimental to the indigenous people's interests. The resentment generated finds expression amongst the more educated in the form of nationalist feeling and activities. The farmers on the scheme had chosen to co-operate with Government by joining the scheme. However, the collaboration was often painful in the circumstances and its continuation depended largely on the farmers relationship to the L.D.O. The importance of the farmers' personal contact with the first L.D.O., and not merely through the routine channel of his African staff, was that this contact, in the particular institutional vacuum at Nyamaropa, provided the farmers with an avenue to Government thinking and with a means of representation.

The first L.D.O. was transferred simply to avoid endangering his family by leaving him in charge of a remote scheme at a time when unrest aimed at the scheme was growing and seemed likely to lead to some act of violence. His sudden removal perturbed the majority of farmers whose continuing commitment to the scheme was partly bound up with the confidence they derived from his presence and leadership. With the split between the farmers on the scheme and the villagers, the farmers were unable to influence the Tribal Authority on matters pertaining to both. Although the farmers lived under the Tribal Authority, the authority resided in the villages and opposed the scheme. However, the farmers realised that the L.D.O., as a Government officer, enjoyed access to the Headman, Sanyamaropa, and had some degree of influence with the villagers. In a real sense therefore, the "father" of the scheme was removed and a "step-father" introduced just when the "father" was needed.

Into this delicate position the new L.D.O. was placed. He was unable to reach across the institutional vacuum and the initial wariness of all involved in the situation. As is virtually always so with peasant communities and particularly in the colonial situation, the replacement of personnel is followed by a period in which the new man's every move is watched carefully to ascertain his fibre. At Nyamaropa the Extension staff and the farmers realised their dependence on the new L.D.O. They learnt quickly, however, that he was difficult to approach, did not particularly care to associate with them, did not speak Shona and that his staff spoke of his easy annoyance and lack of sympathy with their position and experience on the scheme. To some extent a rejection reaction occurred whereby the farmers moved away from the L.D.O. towards greater self-dependence and reliance on their church and family groups.

The only structured avenue to Government, that through the L.D.O., having been closed, the essential dialogue between the farmers and the administration of the scheme ended. It also adversely affected the relationship of the farmers and the Extension staff. The first insight into the effect of this impasse came through the Supervisor - the senior African staff member in charge of the Demonstrators and directly under and responsible to the L.D.O. The Supervisor had gained considerable experience working on Nyanyadzi and on the Nyamaropa scheme since its beginning. I looked forward to using his opinions as a check on our observations and thought that I would encounter little difficulty in establishing a relationship with him in which this would be possible. Although the Supervisor was a cheerful, confident man whom the farmers respected and of whom his subordinates spoke highly, for the greater part of the year it proved impossible to establish any real contact with him. If, during a chance meeting on the scheme, I began to direct the early pleasantries towards topics relating to the working of the scheme he would grow uncomfortable and excuse himself. Slowly, with the help of my assistants, we formed a picture of the Supervisor's position on the scheme that seemed to explain his reticence. Twice I invited him to eat with me. The first time he accepted and did not come. The second time he apologised and said that he could not, much as he would like to, since his position at the time did not allow him to do so. I pressed him to explain what he meant and finally told him that I understood his motives and the reason for them.

There was, he said, a split between the L.D.O. and the farmers. The L.D.O. regarded it to be the duty of his African staff, not his, to have an intimate working relationship with the farmers. However, their difficulty in communicating with him made this link ineffective. Being ineffective it reduced the value of the staff to the farmers and in turn caused the whole relationship between Government and farmers to become virtually sterile. A reflection of the situation was the bombardment of questions from the farmers that I, as a European, faced soon after arriving at the scheme.

The Supervisor, and to a much lesser degree his staff, moved away from the farmers as a result of the widening gap. The Supervisor saw as his main duty the protection of the L.D.O., whose office he realised was vital to the scheme, from the potential antagonism of many farmers. In a sense he isolated the office by blocking the L.D.O.'s view of the farmers. He sought to ease the relationship between Government and the farmers by breaking the link between the two parties at a point between he and the L.D.O. To achieve this aim, a loyal aim in terms of the scheme and loyal to the L.D.O. and one which showed a curiously sensible understanding of all the factors, the Supervisor brought great psychological stress upon himself. He developed a manner of

speech that was "European" in its awareness of the limitations of Africans but which, while attractively "realistic" to some, was artificial.

The impasse that arose between the source of administration, the L.D.O., and the farmers was neither blatant nor obvious. The L.D.O. was not aware of the situation nor of his effect on it. As pointed out earlier, the internal structure of the scheme had altered by the time the second L.D.O. assumed office so that the advent of a very different personality was only a part of the reason for the impasse. The growth of the scheme changed the needs of the farmers in relation to the Extension staff while the service that the staff had been trained to provide remained unaltered.

There was at Nyamaropa a phenomenon that affected the great majority of farmers and bears on this subject. The farmers' view of Government was basically simple and had its origin in the colonial situation and particularly in the history of Land Apportionment. They believed that the officers of Government were extremely powerful and could decide and act promptly on a large variety of issues. Each officer was regarded as having a sphere of influence within which he was almost a personal ruler. In fact, each officer had to work within a bureaucratic framework with its departmental redtape and delay. On the scheme, the L.D.O. in his administrative capacity faced additional problems of inter-departmental co-operation. The farmers at Nyamaropa therefore expected the L.D.O. to act decisively when necessary, particularly under the circumstances that prevailed and as the farmers regarded themselves as being loyal to Government and deserving of fairplay in their relationship with Government. The remoteness of the L.D.O. troubled them, as did the obvious uncertainty of the Government about the future of the scheme. At the time there was a lot of talk about introducing water rates, rents and new conditions but, to the farmers at any rate, nothing was said about the basic issues that worried them. In the situation the farmers had no means of raising the issues, nor did they really dare. A number of farmers became thoroughly exasperated and a few openly resentful. The latter, just prior to the survey year, joined the Nationalist camp and further split the farmers.

For the purpose of the survey some of the better educated farmers were asked to write short essays about the scheme. "The L.D.O.," wrote one farmer, "is a very funny type of man. He doesn't seem to worry about anything that may affect the farmers in administration. Most people say that he does not know their lands or homes though he has been on the scheme for a long time. If asked a question by anyone he just says 'yes' or gives a sharp sort of remark."

Another farmer wrote, "The L.D.O. is very strict of the agricultural assistants (Demonstrators) and when they see his Land-Rover

coming they dodge him within the fields until he disappears. They say that he does not want to see them standing at one place, they should go from one place to the other though there should be no reason why they should visit those farmers."

One of my assistants commented on this. "The Demonstrators are not allowed to associate with anyone that the L.D.O. feels is of reasonable understanding. This is something that no one really understands."

The break-down of any effective communication between the farmers and the Government officer in charge of the scheme affected discipline. The farmers seldom met the L.D.O. personally except when they appeared before him after contravening a regulation, usually dealing with the use of water. The regulations were accepted as necessary by the farmers and the great majority complied with them. However, careless contraventions were common, particularly the flooding of access roads. As the sole personal contact between the farmers and the L.D.O. occurred over matters of discipline, a lop-sided impression of the L.D.O. as a disciplinarian was left and since unnecessary remarks were sometimes added the "spirit" in which the L.D.O. and his staff worked was soured. The regulations stated that after three letters of warning regarding contraventions had been received by a farmer, he could be forced off the scheme. In the prevailing atmosphere letters of this nature were inevitable and several farmers received them, some for the second time. The letters raised concern since there was no known means of appeal nor of realizing capital sunk into the scheme in the form of buildings, fencing etc. While enforcement is necessary, the method of enforcement must be understood to be fair. The farmers regarded the letters and their potential consequence as, firstly, unfriendly and damaging since they lived with the L.D.O. and he could have at least visited them and learnt what had gone wrong; and, secondly, as unfair in that expulsion as the result of the three often petty infringements was unnecessarily harsh.

The implications of such attitude on the part of an advisory service are clear. They contrast markedly with the injunction of Lord Kitchener in the Sudan Government Gazette of 1899. He wrote that the greatest task of British personnel was "to acquire the confidence of the people, to develop their resources, and to raise them to a higher level. This can only be effected by the District Officers being thoroughly in touch with the better class of native, through whom we may hope gradually to influence the whole population ..... they should learn to know personally all the principal men of their district, and show them, by friendly dealings and the interest taken in their individual concerns, that our object is to increase their prosperity. Once it is thoroughly realised that our officers have at heart, not only the progress of the country generally, but also the prosperity of each individual with whom they come into contact, their exhortations to industry and improvement

will gain redoubled force. Such exhortations when carried in the shape of proclamations or circulars, effect little; it is to the individual action of British officers, working independently, but with a common purpose, on the individual natives whose confidence they have gained that we must look for the moral and industrial regeneration of the Sudan." 5

Kitchener's emphasis on officers' conduct and on their interest in individual farmers, and his remarkable insight, that personnel can be taught this approach, is noteworthy. At Nyamaropa the significant deterioration in the early spirit that followed on the change of the L.D.O. demonstrates the importance of Lord Kitchner's emphasis. The inevitable change of personnel and of the needs and concerns of the farmers would necessarily have threatened the continuation of any working relationship between the farmers and Government in a situation in which no clearly defined roles existed and in which there was neither a formal structuring of the relationship nor an institutional framework for representation. The Co-operative Committee, as we shall see, did not feel itself competent to provide either that forum or that leadership, though there were elements who wished to force it into just that.

The real danger inherent in the situation was that participation and the shouldering of local responsibility by the farmers - the basis of any later democratic control - may not come about. The necessary identification with problems of administration and maintenance and an understanding of the possible financial and control arrangements cannot be expected to arise under a paternal administration. The stability and permanence of the scheme must be derived from an administrative approach which holds as paramount the benefit of the scheme to the people involved. As this view must consider social as well as economic factors Government will have to be prepared to accept a slower rate of progress in the short term financial return on the investment in order to ensure that a growing sense of ordered liberty prevails within which the individual farmer and his family can develop to their full potential.

Above all, there has to be the will and the vision to see that the right staff, properly trained, work within a system capable of meeting the needs of the scheme and furthering the identification and participation of the farmers. To realise and to work within the understanding that the farmers have and will retain the basic interest in the scheme is to move onto a more certain path towards optimum returns on the investment and service costs of the scheme and of the eventual management of the scheme by the farmers.

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5. quoted in Gaitskell. *ibid.* Page 32.

THE CO-OPERATIVE.

*"Just as the bursting of customary or physical frontiers releases man from the bonds of space, so too the creation of debt releases him from the bonds of time and can be regarded as a forcing-house of civilization."<sup>1</sup>*

Until the Co-operative was established at Nyamaropa in 1963 the marketing of the two main crops, cotton and seed beans, was undertaken by the African Development Fund (A.D.F.) This arrangement was purely temporary until the recently appointed Co-operative officer in Rusape could tackle the institution of a Co-operative for the scheme. On appointed days officials visited the scheme and bought the crop presented for sale. Payment was immediate and a net price structure was used, transport, handling and levy having been deducted. The A.D.F. marketing arrangements were characterized by the friendliness of the officials, by the spirit of pioneering, by the atmosphere and excitement of the marketplace and the air of festivity. Yields and grades were uniformly good and the cash received more than satisfied most farmers. In fact the net prices were not appreciably different from those ruling through the Co-operative at the time of the survey. However, good crops and immediate payment appeared to have left a suspicion that prices under the Co-operative were lower than those that ruled under the A.D.F.

Unlike the A.D.F., the Co-operative does not purchase crops, it markets them on behalf of its members. Payment for crops can only, therefore, be made some time after the presentation of the crop for bulk transport to the purchasers. The purchasers, the official cotton board and private seed merchants, take some time to handle, check the grading, reweigh and, with seed beans, conduct tests. Payment when it is made is made to the Co-operative with individual farmer's results shown. The Co-operative staff in Rusape then deduct the loans and charges incurred against the crop.

Payment to the farmers was made only after all the returns from the purchasers were received by the Co-operative office in Rusape and all the book-work completed there. The time lag between the first cotton delivered and the payment to the farmers for that and all subsequent bales was at least six months. The delay in payment, which a simple

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1. S.H. Frankel: "The Economic Impact on Underdeveloped Societies." Oxford. 1953, Page 8.

alteration in the Co-operative office procedure has considerably obviated since the survey, was difficult for the farmers to understand and it coloured their attitude towards the Co-operative.

Whereas under the A.D.F. a net price had been paid, under the Co-operative farmers received statements detailing the different deductions from their gross income. With few exceptions the farmers reported that the Co-operative was "expensive" and that, although it reduced the cost of farm materials and implements substantially, it was not being run for their maximum benefit. In fact the Co-operative was a source of savings and economy to the farmers; but the delay in payment and the itemized introduction of costs troubled many. Without the delay, which was unreasonable and unnecessary, the accusation of "expensive" may possibly never have gained the currency that it did.

In order to succeed, a Co-operative must be run as a business. It must serve the needs of the farmers and must do so more efficiently than competitive organisations could. The need, at Nyamaropa, for a marketing agency to handle the major cash crops provided a solid basis on which the Co-operative could start, expand its activities and play a wider and more dynamic role in the community. The usual obstacles to Co-operative development - illiteracy, a lack of economic and business knowledge, improvidence, apathy and the difficulty of conforming to standards of integrity required of its officials while holding unfamiliar positions of trust - all existed to some degree at Nyamaropa. However, this lack of certain attributes and qualities amongst the farmers appeared to be of only minor importance. The real hindrance to the continuing development of the Co-operative appeared rather in the attitude of the Co-operative staff and the farmers towards each other, in the form which the provision of credit took and in its inability to provide an institutional life for the scheme. At the time of the survey the Co-operative was regarded by only a minority of the farmers as of fundamental importance to their farming. Most viewed the Co-operative as an imposed alternative to the earlier more pleasant marketing by the A.D.F.

The Co-operative, instituted by Government, was regarded by the Co-operative staff as arising naturally out of the needs of the people. They also assumed that it satisfied those needs. This presumption was not entirely correct. The Co-operative was, in a sense, an imposed institution of a form that was not part of the experience of the farmers and which they had not all accepted as being clearly beneficial. Although it was necessary that Government should induce the growth of a Co-operative at Nyamaropa, explain it to the people and help them in the running of it, the level of mutual sharing and discipline that is needed for the Co-operative's development will remain impaired until the Co-

operative management can seek out the needs of the farmers more definitively and seek to satisfy them. There was a clear need for an educational programme to acquaint the farmers with the aims, purposes and benefits of the Co-operative and with the discipline required. However, the shadows that played across the Co-operative originated more fundamentally in other parts of the scheme and until those are removed, internal improvements to the Co-operative cannot go very far towards realising its considerable potential.

#### ORGANIZATION.

Co-operatives in Rhodesia are owned and controlled by their members. In practice, the need for Government to act positively to create and supervise Co-operatives has reserved for Government a not unreasonable degree of influence over policy and office management. The Co-operative staff are advisors who of necessity often act as managers. The relationship between the staff and the members is thus delicate and requires a full understanding, particularly on the part of the members, of the constitution and of the role of the staff, committee and members.

The day to day running of the Co-operative - the sale of materials and the distribution of the hired spray-machines - was in the hands of a manager. The manager came under the Committee who employed him on behalf of the members and who was, as was the Committee, advised by the Co-operative Assistant. The selection of the manager was governed largely by the salary the members were prepared to vote. The Officer sought to persuade the members that a good manager was worth having and that to attract such a man a salary of £15 - £25 p.m. would be necessary. Some of the Committee shared his view while the others were not certain that there was sufficient work to warrant such a salary. The members, with at that time very little understanding of the value of good management and suspecting that the Co-operative was "expensive", voted a minimal salary of £7.

The Vice-Chairman of the Committee told me that the members feared that they would lose the close original guidance of the Officer if they employed a capable manager who would enable the Committee to exercise increased control. The issue arose during the peak of the Nationalist fervour and the members feared serious clashes between groups on the scheme should the Committee with a good manager gain sufficient prestige to become a political forum.

For the first three years the members elected as Chairman a strongly apolitical man and as Vice-Chairman a man who was able to work with European personnel. The farmers cognizance of the political and social difficulties facing the scheme made their action over the manager sensible. However, the Co-operative officer was in no position to

sense what consideration had governed the farmers' action over the manager. The officer interpreted the farmers' refusal to provide for a capable manager as an unwillingness to secure the growth of the Co-operative.

#### LOANS

Except for an odd bag of fertilizer, vegetable seeds, insecticides of a less specialized nature, nails and string which the farmers bought from the stores, the Co-operative provided all the farm materials. Over 80% of farm materials were purchased by the farmers on credit against the two major crops.

Implements were purchased through the Co-operative on medium term loans over 3/4 years, the repayments plus interest charged being deducted against a specified crop.

Long term loans were available for farm improvements. Unlike the medium and short term loans, the application for a long term loan was not a routine request involving one form and a signature. The officer had to investigate the potential of such expenditure to ensure a reasonable chance of the loan resulting in an increased income flow with which to repay it. The Co-operative officer had recourse to the L.D.O. to assess the farmer's plan. However, at the time of the survey no farmer had taken a long term loan although expenditure on farm improvements was high on many farms.

The heavy reliance of every farmer on the Co-operative for short term loans and their self-reliance for long-term financing must be unusual, particularly as many farmers were moving into tobacco, contemplating cattle fattening and were concerned to try new field and animal crops to replace the loss of seed beans as the major winter crop.

In popular conversation the farmers at Nyamaropa shared the often reported belief of farmers everywhere that "next season will be good". The belief affected their calculation as to what they could hope to finance from the season's earnings with the consequence that disappointing results forced several farmers to seek additional credits with the stores and, occasionally, cash loans from friends. At the same time the farmers discounted the risk of failure by taking all their farm materials on credit. The 7% interest charged on the loan was not considered to be a burden. Rather, the farmers regarded 7% as a reasonable charge for the ability to retain cash in their pockets and for the opportunity to spread their risks through the Co-operative from one season to another. Two other factors strengthened this practice. The delay in the payment to the farmers meant that it was a year with cotton and nine months with beans after the purchase of materials before the crop payment was made.

Such long periods require that a farmer have ample cash reserves or access to credit at the stores before he can contemplate buying for cash. Even for farmers who had sufficient cash reserves, to tie up capital for so long for routine financing when an alternative source of credit existed which was simple and convenient to apply for did not make sense. The money utilized for loans was not the Co-operative's but Government money that the Co-operative borrowed for the purpose. Most of the farmers realised this and amidst the uncertainties that existed Government was drawn in as a sleeping partner earning a rate of interest but also carrying the farmer until a good crop allowed the repayment to be made.

The reliance of the farmers on the Co-operative for working capital seems to have become an established pattern and one that will grow as working capital requirements grow. Increasingly, Government funds will be tied up in routine, static, financing that could cause difficulties should political antagonism return, perhaps at the time of a drought or some crop failure.

Just as undesirable as the reliance of the farmers on the Co-operative for working capital, was the absence of long term loans. Although many farmers showed a willingness to finance improvements themselves, many were in no position to do so. Roughly 30% of all the farmers, during the survey year had difficulty in meeting family needs. The position at Nyamaropa was thus one in which a third of the farmers could have utilized long-term credit, preferably planned and supervised, to raise farm productivity to give a satisfactory return for their effort.

There were many reasons why the farmers whom we placed in this category did not apply for long term loans. The state of uncertainty on the scheme clearly affected these "marginal" farmers so that they were unwilling to enter into long term projects. Most of them were experiencing difficulties in making ends meet and had drawn on the stores, family and friends as far as they were able. The current feeling on the part of their creditors was that they must first clear their debts, applying only for short term loans to enable successive crops to be grown, before undertaking further financial obligations. Hanging over them and dominating their attitudes was the repeated notice that water rates and rent up to a maximum of £14 per acre would soon be introduced. This group of farmers were in no position to pay such a fee and their continued farming on the scheme became a matter of speculation.

Had there been farm planning and the supervision of farm improvements by the Extension staff the fears of creditors may have been lessened and longer term considerations encouraged. As it was the continued growth of the scheme was impeded, as was the health of the community. The whole issue of credit was clearly linked with administrative issues and with the role of the Extension staff.

WORKING CAPITAL.

A peasant farm "is a home as well as a means of earning a livelihood; a source of subsistence as well as of cash income .....the complex of conditions referred to affords justification of the common description of peasant farming as a way of life and not merely as a business."<sup>2</sup>

At Nyamaropa working expenses included the maintenance of family members, who though at times idle provided the bulk of the labour required. It was not therefore possible to distinguish between capital for farm production and for living expenses. Every farmer hired labour, even if only at crucial periods of peak labour demand. The financing of hired labour was similar in performance terms to the provision of maintenance for the family. Short and medium term loans from the Co-operative were in kind. The fear that loans paid out in cash would be quickly dissipated in a non-productive manner and so make repayment difficult and the loan a burden to the farmer is understandable and, with a young Co-operative, it can be justified. However, without a contented and adequate labour force, family and labourers, the return on the employment of farm materials may be disappointing and even uneconomic. The farmer and his family and, as we shall see later, hired labour, are the main tools in the performance and improvement of the farm. It is unwise to push the distinction between credit for farm materials and working expenses too far.

The system of credit in kind granted through the Co-operative had deleterious effects. It did not teach the farmers money management. Loans were not always put to productive use as farm materials were ordered without reference to a farm plan or to the Extension staff. It did not involve the community and so could not teach co-operation. The community paid large amounts in interest to Government each year without any incentive to build up savings with which to finance themselves. The Co-operative was both the lending and marketing agency and deducted the loan plus interest from the farmer's crop sales. Precedence of payment was thereby given to Government rather than to the family or to labourers and other creditors whose sole source of income payment on the crop may be. The situation could ruin a farmer by causing labour and creditors to avoid him in future, so reducing his ability to recover in the next season or before his own limited capital is exhausted. The problem

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2. "Report of the Centre on Agriculture Financing and Credit for Asia and the Far East." paragraph 57c FAO. Rome, 1957.

would not have been so crucial if the lending agency had been more flexible and intimately concerned with assisting the borrower back onto his feet.

Loans ought to be given on the criteria of "ability to repay." This necessitates an intimate knowledge of the borrower and a close supervision of the implementation of the loan. The Co-operative officer was in no position to adopt such a criteria. The Co-operative Committee could have furnished a report on the applicants personal attributes but not on the potential of the loan. Even then the small size and the fragmented nature of the community might have led to accusations of favouring one farmer and not another and have soured the whole operation. The Extension staff could assess the potential of the loan but not the necessity for it or the personal attributes of the applicant. The weakness at Nyamaropa was that extension and credit were not integrated in the field and that, were this done, the Co-operative Committee was not an ideal body to judge the individuals concerned. Moreover, the farmers' attitude towards the short term borrowing of Government money could have prompted many of them to seek cash for working capital that they did not strictly require. The result, under the conditions existing at Nyamaropa, could have been a use of loans to increase family leisure by employing additional labour, an increase in farm costs, a lowering of farming standards and a possible breakdown of self-discipline.

An efficient system of credit must be based on adequate knowledge not only of economic conditions and requirements, but also of social relations and attitudes. To achieve such a state a new ordering of the application, processing and supervision of credit is needed. With the weaknesses that existed at Nyamaropa there was a danger that a fair proportion of the farmers would become increasingly debt ridden and may have to leave when faced with the £56 p.a. rent and water rate fee. Should this happen the future of the scheme will become more problematical. At the same time the potential of the farm, as demonstrated by the more successful farmers, suggests that with an efficient credit and extension system the dangers could be avoided.

#### THE LEVY

The only tax on African Agriculture in the Tribal areas, apart from the £1 personal tax per adult male and 10/- per wife, is the levy on products marketed through the official channels. The levy is a flat 10% deduction from gross income. The funds collected form the African Development Fund which undertakes development work in African areas. The reasoning behind the levy is that Africans are assumed to be low cost producers who re-invest little of their income. It is presumed that they

consume all and that there is no evidence of a multiplier effect to suggest investment. In fact so little is known of the production costs of Africans, of how they utilize their income or of their true profits that the continued presence of the often criticized levy suggests grievous administrative expediency.

The levy has attracted severe criticism since its inception.<sup>3</sup> The levy is seen as being discriminatory in that it applies only to African farmers, inequitable in that it is applied only to crops marketed through official channels and inefficient in that it acts as a disincentive to produce for sale on the market. Official opinion holds that the effect of the levy should be to call forth more produce at the lower net price to satisfy target needs. Not all tribal farmers sell only their surplus, nor do they all produce for the market. The more important second group of farmers will be discouraged and is likely to find migratory labour more attractive. For both types, if they have a high propensity to consume, the levy may restrict the size of the market and investment opportunities. Yudelman found that when imputed costs are included, the net return to African farmers must be nearly zero or even negative, that is, the levy is generally applied to high-cost and not low-cost farmers as presumed.<sup>4</sup>

Most farmers at Nyamaropa failed to cover either their material costs or their material plus labour costs on the poor seed-bean crop. Although many failed to make a profit on even a simple cash input/output basis, the 10% levy on gross income was deducted "at source" and paid to the fund by the Co-operative.<sup>5</sup> For the great majority of farmers the levy enforced onto the disastrous bean crop acted as an additional punishment for failure. Over the whole year the effective rate of the levy, as a tax on net trading surplus, varied from 10% to 20% when all sources of farm income were included. If family labour is deducted from the net trading surplus the effective rate varies from 14% to 106%, for most of the farmers over 50%. The effective rate of the levy was under 50% only for those farmers who grew tobacco, potatoes or green maize which were marketed unofficially and which therefore avoided the levy.

The advantage of the levy is that it is a comparatively simple means of raising revenue in the Tribal areas. Two alternative means exist which would avoid the disincentive effect of the levy. These are a

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3. See:- M. Yudelman, "Africans on the Land", Harvard University Press, 1964, Page 165 - 168.

4. Ibid. Page 166.

5. For details see chapter on Performance of the Farms.

sales-tax and an assets tax on the area of land farmed and the number of cattle grazed. A sales-tax, if applied solely to the Tribal Areas, would also be inequitable. The benefit of an assets tax is that it fosters an economic use of resources although it has obvious problems in its introduction and administration. The growth of local Government institutions in the Tribal areas may ease the introduction of such alternative measures.

The removal of the levy has been given "serious consideration" for nearly ten years with as yet no outcome. In 1962 The Advisory Committee wrote "this is a problem deserving the highest priority in order to arrive at a speedy solution." <sup>6</sup>

The levy is a heavy burden on those farmers who have not the resources to enter tobacco or to sell outside of the official channels. To those who have the necessary resources, the absence of the levy increases the cash performance of the farm substantially above the real performance as compared with farmers who face the levy. At Nyamaropa the likelihood of the introduction of rent and water rates, without either the abolition of the levy or adequate tailoring of credit and extension to the needs of the farmers, makes the prospects of the majority gloomy. Unless farmers can operate independently of official channels, which were presumably created to further their development, the chances of their ever standing on their feet and deriving satisfaction from their efforts are slim.

The administration and distribution of the levy are too remote to instil a sense of the communal redeployment of income. Were the fund distributed locally and largely according to the felt needs of the farmers much of the hostility and suspicion would be removed. Bauer has pointed out that taxation must be neither heavy nor discontinuous as it affects "the development of the sense of continuity which is a mainspring of the inclination to take the long view conducive to productive long-term investment." <sup>7</sup>

The taxation of gross income is hazardous to the well-being of the majority of the farmers, to the development of the scheme and to the continued and improved establishment of the Co-operative so long as it continues to act as the collecting agent for the levy and while successful farming necessitates the non-use of the Co-operative for marketing purposes.

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6. "Advisory Committee on the Development of the Economic Resources of Southern Rhodesia." Page 271.
  7. Bauer P.T. "Economic Analysis and Policy in Underdeveloped Countries." Routledge and Kegan Paul, London. 1965, P. 118.

## CREDIT UNION.

S.H. Frankel was one of the first authorities to point out that it is a mistake to believe that Western methods can be transplanted straight into Africa. He argued that no technique or industry exists on its own. It is always a part of a technical and cultural complex. Consequently there is a need to adapt suitable known institutions and practices to the conditions of each project.

Nyamaropa had strong characteristics of its own that affected the efficiency with which the Co-operative could administer credit. There appeared to be a need for a new institution to either supplement or take over the financing of farm operations from the Co-operative. I decided during the survey year that a Credit Union would suit Nyamaropa's needs. It could serve as a banking institution; as a means of teaching the farmers thrift and the management and value of money; and as an additional institution to help weld the community together.

A Credit Union is essentially a savings and loan society. It contains provision for the weekly deposit of a minimum of threepence by each member to encourage and to instill the habit of regular savings. Although it operates as a Post Office or Building Society in allowing members to withdraw money when they wish, the application for a loan and thereby the retention of the members' savings intact is advocated. The withdrawal of savings, perhaps the accumulation of months of patient saving, dissipates the reward of thrift and makes it difficult for members to gather together the enthusiasm to begin anew.

When a loan is granted, repayment over a specified period is agreed upon and social and legal pressures help to ensure repayment. Social in that members borrow from the community and legal in that the Credit Union is registered. The Credit Union allows deposits and repayments of as little as a penny to be made so that repayment in minute installments is possible. In this way the cost of the loan is considerably reduced as the balance outstanding is gradually diminished over the period and interest is calculated only on the outstanding balance each month. Interest, of course, accrues on the deposits. The loan is covered by the savings in specified amounts of other members who undertake to guarantee the repayment of the balance of the loan above the value of the member's savings. These amounts are then blocked in the respective books. The functioning of the Credit Union system is therefore dependent upon the willingness of members to support each other.

A novel feature of a Credit Union and one which further differentiates it from a banking institution is that profit in excess of interest paid on deposits accrues to two funds which strengthen the Union and contribute towards communal goals. A quarter of the Union's profit goes into a reserve fund. Interest on deposits up to a legal maximum

of 5% is paid to the members, and any residual money goes into a Special Fund the use of which may be decided upon at a general meeting. The Special Fund belongs to the members as a Union and may not be distributed. It can be used for any number of purposes. At Nyamaropa such a fund, once built up, could be used to support the Red Cross Clinic, to subsidize insurance and pension schemes, to re-fence the scheme, to subsidize a feeding programme at the two schools, to contribute towards the building of a community school, or to purchase a selected bull to improve the stock.

The Credit Union was started towards the end of the survey year at a time when cash was short and the farmers were aware that the cotton and particularly the beans payments were going to be disappointing. At the end of the survey, membership stood at 120, nearly half of whom were women and a few children. The total amount deposited was over £300, not sufficient to register and begin loans business. Its effect on the survey was thus minimal in money terms. However, it had a response that differentiated it from the Co-operative and bode well for its educational and communal role.

The Credit Union belonged to the people. Unlike the Co-operative it was their money and not Government's. Savings were to be used for local purposes and not diverted to work on other areas. The farmers found my explanation of how Banks, Building Societies and Post Offices use funds interesting and were enthusiastic that their money should work within the community. Those farmers who were doing well saved in banking institutions in Umtali or Rusape with little advantage to their fellow farmers. The need was not for propaganda but for a suitable institution. W.A. Lewis believes that peasant farmers would "save more if they could borrow more"<sup>8</sup> The ability of the Credit Union to tailor credit to the needs of the farmer may well create conditions conducive to increased savings.

The management of the farmers' money should lend a sense of responsibility to the working of the Credit Union committee. "It is one thing to be careless with the money of a far off banking institution, even though it is a Co-operative in which the society is a shareholding member; it is quite a different thing to face irate neighbours, depositors in a society, and tell them that they cannot have their money back for a while as some of the members had borrowed too much and have not been able to repay their loans on the due date."<sup>9</sup>

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8. Lewis, W.A: "Development Planning." Page 119 George Allen & Unwin. 1966.

9. "Co-operative Thrift, Credit and Marketing in Under-developed countries." Development Paper No. 34, FAO Rome.

The Credit Union's system of maintaining deposits and borrowing against savings means that the capital of the community is being continually increased as loans are repaid. Deposits, at weekly savings and loans meetings, are designed to clear up all spare monies. In order for this to happen the members must be able to borrow conveniently and quickly when the need arises. For most of the farmers their cash resources are still closely geared to their needs.

When the family lives and works together, institutions that service agriculture must work closely with the family as the family is the unit through which further progress will come. Only heads of households were members of the Co-operative, amongst whom were widows who, apart from voting for the Committee, played little part in its administration. The Credit Union quickly demonstrated its "family" appeal. Several women undertook the collection and marketing of wild tomatoes, trips to the nearby hospital to sell green maize and vegetables to raise money to deposit in their savings books. Three women were given the proceeds of a crop to deposit in their book. This may herald new attitudes towards savings and participation that bode well for better and shared control of family budgets.

The community concern that a borrower be allowed every reasonable chance to repay a loan from his fellow farmers provides an excellent opportunity for extension work and particularly for farm planning to offer its services. The communal pressures that operate to ensure the repayment of a loan from a Credit Union should, in a favourable atmosphere, also operate to ensure the acceptance of farm planning and of its implementation.

The close co-operation and social responsibility implicit in the functioning of a Credit Union and its ability to provide the means for achieving communal goals should lead to and demonstrate the importance of Marshall's "certain social quality." Together a Co-operative and a Credit Union overcome many of the weaknesses and release the potentialities that Co-operatives were believed to have and which recent disappointments suggest stems from too limited an approach.

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## TRANSPORT

The provision of transport facilities is controlled, in the interests of "unfair competition" by the Road Transport Board. The Board awards virtual monopolies over set routes to approved transport firms. Anyone wishing to obtain a commercial licence has to apply to the Board and prove that the current holder of the right to transport over that route is negligent or is charging exorbitant rates.

Inherent in the system is a bias in favour of existing licence holders. They have invested sums in equipment and, unless clearly inefficient, their monopoly will be maintained. One storekeeper at Nyamaropa had applied for a licence to run a bus service in the area. The application, which failed, cost him just over £160.<sup>1</sup> He had to hire a lawyer to present the case and to pay for the transport and accommodation of several witnesses.

The implications of the system are important for it blocks numerous avenues of small but significant entrepreneurial activities. During the survey year the two major crops were transported by the approved contractor through the offices of the Co-operative. Tobacco, though organised by the growers themselves, was transported by the same contractor. Maize, which is sold to local stores who are official agents of the Grain Marketing Board, was transported by the store-keepers to the nearest board depot at a fixed rate per mile. The store-keepers valued the agency business. It sponsored business for the store and, by covering the cost of the trip to town, enabled them to own a truck (maize was delivered to the stores almost all year round to meet farmers' cash needs). Consequently, at Nyamaropa, there were three trucks (two 3 and one 7 tons) and a Land Rover owned by the store-keepers, as well as five older trucks (three 1 and two 3 tons) and a Land Rover owned by the farmers. The monopoly licence granted the contractor, who operated from Rusape, meant that not one of the ten vehicles at Nyamaropa could legally undertake the cartage of goods for reward.

Three of the store-keepers told me that they had often thought of applying to the Road Transport Board for a licence, but that the cost and the difficulty of having to "convict" the contractor was too great.

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1. During the survey year the Rhodesian Herald reported that the Police had stopped three European farmers using their own transport on a route reserved for the Railways Motor Service. The farmers had invited arrest in order to demonstrate against the monopoly.

The result was that the farmers were legally reliant on the contractor. No other provision existed for the transport of small quantities of produce that the contractor could not economically convey. Several farmers transported a bag or two of potatoes, peas or green maize on the bus, for which they paid a fairly heavy baggage rate and which they had to accompany. Although they combined shopping and visiting with the chaperonage of the produce, the costs and the time consumed made the bus inefficient as a means of transport. The bus took nearly a full day to reach either Umtali or Rusape and a day back. To have time in town, a three day absence from the scheme was necessary.

The farmers were in fact reliant on the illegal haulage by the store-keepers and other farmers of produce not handled by the Co-operative. The store-keepers were reluctant to accept the farmers proffered transport business. They feared that, if caught, they would endanger their valued position as agents of the G.M.B. That an offence under the transport regulations would affect their standing with the G.M.B. was, perhaps, unlikely. Whatever the consequences, the store-keepers undertook little illegal traffic although they were frequently beseeched by the farmers to do so. Two examples will suffice.

One farmer enjoyed a close friendship with a store-keeper. It was, however, a difficult friendship to maintain as the farmer, whose family's educational needs were high, had been unable to repay the £110 odd that the store-keeper had granted him in the form of loans and goods on credit. The farmer was one of the best on the scheme but his poor credit rating prevented him from being able to raise the money to build a barn and enter tobacco. He thought that potatoes, a high value crop grown successfully by a few farmers, would bring the high return he needed to be able to repay the store-keeper. He approached the store-keeper and asked him to lend him £20 with which to buy seed-potatoes for three acres and to promise to undertake the transport when the potatoes were reaped. The store-keeper agreed and the farmer went ahead. He obtained fertilizer through the Co-operative against his cotton and he aimed to have the potatoes on the market before the supply became plentiful and the price dropped.

The farmer hired labour in order to reap quickly and so beat the large European potato farmers to the market. A week before the harvest was completed he informed the store-keeper as to which day he should like his crop to be transported. The store-keeper replied that he was "preparing to go to Salisbury" on that day. Then, when the potatoes were ready the store-keeper stalled. He had first to deliver maize to the G.M.B. After a week of waiting and imploring the store-keeper to keep his promise, and having failed with the other owners of trucks, one farmer undertook to carry part of his crop in his Land Rover - an inefficient vehicle for the purpose. The costs were high, the price received had

fallen appreciably during the past week and most of the crop remained at Nyamaropa. The farmer's wife and children peddled potatoes to the mission, the hospital, through the village and around the scheme, selling them for a fraction of the price ruling in town minus a "normal" transport charge. The net result was a disappointing £12 cash profit.

The store-keeper had begun to regret his offer soon after he had made it. His fears of being caught carrying potatoes grew when the farmer insisted that they be taken to Salisbury, an extra 170 miles on a national road, as prices for early potatoes were reportedly higher there than on the smaller Umtali market.

One of the wealthiest farmers on the scheme pioneered the raising of pigs. The major difficulty with their sale to the Cold Storage Commission was that they have to be booked to be delivered to the depot in time to be put on the next train to the slaughter yard in Salisbury. Failure to deliver on time invoked a penalty. The farmer had no truck, and although a store-keeper offered to transport the pigs for him, he could not pin the store-keeper down to a date sufficiently far ahead to enable him to book the delivery. In the end, after trying other truck owners, he went to Umtali and bought a second-hand truck. He had saved several hundred pounds towards the purchase of a store and had worked as a truck driver previous to joining the scheme. Few other farmers, faced with similar problems, could have afforded or managed to solve them as he did.

The farmers with trucks were much more game when it came to transporting produce for reward. Nevertheless, the difficulties that they faced were considerable. Only two of the five trucks could be relied upon to complete the journey and their owners seldom had time to leave the scheme for as long as was necessary.

As no regular transport existed for minor crops, few farmers planned to have more than a small surplus above family needs to meet local demand. The farmers with trucks were continually asked to transport one or two bags all the way to Umtali at the usual rate per bag when the truck was fully laden. This the owners would not do. Few of the farmers were prepared to pay cash so that the truck owners had to tie up capital to continue in business.

The final weakness in the inability of local truck owners to provide an efficient transport service was their failure to include a charge for depreciation. The trucks, with two exceptions, were subsidised by store or farm. The owner of the largest store ran, with the help of his brother, three stores and two mills in The Nyamaropa. In the

surrounding areas they collected maize in the villages to build up business at the stores. He owned a 7 ton truck and handled sufficient maize to show a profit. The other exception was a farmer who had previously taught a labourer to drive his truck. The labourer lived some miles from the scheme but frequently visited the farmer to drive the truck on contract work around the scheme. The farmer had two wives and a permanent labourer and was able, consequently, to devote an average of six hours a week to the truck business.

TRUCK BUSINESS ACCOUNT

<u>EXPENSES</u>	<u>INCOME</u>
Fuel and Oil	£35. 15. 4
Tax and Insurance	£18. 00. 0
Service	£ 2. 08. 0
Mechanic (Local)	£ 3. 00. 0
Spares:	£48. 03. 9
Battery	£8. 18. 09
Tyre, tube	£25. 00. 00
Parts	£13. 10. 00
Mirror	15. 00
	£107. 07. 1
Minus charge to farm	£50. 00. 0
	£57. 07. 1
Plus depreciation charge to business	£20. 00. 0
	£77. 07. 1
Profit on business	£54. 07. 4
	£131. 14. 5
	£99. 8. 06
	£32. 5. 11

The imputed cost of the time which the farmer gave to his truck business was £8 and that of the driver and the permanent labourer who frequently helped was roughly £16. Management and labour for the business cost, therefore, £24. If charged it would leave a net return of 10% on the value of the truck. The return to capital on his farm was 18.4%.<sup>2</sup>

<sup>2</sup> Farm No. 6 in the chapter on Performance of the Farms.

The contractor ran a truck down to the scheme almost daily for some weeks at the height of the cotton reaping season and for a few days after the beans had been harvested. Several farmers approached the driver of the truck requesting him to carry timber from the saw-mill or the Government plantation at Inyanga or thatching grass from Tombo for their barns and houses. The truck was usually empty on its way to Nyamaropa. The farmers "favoured" conducting their business with the contractor rather than with the store-keepers, although it was only for the "import" of material. The driver realised that any work for individual farmers was not covered by the Contract between his company and the Co-operative. It was an abuse of his job and the work undertaken was of a "private" nature with no legal sanction. He insisted on the full payment in cash before he undertook the business and he reserved the right to do it at his convenience. The farmers often waited weeks for their material with no power to do more than beseech him to hurry up. A few farmers, particularly those who had paid him to transport grass which deteriorates when left lying on the side of the road, went up to Inyanga and Tombo and stopped him on his way down offering to help load the truck. Even then the driver would not always comply.

Then, one day, to the horror of several farmers who were still waiting for the delivery of their material, the truck arrived on the scheme with a different driver. The original driver had been switched to another route. One farmer in our sample, Mr. Ebson Magoshe, had paid £4 for the transport of timber for his barn. He had "chased the driver" for two months pleading with him to fulfil his obligation. Mr. Magoshe told me that "drivers are like this". He realised that he could do nothing to regain the money and that he had no hold over the new driver. In effect he wrote off the money as a loss and, anxious that the timber should arrive soon so that he could complete his barn before the planting season began, he approached the new driver who accepted his offer. Four other farmers lost money in the same manner. The decision to switch the driver almost certainly had nothing to do with the private business he had been undertaking for the farmers.

During the survey year some farmers suggested that the Co-operative should buy a truck. The committee discussed the idea with the Co-operative Officer but no decision was reached. The variety of transport needs that have to be met necessitates the provision of bulk transport, the largest truck that the road can accommodate, and a smaller truck to handle most of the minor crops and fresh produce. There are, as in any farm community, long periods of little or no demand for transport, particularly in bulk. The contractor could continue to handle the bulk transport and a truck owned by the Co-operative could serve the other needs of the farmers. The management of a truck would demand that

the Co-operative employ a more able manager than the one employed at the time of the survey. The Co-operative Officer could persuade the farmers through their desire for a truck that to employ a better manager is in their interest.

I questioned those farmers who owned trucks as to their reaction to the idea of the Co-operative running a truck. Only one of them opposed the idea on the grounds of unfair competition; but, as did the others, he agreed that it would benefit the scheme. The store-keeper who had made the application to run a bus service was very critical. "The Co-operative is of Government, not the farmers. They do not run it. Now they want to borrow money from Government for two trucks, and Government will give them a licence. But we who carry maize here for a long time and give credit to farmers, we are not thought of. We have the trucks and Government knows we want to carry for the farmers. Why not give us the licence?"

It seems apparent from the data which I obtained at Nyamaropa, that most trucks were subsidized by the stores. The population of the tribal area was thus paying a form of consumption tax to enable the stores to subsidize the trucks. Apart from the lack of transport facilities for farm produce and materials, the real cost of transporting maize was higher than the official figure because prices at the stores included a hidden transport cost. On the other hand, the transport of maize enabled the stores to run trucks and so facilitated the import of goods.

Apart from buying from commercial travellers, the smaller stores imported very few goods. Occasionally the owners bought goods at wholesalers in the towns, transporting them back on the bus or on a friend's truck or Land Rover. Seldom did the store-keepers who owned trucks help those without trucks.

The position was that store-keepers who were agents of the G.M.B. were more easily able to maintain trucks and that the legal obstacles to the cartage of goods for hire provided them with a real monopoly power over the store-keepers who were not, and who usually owned smaller stores. In The Nyamaropa, the more successful store-keepers had acquired a chain of stores, thereby enabling them to exploit their monopoly and utilise their trucks more efficiently. The stores attracted

customers by displaying a wide variety of goods and through the maize agency business. <sup>3</sup>

A truck run by the Co-operative at Nyamaropa would benefit the farmers considerably. It might also help to break the monopoly of the larger store-keepers if the truck were allowed to carry goods for the smaller store-keepers. The basic ill of the system would still remain, however, and the development of the farms off the scheme would continue to be impaired. The importance to the national economy that the legal obstacles to efficient transport in rural areas represent cannot be exaggerated. The costs and the manner in which the present system stunts individual enterprise must represent a significant barrier to development. It cannot be right that holders of assets should fear to utilize them for the benefit of others when the others have no alternative source of supply. <sup>4</sup>

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3. Yudelman drawing on a report from 1944, "The Report of the Native Production and Trade Commission", (Salisbury, Government Printer 1945) argued that the Co-operative marketing of African farm produce would remove the monopoly power of traders who (quoting the Report), "insist that producers purchase goods at high prices in return for the traders handling their grain." At Nyamaropa there was evidence of competition among the agents for agency business, based largely, I considered, on the desire to utilize their trucks fully. There was no evidence of co-ercion or mis-use of the agency "monopoly". The growth in the number of African traders in the tribal areas would suggest an increased measure of competition. As suggested in the previous chapter, this revolves, to a considerable extent, around the reciprocal ties established between customer and store-keeper and the monetary security which the system offers. "Africans on the Land." Page 188.
  4. The Advisory Commission placed "expenditure on transport and communications high on our list of priorities, if economic development is to be fostered .... (and) if our recommendations for raising the productivity of agriculture are to be effective." The effectiveness with which roads are utilized was not considered. Page. 373.

## THE STORES

To trade, in the more structured sense of owning a store, has been the common ambition of many Africans in Rhodesia for years. To a large extent this ambition is a reflection of the limited opportunities open to Africans. The only qualification for entry is the possession of capital which, if a store is rented, need not be more than a hundred pounds. Ownership or management of a store confers prestige as the mark of a successful man. <sup>1</sup>

At Nyamaropa the store-keepers had similar life-histories. Brothers had pooled their savings from jobs in town until they had accumulated sufficient capital to open a store. The largest store, Nyamarundira Bros., was owned by three brothers. They had worked in domestic service in Johannesburg and each had supplemented his wage by tailoring, mending shoes or gardening in his free time. When they had saved £900, after six years, the eldest brother returned to start the store, the other two followed after two and four years.

Traders have set up new bases of power and potential leadership in the tribal areas that are not entirely consistent with the traditional authority. Hagen has suggested that store-keepers are often deviant characters having different cultural values from the society which they serve. As the first economic men in the society they look after their own interests in a manner that is not true of the other members of the society, by whom they are regarded as being anti-social and immoral. <sup>2</sup> Traders make their living from the buying and selling of other people's produce and trade may, therefore, in traditional society come to be regarded in a dismal light " as a not quite proper occupation." <sup>3</sup>

The position at Nyamaropa was different. Goods traded through the stores have their origin almost entirely from without the "African" world. The development of trade has been pioneered with manufactured goods and has virtually destroyed the few crafts that were practised. The traders at Nyamaropa were closely identified with the churches and not with the traditional authority and way of life. The majority of the store-keepers were foreigners to The Nyamaropa and had only set up

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1. Several officials to whom I talked considered that "most tribal areas are 'overtraded'".
  2. Hagen E.E. : "On the theory of Social Change" The Dorsey Press, Illinois, 1962. Page 60 - 61.
  3. Ibid. Page 61.

business there on the advice of Government officials who were anxious to ensure that facilities existed in the area for Africans forced to settle there after removal from "white" areas. They were not a disparaged group in the sense that Hagen used the word, but rather an important "leader" group that operated outside the traditional society.

A complicated and frequently subtle system of relations existed between the traders and their clients. Few farmers on the scheme would agree wholeheartedly that the growing prosperity of a store-keeper might be the reward for his hard work and good management. Most farmers saw it partly as a demonstration that the store-keeper was withdrawing money from the community by charging unfair prices. Farmers, in fact, regarded the growth of a store as a sign of their support and developed an attitude similar to that of a shareholder. In return for the support of a particular store the farmers, and no doubt the villagers, felt that an obligation on the part of the store-keeper to assist them in time of need had been created. The purchase of the goods on credit became a right of old customers. Conversely, the refusal to allow a customer to buy on credit was likely to involve the loss of that customer to a rival store.

A father and son farming on the scheme occasionally cycled the twenty miles to a store at Tombo, their former home, to do the bulk of their shopping. The round trip took a whole day. They did this, they said, to maintain their old ties with the owner of the store who had frequently given them goods on credit or lent them up to £30 in cash. Although they visited family and friends at the same time, they disagreed when I suggested that this made the trip pleasant and worthwhile in itself. They wanted, they said, to remain independent of the stores and the other farmers on the scheme.

To safeguard themselves from customers over-extending themselves by obtaining credits at too many stores, the store-keepers had instituted an informal arrangement whereby the purchase of goods on credit necessitated the recipient becoming "tied" to that store. To implement the arrangement the store-keepers informed each other of customers whom they suspected of ill-faith. We came across several instances of store-keepers tackling a customer about his excessive drinking, laziness, bad farming or whatever he felt was preventing the customer from paying his way. On the other hand, customers with long overdue credits were frequently able to obtain further credit if they could persuade the store-keeper that without it they would never be able to set their financial position to rights. The store-keepers continually complained about difficult customers whom they had to nurture or run the risk of losing all that was owed to them.

Competition between the stores was based partly on the range of goods carried and partly on the credit facilities offered to established customers. The greater range of goods carried, consisted almost entirely of the number of different articles of a type of good stocked by most stores. The layout of the stores followed a common pattern. In one section, usually nearest the entrance, were the household items: sugar, tea, coffee, biscuits, bread, soft drinks, powdered milk, a few tinned foods, sweets, candles, soap, ballpoint pens, notepaper and kitchenware. In a second section were men's clothes and women's shoes and underwear. In the furthest corner were the blankets, suitcases, lamps, bicycle parts, paraffin and assorted goods. Most stores employed a tailor to make dresses and these hung from the ceiling forming a canopy of colour.

Price competition was insignificant. The standard nature of the goods stocked by all the stores made the direct comparison of prices easy. The store-keepers told us that they followed established prices, usually as suggested by manufacturers or wholesalers. The practice of cutting prices to promote sales did not work, the store-keepers insisted, because it roused suspicions concerning their integrity.<sup>4</sup>

During the survey the Co-operative introduced the sale for cash of paraffin. To reduce costs the paraffin was bought in bulk and hand pumped into bottles which were provided by the farmers. The price of 9d. a bottle was 31% less than the 1/1d. charged by the stores. The majority of farmers supported the initiative of the Co-operative, but many continued to buy paraffin from the stores who did not alter their price. We questioned some of the farmers and each one replied that he enjoyed a precarious relationship with a store-keeper and dared not desert him. Slowly over the following weeks farmers "tied" to the stores began to buy from the Co-operative through friends. The store-keepers remained apparently passive to the Co-operative's successful new venture and the threat it posed should the sale of other commodities follow. After five weeks the stores suddenly dropped their price to 9d. I visited all the stores the next day and each store-keeper gave me a similar reason for the decision to cut the price for paraffin and compete with the Co-operative. It was unfair, they argued, that the Co-operative should compete with them because it could demand cash, which they did not. They had relied on the loyalty of the farmers to make the sale of paraffin by the Co-operative a failure. This had not happened. The store-keepers had chosen to recognise this fact and had brought their price into line with that of the Co-operative so that their customers who were not members of the Co-operative would not "suffer." They stressed that this would involve them

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4. A simple check suggested that prices rose somewhat the further stores were from Umtali and Rusape.

in a loss. A farmer who was in one of the stores at the time informed me that the store-keepers had had to wait five weeks before cutting their price in order to avoid the charge that they had been over-pricing paraffin for years. From the evidence that I collected, it appeared that the difference in the price of paraffin at the Co-operative and at the stores was due almost entirely to the economy of scale and the cash basis of the Co-operative's organisation.

The significance and cost of the credit extended by the stores can be gauged from an analysis of the financial position of the two largest stores (Table 1.) The stores kept very primitive books with which it was extremely difficult to work. The most laborious task was to establish the value of the debtors ledger for each store. There was no system in the manner in which store-keepers recorded transactions so that a full understanding of each entry was impossible without infringing on the store-keeper's time for too long. A further complication was that the entries were written up by several family members who acted as assistants. Poor handwriting, absence of dates and novel procedures abounded. The only figures that were accurate were those for cash takings which were faithfully recorded. The repayment of credits previously extended were treated by the stores as sales. I have deducted the repayments from the cash takings wherever the books and records suggested that the original purchase was made previous to the year analysed. Most of the double counting involved should therefore have been avoided and the figures for sales rendered accurate.

COMPARISON OF THE TWO LEADING STORES AT NYAMAROPA.

<u>TABLE 1.</u>	<u>STORE X.</u>	<u>STORE Y.</u>
A. Average Stock Held	£ 450	£ 690
B. Debtors Ledger	£ 480	£ 910
C. Debtors as % of Stock	106%	132%
D. Annual Sales	£ 5605	£ 5905
E. % on Account approx.	21%	10.2%
F. Debtors as % of Sales	8.5%	15.4%

(The Stores) (Continued)

COMPARISON OF THE TWO LEADING STORES AT NYAMAROPA

<u>TABLE 1.</u>	<u>STORE X.</u>	<u>STORE Y.</u>
G. % of Debtors outstanding: approx.		
one year	60%	45%
two years	12%	23%
three years	18%	14%
more than three years	10%	18%
(five years plus)	( - )	(12%)
H. % of business with farmers	87%	46%
" " " " villagers	13%	54%
	<u>100%</u>	<u>100%</u>
I. No. of times Stock turnover p.a.	12.4	8.5
J. 7% interest charge on Debtors Ledger	£34	£64
7% interest charge on accounts*	£35	£21
	<u>£69</u>	<u>£85</u>
average annual bad debts. 3 yrs.+	£48	5 yrs. + £147
rough annual cost of credit ext.	£117	£232
K. Profit	£708	£840
L. return to management	£390	£340
M. Cost of credit as % of sales	2.8%	3.9%
N. " " " " " " profit: approx.	14%	29%
O. " " " " " " return to management.	30%	68%

\* Calculated on a half-yearly basis.

Most of the farmers and a few villagers maintained what I have termed accounts (Table 1 E.) Food, household goods, and other items under 10/- each were bought by regular customers on credit. Most clients settled a part of their account at least twice a year, nearly always leaving from a quarter to a half unsettled. Regular customers were therefore carried to the value of 5/- and 25/- by the stores all year round. Rather like a reverse membership fee! The store-keepers judged

the reliability of each customer and refused to grant credit above what they felt he could repay after the next harvest or trip to town. Totals on these "accounts" varied from 30/- to £5.

The debtors ledger (B) includes all the goods purchased on credit by occasional customers, few of which were small items, and all the major purchases - clothes, blankets, lamps, - of the regular customers. Cash loans are not included. The payment period for major goods purchased on credit was, during the survey year, once a year after the cotton payment. Had the bean crop been successful, a smaller second payment would have occurred. In fact roughly 40% and 55% of debts at the stores were not paid until after a year from purchase (Table 1 G.)

The owner of store 'X', Samuel Makunike, had assisted many of the farmers when they first settled on the scheme. Farmers told us that he was a "father" of the scheme. He had granted goods on credit and had sometimes loaned cash to farmers whom he had never met before. Although he owned the smaller of the two stores, he did nearly twice the business with the farmers as did the larger store, 'Y', Nyamurundira Bros. The Matiza brothers, John and Langton who own the big store, ran a 7-ton truck and carried maize for the Grain Marketing Board (G.M.B.) Their larger stock of goods included some "fancy" items to attract returning migrants whom they considered to be the most lavish spenders. Among these items were expensive hats, "zoot" suits and shoes, fancy belts and other less utilitarian items that Makunike never stocked for his farmer clientele. The Matiza brothers continually tried to persuade the farmers that they had need of new "smart" clothes, even if only for church on Sundays, but with no evidence of success.

The type and extent of credit given and the costs of running the store (I and J) are shown to have been affected by the nature of the clientele each store attracted.<sup>5</sup> The farmers repeatedly bought small purchases on account which gave store 'X' a rapid turnover of goods, calculated on value as being 12.4 times as against store 'Y', 8.5 times. The cost of carrying the credit system (no interest was charged) was twice that for store 'Y' as for store 'X', (J). Migrant workers took longer to settle with the stores than did the farmers; hence the five years plus for store 'Y'.

As a percentage of sales the cost of credit was small (M) but, more significantly, as a percentage of profit it was high, 14% and 29%, (N). My calculation of profit was necessarily rough. I included a charge on the buildings for maintenance and another to cover depreciation on the two Land Rovers and the truck owned by the two stores. Profit

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5. The disappointing cotton and poor bean crop on the scheme caused store X's sales to drop 23% from the 1965 figure of £7,328, and store Y's only 13% from £6,753.

was thus a residual figure accruing to the person and family of the store-keeper for labour, management and a return on capital. Profit at store X was just over £700 and at store Y, £840 (K). Store X was run by the store-keeper and his sister with the occasional help of an uncle, and store Y by two brothers, a sister and two girl relatives. Both stores employed a tailor and a man to run their grinding mills. The mills and the G.M.B. agency of store Y have been excluded from the analysis. If interest at 7% is charged on the value of the buildings (X £450 and Y £700) and if family labour is charged at £10 per month, the return to management would be, roughly, £390 at store X and £340 at store Y (L). The cost of credit as a percentage of the return to management was 30% at store X and 68% at store Y (O). While the profit and return to management figures are not very useful in themselves, they do reveal the cost of the credit extended by the store-keepers in terms of their income.

A comparison of the two stores suggests that store X performed better than did store Y. However, store Y was part of a larger complex that included the G.M.B. agency business and a very popular grinding mill that did nearly four times the business done by the older mill owned by store X. Both stores were the first and largest of two chains of stores. Makunike ran another smaller store and the Matiza brothers ran three other stores and two other mills. The Matiza's swapped their fancy stock amongst their stores regularly on the principle that, since all the goods in the store are visible and therefore on display, the likelihood of the particular goods being bought drops after two or three months since by then the goods have been exposed to the bulk of the store's customers. In this way they maintained a satisfactory rate of turnover with a greater variety of goods than any other stores in the district.

Both stores reported an increased demand for credit after the farmers had realised that the bean crop was a failure. The earlier disappointing cotton crop had caused many farmers to neglect to pay all or most of their debts to the stores and consequently the stores were short of cash.<sup>6</sup> The greater demand and smaller supply of credit was adjusted through more discriminate loans. Rather than increase the price by raising the rate of interest, which no store charged, the store-keepers sought to reduce the risks involved in each extension of credit.

Part of the cost of the credit system may have been included in the initial price of the goods sold and part may have been borne by the store-keepers as their status brought a reward of its own. It meant

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6. All the store-keepers attended the cotton payment, note-books in hand to "catch bad customers." Several farmers whose payments were insufficient to cover family and education expenses for the next year avoided the store-keepers and crept quietly away from the market place. Later some of them made a token repayment in the hope of being granted additional credit above that repaid.

that customers who purchased for cash were penalised, particularly as the repayment period was typically from one to two years. The absence of an interest charge applied to credit would seem to have evolved from the traditional establishment of reciprocal ties. An interest charge would be regarded as profiteering. The absence of interest was not, at Nyamaropa, a sign that the society was static. The extension of credit had arisen from the growth in year round demand for "Western" goods while the once a year income had remained the sole source of cash for many of the people. The long period away of migrant workers had also increased the need for credit at the stores to supply the needs of their families.

The books kept by the stores, the practice of running a chain of stores as a business unit together with grinding mills and the G.M.B. agency, and the difficulty of assessing the capital value and the returns in kind to the family of the owners made it difficult to produce profit and loss accounts and balance sheets.

Much more needs to be learnt about the role of the African trader in Rhodesia. My acquaintance and work with the stores at Nyamaropa led me to be impressed by the way in which the leading store-keepers managed their business. They were conversant with the economic and social environment in which they worked. They provided an important source of credit and, through the "system", a form of insurance. Quite possibly the absence of interest acted as a mechanism to transfer wealth from the rich to the poor, as the poor relied more heavily on credit and took longer to repay.

The system within which the stores operated, though perhaps not as completely rigid as my findings over a short period may suggest, originated from the tribal complex of relations and attitudes. The extension of reciprocal ties would appear to have had a beneficial effect in terms of security. The stores, the concrete symbols of wealth and ability in the money economy, have become rooted through the system to the peculiar needs of the people in the tribal areas. The knowledge that their families could usually obtain goods as credit and sometimes money from the stores, enabled the men to leave home for long periods as migrant labourers. The strength of the system was its flexibility and, in a society in which suitable collateral seldom existed and was not provided for in law, the personal qualities of the borrower were the sole factors in the store-keeper's decisions as to whether or not to give credit and how much.

The extravagant spending by migrant workers on visits home to The Nyamaropa was not, the store-keepers reported, just to impress their family and friends. It was also to impress the store-keeper with their earning ability. The visit of a migrant worker to a store was sometimes rather like a charade. The store-keeper would be pleased to see him after

a long absence during which time the store-keeper had extended credit to his family. The migrant's primary concern, no matter how much money he had on him, was to keep the source of credit open. During their conversation, the store-keeper would try to evaluate his success in town and therefore his standing as a creditor. The store-keeper would ask after his family and introduce the subject of his credit. The migrant, depending on his assessment of the store-keeper's impression of his performance in town, may feel it necessary to display his wealth. He may buy a suit, expensive shoes, a suitcase or clothes for his wife and pay cash for the articles before settling part or all of his debt.

The Co-operative's proven ability to undercut the stores dramatically, not only with paraffin but with farm materials, gum-boots and other items, was a real threat to their business. However, the reduction in the cost of commodities, a cash basis or on a loan plus interest basis, may not be entirely beneficial. The importance of the insurance and the social transfer function of the stores must be ascertained before a definite answer can be given. At Nyamaropa the loans for farm materials granted by the Co-operative were regarded as a means of involving Government in the risks of crop production and the interest charge on the loan was considered reasonable. A Co-operative store, of which some farmers had begun to talk, would compete directly with the existing stores. All the farmers may not be willing to transfer their business to a Co-operative store unless they feel financially secure and are prepared to cut off ties with the African stores and that source of credit. On the other hand, greatly reduced prices may induce a large scale switch to the Co-operative of financially independent farmers so that the stores are left with an impoverished clientele. Unless other agencies of credit and of farm development are effective, the stores may quite quickly find that a considerable proportion of sales can only be made if the goods are sold on credit. Were this to happen, the stores' ability to compete price-wise would be adversely affected. The final result could be a diminution of function, economically and socially, to that of a virtual money lender. An exorbitant interest rate, to cover the risk, could be hidden in high prices.

The provision of savings and loans facilities to put shopping on a cash basis may therefore be a useful priority. It would allow the African store-keepers a greater degree of flexibility to meet new forms of competition and even to reduce the apparent need for their introduction. Moreover, the transport advantages and monopoly that accrue to stores that are agents of the G.M.B. under the present licensing system must have created, artificially, factors that affect the role and efficiency of the stores.

The Rhodesian Chamber of Commerce has recently suggested to Government that European managed and financed enterprises should be allowed to enter the tribal areas. A leading wholesale company has reportedly started a shop in a tribal area on an experimental basis. The changes in attitudes and loyalties, and the response and competitiveness of the nearby African traders may repay careful study. The crucial questions are whether or not the stores will be able to compete, particularly if the transport arrangements are rationalised, and whether or not as a result the services which the stores provide will be severely damaged.

A study of two stores that were opened during the survey year reveals both the store-keepers' difficulties in establishing themselves and the attitudes of the people towards them. In June, a man from a village five miles from the scheme rented a small store for £4 a month in the main shopping centre above the Nyarawaka. At the end of August, another small store in the shopping centre close to Sanyamaropa's village was rented for £6 a month by a young farmer from the scheme.

The farmer started with £82, over half of which he used to purchase goods for the store. He obtained a further £34 worth of goods on credit from travellers and a wholesaler in Umtali. At first business was brisk. Most of his customers were villagers and nearly everyone sought goods on credit. In order to win regular customers the farmer granted credit worth £41-3-10 to forty eight people in the first three weeks. His cash sales were only £16-14-0. At the end of the month he paid several of his accounts and took £21 worth of new goods on credit. Only three villagers paid for the goods which they had bought on credit, £1-7-0. His balance sheet at the end of the month was:-

<u>LIABILITIES</u>		<u>ASSETS</u>	
Capital	£82	Stock	£47
Creditors	£24	Debtors	£40
	<u>£106</u>	Cash	£19
			<u>£106</u>

Half his capital was tied up to debtors and was unlikely to be repaid for many months. Having worked on his "books" I cautioned the farmer not to sell too many more goods on credit and he took my advice. Two months later, when the survey ended, the farmer was in a more liquid position but found that his inability to grant credit had lost him business. Sales for the three months were £62, £37 and £30. Cash sales had risen from £17 to £25. At one stage in the second month he had opened only three days a week as business had been so slow.

I asked the owner why the villagers should have demanded goods on credit as they did. He thought that he had opened at the wrong time of year - in between the harvest and the migrant workers return at Christmas. I asked, "Would you have had the same demand for credit if your store served only the farmers on the scheme?"

"No", he replied, "they understand why I start store business. (He had had poor cotton and bean crops). Some, yes; but so many, no. Sanyamaropa's people think I am rich from cotton and wish to rest on me. They do not like that I become more rich from store without first helping them. Some old women need credit for sugar and soap, but most have money hidden.

The extent of the villagers' real need for credit and their attitude towards the farmer-turned-store-keeper was impossible to assess. However, the villager who opened a store in the main shopping centre, two months before the farmer had opened his store, fared rather differently. He had begun with only £40 capital. In order to conserve it, he had relied almost entirely on obtaining the quicker moving goods - sugar, cigarettes, soft drinks, biscuits, sweets, soaps and a few tinned foods - on credit from the travellers. After three months business, his balance sheet was:-

<u>LIABILITIES</u>			<u>ASSETS</u>	
Capital	£ 40		Stock	£ 39
Less rent paid	£ 12	£ 28	Debtors	£ 7
Creditors		£ 34	Cash	£ 16
		<u>£ 62</u>		<u>£ 62</u>

His debtors ledger, a sixpenny notebook, revealed a total of £10-16-4 granted over three months to thirty seven customers, of which £6-2-7 had been granted in the first month. Sales were £17, £25 and £31. His limited selection of goods, his high proportion of cash sales, 85% v. the farmer's approximate 58% after three months, and the high rate of turnover, roughly 80% of stock a month v. the farmer's 60%, had allowed the store to develop. He hoped that soon he would find a tailor to contribute to the variety of goods he carried.

Neither store had reached a position where the cash profits could cover the rent and it was impossible to predict when the owners would receive a return on their capital and labour. The progress of the villagers store, relative to that of the farmer's may be ascribed to four complimentary factors:- his inability to grant much credit; his concentration on fast moving lines that usually attract cash customers; the high proportion of farmers who made up his clientele, in particular a comparatively wealthy grass-widow who lived nearby and purchased regularly from him for cash; and, more tentatively, the fact that he had not, like the farmer, made his money on the scheme. The farmer's difficulties

might be ascribed to the "economic rent" that Sanyamaropa's villagers demanded be made available to them as the former landowners in the form of goods on credit.

I cannot close the chapter without relating a delightful episode that resulted from the debt allegiance of a farmer to a store-keeper. The store-keeper made an application for a bottle-store licence. To secure his application he required a witness to testify that there was no bottle-store in the vicinity. The farmer, who was unable to settle his account and repay money loaned to him by the store-keeper, volunteered to appear as a witness. At a time when his presence on the farm was important, he hitched a lift to Umtali, appeared before the Liquor Licencing Board and arrived back on the scheme after a three day absence. The licence was subsequently granted and the store-keeper very generously gave him a suit (value £20) for his assistance. I imagine that he was a most persuasive witness for he liked to drink. However, to everyone's amusement he stood up in church the next Sunday and told the congregation, "You have heard that Matiza is to have a bottle store. I have been to Umtali to tell the Authorities that here at Nyamaropa we have need of a bottle store. Now I ask you, my fellow-churchmen, that as I am a family man with six children to educate, if you see my feet straying towards the bottle store, I pray of you, turn my feet away."

GRAZING AND THE PROBLEM OF TRACTION

"WE AFRICANS SUFFER ALL THE CHANCES"

*Nyamaropa farmer on African attitudes to cattle*

Grazing and the integration of cattle into the farm system was a major problem affecting the scheme's relationship with the surrounding villages and the standard of farming. Roder found on the Sabi schemes that those "with the lowest density of cattle had the lowest yields of maize as they lacked sufficient manure".<sup>1</sup> A rough estimate for the Sabi schemes was that two mature beasts per acre were required to provide manure for year round cropping. On the basis of this estimate, eight beasts would be required by each family at Nyamaropa.

Only 19% of the farms in the sample had eight or more animals; 31% had six and 50% had four animals or less.<sup>2</sup> The Extension staff recommended the application of one-and-a-half tons of manure per bund (1/7 acre) every three or four years. On the four acre plot this meant that with a three year cycle 12 - 15 tons of manure should be applied over 8 or 9 bunds each year, and with a four year cycle 10½ tons of manure over 7 bunds each year.

Few of the farmers followed a three or four year cycle, though all understood that the properties of manure diminished significantly after four years in the ground. Table 1 shows the weight of manure applied: divided into categories related to its effect on maintaining soil fertility on the basis of the recommended practices. Only 60% of the sample manured sufficiently heavily to maintain fertility, and three farmers or roughly 7% applied no manure at all. Table II shows the spread of the manure over the fields, again in categories related to the recommended practice to maintain a three or four year cycle.

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1. Op cit Page 132.

2. See Chapter on Farms.

APPLICATION OF MANURE.

Table I

	<u>No.</u>	<u>QUANTITY</u>			
		<u>Good</u>	<u>Sufficient</u>	<u>Poor</u>	<u>Nil</u>
Locals A	8	4	1	2	1
Locals B	6	1	1	4	0
Newcomers A	13	6	2	4	1
Newcomers B	11	5	2	3	1
<u>T O T A L:</u>	38	16	6	13	3
		60%		40%	

Table II

	<u>No.</u>	<u>SPREAD</u>			
		<u>Good</u>	<u>Sufficient</u>	<u>Poor</u>	<u>Nil</u>
Locals A	8	5	-	2	1
Locals B	6	-	3	3	0
Newcomers A	13	5	3	4	1
Newcomers B	11	4	1	5	1
<u>T O T A L</u>	38	14	7	14	3
		57%		43%	

A few of the wealthier farmers bought in manure, but the cost and the shortage of supply in the villages makes this alternative insignificant.

The high temperatures and, in good rainfall years, the favourable moisture conditions in summer stimulate rapid plant growth. However, maturation is equally rapid so that the grass passes from the easily digestible high protein stage of growth to the fibrous, low nutritive stage soon after the end of the rains. For six months, from July to December of the survey year there was insufficient nutrient to be had from grazing the veld for the proper maintenance of the cattle. The farmers and the Extension staff both testified to the increasing deterioration of the surrounding veld due to over-grazing. Over quite large areas the grass was being replaced by a small coarse plant that the cattle could not eat. During September, October and November, the period of greatest heat, there were many cases of near starvation, particularly amongst cattle belonging to the villagers. On the scheme farmers with green maize topped part of the crop nearly every day and fed it to their oxen. Although it was a source of high food value, the Provincial Extension officer calculated that it would take four acres of green maize to support one adult beast in this manner.

On the scheme, the lean and hottest period coincided with that of the greatest demand on the oxen, the preparation of the fields prior to planting the summer crops. The farmers used their oxen as sparingly as they could. Most rose before 4 a.m. and started ploughing at first light, soon after 5 a.m. By 9.30 or 10 a.m. they stopped ploughing and rested the animals in the shade until late afternoon or the next morning. A few farmers took advantage of a full-moon and ploughed during the night.

The rotation of water, enforced to ration the limited supply amongst the farms, helped to spread the period over which the fields were prepared as water is required to enable the plough to break through the surface crust. A few farmers who were in a position to market minor crops, which would have matured in September or October, chose not to grow them as they would have left little time for land preparation before the summer crops ought to be planted and so put too great a pressure of work on the oxen. Instead they spread out the period of land preparation from August to October.

We judged that roughly a third of the farmers' oxen were not properly trained. These oxen required three or four people to lead and goad them and to hold the plough. Often enough, a poor standard of land preparation was achieved. The use of untrained oxen for cultivation is costly as plants are trampled and cut whenever they wander off course. The well-trained oxen on the scheme invariably belonged to farmers who regularly put their oxen in harness to plough, harrow, cultivate and to pull scotch-carts. Regular training of oxen in harness was more a part of the Newcomers pattern of farming than that of the Locals, and most of the poorly trained oxen did in fact belong to the Locals.

In effect a series of "vicious circles" existed that made the full utilization of cattle difficult in the circumstances and which held back the less well organized farmers considerably. The diagram, over-leaf, does not apply to all the farms equally. The circle may only be broken at the three focal points:-

Lack of Grazing.

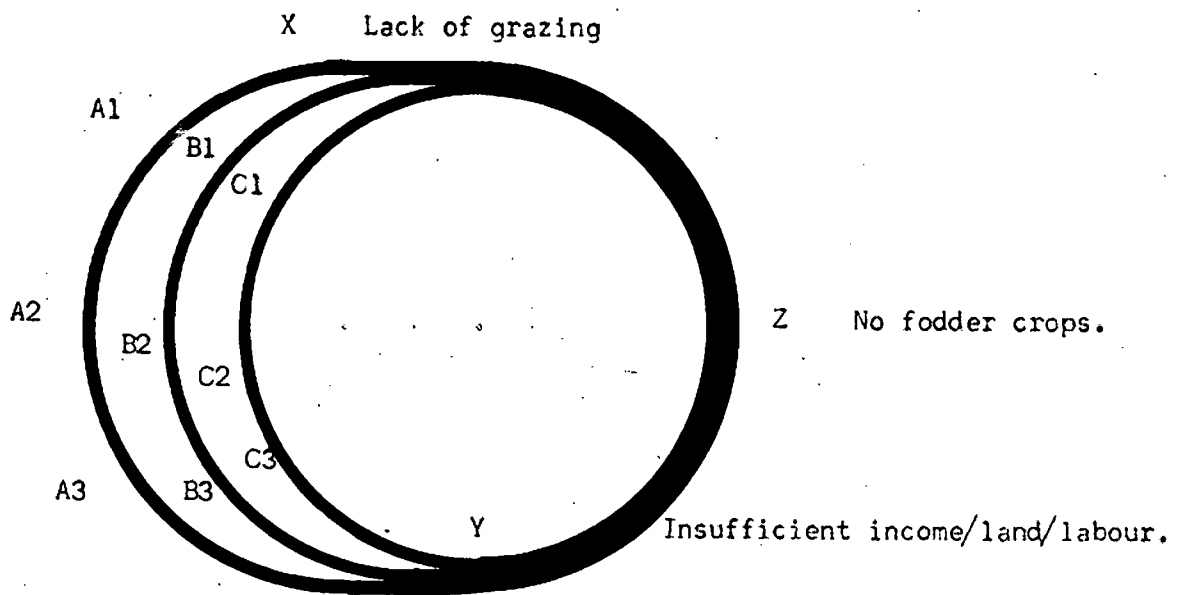
An analysis of pasture management practices in the lower rainfall aread of Rhodesia concluded that it is not possible to change the feeding values of pastures qualitatively by employing various grazing systems.<sup>3</sup>

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3. Veld Management in the Lower Rainfall Areas of Southern Rhodesia.  
T.C.D. Keenan.  
Proceedings of 3rd Professional Offices Conference Page 82 - 88  
Mineralogy of Agriculture 1957.

THE CATTLE PROBLEM.

TABLE 1  
DIAGRAM 1



- A1 Limited number of animals.
- A2 Insufficient manure / humus.
- A3 Poor soil structure (aggravated in October and November by water shortage)
- B1 Poor condition of oxen.
- B2 Need to conserve oxen
- B3 Need to free land from early September.
- C1 Problem with villagers' cattle.
- C2 No winter or spring crops.
- C3 Poorly trained oxen.

The only means of preventing the loss of weight by cattle during the dry season is to produce protein rich feeds in summer for winter feeding. The position at Nyamaropa, should pasture management be contemplated, is complicated by the fact that the scheme has little in the way of pasturage that can be called its own. The cattle belonging to the scheme have to graze on hillsides which traditionally belong to the surrounding villages. Until a position is reached in which the cattle are reliant on the farm for much of their feed, the improvement of pastures used solely by the scheme can have no more than a marginal benefit.

Insufficient Income/Land - leading to no Fodder Crops:

The farmers told us that they did not consider growing fodder crops, although the Extension staff had begun to suggest that they do so, because it would reduce the amount of land that they had for food and cash crops and, of more importance, it would involve them in certain costs which they were not prepared to carry. Although a few of the wealthier farmers and those farming on a larger scale could have afforded to grow fodder crops in respect of finance, labour and land, they seemed to regard the problem as communal. One of these farmers asked me why he should relieve the pressure on the pastures when the cattle of other farmers would graze what his cattle did not. The farmers, though generally concerned at the lack of grazing, were unprepared to act individually to solve the problem. The farmers had developed new attitudes to cattle that were prevented from coming to fruition by the maintenance of the traditional system of communal grazing. The peculiar weakness of the scheme as a community and the farmers reliance on and inability to communicate with Government froze individual initiative.

The position was a stalemate. Even though a solution to the intrusion of villager's cattle on to the scheme (C on the diagram) would benefit some of the farmers, it would have only a marginal effect over the whole scheme. It alone would not break the circle as two threads (A & B), would remain both more intimately connected with the basic problem. The general response to the problem of grazing was that of "wait and see." The year of the survey followed several years of poor rains and the farmers hoped for better years and better grazing.

Unlike Naylor's survey of a settlement scheme in Iraq where the people, formerly nomadic tribesmen, revealed an income elasticity of demand for grain for their livestock in good years of .70<sup>4</sup>, the farmers at Nyamaropa showed little willingness to sacrifice so long as their animals pulled through the lean period. They did support the dipping and recently introduced dosing programme; a few grew lucerne and half of them fed their oxen the tops of the green maize.

The grazing problem requires a practical and determined effort by Government for its solution. Either traction on the scheme must be mechanised and humus built up through the use of crop residues - which the Extension service approves - or the proper integration of the cattle must be demonstrated to be profitable.

#### Mechanization.

Nyamaropa was not designed with the tractor in mind. The compact shape of each farm, the bunds are 110 yards long, makes it difficult to achieve long tractor runs unless canals are bridged and the adjacent bunds of several farms are ploughed at once. This would necessitate a different ordering of the scheme with a management or co-operative company undertaking the traction requirements of the farmers. A tangible control factor over the timing of farm operations would be introduced and would involve supervision and discipline. Planting dates would have to be enforced. Until the supply and use of hired labour improves, many of the farmers, who stagger the planting of their major crops to ease the peak periods of labour demand, may feel coerced. In this situation the farmers' management function would be undermined.

Agreement would have to be reached on the use of each bund over the whole year. This would necessitate complimentary marketing and other arrangements on the part of the management that would both benefit the farmers, by finding additional cash crops, and harm them in that a greater part of their income would become subject to the levy as it passed through the Co-operative. The management function and the autonomy of the farmer may well be reduced if tractor operations and official marketing plus the levy deduction form the main relationship between the farmers and the management.

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4. Naylor: Survey of New Hawiga Settlement Project in Central Iraq, reported in C. Clerk and M. Haswell. "The Economics of Subsistence Agriculture", MacMillan, 1964. Page 147.

Unlike the Gezira with its single cash crop and export marketing, Nyamaropa was fairly diversified and the farmers sought alternative crops and avenues through which they could be marketed. An overall land use policy would not be welcomed. An alternative practice, as contemplated for the large Chisumbanje scheme, is to leave certain bunds "uncontrolled" each year on which the farmers may plant what they wish. This more flexible approach would be costly at Nyamaropa unless groups of farmers could be tied together for tractor purposes.

#### The Integration of Cattle.

"Recent F.A.O. studies", writes Rene Dumont, "point out that in certain cases, mechanical energy in Africa proved to be nine times more expensive than animal energy".<sup>5</sup> The real costs of animal traction at Nyamaropa cannot be established until the cattle have been fully integrated into the farm. Moreover, the social and other side effects of any removal of cattle would have to be ascertained: among these would be the loss of a potentially valuable food supply and a possible loss of leadership in the wider area in which cattle still denote wealth and standing.

In the season after the survey, the stall feeding of oxen for sale to the Cold Storage Commission was undertaken by nearly twenty farmers. The advent of this novel use of cattle showed that once a profit was possible the farmers were prepared not only to put money and labour into the venture but to adopt new attitudes. Several farmers wrote to me and reported that they were pleased with the results: cash profits had varied from roughly £17 to £30 per beast.

The same farmers wrote that they were concerned about the supply of suitable oxen (large frame, good teeth and near the end of its working life) in future years. Local prices had risen by £2 to £5 per ox (previous prices had ranged from £9 - £14, approximately a 20 - 40% increase) and even then it was difficult to find someone willing to sell.

Yudelman has suggested that only a limited number of African farmers respond to increased prices for cattle. Thirty out of fifty farmers he interviewed considered a 25% increase in price insufficient to induce them to sell cattle surplus to their traction requirements. Yudelman noted that after Government stopped fixing prices in 1958, prices rose markedly and the number of cattle put up for sale increased significantly. However the increase did not continue even when prices rose

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5. Dumont, Rene: "African Agricultural Development" FAO 1966.  
N.Y. Page 74.

still further.<sup>6</sup> Yudelman deduced that a limited number of African farmers respond to price changes. Two comments may be made. Cattle "surplus" to traction requirements is a difficult question to put to most African farmers as they may be necessary for security reasons, for reasons of succession and for prestige and other non-measurable factors. The poor calving record of most African cows - mainly because of poor nutrition and, at Nyamaropa, little knowledge of breeding cycles so that cows on heat were often herded with no bull - means that "surpluses" once sold off take years before they arise again.

At Nyamaropa the villagers talked about the large herds of cattle, sheep and goats that belonged to the past. I sat in on the distribution of two large herds, 44 and 35 cattle, to the families of deceased men. Each of the beneficiaries received between two and five animals. I asked them how big their own herd was and, to my surprise although some of the children were middle-aged men, none had more than six beasts. Those who received five animals were the widows and the younger sons who had no cattle of their own. The increasing use of money for lobola purposes, the encroachment of crops, the impoverishment of the grazing areas and migrant labour have reduced the herds to a fraction of their former grandeur and social importance.

If future "surpluses" are to arise, whether for sale to other farmers for fattening or to the Cold Storage Commission, cattle must be scientifically bred and managed.

Both the Advisory Committee and the Report of the Working Party No. 5,<sup>7</sup> supported the use of cows for traction purposes on irrigation schemes. The introduction of cows to replace oxen interested the farmers on the scheme, though most doubted the ability of cows to cope, particularly in September and October. The position would appear to be ripe for the introduction of cows for draught purposes so freeing in stages the oxen on the scheme for fattening and of a longer term plan in which the cows would be utilized to breed top grade beasts suitable for fattening. "Spare" beasts bought in the villages would supplement the number raised on the scheme. Later, as the business becomes more sophisticated the farmers could buy beasts from further afield, if disease and other factors allow the movement of animals, and so ensure a steady supply.

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6. M. Yudelman. op cit. Page 100.

7. "Irrigation in the African Areas" Salisbury Government, Printer 1961.

A study of the potential of African cattle for this purpose concluded that, "native bullocks respond to high levels of feeding (even) after seven successive periods of severe winter restriction."<sup>8</sup> The farmers could trek the cattle to the scheme from quite some distance at little cost, so long as the animals had four to five months on the scheme before being sold in October/November. Transport costs of high value animals to Umtali are less per £1 worth of animal than the equivalent transport costs for £1 of cotton.

The advantages of fattening include: an additional cash crop with a demand for labour in the "off" season; a source of large quantities of manure and possible reduction in the use of fertilizers; an opportunity to introduce cows for traction with the benefit of milk and offspring; fodder crops become cash crops, improve the rotation and the soil; a demonstration of the value of the integration of cattle to the whole area.

A proper livestock policy for the scheme and later for the area could then be formulated. Every facet of the problem must be tackled together: food, breeding, management and markets. The meat, milk and draught qualities of the animal would have to be regarded as economic features. There was, for instance, no sign of any large potential market for milk on the scheme which two or three cows per family could not satisfy. A beef/draught animal would be the objective<sup>9</sup>.

One aspect of the farmers and the villagers approach to their cattle was surprising. They had very little understanding of breeding. The Fulani and other tribes, whose cattle are the core of their subsistence, castrate few animals as they regard a bull as a finer looking animal and consequently cannot practice any real selection of sires. The people at Nyamaropa admire a large ox, and their bulls are often puny. The task of raising food is more fundamental than that of reproduction! These valuations on the bull and ox clearly arise from attitudes instilled by the subsistence economy. A few villagers and one farmer on the scheme had bought Jersey cows from a European farmer at Inyanga. The lack of nutrition and the heat at Nyamaropa was too much for the Jerseys and they fared badly, dampening any further willingness to import stock with which to improve the local livestock. The Extension service must

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8. T.H. Vorster. "The Production of Beef in the Native Reserves of Southern Rhodesia."

Rhodesian Agriculture Journal No. 57. 1960, Page 420 - 435.

9. The Nigerian Livestock Mission recommended that in the rural areas, "the ideal animal on the small farm would be a 'household' cow, good in the draught, of tolerable beef producing qualities and giving a fair yield of milk." H.M.S.O. 1950. Page 20.

advise on any such venture. An imported bull managed by the staff on the scheme to serve the farmer's cows would be a simple first step and one of the farmers might well support financially in the form of a company.

Misunderstanding of breeding cycles is further illustrated by the attitude of the farmers towards poultry. During the year, I brought four young cockerels from Salisbury, one for each of three farmers who wished to improve the laying performance of their hens. The fourth I gave to my servant, Augustine, much to his joy. A few days later he asked me to visit his home in one of the villages in order to see the house he had built for his chickens. To my surprise he had resurrected an old hut. On opening the door I saw the baby cockerel standing forlornly in the middle of the floor with, four feet above him, his twelve fully grown wives perched on a roosting stick to which he could not aspire for several weeks! The farmers regarded every egg as a potential chick, source of other chickens and finally as a source of meat. The view was understandable as their chickens wandered free and the cocks were for ever busy. The few who built proper houses for them still regarded the presence of a cock as necessary if the hens were to lay eggs. Although two Demonstrators kept hens for eggs without a cock to make them lay, the lesson was not common knowledge. Consequently, eggs, which most liked as a food, were seldom eaten in preference to a possible later meal of chicken. However, hawks, snakes and legevaans took most of the natural increase and chicken was not a frequent meal. Augustine's "wedding" of the cockerel and the high flying hens was not an act of enthusiasm. It was a considered move to ensure that the hens would lay!

Whatever role the cow and ox play at Nyamaropa in future, three tasks would benefit from the full or partial use of tractors. The shortage of water in September and October is likely to continue and may hold up operations on the scheme after poor rains or once the remainder of the scheme is opened up. Contract ploughing at rates per bund that decrease as more farmers with adjacent bunds request it, could be organised and financed through the Co-operative. The farms would benefit from a thorough ploughing, deeper than the ox plough can manage, at least every three or four years. The use of tractors during the period would reduce the demand for water substantially, would allow crops to stand in the field until September and still be followed by a summer crop in October, and ease tensions that build up unrelieved in the heat. Simple bridges that the farmers could move by hand would allow tractors to cross the canals and could be rented from the Co-operative. The benefits of hiring tractors would be recognised by the farmers and, if organised with simple, acceptable rules, the likely cost should not be prohibitive.

A rotavator mounted on a tractor is markedly superior to the hand cutting of cotton stalks and could be managed in a similar fashion. It would save days of labour, free the lands more quickly for subsequent crops and assist in the control of pests as the tiresome task of stalk cutting and burning was often left for several weeks after picking had been completed. The likely extension and improvement in the acreage of wheat grown may make feasible mechanised harvesting. With all three possible uses of tractors the approach should be one of "take it or leave it for all or part of your farm."

Two farmers applied for loans to the Co-operative to purchase tractors and equipment to enable them to undertake contract ploughing on the scheme. The Co-operative officer was concerned that, as neither knew anything about tractors, such a loan would be likely to become a burden. Instead he agreed to the loan once the farmers had attended a course on tractor driving and maintenance at Domboshawa, an agricultural training college outside Salisbury. I do not think that the two farmers have yet found the time to attend the course. However, the demand does exist. Better than to wait for a farmer to set himself up in a business without the provisions for finance and the ability to organise long runs as suggested above, Government or the Co-operative should begin by hiring a competent contractor for the first two tasks and then, once all is working, allow local initiative to subcontract at these periods and be free to do business at other periods. Throughout the process, the ability of each farmer to meet his needs satisfactorily from resources on or off his farm must be a paramount concern and each farmer must be free to choose the path he wishes to follow. The numerous family groups on the scheme suggested that traction requirements at other times of the year, when demand is less concentrated, could be met by the pooling of cows or oxen by two, three or more farmers. In this way a minimum number of beasts need be kept to meet the traction requirements of the farms and cows could calve frequently.

## DIET AND HEALTH

The movement to cash farming on a densely settled irrigation scheme from widely scattered homesteads and traditional work patterns has significant implications for diet and health. The scattered native of African kraals enabled the people to browse the veld for berries, roots and leaves which, even if only used to spice the food, provided valuable protein, vitamins and minerals.<sup>1</sup> Contagious diseases were held in check to a far greater extent, with the exception of bilharzia contaminating the water supply. The comparative isolation of each kraal allowed the surrounding veld to be used as a latrine.

At Nyamaropa the farmers, occupied for most of the year on their farms, relied almost entirely on their farms and the stores for their food. Although man has an "enormous capacity for dietary and physical adaptation"<sup>2</sup> and on the scheme the farmers were able to grow and raise a great variety of food all year round, the number of physical and mental breakdowns suggested that dietary deficiencies existed. The doctor at the nearby mission hospital testified to a high incidence of bilharzia<sup>3</sup> and of worm infestation both on the scheme and in the surrounding area. The farmers were generally ignorant of food values and of the factors affecting their health. The resident Health Demonstrator had achieved some success persuading the farmers to build latrines and he undertook control measures related to malaria and bilharzia. However, though prevention is the right approach, a marked improvement will

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1. Altered work patterns and environment, as in town or on settlement schemes, will destroy part or all of traditional work and food patterns: "patterns that provided an adequate diet."<sup>a</sup> ... "it seems to be generally agreed among those who have studied this subject that such shortages (vitamins and minerals) are not likely to arise in primitive nomadic or peasant communities."<sup>b</sup>
    - a. Mead, M. editor: "Cross Cultural studies of Technical Change." UNESCO, Merton 1959, p. 199.
    - b. Clark, C. & Hazwell, M. op cit. p. 4.
  2. Proudfit, P.T. and Robinson, C.H.: "Normal and Therapeutic Nutrition". McMillin, N.Y. 1961., p. 847.
  3. "It has been suggested that elsewhere the costs associated with the detrimental effects of bilharzia infection have outweighed the benefits derived from irrigation". Church and Kimble, quoted by Roder op cit. p. 7. "Bilharzia is merely a symptom. The true disease is bad water supplies ..... In endemic areas piped water is essential. Permanent measures alone have shown that the symptoms are alleviated slowly. Quicker relief once curative measures for the disease have been instituted appear to lie in mass therapy." Editorial, South African Medical Journal, March 1969.

remain unlikely until diet, disease and ignorance is tackled as one problem.<sup>4</sup>

In the majority of cases of illness which we recorded there was a definite tendency, except when pregnant, a child was ill or after an accident, to go to hospital or to an African doctor, when farm work was slight. It appeared that most of the farmers had debilitating infections or deficiencies that, while it affected their health, did not prevent them from continuing essential work until they were free.

Many authorities have written on the effects of malnutrition and of infection. At Nyamaropa most of the farmers mentioned that managing their farms was mentally tiring and that it was hard to think through problems. Occasionally a farmer would ask me to stop an explanation and to continue it the next day as his head "was tired".<sup>5</sup>

At meetings farmers frequently fell asleep after half an hour and were usually left in peace. The effectiveness of meetings was thus considerably reduced. Most meetings lasted too long, not because they were planned to, but because the farmers as a body became dull and it was increasingly difficult to reach decisions and wind the meeting up.

Table I shows the recommended and actual composition of the diets of five families on the scheme. The families were among twenty whose daily consumption of food we followed carefully. The figures are averages per adult equivalent over the year.

Family No. 1 was a Local A and lived on the hillside. The family ate little fruit or meat and practically no wheat or dairy products. Like all the families on the scheme they ate kale as a relish (a green leafed vegetable). They experienced real deficiencies in protein, calcium, vitamins A, B<sub>1</sub>, B<sub>2</sub>, Nicotinic acid and vitamin C.

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4. "Diet and health are closely interwoven and difficult to assess separately as factors determining physical and mental performance. There is, for instance, great difficulty in clearly diagnosing malnutrition since it is not always an insufficiency of food or an unbalanced diet. Even a clinical examination cannot always differentiate between the effects of actual nutrition deficiency and of infection which precipitates or aggravates a state of malnutrition." Prof. J.V.O. Reid. "Pathological Effects of Malnutrition" in The South African Outlook. Dec. 1968.
  5. A protein and vitamin B deficiency "will produce behavioural change usually towards dullness, apathy, poor learning ability, lack of spontaneous activity. Hardly unexpected, seeing that the cells of the brain are most active users of dietary protein". Half the Africans submitted to Pretoria Mental Hospital are suffering from pellagra. (Vitamin B deficiency. Maize is a poor source of Nicotinic acid). Dr. J.P. Pretorius, South African Medical Journal. Sept. 1968.

Families No. 7 and 10 both lived above the Nyaruwaka and had developed stands though their fruit trees were still young. No. 7 sacrificed most of his fruit, chickens and vegetables in order to gain cash for school fees and family essentials. As a result his family's health suffered. Family No. 10 farmed two plots and concentrated on cash crops; tobacco, cotton, seed and ration beans to the exclusion of food crops. Although quite wealthy, the farmer, whose family was frequently ill, did not appreciate the importance of a balanced diet. The whole family were underweight and he frequently ate nothing for two or three days. Possibly he was anaemic, but the large intake of iron in all the families' diets would suggest not. There were deficiencies in good quality protein, calcium, vitamin B<sub>2</sub> and vitamin C in his family's diet which, most likely, exacerbated the effects of worm infestation and probably bilharzia. "There is no doubt that shortages of vitamins and minerals in the diet may have serious effects upon health, and may sometimes be fatal".<sup>6</sup>

Families No. 5 and 6 had the best diets of all the families in the sample. No. 5 kept over ninety chickens and No. 6 had a productive fish pond and for a month, milk from his cow. Both families had developed fruit trees, a number of bananas and grew a variety of vegetables, wheat, potatoes and rice. Their eyes and skin were clear and both families were alert and enthusiastic about their farms and their ability to handle life. They also exhibited enterprise. They both lacked sufficient calcium, vitamin A and vitamin B<sub>2</sub>, all derived mainly from dairy and animal sources.

As the scheme develops the majority of the farmers whose stands are suitable for the propagation of fruit trees will enjoy improved diets, particularly with respect to minerals and vitamins A and C. The encouragement of legumes, peas, beans and lentils, would provide protein of a good biological value and certain vitamins commonly absent or deficient in the families' diets. The only deficiency that would remain would be the "protective" foods required by the "vulnerable groups", the lactating women and infants. They require protein rich foods of animal origin; milk, eggs, meat and fish. The provision of these foodstuffs will require a programme of education and a solution to the grazing problem. Possibly, if incomes rose, dried milk and meat would be purchased in greater quantities. The use of certain oil in the preparation of food could correct the deficiency in vitamin A, the inclusion of which would appear to be a function of income.

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6. Clark and Hazwell, op cit. p. 4. The families financial performance is analysed in the chapter Performance of the Farms.

A major weakness in the pattern of eating was the almost universal absence of breakfast. The families ate at mid-day and in the evening. Although they ate large quantities of maize meal at night, the lack of good protein and roughage did not build the people up for long. A few families who grew or purchased wheat made a heavy bread which they ate occasionally in the early morning. They claimed that the bread made them "strong". Although of no greater food value than maize, the roughage in the whole-wheat would take some time to digest and this process alone would keep the body alert. As is common in Africa, the school-children fell asleep after 10 or 11 a.m. A few who came from "smarter" families had tea before they left which would only have warmed their tummies and provided some energy through the sugar.

The use of Dover stoves and the improvement in the status and role of the women as housewives, through suitable courses and the further development of the scheme would improve the use of the food producing facilities offered by the scheme and of the diet. Bread, eggs, fruit and milk could quite easily be promoted as easy to produce breakfast foods. Groundnuts, fruit and tomatoes and other wild crops grown between the cotton and maize rows should be encouraged as snacks between meals. Even the encouragement of sweet beer brewed to be drunk while in the fields would revitalize the families and the labourers during the long morning work period and increase physical and mental productivity. There was also much scope for the dissemination of knowledge on diseases and their prevention. Human efficiency could be increased greatly at little or no cost if suitable programmes were adopted.

TABLE 1.

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TABLE I.

DIET AVERAGED OVER THE YEAR: FIVE FAMILIES.

	<u>RECOMMENDED</u> <u>MODERATELY ACTIVE</u> <sup>1</sup>		<u>ACTUAL DIET AS PER ADULT</u> <u>EQUIVALENT.</u> <sup>a</sup>				
	<u>MAN</u>	<u>WOMAN</u>	1	5	6	7	10
<sup>b</sup> Calories	3000	2500	2594	2241	2542	2078	2390
<sup>c</sup> Protein (gms)	70	60	50	72	91	48	64
<sup>d</sup> Calcium (gms)	0.8	0.8	0.114	0.35	0.38	0.28	0.15
<sup>e</sup> Iron (m.gms)	12	12	22	31	36	20	25
Phosphorous (gms)	1.2	1.2	1.1	1.4	1.7	0.9	1.0
Ether (gms)	-	-	21	21	25	16	22
<sup>f</sup> Carbohy- drates (gms)	850-325	-	368	330	480	351	355
Fibre (gms)	7.5	7.5	10.4	13.6	15.2	10.9	10.7
<sup>g</sup> Vitamin A ( )	3-4000	3-4000	980	1569	1827	934	302
<sup>h</sup> Vitamin B <sub>1</sub> (gms)	2.0	1.5	1.4	1.6	1.6	1.7	2.8
<sup>i</sup> Vitamin B <sub>2</sub> (m.gms)	2.0	2.0	1.0	0.8	0.8	0.7	1.4
<sup>j</sup> Nicotinicacid (m.gms)	10	10	8.3	14	15	8	15
<sup>k</sup> Vitamin C (m.gms)	30	30	17	34	37	7	9

1. Derived from South African Food Tables. Fox and Goldberg. Institute of Medical Research. Jhb. 1944. Revised 1968.

Footnotes a to k appear in Appendix III.

## LABOUR

Until recently economists and others have underrated employment possibilities in agriculture. In many countries in which capital cannot substitute for labour, agricultural development through technological change can raise the demand for labour per unit of land substantially. Areas in which shortages of land have long been regarded as limiting the expansion of agricultural production can quite quickly, upon the adoption of new farm practices, become areas characterized by acute shortages of labour. The extensive literature on disguised unemployment and under-employment in primitive economies was written before this was disclosed. In agriculturally developed areas which have dense populations relative to their resources, Ester Boserup found that Extension services have commonly overestimated the supply of labour. Consequently, their recommendations have frequently not been adopted as the farmers could not command the additional labour required.<sup>1</sup>

There were, at Nyamaropa, two categories of labour which differed appreciably in their supply function, the wages that they commanded and their productivity. The result was an unusual combination of labour shortage and abundance and of relatively cheap and expensive labour which had a curious inverse relationship to efficiency. Every farmer in the sample employed labour, particularly from March to July when maize, cotton and tobacco were reaped and processed and when seed-beans, wheat and other minor winter crops were planted and tended. On a small number of the more developed farms labour was hired almost year round.

Two categories of labour existed, permanent labour and casual labour. 72% of the permanent labourers hired by the farmers in the sample were boys between the ages of fourteen and twenty-five (55 boys); 19% were girls of much the same age (16 girls); and 9% were men over twenty-five (8 men).<sup>2</sup> Over half the boys, 64%, and nearly a third of the girls, 30%, came from inside Mocambique. Movement across the border was unrestricted. Their homes, according to their testimony, ranged from three to over sixty miles from the scheme. Those who came from inside Rhodesia, came almost entirely from The Nyamaropa or the neighbouring reserve, The Sawunyama, and mostly from areas to the north of the scheme where the climate and soil made farming difficult. None of the labourers had spent more than four years at school, and 30% of them had not attended school. They were, in effect, teenagers or young unmarried men and women who were still dependent on their parents for their basic living.

1. Boserup E. "The Conditions of Agricultural Growth: the Economics of Agrarian Change under Population Pressure". George Allen & Unwin, London, 1965.
2. When referring to permanent labourers I shall refer to them as boys and girls since so few of them were adults.

With very few exceptions work on the scheme was their first wage employment, though 18% of the boys and 6% of the girls had worked there in previous seasons. Of those who had worked on the scheme before, 61% of the boys and 84% of the girls were still with their previous employers. On being hired for the first time, only 14% of the labourers were known by the farmer and of these roughly half were contacts made while working on neighbouring farms on the scheme. Family ties were of little importance. Church contacts were more numerous and more wide spread and showed signs of becoming increasingly important as a means of making contact with possible sources of labour.

The labourers lived with the farmers and their families. The girls did a fair proportion of domestic chores, washing, cooking, fetching water and tending the children as well as field work, and consequently worked longer hours than did the boys. In most families the labourers were treated as family and ate the same food. In a few cases where more than one boy was employed they lived and ate separately, though usually their food was cooked for them by the farmer's wife. The only labourers to work a seven day week were those who were hired to herd cattle. They were usually younger boys and they frequently herded with other youngsters and, according to the farmers, "often played". Otherwise the labourers worked a full six day week, with occasional Saturday afternoons off.

Wages were determined, in what was a free market, according to the age of the labourer and his length of service. Wages started at 15/- per month and rose to 40/-. Most labourers earned from 17/6 to 25/-. We calculated that their keep cost the farmers from 15/- to 20/- per month.

The supply of labour on the scheme was closely associated with the periods of little labour demand on the dry-land. In fact a similar response to that prevalent in West Africa. Most labourers reported that they had no other opportunity to earn cash when not assisting their parents on the farm. This was particularly so for those from Mocambique where the hilly nature of the terrain had prevented any development of markets so that surpluses had no ready outlet.

The farmers did not enter into formal contracts with their labourers whom they could ask to leave or who could ask to leave from day to day. Several farmers held on to labour till the end of a particular cycle of work and then, without warning, released them. On the surface this was unfair as the labourers suddenly found themselves out of work. The farmers had learnt from experience that many of the labourers, once informed that they would have to leave in a week or two weeks time, often left as soon as they found another job. To give notice of an impending dismissal was thus to court the loss of labour while it was still needed.

The labourers frequently left without notice if they disliked the farmer or his family, or felt that they could find better treatment, food

or shelter elsewhere on the scheme. King, an eighteen year old boy who had worked previously on the scheme, left one farmer after only three days because, he claimed, the farmer had "ill-treated, badly fed and yelled at me". He approached a farmer who was a member of the sample and asked for work at 40/- per month. The farmer employed him as he "liked the boy" though he feared that King would leave within a few days as the farmer and his family worked hard on their farm. King stayed five weeks and gave two weeks notice. His place was taken by Kafikira, who was twenty-five years old, at the same wage. Kafikira left without warning after three days.

A labourer with whom I became acquainted, a boy of sixteen called Moffat, left his first job on the scheme after the first day when he was made to work eleven hours cultivating cotton. That evening he told the farmer that he felt sick and had to go. Two days later he started working for another farmer for 17/6 per month, 5/- less than his previous employer had offered. Moffat stayed with the second farmer for five months, seldom working for more than nine hours a day.

The absence of any mores or contracts governing the employment of permanent labour on the scheme was advantageous for the labourers in that they did not have to commit themselves for any period and, the scheme being convenient to their homes, they could come and go easily. Maize and millet were reaped on the dry-land during part of April and most of May, which was also a busy period on the scheme, and many farmers lost labour at that time. The result was that the farmer faced the real difficulty of an unstable supply of labour.

The farmers regarded the boys and girls whom they employed as target workers who were seeking the means to purchase specific goods. In order to retain their labour the farmers endeavoured to avoid paying wages monthly. One farmer in the sample who employed two labourers and who had a cash reserve laughed at my naivety when I asked him at the end of the month what expenditure I was to record for labour. "If I pay them now, to-morrow they will buy shirt and shorts and be gone. No, I only gave them four shillings for sweets and cigarettes."

For some farmers who had few or no cash reserves, and no access to loans for working capital, the postponement of payment to labour until they received a return on the crop was necessary. Otherwise small cash reserves held to meet family needs and to cover emergencies would be dissipated before any income was due. Should the crop prove a failure, payment to labour might be further postponed until payment was received for another crop or until the end of the next season, and family funds could be retained intact.

The majority of labourers accepted the practice of postponing payment until crop returns were received. For most this meant waiting

until the cotton or bean payments were made by the Co-operative Officer, usually some three to five months after the labourers had left the scheme. When it became known that one of the payments was due to be made, the former labourers would drift back to the scheme to claim what they were owed. Three labourers whom we encountered had returned to claim their wages having been away for over a year as they had been otherwise occupied at the time of earlier cotton or bean payments. One of the three labourers had only worked two days with the farmer and collected three shillings. His home was ten miles from the scheme. Another arrived at a time when the farmer had no cash and so had to return home and wait a further three months before another payment was due.

Some labourers disliked the practice and demanded that their wage be paid at the end of each month, threatening to leave their employer if he did not meet their demand. The farmers reported that it was a fairly new demand: they were, generally, critical of it on the grounds that it would allow the turnover of labour to increase. One farmer even threatened a labourer with the cancellation of all that was owed to him should he leave before the end of the season. The labourers, we judged, were in fact more interested in ensuring more frequent payment than in simply taking their money and leaving the scheme. The minority of farmers who paid monthly were, with a few exceptions, asked by their labourers to look after all or part of their money for them until they left their employ. The situation was, however, by no means one-sided. The labourers were able, during busy periods, to switch from farmer to farmer. They did this in search of a farmer who had a good reputation for paying what was due his labour or a farm on which they were better fed and housed. Seldom did the labourers move in search of more money although wages varied quite considerably from farm to farm. Only a few of the older labourers sought a specific wage below which they would not work.

We interviewed all the labourers employed by the farmers in the sample and found that while most intended purchasing goods at the stores when paid, few had decided what it was that they wanted. A reasonable reply as most could not expect payment for some time. Unfortunately it proved difficult to record what the labourers did with their earnings as most of them purchased goods after they had left the employ of the farmers. We only recorded four cases in which a labourer had purchased goods while still in employment. Three boys bought a belt and a pair of shoes, a khaki shirt and shorts, and a blanket, and a girl bought a dress in which to attend church on the scheme and some underwear. Two of the boys went to the stores with their respective farmers so that their purchases could be charged to the farmer's account.

As minors dependent on their parents for their basic security, the labourers' first obligation was to assist their parents on their tribal holdings. Consequently they only sought work on the scheme when

their presence was not required at home. Most of the labourers reported that they liked the scheme because it was "open", a place of contact with modern ideas. They enjoyed meeting other young people from a wide area surrounding the scheme and several mentioned that the food they were given was more varied than at their homes.

The labourers frequently replied to our questioning that they intended staying on the scheme "until there is no more work" or "until my family need me" and a few replied that they did not know. The labourers came and went in response to the demands of their families to help with the harvest, to build a hut, to herd because someone was ill or to attend social or religious functions. One labourer simply asked for a week's leave as he wanted a rest. The farmers seldom believed the reasons they gave for leaving but had no means of stopping them from going. All the farmers could do was to hope that they would come back and come back when they said they would. Only seven, 8%, out of the ninety-eight boys and girls who worked on thirty-six of the fifty farms in the sample stayed for the whole "season", roughly five months.

Although it proved impossible to collect all the information that I would have liked to collect, the farmers' premise that the labourers came to the scheme to earn a specific sum of money with which to purchase particular goods seemed too narrow to fit the conditions at Nyamaropa. Certainly the labourers came to earn cash with which to buy goods, goods that they had no other means of purchasing. Many labourers did leave unexpectedly, but seldom upon payment as few farmers paid before the end of the season. Rather, it appeared, the labourers were target workers mainly in relation to time.

Migrant labour has been the subject of an extensive literature. Nearly all of it has, as with the survey at Nyamaropa, dealt with the migrants as employees and as temporary residents. The main focus of such studies has been on the supply response of the migrants to changes in wage and fringe benefits and to the clarification of the term "target worker". Yudelman interviewed fifty low paid migrant labourers in Salisbury (£3 - £5 per month) and "asked their opinions as to what they would do if their wages were doubled. There were many qualifications . . . but 46% of the group said that they would return to the African areas sooner than they had anticipated".<sup>3</sup> Yudelman's group of migrants were, he claimed, target workers in that they aimed to purchase particular goods or to save specific amounts, after which they would return home. It would be wrong, however,

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3. Yudelman M. op sit p. 98.

to take the analysis too far. No exact mathematical relationship is likely to exist between wage increases and the period of employment sought. Doubling the wage is unlikely to result in a reduction of the period worked by exactly half. Elkan, in a valuable study of migrants in Uganda, found that the African workers in town did not lack "wants".<sup>4</sup> They were not target workers in the sense that they worked only long enough to acquire the means to buy those things which only money can buy. Their target was to "save as much as possible in a more or less given time with which to increase the productivity of their farms".<sup>5</sup>

The different findings of these two studies are not necessarily inconsistent. It may be presumed that conditions and opportunities for Africans in Rhodesia and Uganda are not similar, particularly on the land. Nor were Yudelman's findings in Salisbury inconsistent with the position at Nyamaropa for his labourers were adult men, not unmarried boys and girls.

Several labourers developed strong attachments to their employers and their families. These labourers were quite happy to undertake additional work on Sundays or to work long hours without compensation. They seemed to do so on one condition and that was that the farmer or his wife work with them.

We did not record a clear instance in which the hire of labour was used to increase family leisure. A farmer who acceded to the Chairmanship of the Co-operative during the year and who was absorbed in church activities and in overseeing the building of a store, attempted to run his farm by merely supervising his four labourers. He found that they did little work when he was not there and frequently made mistakes. At the time, his wife and children were often ill and his wife seldom went to the fields. He then devised a system of piece work which, if not completed, would cost that labourer his lunch or supper. As an incentive he raised their wages by 10/- each per month, roughly 40%. The four labourers were dubious as to the merits of the system but agreed to follow it. Frequent disputes developed over the fairness of the work set for each morning or afternoon and the labourers quickly grew sullen and resentful. At night they made a considerable noise in the hut in which they slept and complained out loud so that the neighbours could hear whenever one or more forfeited a meal. A week after the experiment began all four labourers left. The incident attracted considerable comment on the scheme and widespread condemnation as being wrong in principle. I learnt later that on two or three occasions other farmers had entertained one or all of the four labourers to meals.

Even the grass-widows, the most sophisticated group in the sample found it difficult to escape farm chores by hiring labour. One of them,

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4. Elkan W. "Migrants and Proletarians". O.U.P. 1960.

5. *ibid* p. 131.

Mrs. Violet Kuwana, explained that to "leave Vitosi (her labourer) in the field for two hours is to have trouble. He does not like to work when he is alone. And if I find another boy to work with him, they will play together." Mrs. Kuwana looked forward to the day when her husband would settle on the scheme and run the farm, leaving her free to run her house and to sew.

The only labourers employed by farmers in the sample who were in any real sense permanent were three who were virtually resident on the scheme and who each earned £4 per month. They had each been with their employers for more than three years and had broken close dependent ties with their families. They were given leave of from one month to two and a half months during the off season, a time when, unless the rains were early, there was little to do on the dry-land. They derived their security, status and satisfaction almost entirely from their work on the scheme. The three farmers who employed them farmed more intensively than did the great majority of farmers and two ran trucks with which they did contract work on the scheme. The farmers were thus in a position to utilise hired labour almost year round and had found it worthwhile to pay twice as much for labourers on whom they could rely.

The wages paid to the three labourers had no effect on the wages paid to the other (seasonal) permanent labourers. Unlike the others, they were not target workers. The farmers regarded the two as separate markets. The farmers were concerned about the volatile nature of the labourers' supply function and were interested in stabilising it. Most of them replied to our questioning that they would like to have reliable labourers and would pay them more if that would help. The difficulty, they said, was that until the labourer had spent a year or more with the same farmer there was no way of telling how reliable he would prove to be. Initially, the wage was unimportant with respect to stability of supply. Moreover, there were few farms on the scheme on which a labourer could be kept busy for much longer than the five month season. Until the barriers to more intensive year round farming were removed, year round employment was unlikely to become a major feature in the use of labour. The farmers and their families did not appear to be prepared to purchase leisure by employing labourers needlessly while the labourers and popular opinion on the scheme were against gentleman farming. Permanent labour was in short supply and was hard to institute.

One farmer in the sample had earlier been "lent" two nieces, both teenagers, to help him on the farm. They had each stayed some months, had worked hard and had been pleasant companions for his wife. He had kept them well and, in lieu of a salary, had given them clothes and other presents equivalent in value to the salary they might have earned. During the survey year only one niece was able to come and he had difficulty in finding a labourer who then left after two weeks. The farmer then went to visit relatives of his who lived some distance from the scheme and returned with

a cousin, a boy of nineteen. Very proudly he told me that he had thought for some time about a suitable replacement for his one niece and had decided to offer to teach farming to the sons of relatives in return for their working on the farm for a season. According to the agreement he had reached with his uncle, he had to pay his cousin only 10/- a month and to keep and teach him; the boy was to work hard and remain until the course was finished, almost a year. The farmer intended to buy him gifts of clothing at the store to raise his effective salary to £2 per month.

Other farmers had taken to canvassing for labour while away from the scheme. A few labourers were found in this way. The farmers usually met their fathers while travelling on a bus or attending a church meeting and arranged with the fathers that a son or daughter of theirs come to work for them on the scheme. The farmers were slowly expanding their net work of contacts in an effort to increase the supply of labour and to stabilize it by entering into agreement with the parents. The process had not proved very productive as contacts were hard to maintain and sources of supply dried up quickly. The most effective means of securing labour was for farmers to send employees back to their villages to find brothers or friends who might wish to work with them on the same farm. The process usually took three or more days and the success rate was not high. Even if they did find potential labourers, the boys or girls may not wish or be able to come at the time.

The scheme paid quite a heavy social cost in order to have labourers. Theft was common and had, apparently, been rife. The farmers huts and houses had at first never been locked, but by the time of the survey everyone locked up carefully, even if only to leave the house for a few minutes. During the season the stands on which the farmers' homes were built were empty during most of the day. Even when locked the fragile nature of soap-box doors and old huts left most farmers vulnerable. Two of the sample had clothing stolen - a real loss as there was no insurance and seldom were they recovered. Not all the cases were reported to the police, though all went to the Kraalhead under whom the farmer lived and through him to Sanyamaropa. One woman who lived just across the border disappeared after a theft and Sanyamaropa ordered her hut to be searched. She had all the clothes but had dirtied or torn most in an attempt to disguise them. The tribal court viewed her case with compassion as she was destitute and probably mad. She was ordered to work for the farmer for a month and to return the clothes, many of which the farmer let her keep as they were worthless to him.

Sanyamaropa, at the case, said publically that the Tribal Authority could not act effectively to stop theft by labourers on the scheme as the labourers were brought into the area to live and work without the permission of the authority and without any form of registration. Consequently, when a theft occurred the Authority had no means of establishing who the thief was nor from where he had come. Sanyamaropa asked the farmers to consider registering their labour with him and added that even the labourers who lived

in Mocambique lived under the same system of authority. The Authority could therefore effect an improvement on the incidence of theft.

Sanyamaropa's suggestion was sensible. Apart from a likely reduction in the rate of theft, the registration of labour with the Tribal Authority would cement the scheme's relations with the dry-land and give it official recognition in the area. By providing a public forum for the adjustment of grievances, codes of behaviour for both parties toward mutual responsibility would begin to be formulated. Labour practices would thereby be institutionalized within the framework of traditional law without interfering with the market and it would bring the Authority into the daily working of the scheme. However, few of the farmers learnt of Sanyamaropa's suggestion and, though they approved of it, none of them wished to press for its implementation. As with so many issues at Nyamaropa, the breakdown in relations between the scheme and the Tribal Authority hindered the development of what would have been a constructive and healing innovation with possible far reaching beneficial effects. The registration of labour was one area of life on the scheme in which Management could have acted to improve the performance potential of the farms and thereby begin the process of reconciling the scheme and the area under the Tribal Authority.

Another move which management could initiate and one which would have the farmers' support would be the introduction of a night-school as at Nyanyadzi. At Nyanyadzi a fair proportion of the labourers attended a night-school which was administered by a nearby mission. During the day they worked for the farmers who paid their school fees in lieu of a salary and kept them. A night-school at Nyamaropa would be quite simple to organise. Existing school buildings could be used. Work on the scheme would provide a means for many children to acquire even a modicum of education that their parents could not otherwise afford. It would also stabilize a part of the labour supply on the scheme and benefit the scheme's relations to the area. Education through work on productive, cash orientated farms might also raise the status of farming amongst the youth in The Nyamaropa.

The other major source of labour for the scheme was the women who lived in the adjacent villages. They were hired on a daily basis at 3/- a day. The women seldom worked longer than eight hours a day and were employed mainly to reap cotton and tobacco and to sort seed-beans. Their cost to the farmer per hour, compared to that of the great majority of labourers, was expensive. The costs are set out in Table I below.

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TABLE I. THE COST PER HOUR OF HIRED LABOUR.<sup>6</sup>

	<u>WAGE</u>	<u>KEEP</u>	<u>RATE PER HOUR</u>
Casual Labour	3/- per day	-	0.375/- <sup>a</sup>
Permanent (Seasonal) Labour	25/- p. m.	18/- p.m.	0.165/- <sup>b</sup>
Permanent Labour	80/- p.m.	25/- p.m.	0.365/- <sup>b</sup>

<sup>a</sup> Calculated for an eight hour work day.

<sup>b</sup> Calculated for a ten hour work day on twenty-six days of the month.

Compared to the cost per hour of a typical permanent (seasonal) labourer who were paid 25/- per month and whose keep cost 18/- per month, the village women cost over twice as much per hour to hire. Although casual labour is, in the nature of things, usually more expensive per unit of time than is permanent labour, the difference is too great to accept on that basis alone. Moreover, none of the women could compare with the few truly permanent labourers in terms of reliability or responsibility. In fact, to most of the farmers they were a necessary nuisance.

That the rate of pay for casual labour was standard, suggested that at the outset of farming on the scheme the rate had been laid down either by the Management of the scheme or at an official meeting between the farmers and the Tribal Authority. We found no evidence for such an occurrence. The marked difference in the rates paid to the different types of labour could only have arisen for reasons related to the market for labour.

The farmers, with few exceptions, experienced a seasonal problem securing sufficient permanent labour to handle the work load on the farm. Besides, the labourers were frequently unreliable and if they deserted they were hard to replace. The demand for labour on the scheme grew steadily from the end of January. At first the tobacco growers required labour to help reap the larger bottom leaves individually and expeditiously so that good grades could be achieved. In March the harvesting of cotton and maize began, resulting in a major increase in the demand for labour.

Being unable to secure sufficient permanent labour, the farmers tended to fall behind the optimum rate of work, particularly with the picking of cotton. Consequently, towards the end of the season, June and July, there was a demand for labour that for many farmers bordered on a demand to be rescued. By then the farmers and their families had worked

6. Clark and Hazwell found that, in subsistence agriculture, "a marginal productivity of only about 0.3 kg. grain equivalent/man hour" was prevalent. "The Economics of Subsistence Agriculture". MacMillan, 1977. p. 94. This is equal to 0.7 lbs. of grain or, in terms of maize at Nyamaropa (local market price), .07/- per hour. The figure is considerably below that paid to labour on the scheme.

for three months in the fields mostly picking, cleaning and grading cotton. A substantial degree of boredom had set in on nearly all the farms which was aggravated by the fact that the cotton still to be picked was of poor quality and required longer to pick and to clean. The plants had begun to dry out and scratched the pickers as they moved through the rows. The process became increasingly petty, irksome and irritating. The need to complete reaping and grading grew day by day as the final date for the acceptance of cotton by the Co-operative loomed closer. By July, most farmers had to begin reaping and sorting their beans: everyone regarded sorting as the most tiresome task of the year.

By the end of May the women in the villages had harvested their maize and were free to undertake work on the scheme. The women, attached as they were almost exclusively to the subsistence economy, had little opportunity to earn cash and as traditional women they seldom, if ever, gained control of any part of the income that their husbands might earn in town. Work on the scheme was thus their only opportunity to earn cash.<sup>7</sup>

Before seeking employment on the scheme they had to gain the approval of their men. The socio-political relationship between the villages and the scheme was thus a factor determining the supply response of the women. The desperate nature of many of the farmers need for labour towards the end of the season was, in the circumstances surrounding the scheme at Nyamaropa, manipulated by the women, with their husbands consent, to elicit a wage considerably higher than that received by the majority of the permanent labourers. Although most of the women were married and therefore had family and household chores to leave - a higher opportunity cost than that of the boys and girls - their lack of any commitment to particular farmers from day to day reduced the import of their absence from home. The men in the villages did not work on the scheme during the survey year. A small number of them had, apparently, worked on the scheme in the first four years after its settlement. The men had worked beside their women for the same pay, originally 2/- a day. When relations between the scheme and the villages became difficult the men stopped working on the scheme, even though the rate had risen. In 1965 the men, during the lull before the "attack" on the scheme, had demanded 4/- a day. The farmers had refused to pay so much. They argued that it was a ridiculous demand as the women, while far from perfect, were more deft at picking cotton and less troublesome than the men. There the matter rested. What effect the self-imposed loss of a convenient source of wage work had on the men in the

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7. Although the women were the traditional guardians of the food crops, any cash from the sale of surpluses to the stores was kept by the men. Only women who were at the time grass-widows retained cash realised by selling surpluses. However, they seldom appeared to be able to grow sufficient to produce a surplus. The brewing of beer for sale, an important source of cash for African women in many parts of Rhodesia, was not practised in The Nyamaropa.

villages, I could not ascertain. They had never formed more than a small fraction of all labour employed on the scheme and they had the alternative of work in town.

The cohesion of the villagers and the period of opposition to the scheme had allowed and had demonstrated to the women the advantages of collective action. With the support of their men, the women had used the threat of a general strike to raise the rate for casual labour substantially above that of the other labour. Without the political disparity and the social tension that existed between the sources of demand and supply it was doubtful that the women could have demanded and received as much as 3/- a day. The women used their power against individual farmers whom they threatened to boycott if they failed to pay them what was owed to them once the cotton and bean payments had been made. They were beginning to push for payment at the end of their period of work rather than wait until the farmer received payment for his crop. Several farmers reported that the women had begun to include the time it took them to walk to and from their villages to the farmers' fields as part of the working day. Instead of arriving at 8 a.m. and leaving at 5 p.m. (both rough approximations) they arrived at 8.30 a.m. and left soon after 4 p.m. Some farmers sacked the women who adopted the practice, and were threatened with boycott by the other women.

One farmer, who at the time was employing ten women on tobacco and cotton, used his truck to fetch and carry them. He left a focal point close to the villages at ten minutes to eight in the morning and drove them back after five o'clock. In this way he gained fifteen hours work a day from the ten women; equivalent to driving  $3\frac{3}{4}$  miles to save 5/8d. He disliked having to use his truck, but did so as he could not find additional women whose labour would have been necessary to make up the total hours worked on the farm had he not used the truck. He also told me that he found it easier to work with the women if he did not have to exhaust his patience waiting for them in the morning. After three weeks the women suddenly demanded that they leave at 4.30 p.m. on the truck in order that they may be home in time to prepare the evening meal for their families. Otherwise, they claimed, their husbands would not allow them to work on the scheme. The farmer, already sore with the women, harangued them, whereupon they all left. After three days he sent a message to one unmarried girl who had worked the whole of the previous month for him. He offered her 4/- a day if she undertook to collect a band of, preferably, unmarried girls to work for him for the accepted eight hour day. The girl agreed and returned two days later with eight other girls. For the next two months the farmer worked through this girl and had all the labour that he wanted. Both he and she kept their agreement a secret. He to maintain a monopoly position over the other farmers and she to retain friendly relations with the other women.

The women's attempt to gain a working day of less than eight hours soon petered out. As with the men's demand for 4/- a day, the farmers demonstrated their conviction that 3/- a day was above the real worth of casual labour by sacking frequent latecomers. The value of the farmer's agreement with the girl had by then proved itself regardless of the other issue. She was able to secure sufficient labour to meet his needs on request, close to the optimum time for the farm operation to be tackled.

The farmers lacked any real ability to directly counter the strength of the women's position. The only effective course that they could have adopted was to reduce their dependence on the women by hiring more permanent labour; a course Management could have done much to promote. Other than that, there was only one development which promised to ease the position and it sought to circumvent the situation rather than to alter it. A few farmers had discovered that villagers at a short distance from the scheme had begun to seek work on the scheme in return for wheat. Two farmers in the sample had initiated informal arrangements with them in which the farmer would pay for labour with wheat valued below the price ruling on the local market and in return for which the villagers and their wives would undertake to work when called. There were considerable advantages for both parties. The farmers were tobacco growers and had found it difficult to find sufficient labour in February and March. Under the arrangement they could rely on the labour of four or five people for a short period when most needed. The villagers would work either every day for a week or so, or for as many days as they could spare from their own farms. The farmers were also able to sell wheat, a crop which enjoyed a comparative advantage over other food crops when exchanged on the local market but for which there was little demand in The Nyamaropa. In return the villagers were paid a wage that in money terms was equivalent to 3/7d a day. An additional advantage, should the arrangement become an annual event, would be the growth in the villagers' identity with the farm, in their ability to handle the tobacco and to work without close supervision.

Although this solution to the problem of labour was mutually advantageous, its potential was limited according to the periods that the villagers could afford away from their farms and by the amount of wheat they sought. Moreover, the villagers had the alternative of working on the scheme after May when they were comparatively free: they may choose to earn enough at the normal rate of 3/- a day to purchase as much wheat as they want. One of the farmers with whom I raised this point replied that if the villagers did not wish to work for long at the beginning of the season, then he would offer to buy part of his maize requirement from them at the local price - a price nearly double that which they could obtain by selling to the stores - if they worked for an agreed number of days during February and March. By purchasing maize on the local market rather than growing it himself, the farmer would be able to introduce another element of contract into the relationship at no additional cost to himself but which held a financial inducement to the vil-

lagers. However, the success or otherwise of this and other innovations can only be established if a subsequent survey is undertaken.

One group of farmers, the Locals A, employed a considerable amount of casual labour. As former villagers it appeared natural that they should enjoy a measure of preference whenever the women from the villages sought work on the scheme. There were strong reasons for the women seeking work first with the former villagers. Their farms were closer to the villages than were the great majority of the other farms on the scheme, the work was easier and the atmosphere more social.

The village women were invariably difficult to manage no matter for whom they worked. Most farmers entertained a certain dislike for the village women whose conversation they considered to be coarse and to which they often found it embarrassing to listen. Several farmers left their wives to manage them. The Newcomers and their wives were primarily interested in obtaining a full day's work from the women over whom they acted as overseers. The position was different among the Locals A with several of whom I worked for a morning or afternoon. When the village women were present the field hummed with voices, giggles and raw laughter. Breaks were frequent, often just to stretch or to listen to a story. Whereas on the Newcomers farms the farmer or his wife seldom joined in conversation with the women unless they were working well, the wives of the Locals A mingled freely among the women and their husbands were often absent, usually cleaning or grading cotton at their homes.

As members of a small tribal group the former villagers did not like to employ strangers (permanent labour), particularly as the strangers would have to live with them. They were therefore entirely reliant on the village women. Most of the Locals A left the management of labour to their wives. As their wives did not share in the control of the farm or family finance, they had no inducement to seek greater efficiency in the use of labour. Nor, unlike the Newcomers, did the Locals A have common family goals, principally the education of their children. In fact, the wives derived status from the employment of the village women and enjoyed their companionship.

The Locals A maintained close ties with the villagers and continued to derive much of their status from their original world. The difficulties surrounding transport and the marketing of minor crops and the intrusion of the villagers cattle onto their fields from August till the rains in November/December had limited the period during which they were occupied on their plots to one which fitted the rhythm of village life. Settlement on the scheme had thus not prevented them from partaking in the major events of village life.

The Locals A were, as a group, the most elderly of the farmers on the scheme and the group who had the poorest diet. In general, they worked for as many hours each day as did most other farmers on the scheme, particularly when picking cotton, but their pace was more leisurely. The result,

in economic terms, was that the Locals A hired more labour per unit of output than did the other farmers. It also appeared that the village women exercised a certain pressure on the Locals A to employ more women than was necessary. Moreover, the labour they hired was twice as expensive per hour as was the alternative permanent labour. In effect, the Locals A were sharing a sizeable part of the income they earned on the scheme with the village women. Their employment of the women appeared to be a self-perpetuating process that, while expensive, was bolstered by the existing social factors and by several of the weaknesses operative on the scheme.

The close contact that the Locals A maintained with their former tribal life may have limited their ability to act on the situation. Hoebel, in an analysis of the social consequences of the ascribed status system of tribal life listed social inefficiency, a lack of competition and the fact that social strains are kept at a minimum.<sup>8</sup> At Nyamaropa the peculiar difficulties on and off the scheme prevented the Locals A from being able to commit themselves freely to the scheme, nor indeed in the circumstances did the scheme appear to offer sufficient rewards for them to do so. The Newcomers having largely broken away from tribal life had still to achieve a position in which social contract replaced the ascribed social system.

It appeared, on the surface, that the Locals A were not aware of the costs of casual labour - in marked contrast to the majority of the Newcomers. It was as if tribal life had ingrained in them an acceptance of ill-arrangements to the extent that economic inefficiency was tolerated or not noticed. Similar theories are not uncommon in the literature and are generally held by administrators and other official personnel. Although all the symptoms were present at Nyamaropa, it was hard to accept the theory as applicable to the Locals A. Why should the former villagers, in view of the fact that the hire of labour was part and parcel of their entry into cash farming, have such a blind spot in their management ability?

When the Locals A first settled and particularly during the period of hostility towards the scheme, their contact with the village women had stood them in good stead. They had been able to obtain all the labour that they had needed while the Newcomers, who as foreigners to the area, were more closely identified with the scheme, had gone short. In the uncertain conditions that still prevailed the Locals A may not have felt confident enough to try and rationalize their management of labour in case it would upset the women, their major source of labour. No clear alternative source of supply existed on which they could rely should the women boycott them. A few had begun to employ permanent labourers in conjunction with the employment of women from the villages. They expressed a desire to increase their use of permanent labour. The labourers, however, preferred the more "open" atmos-

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8. Hoebel, E. Adamson. "Man in the Primitive World". McGraw Hill & Co. 1958. p. 388.

phere and modernity of the Newcomers homes. They therefore avoided or left employment with the Locals if work was available elsewhere on the scheme. We recorded several instances on the farms of Locals and Newcomers in which permanent labourers refused to work alongside the women and had to be allowed to work apart from them. Certainly none of the permanent labourers would undertake the management of the women on behalf of the farmer or his wife should they wish to leave the farm for a while.

The heavy and, in the prevailing conditions, uneconomic use of casual labour by the Locals A suggested a certain willingness to utilize part of their income to support or retain their kin. Mauss, among others, has stressed the "total" character of traditional exchanges. "These phenomena are at once legal, economic, religious, aesthetic ..... and so on."<sup>9</sup> It would be wrong to interpret traditional exchanges in purely utilitarian or economic terms. In "labour surplus" economies the practice of supporting "retainers", particularly in the towns and notably, in South Africa and independent Africa, in the public services has been frequently reported.<sup>10</sup> These retainers are employed in order to give them a livelihood - an imperative economic act. In Rhodesia a tenancy system has arisen on many of the Purchase Area Farms. No research has been conducted into the rationale behind the phenomena. The large size of the farms relative to tribal holdings may have allowed the system to arise. The owner of the farm may enjoy status and other non-economic benefits from the dependency of his kin. It may well be that the system represents a social obligation and that it may do little to increase the returns to the owner of the farm in terms of either cash or leisure.

Dr. Norman Long has analysed the social factors which determined farm management practices in the Serenje District of Zambia.<sup>11</sup> Using the extended case method, Long described a typical case of a migrant who, on returning home to settle, gathered around him a residential grouping of kin in an effort to produce a viable farming unit. In return for the use of equipment and oxen which the migrant purchased, the kin provided a regular labour force and acted as a source of farming knowledge and expertise. Later the network of obligations grew unwieldy and threatened the viability of the parent farm. The farmer had then to repudiate some of the ties so as to escape the limits that they placed on his management ability. Some of the component families left the farm to settle elsewhere and the farmer hired labour to replace them. Freed of commitments to family, the farmer was able to develop a local business selling beer which was brewed in town and transported by his brother who owned a van.

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9. Mauss Marcel: "The Gift". The Free Press 1954. p. 76.

10. See Georgescu - Roegen N. "Economic Theory and Agrarian Economics" Oxford Economic Papers. Feb, 1960. p. 1 - 40.

11. Long N. "Sociological Determinants of Farm Management" in African Social Studies, University of Zambia. June 1968. p. 327-355.

At Nyamaropa the Locals A could not be expected, at the time of the survey, to alter significantly their use and management of labour until they were able to identify themselves more closely with the scheme. There were signs that they wished to do just this. Many of them had begun to fence their fields against the villagers' cattle; a few had employed permanent labourers and they had voted one of their younger and better educated fellows onto both the Co-operative and Credit Union Committees.

The ability of the Locals A to re-order their relationship with the women depended upon certain external determinants. A greater degree of political acceptance of the scheme in the villages and of stability in that relationship would have to occur before the former villagers could initiate more productive farm management practices without risking too serious a disruption of old and still important ties. The supply and quality of permanent labour would have to improve considerably and the Locals A would have to be able to undertake farming over a greater part of the year so that the reward for innovation would be in keeping with the economic and social risk involved. Until then the Locals A may have appeared, on the surface, to have been looking first for "a safe livelihood for themselves and their posterity not in pioneering originality but in routine conformity to their fellows in the clan".<sup>12</sup> More accurately, settlement on the scheme had involved them in several difficulties which had severely limited their capacity as managers and innovators.

The absence of any rent or water charge had enabled the Locals A to treat their four acre plots as sources of security, not as assets that demanded a return on their market or otherwise assigned value. Had the proposed rent been charged from the beginning of settlement on the scheme it appeared unlikely that the Locals A could have afforded to maintain the same labour relationship with the women. Certainly, when the external limitations to their farming are considered, they would have been hard put to meet the rent and water rate (£56 p.a.) unless they had adopted more efficient labour practices. In fact it is doubtful that they would have settled on the scheme. After five years on the scheme the former villagers were still economic prisoners of the system though they displayed signs of seeking a release. Had the scheme been properly constituted and had Management been aware of their difficulties, particularly over the cattle problem and the supply of permanent labour in which it could have been effective, the Locals A should have been able to place themselves in a far stronger position to carry the rent and water rates that were introduced just after the survey.

Few attempts have been made to calculate labour input per unit of land in order to estimate the marginal productivity of labour, or of land.

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12. The East African Royal Commission's description of the adverse effect which the tribal system has on innovational ability.  
p. 285.

Clark and Hazwell, reviewing studies made in this field, concluded that, "These procedures have not yet been carried out satisfactorily in any great number of cases by agricultural economists even in the advanced countries, and we must be content with rough and ready measurements. Nevertheless, they are of great interest and importance."<sup>13</sup>

One of the best known studies was conducted by Mellor and Stevens in Thailand.<sup>14</sup> They found that labour inputs had little impact on the yield of rice per hectare even though labour inputs varied from 500 to 2,000 man hours/hectare/year. Commenting on this and other studies, Eicher and Witt stated that, "Given the assumptions of labour homogeneity and a uniform production function, Mellor and Steven's study represents a valid method of measuring marginal labour productivity."<sup>15</sup> However, in another study conducted in Thailand, Sitton found great variability in what appeared to be homogeneous conditions.<sup>16</sup> In fact the data, and that of another study by Mellor in India, suggested "that yields can be raised by greater use of labour".<sup>17</sup> Empirical studies to investigate marginal returns to labour and the extent of disguised unemployment have often been poorly conceived. Eicher and Witt acknowledged that "the existence of disguised unemployment is largely a matter of definition and of the assumptions made about the institutional forces involved".<sup>18</sup>

At Nyamaropa the complexity of the labour market precluded any attempt to build models or to calculate marginal returns. Not only was it a period in which social factors were important determinants of labour use, but labour was, in general, in short supply. Moreover, the seasonal and crop condition factors affected the quantity, type and the productivity of labour utilized. Poor cotton picked towards the end of the season required more labour per unit of value than did good cotton. The village women when employed to sort the seed bean crop were customarily paid in kind: they sorted the beans and took home all those which were unacceptable for sale to the merchants. The poor bean crop during the survey year meant that the women were able to take home from three to five times as many beans per unit of time worked as they had done in previous years. The poor crop required considerably more labour to sort than did a good crop, even if yields per acre were only a fraction of those achieved in normal years.

Poor crops are invariably expensive crops to handle. On marginal principles the farmers should not have sorted their beans. They should have sold them unsorted on the local market, presuming the market would accept

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13. Clark C. and Hazwell M. op cit. p. 77.
  14. Mellor J.W. and Stevens R.D. "The Average and Marginal Product of Farm Labour in Under-Developed Economies." *Journal of Farm Economics*. August 1956.
  15. Eicher K. and Witt W. op cit. p. 136.
  16. Sitton G.R. quoted in Oshima H.T. "The Ranis-Fei Model of Economic Development." in Eicher & Witt p. 197.
  17. Oshima H.T. *ibid.*
  18. *ibid* p. 141.

that many beans.<sup>19</sup> Instead, because the unacceptable beans were used to pay labour and, possibly, because the farmers were depressed by their poor yield they frittered away a large part of the crop sorting out a few to sell to the merchants. The net results were disastrous.<sup>20</sup>

The usual premise of labour homogeneity did not hold at Nyamaropa and neither did the more sophisticated premise postulated by Liebenstein.<sup>21</sup> The productivity of labour, Liebenstein argued, depends not only on the level of technology employed (the ratio of capital to labour) but also on the level of wages because the level affects the amount of work effort. As a result several possible average and marginal productivity curves could be formed for different wage levels. At Nyamaropa the different wage levels did not correlate with the productivity of the various categories of labour. Even if a sophisticated analysis could handle the inconsistencies in wage levels, it is doubtful that the significance of the timing of the application of hired labour and the effect of good and poor crops on productivity could be included.

Normally the farmers on the scheme appeared to be feudal in their management of family labour, but marginalist or capitalist when employing labour. No one outside of the immediate family would be employed unless the product of his labour was greater than or equal to his cost in wages plus his subsistence if he lived with the family. Family labour on the other hand could be used even to the point where its marginal product equalled zero. Without an intimate knowledge of the difficulties surrounding the supply and retention of labour, the time gap that often appeared between the need to hire labour for optimum results and the actual hiring of labour (often not of an optimum kind or amount) would have suggested to an observer a retention of feudal thinking by many of the farmers. Certainly the Locals A appeared to hire labour whose product was at times below the wage paid.

In fact the farmers within their effective management field could not be regarded as poor managers of labour. Rather, in the circumstances, a minority of the farmers were clearly good managers of labour. Only under more ideal conditions could the weaknesses displayed be given much weight.

Labour appeared to be the most crucial limiting factor to the overall performance of the scheme. Two hundred four-acre and fifty two-acre plots farmed by family units had created a demand for labour that, although in the main complimentary to the traditional farming on the dry-land, was

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19. A lively Management should have asked the Co-operative to investigate the opportunity of selling the unsorted beans in the African townships of Umtali and Rusape or else direct to merchants. If such a market had existed for the beans as a food instead of as a seed crop, it would have turned the losses on the crop into small profits and demonstrated the value of a National Co-operative body.
  20. See chapter on Management and the Crops.
  21. Lieberstein, Harvey: "Economic Backwardness and Economic Growth." John Wiley and Sons. New York 1960. p. 58 - 76.

not met by the population, many of whom were migrant workers, of the large area of neighbouring tribal reserve land. A complete gambit of factors made it difficult for the scheme to attract permanent labour. The loan of working capital; the possible institution of a night school; the formulation of some form of contract, even if informal, through the registration of labour with the Tribal Authority; and even the introduction of farm planning to encourage the farmers to make greater efforts earlier in the season to find labour and to bring management into contact with the limits to the farmers' control over the supply of labour would all help. However, without active measures to intensify farming on the scheme particularly in the direction of year round farming - transport, marketing, grazing, the integration of cattle and the problem with the intrusion of the villager's cattle - the measures to promote the supply and stability of permanent labour may not, by themselves, improve the situation appreciably in the short run. Of equal significance, the scheme had been unable to attract more than a handful of all the men who year after year left The Nyamaropa and surrounding areas to seek work in the towns. The scheme had demonstrated that farm labour was an acceptable form of permanent employment. In nearly every case where a farm was sufficiently developed or a farmer owned a truck with which he undertook business or where the store-keepers could offer permanent employment as drivers or millers, a competent man was employed. The reason was not the attraction of town life or of higher wages as unemployment was then high and growing in Rhodesia and the men from The Nyamaropa typically earned the lowest salaries: from £4 to £8 per month, usually plus keep. After paying for rent and transport in town and for travel to and from The Nyamaropa, one may suppose that real wages were often equal to or less than the £4 paid to this class of labourer on the scheme. The latter incurred none of these expenses. This major source of labour was substantially denied the scheme because of the scheme's lack of development.

Elkan and Barber<sup>22</sup> are two authorities who have demonstrated that the incidence of migrant labour is dependent mainly on the degree to which equivalent alternative employment does not exist close to their homes. Migration would not appear to be a cultural requirement as has been suggested by some anthropologists.<sup>23</sup> "... in some areas where the practice was at one time almost universal, the coming of alternative opportunities has caused it to melt away like snow."<sup>24</sup>

Perhaps the time is overdue for economists to forsake their long held interest in attempting to measure the extent of underemployment and

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22. Barber W.J. op cit.

23. Schapera I: "Migrant Labour and Tribal Life". London 1947.

24. Elkan W. op cit. p. 132.

the marginal productivity of labour in "labour surplus" economies. Both study areas have been beset with problems of definition and measurement. Little confidence can be placed in the usefulness of their findings for the formation of development policy. Apart from the wide range of viewpoints and the often conflicting results, the neglect of social and institutional factors in the great majority of studies makes it difficult to accept their findings. More recent work would suggest that the problems of so called underemployment should be tackled from the premise that economically viable labour can be in short supply in the early stages of development in areas of apparent labour surplus.

Eicher and Witt reported that "there is little reliable empirical evidence to support the existence of more than token - 5% - disguised unemployment in underdeveloped countries as defined by a zero marginal product of labour and the conditions of *ceteris paribus*."<sup>25</sup> The study of how the supply of labour to farms entering the money economy and how the demand for labour on those farms can be matched and stabilized should prove an area of study more tuned to development needs. Experience at Nyamaropa would suggest the need for careful multi-disciplinary approaches, including the much needed study of the effects of migrant labour on the tribal holdings, rather than large scale and necessarily superficial or narrow surveys.

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25. *ibid.* p. 141.

## SCHOOLS.

*"I was careful not to let my schooling interfere with my education.": Mark Twain.*

For the great majority of the farmers the education of their children provided a major impetus in their decision to settle at Nyamaropa and for their subsequent efforts. The place and influence of the schools in the community is thus germane to any full understanding of the scheme. Two primary schools, at opposite ends of the scheme, run by the Carmelite mission and two secondary schools attached to the Missions, both six miles away, served the scheme, the surrounding villages and, with the secondary schools, the greater part of The Nyamaropa. A few children attended schools further afield: some for specialized training at post-school level, some through their parents personal or church affiliations and perhaps for prestige, but mainly in order for the child to live with an elderly relative whose home was convenient to a school or with a brother who financed the child's education or because it was the only school at which the child could gain a place.

One of the primary schools, St. Cassions, was closer to most of the homes on the scheme and both parents and children preferred it to the other which attracted children mostly from the villages and a number from Mocambique.

Just as the expected introduction of water rates and rent threatened to ruin much of the progress made, so a Government promulgation in 1967 threatened the continued progress of education in the area. The Government in 1963 introduced an education plan to fit the principles of Community Development. The responsibility for primary education is to devolve increasingly onto the local community. Government will continue to provide the teachers, but the community will have to take over the running and maintenance of existing primary schools and the building of new schools. The policy aims at helping to form and galvanise new Community Boards by granting them a recognised field of interest and it allows Government to concentrate funds on teacher training, technical training and secondary education. Should Government adequately fulfill its obligations in these areas of education, the new policy may be successful in generating local endeavour and in improving standards.

After only four years Government decided to force the pace of communal participation, a decision not altogether concerned with education but with the desire to further the acceptance of the Community Development programme. The 1967 promulgation, which introduced the phased withdrawal of Government from the administration of primary schools and from the responsibility for financing buildings, caused real fears amongst the farmers. They were concerned that the administration and expansion of schools would suffer as there was no board in existence that could take over the responsibilities towards the schools. Moreover, no new school could be built except where a community Board had been established and certain limitations were placed on the expansion of existing schools.

A Community Development Agent had worked in The Nyamaropa for some years but little progress had been made towards local government. The farmers on the scheme felt a need, and often expressed a desire, for more control over their own affairs. The uncertainties surrounding the future of the scheme curbed any strong movement towards increased autonomy. The Government's plan for The Nyamaropa was to divide it into two or three Community Board areas with a Council for the whole area. The agent had talked to many of the farmers about the plan and their reaction was, generally, one of suspicion. They did not relish the idea of having to work closely with people opposed to the scheme. As cash farmers they were worried lest their contribution to local funds be far greater than that of their neighbours and that these funds would be spent evenly over an area larger than the scheme. Should this be so, they would be subsidizing people opposed to their efforts and perhaps they would have only a minority representation on the Board.

The 1967 Act appeared to the farmers to be an enforcement of an additional financial burden within a framework that was inimical to their interests. The farmers were convinced that no Board could be established at Nyamaropa for some years and feared an unchartered interim period. The farmers had had no administrative experience and the promulgation offered no guidance. Within an area so split, the control of schools might well become an issue which could threaten the schools themselves. The present schools near the scheme were only just able to cope and needed expansion year by year as larger junior classes moved up. In the absence of a Board, orderly progress was threatened. The farmers realised that the Act used the desire for education amongst Africans as a lever to implement a political blueprint. Although only a few farmers were at all conversant with the Community Development programme, and there was little opposition to it, the situation at Nyamaropa led the farmers to feel that they were being blackmailed.

Behind the farmers' reaction to the forced implementation of the Community Development programme was a disappointment with the schools and with the results of education. The farmers and their wives talked of the "expense" of education much as they talked of money spent on a crop that yields a poor harvest.

The farmers saw the schools as the main agency in the formation of a new society. Inevitably, therefore, they accorded grave responsibility to the teachers. The teachers at Nyamaropa, with a couple of exceptions, appeared unaware of this responsibility. As educated people and church members the teachers had broken away from their traditional culture and taught very little that could be regarded as maintaining, instilling or furthering the traditional culture and its values in the face of "modern" education. A delicate balance, a synthesis is required between the old and the new. From what we saw and heard and from conversations and reading it appeared that no attempts were being made to achieve a synthesis. <sup>1</sup>

Social studies which are relevant to the pupils' experience, but wider in scope, should be taught in order to equip the pupils with sound values and with a conception of society that is lucid and meaningful. The values should be drawn from the traditional society where possible. Synthesis will have to be based on observable fact or structure. It is necessary to prepare pupils for the likely clash into which education must direct them. Self-improvement must be shown to be possible.

It is imperative that education, even in primary schools, should equip their products to handle change. Much change in Africa is still initiated through the school. The school must be, especially in the village, a vital centralizing force. At Nyamaropa the schools were little more than expensive appendages offering status and a fairly remote chance of bettering oneself and one's family.

The teachers at Nyamaropa were ill-prepared for their task. Many had suffered under old-fashioned tuition methods based on rote-learning and most had undergone inappropriate and insufficient training. Teacher training centres must be given adequate material, scope and facilities with which to produce teachers capable of guiding pupils through the curriculum utilizing learning situations to the full. In this way the children should be equipped to evaluate information, to see the relevance of topics and to possess a general knowledge strong in the important particulars.

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1. See list at end of chapter.

The teacher must be a source of advice and confidence to them and of moral leadership. Through leadership of the children and on the basis of his "civilization" and knowledge, the teacher should become a key figure in the community.

The teachers lived in isolation with little or no contact with their training institution or other advisory body. They owned few or no books, seldom if ever read outside of the prescribed textbook and only a small minority sought to improve themselves. Too often the teachers sought alcohol and leisure as relief from their frustration and aimlessness and they failed to contribute as much to the community as they were capable of doing. While there were a few good teachers, too many were ill-equipped to make education meaningful or directed and many lacked the personal qualities which their position demands.

Education, as practised at Nyamaropa, was a dull pedantic recitation of facts. The possible benefits of such education are strictly limited. The children must be freed from rote-learning and the handicap of limited teachers who rely solely on textbooks and who judge purely on exams and endless tests.

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LAND USE

All but two of the thirty-seven families in the sample farmed four acres, (twenty-eight bunds). A simple comparison of the use that these families made of their four acre plots reveals significant differences between the groups. Table I shows the average number of bunds per crop grown by each group. The two farmers who farmed more than four acres were Newcomers A. We shall turn to these two larger farms later. The figures in brackets show the number of families who grew that respective crop when not all the families in that group did so. One factor should be borne in mind when examining data in this section. The intrusion of the villagers' cattle in search of food at the end of the dry season prevented farms close to the villagers' land from being put to late winter and early spring crops, principally green maize. As we have seen, the farms affected belonged mostly to Locals A and B.

TABLE I.

LAND USE : AVERAGE AREA PLANTED / BUNDS.

FAMILY NOS.	SUMMER			WINTER				SPRING		MINOR CROPS				
	MAIZE	COTTON	TOBACCO	SEED BEANS	WHEAT	POTATOES	GARLIC ONIONS	GREEN MAIZE	RATION BEANS	VEGETABLES	RICE	RAPOKO	GROUND NUTS	LUCERNE
LOCALS A. 8	13	14	-	12.0	1.8	.9	.25	.4	-	.4	-	.25	-	-
				(6)	(3)	(1)	(1)	(3)		(3)		(1)		
LOCALS B. 5	14.8	12.6	-	10.8	3.6	-	-	1.0		(4)	-	-	-	-
								(3)		(4)				
NEWCOMERS A. 11	10.5	12.6	2.2	9.0	3.3	2.0	.19	2.0	1.6	1.1	-	-	-	.2
			(4)	(9)	(4)	(1)	(5)	(5)	(4)	(1)				(2)
NEWCOMERS B. 11	9.3	14.0	2.0	6.5	3.0	1.7	.7	3.3	2.0	1.2	.3	-	.2	.3
			(4)	(7)	(7)	(5)	(2)	(10)	(4)	(1)			(1)	(3)
OF THE 35 FAMILIES, THE NUMBER WHO GREW EACH CROP.	35	35	8	31	27	11	4	21	8	29	1	1	1	5

N.B. Numbers in brackets denote the number who grew that crop when not all in the group did so.

Significant factors relating to Table I are:-

Maize.

Maize was grown as a food crop by all the farmers with only one exception: a Newcomer B who grew 12 bunds and sold to the Mission at a price nearly double the official one. He achieved a yield of 42 bags per acre. The fall in the size of the crop grown from Locals to Newcomers, reflects fairly accurately the yields achieved as the size of families including permanent labourers differed little between the groups. The area of maize planted by each group ranged from :-

Locals A	11 - 14 bunds
Locals B	13 - 17 bunds
Newcomers A	8 - 14 bunds
Newcomers B	5 - 12 bunds

Cotton.

Of the Locals A all but one planted 14 bunds (2 acres) of cotton. Two acres was standard on the scheme, mainly because it allowed for a simple cotton-maize-cotton rotation. Yields and grades within the standard acreage differed considerably. One of the Locals A planted 17 bunds of cotton. His maize yield, 20 bags/acre, was higher than that of any other Local A and this allowed him to secure his maize needs off the remaining 11 bunds.

Two Locals B constructed tobacco barns during the year. They cut their cotton to 10 and 11 bunds respectively, in order to relieve themselves of fieldwork in winter and early spring when they were engaged on their barns and tending to their new seedbeds.

Four Newcomers A grew tobacco and the size of their cotton crop was 7, 8, 9 and 14 bunds. Four other farmers had 14 bunds of cotton and two grew 16 and 18 bunds.

The Newcomers B had a similar distribution to the Newcomers A except that that the four tobacco growers in this group grew less tobacco and maize than did the four above and their cotton was 10, 10, 10 and 15 bunds.

Locals A	14 - 17 bunds
Locals B	10 - 14 bunds
Newcomers A	7 - 18 bunds
Newcomers B	10 - 18 bunds.

Tobacco.

Three Newcomers A and three Newcomers B were members of the Apostles who forbade contact with tobacco. Had this church rule not applied to them it may be presumed that more Newcomers would have grown tobacco during the survey year and that the average acreage would have been above the 2.2 and 2.0 bunds in Table I. Of the tobacco growers, the four Newcomers A grew 4, 6, 6 and 8 bunds and the four Newcomers B - 4, 5, 6 and 7 bunds.

Seed Beans. The major winter cash crop.

Locals A	11 - 14	Similar distribution to maize which it replaced.
Locals B	10 - 12	Less than maize as all planted wheat as well.
Newcomers A	5 - 11	Replaced a smaller acreage of maize. Also competition with other winter crops.
Newcomers B	9 - 12	Four farmers did not grow seed beans: preferred other winter cash crops.

Ration Beans. Grown only by Newcomers.

Four farmers grew ration beans as a cash crop, planting 7, 7, 6 and 4 bunds. The other four grew it as a food crop, 2, 3, 3 and 3 bunds.

Green Maize.

The farmers valued green maize as a food crop. The villagers' cattle prevented the Locals from growing it as a major crop. Those Locals who did, ran the risk of losing all. Amongst the Newcomers, eight grew the crop for sale in Umtali or locally. Each planted 5 or 4 bunds. More green maize would have been grown were it not that its planting, after the winter crops, was difficult to fit in without jeopardizing the timely sowing of the important summer crops and their subsequent winter crops.

Wheat.

Wheat, which was used to make a rough heavy bread, was prized as a food. However, yields were poor and no farmer grew it as a cash crop. Several farmers, Locals and Newcomers, manured before planting wheat knowing that the manure would benefit subsequent crops as well. The local price varied from 60/- to 65/- a bag. Had wheat been sold through official channels the price at Nyamaropa would have been between 15/- and 20/- a bag. Wheat, as farmed on the scheme, gave a good return per hour of labour spent, but a poor return

per acre. The average yield per acre for each group of farmers was: Locals A 2.5 bags, Locals B 3.2 bags, Newcomers A 4 bags and Newcomers B 4.2 bags per acre. The small local market discouraged production for sale and, because of the high local price, encouraged the growing of wheat for food. Proportionally fewer Newcomers grew wheat than did Locals because the Newcomers were more interested in other crops that occupied the land at the same time but brought in cash returns.

#### Potatoes.

Most of the farmers who grew potatoes regarded them as a minor cash crop and as a source of variety in their diet. Only one farmer, a Newcomer A who grew 14 bunds, regarded potatoes as a major crop.

#### Garlic Onions.

One farmer, a Newcomer B, had pioneered garlic onions on the scheme. He grew 6 bunds in place of seed beans and sold direct to an Indian businessman in Salisbury. His success aroused great interest on the scheme but the fragile nature of his yearly negotiation with the merchant quashed the enthusiasm of the others. However, he sub-contracted 2 bunds each to three farmers who were friends and a fourth grower supplied the local market.

#### Vegetables.

Newcomers grew twice as many vegetables as did the Locals. Although a small volume of sales and exchange of vegetables took place, the great bulk grown were consumed on the farm. Four Newcomers and one Local grew peas or cabbages for sale on the scheme or at the mission.

#### Lucerne.

Lucerne was a new crop at the time. It was introduced by the Extension staff to help feed livestock in winter and to demonstrate the link between field and pasture. It was grown by five Newcomers, each with 1 bund.

#### Rice.

One Newcomer B grew 4 bunds of rice on part of his land where the drainage was poor.

The Two Large Scale Farms: both Newcomers A.

Farm A, 8 acres: four registered in his brother's name.

Farm B, 9½ acres: four acres registered in eldest son's name, one and a half in second son's name.

	<u>Tobacco</u>	<u>Maize</u>	<u>Cotton</u>	<u>Seed Beans</u>	<u>Wheat</u>	<u>Ration Beans</u>	<u>Potatoes</u>
<u>FARM A:</u>	16	13	24	29	-	10	-
<u>FARM B:</u>	8	33	6	-	7	28	3

	<u>Garlic Onions</u>	<u>Rapoko</u>	<u>Green Maize</u>	<u>Veg.</u>	<u>Lucerne</u>	<u>Total</u>
	-	-	-	1	-	93
	1	4	4	6	1	101.

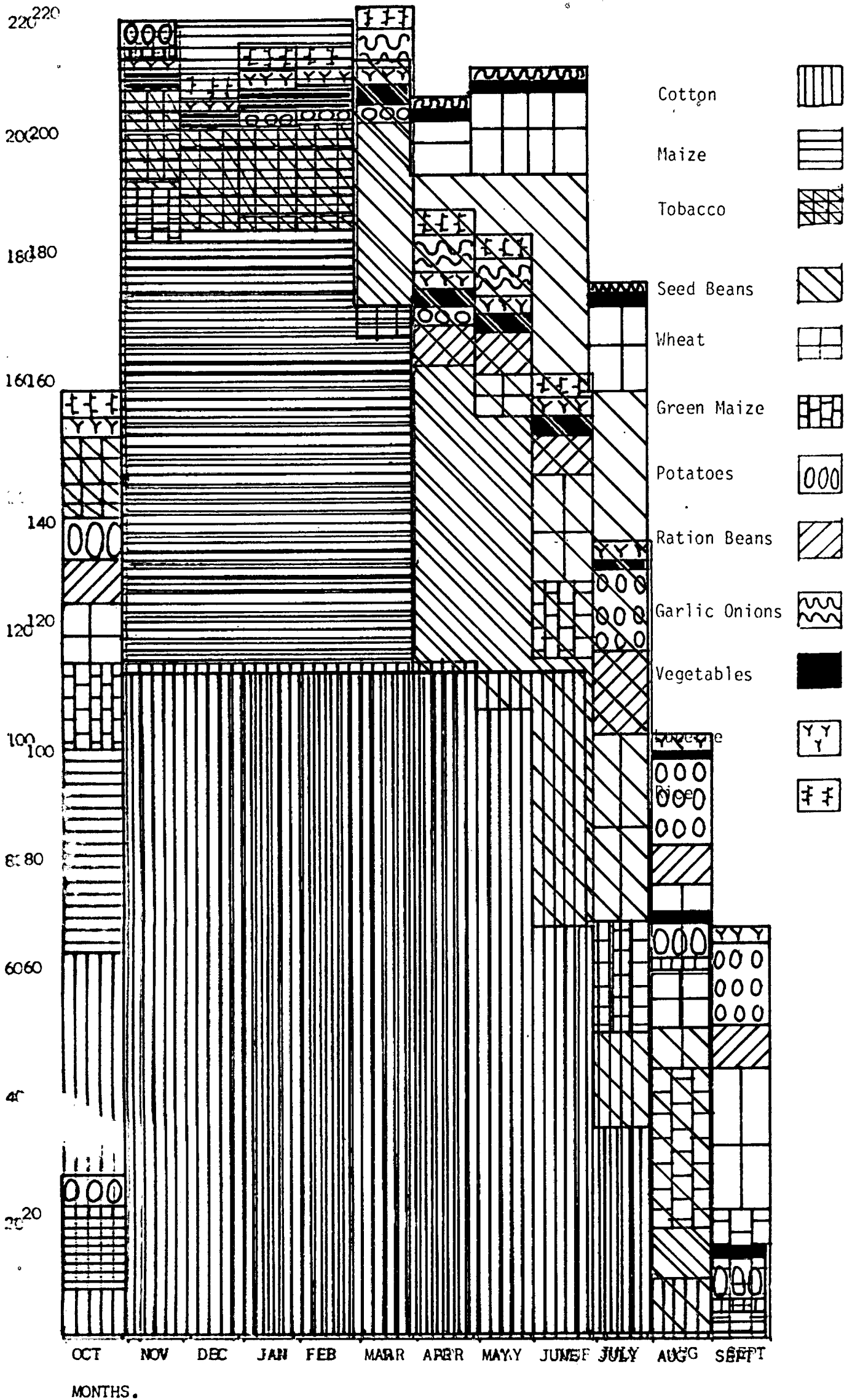
The difference in the land use of these two farms was determined by transport and labour. Farmer B owned a truck and undertook the transport of his maize, ration beans, potatoes, green maize, garlic onions and vegetables to Inyanga and Umtali. At Inyanga he sold maize at £2.4.0d. a bag, three times the official price at Nyamaropa and twice the local market price. In fact, he was only able to do so well on maize because he circumvented the official marketing system. On five and a half acres Farmer B grew nothing in late winter and spring because of the problem with the villager's cattle. He had fenced his own four acre plot and planned to fence the rest before the next season. He would then be able to double the acreage of potatoes, green maize, wheat and vegetables and make fuller use of his truck. He hoped that by then his eldest son would return from Salisbury where he had gone to "try his luck" the year before when he had finished school. Farmer B, because he was able to transport his maize to Inyanga and so obtain a good price, grew a large acreage of maize and only 6 bunds of cotton. In this way he also reduced the labour required at harvest time. Unlike Farmer A who handled his labour well, Farmer B did not like to rely on girls from the villages and they were reluctant to work for him. He demanded a great deal from his family and labour and was impatient with the girls. He employed permanent labourers but could not keep as many as he wanted. Farmer A employed four permanent labourers and up to twelve girls at the height of the season.

The distribution of crops over the year.

If we introduce a time value to the period that each crop occupied the land, the value of comparison is strengthened. In Table II and, pictorially, in Graphs I and II, the land use over the year

GRAPH I

TOTAL OF 8 FARMS LOCAL AREA = 221 BUNDS.



MONTHS.

After reaping maize, the Locals A planted most of their seed beans in April and on average three weeks after the time that the Extension staff had recommended and repeatedly emphasized. The Newcomers B planted most of their seed-beans after reaping tobacco and the remainder after maize; nearly all in March as recommended. The Locals' A late planting is surprising as their acreage of seed-beans was twice that of the Newcomers B. However, the Locals A had to divide their labour between their two major cash crops, cotton and seed-beans, until the end of July. The work that they considered the most tiresome of the year, the sorting of the beans, took place in part of July, August and September. Had they planted their seed-beans in March instead of April, the reaping and sorting of beans would have clashed with the reaping and grading of cotton in part of June and July and created a major peak in labour demand during these months. As it turned out the bean crop was uniformly poor. However, had it been as successful as in previous years, the Locals' A extension of the peak labour demand into September would seem to have been a sensible management decision. The Locals A planted slightly more seed-beans than in the previous year and somewhat later to avoid too serious a clash with labour for cotton. The Newcomers B completed reaping most of their cotton and over half their seed-beans during June.

Wheat, grown as a food crop, yielded poor results. The farmers therefore accommodated wheat in relation to the demands of more profitable crops. The Locals A planted most of their wheat in April as recommended and the remainder in May. Although the removal of maize from their fields in March made the planting of wheat in April possible, the wheat did compete for land with both the seed-beans and cotton. The Locals A adhered to the recommended planting dates in order to reap by September when their crops began to be threatened by the villagers' cattle. The Newcomers B, who were particularly busy in March, April and May, only managed to plant a quarter of their wheat in May, a half in June and a quarter in July.

The Extension staff were anxious to improve the cultivation of wheat. The Newcomers' B almost total neglect of their advice perplexed them and was used to justify other beliefs as to the farmers lack of rational and their laziness. In fact the Newcomers B delay in planting wheat reflects an ordering of labour priorities rather than land use. The Extension staff, in their narrow concern with

field crops, failed to appreciate this. Their limited view of the farmers must have further isolated the staff from their wards. Should improved varieties of seed demonstrate the profitability of wheat, the acreage of wheat grown may well average an acre to an acre and a half over all the farms on the scheme and become the major replacement for the farmers loss of the seed-bean crop.

Tobacco was grown only by the Newcomers B and it occupied the land for four months. Its profitability acted as an inducement to the growers to increase their maize yields, so reducing the area devoted to maize. The tobacco seedbeds were begun in August.

The green maize that the Newcomers B grew stood in the field until October or November, by which time the summer maize was growing nearby. The extension staff sought to persuade the farmers that the mature maize constituted a threat to the young summer maize as it harboured disease. In effect, strict discipline would require a choice by all the farmers as to which maize they would all drop and which they would all grow. At the time of the survey no demonstrable lesson of the danger had occurred. After I left Nyamaropa one farmer wrote to say that many farmers' summer maize had been affected precisely as the Extension staff had warned.

The most surprising feature of the graphs is that the Locals A, who were comparatively inactive in August and particularly in September, should have planted so little in October as recommended by the Extension staff. The reason for this was largely a question of discipline. As close relatives of the villagers, most of the Locals A became involved in the round of beer drinks and ceremonies in the villages that began in July and reached a climax in the hot period of September and October before the rains arrived. Once immersed in the routine, farm work became a drudge. The shortage of water on the scheme at that time meant that farmers had to apply for and wait their turn for water, a process dependent partly on determination and insistence. Unlike the Newcomers who were fairly busy on their farms or occupied with capital construction work, many of the Locals were not present in several senses and so frequently failed to secure water which they might otherwise have obtained and which was needed to soften the land prior to ploughing and for planting.

The difficulties which surrounded the transport of crops not handled by the Co-operative and the problem with the villagers' cattle precluded the Locals A from growing minor cash crops or from growing crops after July. There was thus no incentive to plant their cotton early or to reap it expeditiously.

Proposed land-use for the season after the survey.

The loss of seed-beans affected nearly all the farmers on the scheme. The altered land use by the two groups in response to the loss of the major winter crop is instructive. The table deals with all the Locals A apart from one who had not decided on his land use for the year, and with the seven Newcomers B who had previously grown seed-beans.

Table III. Altered Land-use for 1967/68 Season/Bunds.

<u>Locals A.</u>										
	<u>Tob.</u>	<u>Maize</u>	<u>Cotton</u>	<u>Rapoko</u>	<u>Ration Beans</u>	<u>Potatoes</u>	<u>Wheat</u>	<u>Onions</u>	<u>Veg.</u>	<u>Empty.</u>
A	-	-2	-3	+3	+13		+2	+7		+8
B	-	-4	-3		+6		+5			
C	-	-4	+3		+6		+3			
D	-	-	+4		+7		-			
E	-	-	-		+5		+4			
F	-	-1	+2		+4		+3			
G	-	-			+7		-			
<b>Total</b>	<b>-</b>	<b>-11</b>	<b>+3</b>	<b>+3</b>	<b>+48</b>		<b>+17</b>	<b>+7</b>		<b>+8</b>
<u>Newcomers B.</u>										
A	+4	+5	-6		+7		+3		+1	
B	+3		+4		+5	+17	+3			
C	-	-2	+2		+4	+3	+2			+1
D	+4	-2	+2		+4		+2			+2
E	-1	-1	+1		+3		+2			+11
F	-	-5	+3		+4		+3	+2		
G	+2	-6	+5		+4		+3			
	<b>+12</b>	<b>-11</b>	<b>+11</b>		<b>+31</b>	<b>+20</b>	<b>+18</b>	<b>+2</b>	<b>+1</b>	<b>+14</b>

Two factors influenced the swing to ration beans and wheat. The two largest store-keepers on the scheme had contacted merchants in Umtali and had received assurances that ration beans of a standard quality delivered to them would receive a quoted price per lb. The store-keepers bought two varieties of seed from the merchants and distributed these to the farmers against their bean crop, guaranteeing them a price for beans accepted just under the merchants' quoted price. The farmers' response was enthusiastic and the store-keepers had to bring in more seed. The store-keepers demanded of some farmers who had poor debt payment records that they buy seed for cash. Although I have no details of the transactions or of its success, the initiative of the store-keepers was commendable and it offered the farmers a replacement crop.

The Co-operative, which had marketed the seed-beans, had failed its members in not finding a replacement and this must have been noted by the farmers. The farmers must also have noted that the arrangement through the store-keepers avoided the levy.

Very few farmers replaced their previous seed-bean crop entirely with ration beans. One reason was the fairly general increase in the area of cotton grown. Another reason was that during the survey year a demonstration plot on one farm of a new strain of wheat from the Sabi schemes had proved responsive to proper treatment and more resistant to rust than the wheat used previously. Most farmers increased their area of wheat by 2 or 3 bunds and many hoped to raise their yields to ten or more bags per acre. There was a definite reduction in the area of maize to be grown on most farms. One more Newcomer began growing tobacco, three increased their acreages and one farmer dropped 1 bund. This last farmer (E on the table) planned to leave 11 bunds empty in winter so that he would be free to rebuild his barn and to build a pen in which to fatten cattle. Another Newcomer (A on the table) also intended to fatten cattle. To this end he planned to grow more maize, the stalks and cobs of which he would feed to the cattle.

THE GRASS-WIDOWS.

The fairly impressive land-use pattern of the grass-widows is misleading. Their yields were amongst the poorest of all the farmers and none of the three farms in the sample paid its way. Their husbands determined what crops should be grown, usually on the advice of other farmers. Consequently the intensity of farming was similar to that of farms on which the husbands were present. The grass-widows could not always find the necessary labour and they all, once behind, allowed the farms to slide. One widow explained that it may help her husband to decide to settle and manage the farm properly. Migrant remittances from their husbands maintained the farm and the family.

Table IV. Grass-Widows: Land-Use in Bunds.

	<u>Maize</u>	<u>Cotton</u>	<u>Seed Beans</u>	<u>Potatoes</u>	<u>Green Maize</u>	<u>Wheat</u>	<u>Rice</u>	<u>Veg.</u>	<u>Yams</u>
A.	5	14				2	18	1	2
B.	12	14	10	3	3	2		1	
C.	13	13	13		2			1	

The farm belonging to the Grass-widow A was partly water-logged. Her husband had applied for another four acres and had received two. She farmed all six acres, but on nearly three acres could only farm rice.

The Widows.

The use that the widows made of their land was determined largely by the extent of their reliance on family and the degree to which the family farms were integrated. Two widows relied on their sons for part or all of their maize, which enabled them to grow 11 bunds of cotton each (B & E). Widow E spent three months in hospital and her son used her land to grow 7 bunds of potatoes, the return from which paid her hospital expenses.

Widows A and D had no family farming on the scheme and so grew sufficient maize for their needs. D farmed close to the villagers' land and could grow neither late winter nor spring crops.

The two widows with four acres, H and I, were both reliant on labourers to help run their farms, although the brother of I ploughed her fields. Both widows were over ambitious. They had difficulty in finding and keeping labour and had poor yields.

Table V.            The Widows. Land-Use in Bunds.

<u>2 Acres</u>	<u>Maize</u>	<u>Cotton</u>	<u>Seed Beans</u>	<u>Potatoes</u>	<u>Green Maize</u>	<u>Wheat</u>	<u>Veg.</u>	<u>Ration Beans</u>	<u>Rapoko</u>
A.	6	7	5		1	3		1	
B.	-	11	2					2	
C.	5	8	4		1	4	1	1	
D.	7	7	6				1		
E.	3	11	3	(7)	1				
F.	6	7	6			5	$\frac{1}{2}$		
G.	5	9	3			5			
<u>4 Acres</u>									
H.	7	12	8		3	3	1		1
I.	15	13	13		2	2			

### THE PERFORMANCE OF THE FARMS

The real value of a farm study lies in the analysis of the relationship of each farm's performance to the social and economic factors which circumscribe the use of available resources and which block the introduction of methods, materials and capital. Management ability can only be assessed once all the factors that the farmer cannot alter have been evaluated. At Nyamaropa the problem of the villagers' cattle, the obstacles to the transport and marketing of the minor crops, the benefits that flowed from membership of family and church groups, the limitation on the provision of credit and the weaknesses of the extension service all affected farm practices and largely determined the crops each farmer could grow.

The circumstances surrounding, and the performance of, the farms differed considerably. Some farmers achieved gratifying results, both from their own viewpoint and that of management. Others struggled to meet family needs for education, became more indebted to the storekeepers and other farmers, and less able to adopt more rewarding practices. The farmers were generally aware of and were frequently able to express their difficulties.

Initial analysis work on the data suggested that family and farm circumstances affected performance and that the treatment of the data as directly comparable between the farms would be misleading.<sup>1</sup> The important factors, those which prevented the less successful from emulating the successful and the successful from doing better than they did, would not be revealed with the clarity required. It was decided to present a detailed analysis of ten farms in this section before analysing certain major indices of farm performance for the whole sample.

Each of the ten farms will be treated as a business enterprise and the impinging factors described so that an evaluation of the management ability of each farmer may be arrived at. The selection of the farms and the number chosen for analysis was not based on any statistical principle. Each farm was representative of one of ten farms "types" that existed amongst the sample. Within each "type" I chose what I considered to be a typical farm.

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<sup>1</sup> The reasons for dropping the intended programmed optimal solution are discussed in the chapter on theory.

The circumstances under which the Locals A farmed, the cattle problem, their tie with the villagers and their lack of capital, education and work experience relative to the Newcomers acted to circumscribe their crop and labour alternatives. Consequently the farms of Locals A displayed more uniformity across crops, inputs and returns than did those of the Newcomers. The first two of the ten farms analysed belonged to Locals A. Farm No. 1 is representative of a farmer who relied on family and friends for part of his equipment needs: No. 2 of a farm with a full complement of farm equipment.

Farms No. 3 and No. 4 were tobacco growers. No. 3 was growing tobacco for the second season, was young, relatively well educated and belonged to a leading family. No. 4 was in his first season of tobacco, was older, had little education or work experience and had no immediate family on the scheme.

Farmers No. 5 and 6 had two wives each, were prevented from growing tobacco by their church, exhibited enterprise and were both searching for new sources of income. No. 6 had run a truck business prior to joining the scheme. He undertook transport work on the scheme and twice ventured to Umtali to sell potatoes and green maize of his own. No. 5 grew a similar variety of crops to No. 6, but, without a truck, he had to sell on the small local market.

Farm No. 7 was chosen to represent a significant type of farmer: those who had been prevented by limited financial resources and weaknesses in the credit and marketing system from achieving an intensity of farming that would allow them to meet their family needs and to capitalize the farm. The farmer chosen was one of the best educated and most knowledgeable of the farmers. He exhibited leadership qualities that the other farmers recognised. He and his family experienced serious dislocation effects caused by illness.

Farmer No. 8 represents a less defined group of farmers who, given their resources, should have done better than they did. The farmer's major weakness was an inability to fully utilise the considerable family labour which he commanded.

Farmer No. 9 was chosen to represent the farmers who dropped late winter crops in order to build tobacco barns. He had undertaken the Management of his mother's two acre plot as she lived most of the year at Tombo, and assisted an elderly uncle and a son on their plots.

Farm No. 10 was one of the two large farms, each eight acres, in the sample. The farmer's achievements and his difficulties illustrate on a grander scale many of the strengths and weaknesses of the farmers and of the scheme itself. Where possible figures related to the farm have been halved to provide a figure for four acres to facilitate comparison with the other farms.

To ease the presentation of the analysis the tables and accounts which are drawn on in the analysis appear on the next few pages. Other tables and accounts appear in Appendix I.

Farms No. 1 and 2 are directly comparable and can be analysed together. Both concentrated almost entirely on cotton, maize and seed-beans; both grew a little wheat and rapoko (an African millet valued as an ingredient for beer) and No. 2 grew potatoes for home consumption and garlic onions which he marketed through another farmer. (Table II) The percentage occupation of their four acre plots in bund/months was 76%, the average for the scheme. The value of produce sold off the farm, £207 and £224, was higher than only two of the other eight farms. Cotton provided a major part of each income, 87% and 82%. (Table IV A) Over half of the produce consumed on the farms was maize with a small percentage spread across wheat, potatoes, vegetables, fruit, eggs, chicken and rapoko. The average value of produce per adult equivalent, £5.0 and £6.2, was below the average for the ten farms and for the sample as was the average of the total value of food produced and purchased per head, £7.5 and £8.0. (Table IV B)

The farms had similar total current farm expenditures (Table V), £114 and £121, and similar proportions of the recommended inputs, which they used almost entirely for cotton and seed-beans:- seed, fertilizer, insecticide, transport, hire of equipment and cattle tax. No. 2 spent £8 more on fertilizer for his garlic onions. The proportion spent on labour was high, particularly as current farm expenditure was low relative to the other farms. Farm No. 1 spent £48 hiring casual labour and No. 2 spent £34 hiring casual and £5 hiring permanent labour (Table VI). Their return on farm expenditure (Table VII) was higher than for two of the ten farms as a return on cash expenditure, 93% and 76% of Net Surplus. After charging the imputed value of family labour (Table VIII), the Net Surplus as a return to farm expenditure plus family labour on farms No. 1 and 2 is lower than all the other eight farms, 38% and 36%. The high expenditure on labour and the high imputed value of family labour suggests that, as we have seen earlier, these former villagers used labour inefficiently on both farms.

Farm No. 1 devoted 73% of all labour to work on the crops and No. 2 82% (Table IX). Labour related to the production of the crops and the maintenance of the farm was 97% and 95%, from 8% to 20% higher than on all but one farm. Both farms expended only 1% of labour on construction - to build fences to protect their fields from the villagers' cattle. No. 1 rebuilt a kitchen hut, 0.3% of labour and spent 6% fending off the cattle from his field and the baboons that raided his rather primitive granary. The labour employed to herd the cattle was determined by the repayment arrangements made with relatives or friends for the use of equipment and by the number of families who herded together rather than

TABLE 1.

SYNOPSIS OF THE TEN FAMILIES

Farm No:	1	2	3	4	5	6	7	8	9	10
Father's: Age	48	55	30	45	34	34	44	45	50	35
Education <sup>1</sup>	-	-	8	2	5	*6	*7	6	3	5
Work experience <sup>2</sup>	E	D	B	D	C	A	A	A	A	B
Family: Adults	2	3 <sup>3</sup>	2	2	3	3	2	4	2	3
Children A <sup>4</sup>	3	3	-	2	1	3	4	4	5	1
Children B <sup>5</sup>	3	1	2	-	2	3	2	4	1	3
Total Family	8	7	4	4	6	9	8	12	8	7
Family Workers man/year <sup>6</sup>	4	3½	1¾	2½	3	3	2	3¾	4	2½
Permanent Labour	-	-	1	-	-	1	-	-	1	2
Permanent Work Force	4	3½	2¾	2½	3	4	2	3¾	5	4½
Length on the scheme yrs.	5	5	4	3	4	3	5	5	4	4

TABLE 1. footnotes.

1. <sup>1</sup> Years of formal schooling. \* Trained as builders.
2. A. Were self-employed or had earned £15 p.m. prior to joining the scheme.  
 B. £10 - £12 p.m.  
 C. £7 - £9 p.m.  
 D. £0 - £6 p.m.  
 E. Farmer No. 1 earned £2 p.m. from 1944-7. Thereafter subsistence farmer until employed as labourer for 6 months on the construction of the scheme.
3. Daughter 18 yrs. failed to pass Std. III, worked all year on the farm.
4. Children over six years. Incur education expenses and are old enough to work in the fields and to herd.
5. Children under six. Incur few expenses apart from food and medical attention. Contribute little to the family labour force, although they sometimes free the mother by looking after infants while she works nearby.
6. Figure represents effective family work force during the year.
7. Permanent labourers employed for the greater part of the year; not just for seasonal work.

TABLE II.

	LAND USE: IN BUNDS.										
Farm No:	1	2	3	4	5	6 <sup>1</sup>	7	8	9	10	
Cotton	14	14	14	14	17	18	14	14	12	24	(12)
Tobacco	-	-	7	5	-	-	-	-	-	17	(8½)
Maize	14	13	5	9	4	4	12	10	10	13	(6½)
Seed-Beans	12	11	11	10	7	5	12	10	11	30	(15)
Wheat	2	1	-	6	6	3	-	7	5	-	
Potatoes	-	1	5	2	3	14	-	-	-	-	
Vegetables	-	-	-	-	2	1	1	1	1	-	
Green Maize	-	-	1	-	4	5	-	4	2	-	
Garlic Onions	-	2	-	-	-	-	-	-	-	-	
Rapoko	1	1	-	-	-	-	-	-	-	-	
Ration Beans	-	-	-	-	-	4	-	-	-	10	(5)
Rice	-	-	-	-	-	(5)	-	2	-	-	
Lucerne	-	-	-	-	1	1	-	-	-	-	
TOTAL BUNDS	43	43	43	46	44	55	39	48	41	94	(47)

TABLE 2. Footnotes.

- Farmer No. 6 grew 5 bunds of rice on his mother's land. In return for the use of this land he ploughed and cultivated for her and provided labour at peak periods.

TABLE III.

	LAND OCCUPATION: BUND/MONTHS.										
Cotton	120	119	110	120	148	153	123	114	102	204	(102)
Tobacco	-	-	28	22	-	-	-	-	-	68	(34)
Maize	70	65	21	44	20	20	58	50	50	65	(32)
Seed Beans	42	38	39	37	25	18	42	35	34	105	(52)
Wheat	7	3	-	19	19	10	-	21	15	-	
Potatoes	-	3	17	7	9	39	-	-	-	-	
Vegetables	3	5	4	-	21	7	14	14	11	-	
Green Maize	-	-	4	-	15	25	-	10	8	-	
Garlic Onions	-	8	-	-	-	-	-	-	-	-	
Rapoko	4	4	-	-	-	-	-	-	-	-	
Ration Beans	-	-	-	-	-	-	-	-	-	30	(15)
Rice	-	-	-	-	-	(21)	-	8	-	-	
Lucerne	-	-	-	-	12	12	-	-	-	-	
TOTAL OCCUPATION											
BUND/MONTHS	246	245	223	249	269	284	237	252	220	472	(236)
% OCCUPATION	76%	76%	68%	77%	83%	87%	73%	78%	67%	73%	

TABLE NO. IV. A.

PRODUCE SOLD OFF THE FARM (GROSS VALUE):<sup>1</sup>

AS PERCENTAGE OF TOTAL VALUE.

Farm No.	1	2	3	4	5	6	7	8	9	10
Tobacco	-	-	44	42	-	-	-	-	-	58
Cotton	87	82	42	44	83	67	66	80	91	30
Maize	2	2	-	2	2	-	23	1	0.2	-
Green Maize	-	-	-	-	1	16	-	1	-	-
Seed Beans	11	10	8	11	3	3	11	7	7	5
Ration Beans	-	-	-	-	-	-	-	-	-	5
Wheat	-	-	-	-	0.5	-	-	5	1	-
Potatoes	-	-	6	-	0.2	15	-	-	-	-
Vegetables	-	-	-	-	-	0.5	0.5	5	-	-
Fruit	-	-	-	-	-	0.6	-	-	-	-
Eggs	-	-	-	-	2	-	-	-	-	-
Chickens	-	1	-	-	1	-	-	-	1	-
Pigs	-	-	-	-	-	-	-	-	-	2
Other Livestock	0.5	-	-	-	6	0.6	-	0.5	-	-
Garlic Onions	-	5	-	-	-	-	-	-	-	-
VALUE: 100%	£207	£224	£367	£311	£301	£403	£262	£176	£212	£835
(4 acres)										(£417)

TABLE NO. IV.A. Footnote.

1. Derived from column two of Gross Farm Income Account (appendix I).

TABLE NO. IV.B.

PRODUCE CONSUMED ON THE FARM<sup>1</sup> AS

PERCENTAGE OF TOTAL VALUE

Farm No.	1	2	3	4	5	6	7	8	9	10
Maize	58	55	21	22	12	16	43	22	35	77
Green Maize	-	-	10	6	11	7	10	3	1	4
Seed Beans	5	2	6	2	4	5	15	1	2	1
Ration Beans	-	-	-	-	-	-	-	-	-	6
Wheat	5	4	-	29	17	15	-	20	30	-
Potatoes	-	7	9	7	5	4	- <sup>2</sup>	-	-	-
Sweet Potatoes	8	1	4	2	3	2	-	4	1	1
Vegetables	10	7	24	7	10	8	25	18	18	5
Fruit	2	2	14	9	4	12	4	5	2	3
Eggs	2	6	4	4	11	4	1	-	3	2
Chickens	4	6	8	2	23	4	2	-	7	1
Other Livestock	-	-	-	-	-	4	-	-	-	-
Rice	-	-	-	-	-	5	-	8	-	-
Fish	-	-	-	-	-	10	-	18	-	-
Milk	-	-	-	-	-	4	-	-	-	-
Rapoko	5	10	-	-	-	-	-	-	-	-
VALUE 100%	£30	£34	£21	£35	£45	£62	£25	£51	£42	£33
Adult Equivalents <sup>3</sup>	6	5½	3	5	4	6	6	6½	6	6
Average Consumed per head	£5	£6.2	£7	£7	£11	£10.3	£4.2	£8	£7	£5.5
Family Cash Expenditure: Food <sup>4</sup>	£15	£9	£31	£7	£18	£18	£19	£18	£12	£26
Food, Cash & Kind	£45	£43	£52	£42	£63	£80	£44	£69	£54	£59
Total value food consumed per head	£7.5	£8	£17	£8.4	£16	£13	£7.3	£11	£9	£10

1. Derived from column one of Gross Farm Income Account (appendix I.)
2. Wife ill during period of planting. Received some sweet potatoes from friends.
3. Includes permanent labourers. Children 12-16:½, 4-10:¼. Under 4 not counted.
4. Includes expenditure on food for permanent labourers.

TABLE NO. V.

CURRENT FARM EXPENDITURE AS PERCENTAGE OF TOTAL<sup>1</sup>

Farm No:	1	2	3	4	5	6	7	8	9	10
Seed	7	8	8	10	8	6	6	11	8	7
Fertilizer	21	29	35	40	27	14	34	33	35	20
Manure	-	-	-	-	12	-	-	-	-	8
Insecticide	6	6	8	8	7	5	6	11	7	5
Transport	18	18	26	26	21	39	13	21	18	24
Marketing	2	2	5	3	2	1	1	2	2	3
Hire of Equipment	3	4	3	3	4	3	2	5	5	1
Sundries	-	-	1	2	-	-	-	-	-	1
Ploughing	-	-	-	-	-	-	4	-	-	-
Pig Protein	-	-	-	-	-	-	-	-	-	1
Cattle Tax	1	1	-	1	0.7	0.5	-	0.7	1	1
Wages	42	33	13	15	17	27 <sup>2</sup>	34	15	24	29
TOTAL: 100% (4 acres)	£114	£121	£141	£135	£126	£185	£156	£70	£103	£469 (£234)

TABLE V. Footnotes.

1. Derived from Current Farm Expenditure Account. Appendix I.
2. £10. 2. 0. wage labour has been charged to the farmer's truck business.

TABLE NO. VI.

ANALYSIS OF WAGE PAYMENTS AS % OF CURRENT FARM EXPENDITURE

Farm No:	1	2	3	4	5	6	7	8	9	10
Permanent Labour:										
Wages	-	3	8	9	10	28	5	6	20	12
Permanent Labour:										
Keep (Cash)	-	1	4	2	3	4	-	1	2	4
Total Cost of Permanent Labour	-	4	12	11	13	32	5	7	22	16
Casual Labour	42	29	1	4	4	-	29	8	2	13
Total Labour Cost	42	33	13	15	17	27	34	15	24	29
% of F. Exp.	42	33	13	15	17	27	34	15	24	29
TOTAL LABOUR COST (4 acres)	£48	£40	£18	£18	£21	£52	£53	£10	£23	£129 (£64)

TABLE NO. VII.

RETURN ON CURRENT FARM EXPENDITURE

Farm No.	1	2	3	4	5	6	7	8	9	10
Harvest	£237	£258	£388	£346	£346	£464	£288	£227	£254	£868
Farm Expenditure	£107	£120	£141	£135	£126	£185	£156	£69	£103	£474
Surplus on Operations	£130	£138	£247	£211	£220	£280	£132	£157	£151	£394
A. Surplus as % of Expenditure	121%	113%	175%	156%	175%	151%	85%	22%	150%	83%
NET SURPLUS <sup>1</sup>	£100	£91	£199	£155	£178	£205	£99	£120	£98	£293
B. Net Surplus % of Expenditure	93%	76%	141%	115%	141%	111%	63%	174%	97%	62%

TABLE NO. VII. Footnote.

1. Net Surplus = surplus - (depreciation + levy + interest charges.)

TABLE NO. VIII.

RETURN ON CURRENT FARM EXPENDITURE INCLUDING IMPUTED VALUE  
OF FAMILY LABOUR + UNPAID LABOUR.

Farm No:	1	2	3	4	5	6	7	8	9	10
Family Labour	£158	£125	£62	£111	£118	£102	£84	£159	£134	£93
Farm and Family Expenditure	£265	£246	£203	£246	£244	£287	£240	£232	£237	£567
C. Surplus as % of F. & F. Expen.	49%	56%	122%	80%	90%	97%	55%	69%	60%	69%
D. Net Surplus as % of F. & F. Exp.	38%	36%	98%	63%	73%	71%	41%	54%	42%	52%

TABLE IX.

USE OF ALL LABOUR AS PERCENTAGE OF TOTAL FARM MAN/DAYS<sup>1</sup>

Farm No:	1	2	3	4	5	6	7	8	9	10
Crops	73	82	90	70	54	66	76	63	60	82
Land Prep.	4	1	1	2	2	2	-	2	3	1
Fieldwork	-	-	-	-	1	-	-	-	1	-
Herding	12	6	3	14	19	9	-	9	10	1
Livestock	-	-	-	-	5	-	-	-	-	2
Cattle off Fields	4	1	-	-	-	-	-	-	-	-
Baboons	2	-	-	-	-	-	-	-	-	-
Labour Exchange	1	1	-	-	1	2	2	3	3	-
Beer Group	1	2	-	-	-	-	-	-	-	-
Beer Brewing	-	2	-	-	-	-	-	-	-	-
Manure/Compost	-	-	-	-	1	3	-	1	-	-
Looking for Labour	.4	-	-	-	-	-	.4	-	-	1
LABOUR RELATED TO CROP PRODUCTION AND FARM MAINTENANCE	97.4	95	94	86	83	82	78.4	78	77	87
Marketing	-	-	1	-	-	1	-	-	-	1
Local Trade	-	-	-	-	2	1	2	3	-	-
Vegetables	1	-	-	-	2	1	6	4	1	-
Farm Construction	1	1	-	5	1	4	-	3	7	2
Homestead Construc.	.3	-	-	8	4	1	1	-	1	-
Local Employment	-	3	-	-	-	9	3	9	14	2
Committee Work	-	-	2	-	-	-	3	2	-	2
Illness <sup>2</sup>	2	1	4	1	7	1	6	1	-	6
Firewood	2	1	-	-	1	-	1	-	-	-
TOTAL FARM MAN/DAYS:	1203	1048	616	1026	1035	1247	836	1080	1191	1639 100%

1. An 8 hour day has been used to cost labour against crops. Cotton could only be picked after the dew had cleared in the morning and with the tendency to break up crop tasks with other farm or household tasks, most family and employed labour for 8 hours a day on the crops. All activities that compete for farm labour have been included so that a longer working day results. The 8 hour day I have termed a Crop Man/Day; and the 10 hour day a Farm Man/Day.
2. Actual days ill at home or in hospital for the families of the ten farms were: (1) 21, (2) 8, (3) 25, (4) 9, (5) 73, (6) 11, (7) 50, (8) 10, (9) 9, (10) 96.

TABLE X.

DIVISION OF LABOUR ON CROPS<sup>a</sup>

A. <u>FAMILY</u>	1	2	3	4	5	6	7	8	9	10
Farm No:										
Adult Equivalents present for year	4	3½	1¾	2½	3	3	2	3¾	4	2¼
Total Family Man/days <sup>1</sup>	752	717	416	594	637	594	399	710	561	525
Average Family Adult Man/Days	188	204	235	238	212	198	199	181	140	232
% of Total Crop Labour	70%	68%	57%	65%	90%	57%	50%	85%	76%	30%

TABLE X Footnotes

1. 8 hour "crop/man/day".
- a. See also Table X, appendix I.

B. <u>PERMANENT LABOUR</u>	1	2	3	4	5	6	7	8	9	10
Farm No:										
Man/Days 100%	-	72	281	279	32	437	69	48	126	806 (403)
% of Total Crop Labour	-	7%	39%	31%	5%	42%	9%	6%	14%	46%

C. <u>CASUAL LABOUR</u>	1	2	3	4	5	6	7	8	9	10
Farm No:										
Man/Days 100%	285	201	24	29	27	2	319	34	12	391 (195)
% of Total Crop Labour	26%	19%	3%	3%	4%	-	40%	4%	1%	23%

D. <u>GIFT LABOUR</u>	1	2	3	4	5	6	7	8	9	10
Farm No:										
Man/Days 100%	49	55	6	11	8	7	6	38	17	18
% of Total Crop Labour	4%	5%	1%	1%	1%	1%	1%	5%	2%	1%

E. <u>TOTAL CROP LABOUR</u>	1	2	3	4	5	6	7	8	9	10
Farm No:										
Total Crop Labour Man/Days	1084	1047	728	913	705	1041	793	832	739	1742 (871)
% of all Farm Labour	73%	82%	90%	70%	54%	66%	76%	63%	60%	82%

the size of the farmer's herd. No. 1 devoted twice the labour to herding than did No. 2. On both farms the family provided over 2/3 of crop labour and casual labour provided roughly a quarter (Table X). Total crop labour in man/days was higher on these two farms than on any other of the ten farms, particularly considering their limited number of crops and relative lack of other activities.

A.	<u>SURPLUS ON FARM OPERATIONS</u>	<u>NO. 1.</u>	£130. 3. 2.
B.	<u>DEPRECIATION ON FARM ASSETS</u>	CURRENT DEPRECIATION VALUE	
	Buildings 15%	2. 0. 0.	6. 0.
	Tobacco Barn 25%	-	
	Implements 20%	10. 5. 0.	2. 1. 0.
	Truck 15%	-	
	Livestock 12%	49. 0. 0.	6. 0. 10.
	<u>TOTAL:</u>	61. 5. 0.	<u>£ 8. 7. 10.</u>
C.	<u>LEVY</u>		
	A.D.F. 10%	20. 1. 6.	
	Tobacco (commission & Levy) of 3%	-	
	<u>TOTAL:</u>		<u>20. 1. 6.</u>
D.	<u>INTEREST</u> paid on Co-Op. Loans		<u>1. 12. 7.</u>
	<u>NET SURPLUS. A-(B+C+D).</u>		<u>£100. 1. 3.</u>

BALANCE SHEET

	Value of Homestead at beginning of year	4. 0. 0.	
	Value of Farm Assets at beginning of year	<u>61. 5. 0.</u>	65. 5. 0.
<u>ADD</u>	Net Surplus		100. 1. 3.
	Family Labour on Construction		3. 9. 0.
	Sundry Income		-
	Capital Introduced to farm & Homestead		<u>60. 12. 1.</u>
			229. 7. 4.
<u>LESS</u>	Produce consumed on farm		29. 11. 7.
	Family Expenditure (Less Keep Permanent Labourer)		80. 1. 7.
	Other Expenses	Bicycle	<u>10. 8. 0.</u>
			120. 1. 2.
	<u>FARM CAPITAL AT END OF YEAR</u>		<u>£109. 6. 2.</u>

REPRESENTED BY:-

	Fixed Assets O/Balance	65. 5. 0.	
ADDITIONS:-	Farm	49. 0. 0.	
	Homestead	-	
	Family labour on Construction	3. 9. 0.	
	Capital Surplus to farm and homestead needs	-	
			117. 14. 0.
<u>LESS</u>	Depreciation on Farm Assets	8. 7. 10.	<u>8. 7. 10.</u>
	H.P. Creditor	-	
	<u>FARM CAPITAL AT END OF YEAR</u>		<u>£109. 6. 2.</u>

A.	<u>SURPLUS ON FARM OPERATIONS</u>		<u>NO. 2.</u>	£137.15. 5.
B.	<u>DEPRECIATION ON FARM ASSETS</u>	<u>CURRENT</u>	<u>DEPRECIATION</u>	
		<u>VALUE</u>		
	Buildings 15%	5. 0. 0.	15. 0.	
	Tobacco Barn 25%	-	-	
	Implements 20%	57. 0. 0.	11. 8. 0.	
	Truck 15%	-	-	
	Livestock 12%	104. 0. 0.	12. 9. 9.	
	<u>TOTAL:</u>	166. 0. 0.		<u>£24.12. 9.</u>
C.	<u>LEVY</u>			
	A.D.F. 10%	20. 8.10		
	Tobacco (commission & Levy) of 3%	-		
	<u>TOTAL:</u>			<u>20. 8.10.</u>
	<u>INTEREST</u> paid on Co-Op.Loans			<u>2. 3. 9.</u>
	<u>NET SURPLUS</u> A-(B+C+D).			<u>£90.10. 1.</u>

BALANCE SHEET

	Value of Homestead at beginning of year	7. 0. 0.	
	Value of Farm Assets at beginning of year	<u>166. 0. 0.</u>	173. 0. 0.
<u>ADD</u>	Net Surplus		90.10. 1.
	Family labour on construction		2. 8. 6.
	Sundry Income		13. 0.
	Capital introduced to farm & homestead		-
			<u>266.11. 1.</u>
<u>LESS</u>	Produce consumed on Farm		33.15. 9.
	Family Expenditure (Less Keep P.L.)		63. 5. 8.
	Other Expenses		-
			<u>97. 1. 5.</u>
	<u>FARM CAPITAL AT END OF YEAR</u>		<u>£169. 9. 8.</u>

	<u>REPRESENTED BY:</u>		
	Fixed Assets O/Balance	173. 0. 0.	
	<u>ADDITIONS:</u> Farm	7.18. 4.	
	Homestead	-	
	Family Labour on Construction	2. 8. 0.	
	Capital Surplus to Farm & Homestead needs	<u>10.16. 1.</u>	
			194. 2. 5.
<u>LESS</u>	Depreciation on Farm Assets	24.12. 9.	
	H.P. Creditor	-	
			<u>24.12. 9.</u>
	<u>FARM CAPITAL AT END OF YEAR</u>		<u>£169. 9. 8.</u>

The Surplus on farm operations (Gross Farm Income - Current Farm Expenditure (appendix I) was similar for the two farms. Depreciation was considerably higher for farmer No. 2. His ability to loan implements and occasionally oxen to family and a friend was rewarded by roughly seventy-two days labour on herding which was given to him over and above any reciprocal arrangements. The value of this labour was £10.16.0. If deducted from the depreciation charged against Farm No. 2 and if to farm No. 1 is added roughly 41 days or £6.4.0. in labour given to herd above his reciprocal arrangements, then the net figure for depreciation becomes £14.11.10. for No. 1 and £13.18.0. for No. 2. The financial equilibrium introduced by the adjustment is not very significant. It is interesting, however, that assistance was repaid mainly through herding, not by the exchange of labour on crop activities.

The value of farm No. 1 increased by £44 or 68% during the year. The asset value of the farm increased by £52.9.0. with the addition of fencing worth £15 and family labour on its construction worth £3.9.0; a crossed Jersey cow bought for £17 (about £5 more than the cost of a local cow); and three young oxen purchased with the revenue from the sale of two old oxen, the balance of which sale was £17. The depreciation charge reduced the increase to £44.1.2. A second hand bicycle bought off a migrant worker for £10.8.0. has been treated as consumption expenditure not as an addition to farm assets. The increase in the value of the farm was financed out of previous savings. The farmer displayed a willingness to invest in the farm despite the poor season. Having fenced his field and rebuilt his herd he was in a stronger position to maintain the fertility of the soil, to breed replacement stock and to utilize his land more intensively by growing late winter and spring crops. The acquisition of a crossed jersey cow could be questioned on the grounds of its unsuitability for the climate, the shortage of feed and the traction demands that would be put on its off-spring. The farmer regarded the cow as a prestigious addition to his herd. He expected it to be a good milker and to make a profit on the sale of its off-spring. He would continue to rely on a friend for the loan of implements which he did not possess.

Farm No. 2 purchased £5 worth of fencing to complete the fence he had begun the season before. The only other additions made were sacks, £2.18.4. to ease the handling and storage of crops and the value of family labour on constructing the fence, £2.3.0. The family saved £10.16.1. on the year. The value of the farm after charging depreciation, fell by £3.11.4. The completion of the fence improved his competitive position.

Both farmers had begun a process to break their inhibiting ties with the villagers. The fences epitomized this in a dramatic form. Just as important a break was the experience which Farmer No. 2 had with

permanent labour. Both farmers, as was common with the Locals A, talked of hiring more permanent labour to meet the extended demand for labour of the new crops that they would be able to grow behind the fences. They would draw on the village women as a reservoir of labour at peak periods instead of relying heavily on them as an inefficient labour supply during the year. The pressure to harvest early would enforce greater work discipline in the fields and the increased year round activity would eliminate much of the daily contact with the villagers during the off-season beer drinks and ceremonies.

Farmers No. 3 and No. 4, the two tobacco growers selected, may be analysed together. No. 3 ran a highly efficient farm. His father was a successful farmer and owned a small store and a bakery, from which the son purchased bread twice a week. Consequently he grew no wheat. He borrowed an ox and a cultivator from his father, and transported his potatoes to Umtali on his father's Land Rover. His wife gave birth to their second child during the year and did little farm work for three months. Farmer No. 4 had no immediate family and was self-reliant. It was his first season of tobacco.

Tobacco and cotton formed 86% of the gross value of produce sold off each farm (Table IV A). No. 3 grew 7 bunds of tobacco (Table II), £163, and No. 4 5 bunds, £130. Both grew two acres of cotton, No. 3 had a slightly higher yield, £155, than did No. 4, £138. No. 3 received £20 for the potatoes he sold in Umtali and No. 4 sold £6 worth of maize. Total values, £367 and £311, are higher than those for all but two of the ten farms and for 8% of the sample.

Maize formed  $\frac{1}{5}$  and  $\frac{1}{3}$  of produce consumed on the two farms (Table IV B). No. 3 consumed a fair proportion of green maize, vegetables, fruit, potatoes, chickens and eggs. Almost another  $\frac{1}{3}$  of produce consumed on farm No. 4 was wheat, with smaller proportions of all the other items. The total of produce was higher on Farm No. 4, but averaged the same per adult equivalent, £7: just under the highest figure for the ten farms. Cash expenditure on food differed considerably. No. 3 spent £31, nearly all at his father's store and bakery and the average value of food consumed per head, £17, was the highest of the ten farms and of the sample. Farm No. 4 spent less on food than did all but 8% of the sample, but the average value of food consumed per head was higher than four of the ten farms and 65% of the sample.

The two farms have very similar current farm expenditure patterns and totals. The wage payments are lower than all but one farm. Both employed a high proportion of permanent to casual labour, particularly No. 3.

The return on current expenditure was high for both farms.

No. 3 175%, No. 4 156% (Table VII), and Net Surplus as a percentage of expenditure places them in the top four farms. Family labour on crops was comparatively low on both farms so that Net Surplus as a return on farm expenditure and family labour was high, 98% and 63%: between two and three times the return on current farm expenditure of the Locals, Farm No. 1 and No. 2.

Farm No. 3 managed to concentrate 90% of his labour on crop activities and 94% on activities related to crop production and farm maintenance (Table IX). His father, who has a large family, undertook most of his herding. The variety of activities that the family pursued, his sisters worked in the store, a brother farmed, and their regular commitment to work limited the opportunities for labour exchange. He received six man/days during the year and, because of his wife's illness, gave only three days. His total farm/man/days, 616, was considerably below that of all the other farms, whereas his total man/days employed on the crops, 728 (Table X), was, though low, not very different from two other farms or 25% of the sample.

Farm No. 4 expended 913 man/days on his crops, or 70% of all farm labour. Herding employed 14% of all farm labour and the proportion relative to crops and farm maintenance, 86%, was fairly high. He added to his tobacco barn and built a brick house that, with an asbestos roof, cost £98. 13% of farm labour went on construction. Total farm/man/days, 1,026 was about average for the farms.

A.	<u>SURPLUS ON FARM OPERATIONS</u>		<u>NO. 3.</u>	£247. 1.11.
B.	<u>DEPRECIATION ON FARM ASSETS</u>	CURRENT	DEPRECIATION	
		VALUE		
	Buildings 15%	-		
	Tobacco Barn 25%	50. 0. 0.	12.10. 0.	
	Implements 20%	17. 0. 0.	3. 8. 0.	
	Truck 15%	-	-	
	Livestock 12%	27. 0. 0.	3. 4.10.	
	<u>TOTAL:</u>			<u>£19. 2.10.</u>
C.	<u>LEVY</u>			
	A.D.F. 10%	18. 7. 2.		
	Tobacco (commission & Levy) of 3%	5. 7. 8.		
	<u>TOTAL:</u>			<u>23.14.10.</u>
D.	<u>INTEREST</u> paid on Co-Op.Loans			<u>4.15.10.</u>
	<u>NET SURPLUS</u> (A-(B+C+D)).			<u>£199. 8. 5.</u>

BALANCE SHEET

NO. 3.

	Value of Homestead at beginning of year	168. 0. 0.	
	Farm Capital at beginning of year	<u>94. 0. 0.</u>	262. 0. 0.
<u>ADD</u>	Net Surplus		199. 8. 5.
	Family Labour on construction		9. 0. 0.
	Sundry Income		-
	Capital Introduced to farm and homestead		-
			<u>461.17. 5.</u>
<u>LESS</u>	Produce consumed on farm		20.19. 3.
	Family Expenditure (Less Keep P. Labourers)		116. 0. 7.
	Other Expenses		-
			<u>136.19.10</u>
	<b>FARM CAPITAL AT END OF YEAR</b>		<u><b>£324.17. 7.</b></u>

REPRESENTED BY:

	Fixed Assets O/Balance	262. 0. 0.	
ADDITIONS:	Farm Capital	14. 1. 3.	
	Homestead	-	
	Family Labour on construction	9. 0. 0.	
	<u>CAPITAL SURPLUS to farm and homestead needs</u>	<u>67.10. 2.</u>	344. 0. 5.
<u>LESS</u>	Depreciation on Farm Capital	19. 2.10.	
	H.P. Creditor	-	
			<u>19. 2.10.</u>
	<b>FARM CAPITAL AT END OF YEAR</b>		<u><b>£324.17. 7.</b></u>

A.	<u>SURPLUS ON FARM OPERATIONS</u>		<u>NO. 4. £210.11. 7.</u>
B.	<u>DEPRECIATION ON FARM ASSETS</u>	CURRENT VALUE	DEPRECIATION
	Building 15%	8. 0. 0.	1. 4. 0.
	Tobacco Barn 25%	40. 0. 0.	10. 0. 0.
	Implements 20%	24. 0. 0.	4.16. 0.
	Truck 15%	-	-
	Livestock 12%	116. 0. 0.	13.18. 0.
	<u>TOTAL:</u>		<u>29.18. 0.</u>
C.	<u>LEVY</u>		
	A.D.F. 10%	17.10. 1.	
	Tobacco (commission & Levy) of 3%	3. 9. 3.	
	<u>TOTAL:</u>		<u>20.19. 4.</u>
D.	<u>INTEREST</u> paid on Co-Op.Loans		<u>4.13. 1.</u>
	<b>NET SURPLUS (A-(B+C+D)).</b>		<u><b>£155. 1. 2.</b></u>

<u>BALANCE SHEET</u>		<u>NO. 4.</u>
	Value of Homestead at beginning of year	10. 0. 0.
	Farm Capital at beginning of year	188. 0. 0.
		<u>198. 0. 0.</u>
<u>ADD</u>	Net Surplus	155. 1. 2.
	Family Labour on construction	15. 9. 0.
	Sundry Income	5. 6.
	Capital Introduced to farm and homestead <sup>1</sup>	23. 9. 3.
		<u>392. 4. 11.</u>
<u>LESS</u>	Produce consumed on farm	34. 12. 0.
	Family Expenditure (Less Keep P. Labourers)	53. 7. 11.
	Other Expenses	-
		<u>87. 19. 11.</u>
	<b>FARM CAPITAL AT END OF YEAR</b>	<u><u>£304. 5. 0.</u></u>

<u>REPRESENTED BY:</u>		
	Fixed Assets O/Balance	198. 0. 0.
<u>ADDITIONS:</u>	Farm Capital	21. 16. 10.
	Homestead	98. 17. 2.
	Family Labour on construction	
	<b>CAPITAL SURPLUS to farm and homestead needs</b>	<u>-</u> 334. 3. 0.
<u>LESS</u>	Depreciation on Farm Capital	29. 18. 0.
	H.P. Creditor	-
		<u>29. 18. 0.</u>
	<b>FARM CAPITAL AT END OF YEAR</b>	<u><u>£304. 5. 0.</u></u>

1. The calculation includes the cost of depreciation, i.e., not a cash figure.

The Surplus on Operations and Net Surplus of farms 3 and 4 was roughly £100 more than for farms 1 and 2. The levy charged was much the same, £20, on all four farms.

The value of No. 3's farm and homestead increased by £63 or 23% during the year. £14 worth of equipment was purchased and family labour on construction was worth 9/-. Savings for the year were £67.10.2. The farmer's tobacco barn would have had to be rebuilt either in the next season or the one after, an operation which would entail expenditure of from £20 - £35 depending on the labour he used. He had the financial resources to do the job expeditiously so that he could undertake and finance his plan to stall-feed two oxen. His wife was over her troubles with the baby and both were enthusiastic about the prospects.

Farm No. 4 raised the value of his farm and homestead by £106, or 53%. Family expenditure was kept low; only £53, of which £19 went to purchase furniture and appliances for the house. At the end of the year he had a barn nearby double the size of his previous barn, a new brick and asbestos roofed house, a scotchcart which he purchased on a medium term loan through the Co-operative and a pig. He received a remarkable transformation of his house and farm with the introduction of only £23 from outside the farm business.

Farms No. 5 and No. 6 were selected to represent two farmers of enterprise whose difference in performance was determined almost entirely by the markets in which they were able to sell. No. 6 owned a truck and was able to operate in the Umtali market while No. 5 explored the opportunities offered by the local market. Both were prevented by church regulations from growing tobacco or raising pigs. Both farmers had two wives and young families. No. 6 had a permanent labourer who had been with him for three years. He paid his labourer £4 per month and gave him a month paid leave a year. His senior wife had been awarded a Master Farmer's Certificate prior to their joining the scheme at a time when he worked as a transporter at Inyanga. He borrowed some implements from his brother.

Farms No. 5 and No. 6 grew a greater variety of crops in autumn, late winter and spring than did the other eight farms (Table II). Although they grew more cotton than did the others, they both grew considerably less seed-beans in order to fit in the other crops. Farmer No. 5's land use intensity was 1.6, no more than most of the farms, but he achieved a higher occupation of the land over the year, 83% (Table III) than did all but No. 6, 87%. No. 6 grew five bunds of rice on his mother's land in return for which he ploughed and cultivated for her and gave her labour at peak periods. The rice is not included in the total bund and bund/month figures. Both

farmers grew one bund of lucerne which they cut in stages and fed to their livestock.

The gross value of produce sold off farm No. 6 was £100 higher than that for No. 5 (£403 v £301) and is comparable to the four acre figure of farm No. 10. Green maize and potatoes, which No. 6 sold in Umtali, worth £64 and £58, account for the difference. Although No. 5 grew four bunds of green maize, the only input was seed and labour and his yield was half that of No. 6's (Crop Analysis Accounts, Appendix 1). No. 6 manured his two acre crop of potatoes heavily and experimented with fertilizer on two of the bunds. No. 5 applied no manure to his 3 bunds of potatoes and only a little fertilizer that he had in stock. No. 6's potato yield was four times that of No. 5. The inability of farmer No. 5 to find a market determined his inputs on his crop. No. 5 sold eggs worth £6 and chickens worth £4 to farmers on the scheme.

The total value of produce consumed on the farms was high, particularly that on farm No. 6, £62 (Table IV B). The value per adult equivalent was higher than that on the other farms, £11 and £10.3. Maize formed only 1/8 and 1/6 of the value, considerably less than on all the other farms. Green maize, wheat and potatoes on both farms, and rice and fish on No. 6 replaced the consumption of maize several times a week. Both farmers spent £18 on food and the total value of food consumed per adult equivalent was higher than on most farms, £16 and £13. Each member of the family and the labourer on farm No. 6 had unusually bright eyes and clear skins. The presence of a fair proportion of valuable protein, vitamin and mineral sources in their diet, must help to explain their comparative health.

Current farm expenditure (Table V) was appreciably higher on farm No. 6, £185, than on all the other four acre farms. Transport (£76) and the cost of permanent labour (£52) accounted for more than 2/3 of expenditure. Farm No. 5 utilized more fertilizer than No. 6 (£33 v £27) and purchased manure for £16 to supplement his farm supply.

Return on current farm expenditure for Farms No. 5 and No. 6 was similar to that of the two farms on which tobacco was grown, No's 3 and 4; net surplus was 141% and 111% of expenditure (Table VII). After including the imputed value of family labour, the percentage return of net surplus was higher than for all but farm No. 3, 73% and 71% (Table VIII).

Total farm/man/days was high on both farms, 1,035 and 1,247 days, of which 83% and 82% was devoted to crop production and farm maintenance (Table IX). Total crop/man/days was, however, low on Farm No. 5, 705 days; the lowest of all the farms (Table X). Total crop/man/days on Farm No. 6, 1,041 days, compared with the highest of the four acre farms. As a percentage of all farm labour, labour employed on the crops was low on both farms, 54% and 66%.

Farmer No. 5 devoted 19% of all farm labour to herding (Table IX).

He and his brother shared the herding of their livestock, only occasionally sharing with others. He employed a permanent labourer to herd their livestock for 187 days. He and his family only spent 11 days herding during the year. Another 50 days, or 5% of all labour, was employed to cut grass with which to feed the sheep and goats which he kept in a kraal for most of the year. He built an improved kraal for his sheep and goats, employed a builder to build a chicken house to the extension department's specifications and built his second wife a brick bedroom. She spent just over a month away at the home of a mid-wife while producing a baby, his senior wife was ill and resting for a total of nearly a month and he rested on four different days: in all 72 days lost to the farm. Farm No. 6 lost only 11 days due to illness ten of them while his second wife produced a baby. 9% or 112 man days were devoted to his truck business.

A.	<u>SURPLUS ON FARM OPERATIONS</u>		<u>NO. 5.</u>	£220.19.10.
B.	<u>DEPRECIATION ON FARM ASSETS</u>	CURRENT DEPRECIATION VALUE		
	Buildings 15%	10. 0. 0.	1.10. 0.	
	Tobacco Barn 25%	-	-	
	Implements 20%	17. 0. 0.	3. 8. 0.	
	Truck 15%	-	-	
	Livestock 12%	87. 0. 0.	10. 8. 0.	
	<u>TOTAL:</u>			<u>15. 6. 0.</u>
C.	<u>LEVY</u>			
	A.D.F. 10%	26. 1. 2.		
	Tobacco (commission & Levy) of 3%	-		
	<u>TOTAL:</u>			<u>26. 1. 2.</u>
	<u>INTEREST</u> paid on Co-Op.Loans			<u>1.19. 3.</u>
	<u>NET SURPLUS</u> A-(B+C+D).			<u>£177.13. 5.</u>

BALANCE SHEET

	Value of Homestead at beginning of year	52. 0. 0.		
	Value of Farm Assets at beginning of year	114. 0. 0.		
			166. 0. 0.	
<u>ADD</u>	Net Surplus		177.13. 5.	
	Family labour on construction		8. 8. 0.	
	Sundry Income		16. 0.	
	Capital introduced to farm & homestead		-	
			<u>352.17. 5.</u>	
<u>LESS</u>	Produce consumed on Farm		45. 2. 6.	
	Family Expenditure (Less Keep P.L.)		50. 1.11.	
	Other expenses		-	
			<u>95. 4. 5.</u>	
	FARM CAPITAL AT END OF YEAR			<u>£257.13. 0.</u>

REPRESENTED BY:			
	Fixed Assets O/Balance	166. 0. 0.	
	ADDITIONS: Farm	32. 8. 5.	
	Homestead	-	
	Family Labour on Con- struction	8. 8. 0.	
	Capital Surplus to Farm & Homestead needs	<u>66. 2. 7.</u>	
			272.19. 0.
<u>LESS</u>	Depreciation on Farm Assets	15. 6. 0.	
	H.P. Creditor	<u>-</u>	
			<u>15. 6. 0.</u>
	FARM CAPITAL AT END OF YEAR		<u>£257.13. 0.</u>

A.	<u>SURPLUS ON FARM OPERATIONS</u>		<u>NO. 6.</u>	£279.10. 3.
B.	<u>DEPRECIATION ON FARM ASSETS</u>	CURRENT VALUE	DEPRECIATION	
	Building 15%	11.13. 0.	1.15. 0.	
	Tobacco Barn 25%	-	-	
	Implements 20%	28. 0. 0.	5.12. 0.	
	Truck 15%	300. 0. 0.	25. 0. 0.	
	Livestock 12%	110.10. 0.	13. 5. 0.	
	<u>TOTAL:</u>			<u>45.12. 0.</u>
C.	<u>LEVY</u>			
	A.D.F. 10%	27. 7. 8.		
	Tobacco (commission & Levy) of 3%			
	<u>TOTAL:</u>			<u>27. 7. 8.</u>
	<u>INTEREST</u> paid on Co-Op.Loans			<u>1.19. 6.</u>
	<u>NET SURPLUS</u> A-(B+C+D).			<u>£204.11. 1.</u>

BALANCE SHEET

	Value of Homestead at beginning of year	62.14. 0.	
	Value of Farm Assets at beginning of year	<u>440. 3. 0.</u>	502.17. 0.
<u>ADD</u>	Net Surplus		204.11. 1.
	Family labour on construction		10. 1. 0.
	Sundry Income		54.12. 4.
	Capital introduced to farm & homestead		49. 3. 7.
			<u>801. 4.11.</u>
<u>LESS</u>	Produce consumed on Farm		61.19. 0.
	Family Expenditure (Less Keep P.L.)		115. 2.11.
	Other Expenses (Lobola)		<u>140. 9. 0.</u>
			317.10.11.
	FARM CAPITAL AT END OF YEAR		<u>£483.14. 0.</u>

REPRESENTED BY:			
	Fixed Assets 0/Balance	512.17. 0.	
	ADDITIONS: Farm	6. 8. 0.	
	Homestead	-	
	Family Labour on Construction	10. 1. 0.	
	Capital Surplus to Farm & Homestead needs	-	
			529. 6. 0.
<u>LESS</u>	Depreciation on Farm Assets	45.12. 0.	
	H.P. Creditor	-	
			45.12. 0.
	FARM CAPITAL AT END OF YEAR		<u>£483.14. 0.</u>

Farmer No. 5 increased the income potential of his farm by improving his livestock and chickens. He bought a cow, two sheep, built a better kraal for his goats and a proper chicken house. Family labour on construction was worth £8. 8. 0. The value of the farm and homestead increased by £31.10. 5, or 19%. Savings came to £66. 2. 7. Family expenditure, £50. 1.11, was the lowest of all the farms. Only one child was old enough to attend school which meant that expenditure on education and clothing was low.

Farmer No. 6 paid £140. 9. 0. to settle the lobola payment on his second wife, only £49 of which had to be introduced from previous savings. He belonged to a church which encouraged polygamy so that amongst other members he derived status from having two wives. He was aware that while a second wife increased the labour at his command, the three children that she bore him would involve him in considerable expense. That he saw her as a source of consumption expenditure and not just as an investment was shown when he opened savings accounts for each of his children to defray the expenses of their education when they reached school age.

The truck business earned £54.12. 4. (See p. transport). Excluding the lobola payment, savings on the year were £91. The value of the farmed decreased slightly, by £17. 3. 0. or 3%. He bought a steer to replace an older ox which he planned to stall-feed the next year. Family labour worth £10. 1. 0. went into the construction of a store-room, a kraal in which to stall-feed two oxen and an enlarged fish pond.

Farm No. 7 will be analysed on its own. The education and work experience of the farmer were similar to those of farmer No. 6. The two differed in the resources that they controlled. No. 7 was the first child in his village to attend school, which he put himself through working as a herd-boy and gardener in his free time. As the eldest of eight sons he has contributed to the education of each one, roughly £740. At the time of the survey he was supporting his youngest brother by his father's third wife at the secondary school attached to the Regina Coeli Mission. His brother's school fees, clothing, note-books and pocket money came to £61, nearly half of all family expenditure. His other brothers replied to his letters asking for assistance with the education of the youngest that they were now married and had to educate their own children. In return for his education the youngest brother worked on the farm in the holidays. The imputed value of his labour was £7.12.0. At the end of the year he went to an agricultural college to become a Demonstrator. The fees at the college are much less, but at the same time the farmer's six children would soon all be at school, with the first due to enter secondary school the year after the survey.

His farm capital consisted of a brick store-room which also served as the family bedroom and his 'office', a bricked in corner, in which he kept and read farm literature, and a few hand implements.

While having dinner with the farmer and a friend one evening, the farmer, in response to his friend's admiration of his house, explained about his five year plan. He was a born actor and to begin with it was treated with such seriousness and respect that I felt any lapse in completing the plan would have branded him as a miserable failure. The plan included the completion of his 'office', the construction of a house and the accumulation of a full complement of implements, a pair of oxen and a cow. However, he cleverly introduced the failings of the human - all too much himself - into the spokes of the mechanical plan and very amusingly explained that soon it would be left to his son (15 years old at the time) to take over and finish it in his, the son's lifetime! He may well have been taking off some self-righteous party boss, first when he came to power and later at his trial for treason and for squandering public funds.

His crops were limited to three - cotton, maize which he sold to the mission, and seed beans - because of his shortage of cash and his difficulty in not being able to find farmers prepared to plough on credit against the crop. Land-use intensity was the lowest of the ten farms, 1.4 (Table II). Use of the land over the year was 73%, not appreciably lower than the majority of farms. Illness and labour problems retarded the harvesting of all three crops. One bund was devoted to vegetables and was used intensively all year. Cotton and maize formed 89% of the gross value of the produce sold off the farm (Table IV A). The total value, £262, was higher than four other farms. Maize and vegetables formed three-quarters of the value of produce consumed on the farm, the lowest total of all the farms, £25. The average value per adult equivalent was only £3.6, again the lowest figure of the ten farms. Expenditure on food was comparatively high, £19: £5 of which bought chickens, eggs, wheat and fruit from neighbours. Total value of food per head was £6.3; again the lowest of the farms. The family sacrificed their health by skimping on food to meet other family needs. The toll on the performance of the farm was considerable, perhaps £35 to £45, if the poorer yield and cost of additional hired labour is approximated. Had the farmer been able to apply for credit to cover running expenses he could have installed labour during his absence while travelling with his wife to hospital and caring for her there. Even if he had not had time to apply for credit before leaving the scheme, the knowledge that he could on his return would have reduced the fear of labourers that they would not be paid until the cotton payment was made or not at all. Even £5 granted at the time of the application would have employed two labourers or a few women from the villages and saved the family seven to nine times that amount. His wife's family on the scheme could have supervised the labourers, though heavily committed to their own crops at the time.

68% of current farm expenditure, which at £156 was higher than 78% of all the farms in the sample, went on fertilizer and hired labour. Ploughing cost £6. Nearly all the hired labour was casual labour (Tables V and VI). The return on expenditure before imputing family labour was comparatively low, Net Surplus 63%.

After inputting family labour, Net Surplus as a return on all inputs was 41%, slightly above the locals (Tables VII and VIII).

With no cattle to herd or with which to plough, he was able to devote 76% of all labour employed to the crops (Table IX); only half of it was family labour and 40% casual labour (Table X). Local trade and vegetables took up 8%, local employment as a builder and committee work 6% each and illness 6% or fifty days.

A.	<u>SURPLUS ON FARM OPERATIONS</u>		NO. 7.	£131.16. 6.
B.	<u>DEPRECIATION ON FARM CAPITAL</u>	CURRENT VALUE	DEPRECIATION	
	Buildings 15%	49. 0. 0.	7.10. 4.	
	Tobacco Barn 25%	-	-	
	Implements 20%	3. 0. 0.	12. 0.	
	Truck 15%	-	-	
	Livestock 12%	-	-	
	<u>TOTAL:</u>			<u>8. 2. 4.</u>
C.	<u>LEVY</u>			
	A.D.F. 10%	20. 1. 3.		
	Tobacco (commission & Levy) of 3%	-		
	<u>TOTAL:</u>			<u>20. 1. 3.</u>
	<u>INTEREST</u> paid on Co-Op.Loans			<u>4. 3. 9.</u>
	<u>NET SURPLUS</u> A-(B+C+D)			<u>£99. 9. 2.</u>

BALANCE SHEET

	Value of Homestead at beginning of year	45. 0. 0.		
	Value of Farm Assets at Beginning of year	<u>52. 0. 0.</u>	97. 0. 0.	
<u>ADD</u>	Net Surplus		99. 9. 2.	
	Family labour on construction		2.14. 0.	
	Sundry Income		47. 2. 9.	
	Capital introduced to farm & homestead		<u>26. 0. 2.</u>	
			272. 6. 1.	
<u>LESS</u>	Produce consumed on Farm		25. 7. 0.	
	Family Expenditure (Less Keep P.L.)		143.17. 5.	
	Other Expenses		-	
	<u>FARM CAPITAL AT END OF YEAR</u>		<u>169. 4. 5.</u>	<u>£103. 1. 8.</u>

	REPRESENTED BY:			
	Fixed Assets O/Balance	97. 0. 0.		
	ADDITIONS: Farm	6.10. 0.		
	Homestead	5. 0. 0.		
	Family labour on Construction			
	Capital Surplus to Farm & Homestead needs	-	111. 4. 0.	
<u>LESS</u>	Depreciation on Farm Assets	8. 2. 4.		
	H.P. Creditor	-		
	<u>FARM CAPITAL AT END OF YEAR</u>		<u>8. 2. 4.</u>	<u>£103. 1. 8.</u>

The value of the farm and homestead increased by £6 or 6% during the year. A pole - and - dagga granary was built by two labourers. The farmer was employed to add a classroom to the local school. His net earning after paying the labour that he employed to mix cement and lift the bricks was £47.2.9., equivalent to £33 per month. Later he plastered his store-room to protect the home-made bricks from the rain. Family labour on construction was worth £2.14.0. His considerable family expenditure, £144, was made possible by the loan of £26 from a store-keeper to enable him to pay his labour. Had the loan come earlier he could have employed it more efficiently and might have repaid it within the year and have had savings to boot. Instead he ended the year in debt.

He depended on the continued goodwill of the missionaries to be able to remain in the scheme. He wrote to me later to say that they had dropped the price for maize to 18/- a bag, roughly comparable with local prices. The farmer had doubled the acreage of maize he grew to three acres, and though it represented a loss of 7/- per bag or a probable total loss of around £40, he was satisfied as he was engaged to sub-contract on a large dining-hall kitchen at the Mission Secondary School.

Farmers No. 8 and No. 9 had similar backgrounds; both had been self-employed in trading and in hawking after long careers in Salisbury and Johannesburg. Farm No. 9 had employed a man of thirty-eight for three years as a permanent labourer. The labourer had his own hut, frequently ate on his own, and took leave outside of peak labour demand periods as he wished. His wage was negotiated every now and again, but worked out at nearly £3 per month. The children provided 362 man days on the crops (Table X Appendix 1). As a result, the effective labour size of farm No. 9 was greater than that of No. 8 although he, No. 8, had three wives. However, No. 9 managed his mother-in-law's two acre plot and assisted his elderly father and a son on their plots. 14% of all labour was utilized as a gift to family. Both farmers faced the same limitation to their performance: transport. No. 9 decided to move into tobacco. No. 8 was prevented by his church from doing so. Instead he accepted the post as manager of the Co-operative at £7 per month and hired a quarter acre of land. On his increased acreage he planned to grow more cotton, to reduce his acreage of maize and grow vegetables. He intended exchanging vegetables for maize on the local market. Cotton, after the failure of seed-beans, remained his only cash crop.

No. 8, having a larger acreage of cotton and wheat and two bunds of rice, had a greater intensity of land use, 1.8 v 1.5 and a greater crop occupation of his plot, 80% v 67% (Tables II and III). Cotton formed 80% and 91% of produce sold off the farms. Wheat and vegetables, £8.10.1, accounted for 10% of farm sales on farm No. 8 (Table IV A). Both farms

had low totals, with No. 8, £176, the lowest of the ten farms. Maize formed a  $\frac{1}{5}$  and  $\frac{1}{3}$  of the value of produce consumed on the farms, wheat was in similar but smaller proportions and vegetables were nearly  $\frac{1}{5}$  on both farms (Table IV B). There was little fruit on either farm. No. 8 grew rice and ate fish fairly frequently. No. 9 relied on chicken, eggs and beer which his wife brewed frequently for their protein intake. The average value per adult equivalent was about average for the farms, £8 and £7. After including cash expenditure on food the figures rose to £11 and £9.

Farm No. 8 had the lowest current farm expenditure, only £70, between  $\frac{7}{10}$  and  $\frac{1}{2}$  of the amount spent on the other farms. The three major items, fertilizer, transport and wages were each the lowest of the farms. He used more manure than most farmers, but felt that he had made his soil too rich for cotton. The plants grew to a height of five feet and were slow to form bolls. Consequently his yield was poor.

Although both farmers grew limited crops, and had a large supply of family labour, they both hired labour. Farmer No. 8 to assist his three wives picking cotton while he worked as the Co-operative's manager, and Farmer No. 9 to help with the construction of his tobacco barn and the management of his mother's plot (Table VI).

Net Surplus as a return on current expenditure (Table VII) was high for farm No. 8, 174%, current expenditure being low. However, once the value of family labour was charged, (Table VIII) the return to both farms was more comparable, 54% and 42%. The value of family labour was high on both farms, £159 and £134, and contrasts with the low figure for average family adult man/days employed on the crops, only 181 and 140 days, the lowest of all the ten farms (Table X). The proportion of all labour expended on the crops was fairly low on both farms: 63% and 60%. Both farms used considerable labour to herd their own and family cattle (Table IX). The youngest wife on farm No. 8 spent two days a week herding, which was unusual as children or labourers herded for all the other families in the sample. She did this in order to escape her husband's two older wives and to meet other young people. The proportion of total labour expended on local employment was high on both farms. The 9% figure on Farm No. 8 records his employment as the manager of the Co-operative and the 14% for No. 9 his assistance to family. The value of No. 9's labour gift was £34. His mother-in-law gave him £10 after the cotton payment and his family returned labour to the value of £7.7.0. The net gift of labour, excluding oxen and implements, was therefore £13.13.0. Farm No. 8 rebuilt his fish pond and Farm No. 9 built a tobacco barn.

A.	<u>SURPLUS ON FARM OPERATIONS</u>		NO. 8.	£157. 8. 11.
B.	<u>DEPRECIATION ON FARM CAPITAL</u>	CURRENT VALUE	DEPRECIATION	
	Buildings 15%	4. 0. 0.	15. 0.	
	Tobacco Barn 25%	-	-	
	Implements 20%	63.15. 0.	12.15. 0.	
	Truck 15%	-	-	
	Livestock 12%	54. 0. 0.	6.10. -.	
	<u>TOTAL:</u>			<u>20. 0. 0.</u>
C.	<u>LEVY</u>			
	A.D.F. 10%	15. 6. 5.		
	Tobacco (commission & Levy) of 3%	-		
	<u>TOTAL:</u>			<u>15. 6. 5.</u>
	<u>INTEREST</u> paid on Co-op.Loans			<u>1.18. 6.</u>
	<u>NET SURPLUS</u> A-(B+C+D)			<u>£120. 4. 0.</u>

BALANCE SHEET

	Value of Homestead at beginning of year	36. 0. 0.	
	Value of Farm Assets at beginning of year	<u>121.15. 0.</u>	157.15. 0.
<u>ADD</u>	Net Surplus		120. 4. 0.
	Family Labour on construction		4. 1. 0.
	Sundry Income		37.19. 0.
	Capital introduced to farm & homestead		<u>6.11. 5.</u>
			326.10. 5.
<u>LESS</u>	Produce consumed on Farm		51. 2. 4.
	Family Expenditure (Less Keep P.L.)		79. 7. 5.
	Other Expenses		<u>34. 1. 5.</u>
			164.11. 2.
	FARM CAPITAL AT END OF YEAR		<u>£161.19. 3.</u>

REPRESENTED BY:

	Fixed Assets O/Balance	157.15. 0.	
ADDITIONS:	Farm	20. 3. 3.	
	Homestead	-	
	Family labour on Con- struction	4. 1. 0.	
	Capital Surplus to Farm & Homestead needs	<u>-</u>	181.19. 3.
<u>LESS</u>	Depreciation on Farm Assets	20. 0. 0.	
	H.P. Creditor	<u>-</u>	
			<u>20. 0. 0.</u>
	FARM CAPITAL AT END OF YEAR		<u>£161.19. 3.</u>

A.	<u>SURPLUS ON FARM OPERATIONS</u>		<u>NO. 9.</u>	£150.18. 4.
B.	<u>DEPRECIATION ON FARM CAPITAL</u>	CURRENT	DEPRECIATION	
		VALUE		
	Buildings 15%	26. 0. 0.	4. 0. 0.	
	Tobacco Barn 25%	-	-	
	Implements 20%	81. 0. 0.	17. 8. 0.	
	Truck 15%	-	-	
	Livestock 12%	75. 0. 0.	9. 0. 0.	
	<u>TOTAL:</u>			<u>30. 8. 0.</u>
C.	<u>LEVY</u>			
	A.D.F. 10%	20.10.10.		
	Tobacco (commission & Levy) of 3%	-		
	<u>TOTAL:</u>			<u>20.10.10.</u>
D.	<u>INTEREST</u> paid on Co-Op. Loans			<u>2. 9. 1.</u>
	<u>NET SURPLUS</u> A-(B+C+D)			<u>£97.10. 5.</u>

BALANCE SHEET

	Value of Homestead at beginning of year	8. 0. 0.		
	Value of Farm Assets at beginning of year	<u>182. 0. 0.</u>	190. 0. 0.	
<u>ADD</u>	Net Surplus		97.10. 5.	
	Family labour on construction		7.10. 0.	
	Sundry Income		12. 9. 0.	
	Capital introduced to farm & homestead		<u>105. 5. 2.</u>	
			413.14. 7.	
<u>LESS</u>	Produce consumed on Farm		41.17. 0.	
	Family Expenditure (Less Keep P.L.)		131. 9. 1.	
	Other expenses		-	
			<u>173. 6. 1.</u>	
	FARM CAPITAL AT END OF YEAR			<u>£240. 8. 6.</u>

REPRESENTED BY:

	Fixed Assets O/Balance	190. 0. 0.		
ADDITIONS:	Farm	45.18. 0.		
	Homestead	26.18. 6.		
	Family labour on Construction	7.10. 0.		
	Capital Surplus to Farm & Homestead needs	-	270.16. 6.	
<u>LESS</u>	Depreciation on Farm Assets	30. 8. 0.		
	H.P. Creditor	-		
			<u>30. 8. 0.</u>	
	FARM CAPITAL AT END OF YEAR			<u>£240. 8. 6.</u>

Farmer No. 8 increased the net value of his farm by £4. To do this he introduced £6.11.5. to the farm and homestead above the £38 he earned as manager of the Co-operative. Family expenditure was low, £79, but with the addition of other expenditure, repairs to his van and to a bicycle, the total of £113 was comparatively high. During the year one of his two trained oxen died and he replaced it with another which cost £15. Apart from the quarter acre that he rented, the farm was no better placed at the end of the year than at the beginning.

Farmer No. 9 followed a deliberate plan to improve the potential of his farm and the comfort and status of his family. He built a house and a tobacco barn. He also bought a young ox and a heifer to strengthen the potential of his herd to meet continued family demands for assistance and to prepare for the stall-feeding of the oldest of his four trained oxen. Additions to farm and homestead, including the imputed value of family labour on construction, came to £72. The increase in the net value of the farm and homestead was £50. Clothing, nearly half of which was for school uniforms, school fees and furniture for the house (£58, £20 and £15) accounted for 70% of family expenditure. To finance the year, £105 was introduced to the farm and homestead. The farmer had accumulated over £400 while working as a seed-salesman in Johannesburg where he earned £22 per month. Since returning in 1954 he had worked as a boss-boy for the African Development Fund at £5 per month and for six years had held a hawker's licence at Inyanga which he utilized for the first two years that he was on the scheme to help meet the education expenses of his children and to assist family. At the end of the year the farmer told me that he had savings of £180 which he hoped his tobacco would enable him to build up again to £400.

Farm No. 10 was made up of two plots. The farmer had applied for the second plot for his brother and hoped that he would soon join the scheme. For over half the year his brother's wife helped on the farm before returning to look after their aged parents who lived close to Inyanga. His wife was ill in hospital for a month and spent several weeks tending a child who was in hospital. In all she was away from the farm for three months. The farmer employed two permanent labourers who remained for the greater part of the year. One of the labourers, a boy of 15, had been with him for two years. During the year the farmer bought a second-hand truck which enabled him to transport his crop of ration beans to Umtali for sale. His land-use intensity was high for the scheme, 1.7 (Table II), and his crop occupation of the fields, 73%, about average. He grew three and a half acres of cotton, two and a half acres of tobacco, and just over four acres of seed-beans and an acre and a half of ration beans. His average of maize was slightly higher than the average for the sample, just under two acres.

The gross value of produce sold off the farm, £835, was over twice that of any other farm. Tobacco formed a higher proportion of income, 58%, than on the other two tobacco farms, and cotton only 30% (Table IV A). Gross income from the four acres of seed-beans was only £42, similar to that from his acre and a half of ration beans. He sold six pigs, one of which was condemned, to the Cold Storage Commission. The Extension staff were unable to tell him why the pig had been condemned and he did not, as they suggested, write to the Commission to find out. 81% of the value of produce consumed on the farm was maize, of which 4% was eaten green. Beans and vegetables formed 12% and chicken and eggs, the main source of protein, only 3%. £26 was spent on food, nearly £4 from neighbours for chickens, fruit and rapoko. Average value per adult equivalent was £10, higher than on most farms (Table IV B).

Current Farm Expenditure was from three to six times that for the other single plot farms (Table V). Labour £129, transport £114, and fertilizer £92, account for 73% of expenditure. The farmer paid £40 for the purchase and transport of fifteen tons of manure which he spread on the land prior to planting tobacco. Casual and permanent labour formed roughly a half each of his total labour bill (Table VI). He was the only farmer to use casual labour on nearly every farm activity. The other farmers used casual labour almost exclusively on reaping and processing (see Table X, part III, Appendix I).

Surplus on Operations, £394, and Net Surplus, £293, were from three to one and a half times that on the four acre farms (Table VII). Net Surplus as a return to current farm expenditure and the imputed cost of family labour was 52%, mid-way between the ten farms. 82% of all labour was devoted to the crops, or over twice as many man/days as on any other farm (Table IX). He kept his four oxen at his parents home at Tombo for most of the year where the grazing was better. It took a labourer a day to herd them to or from, a total of six days in the year. While on the farm they spent most of the time working and therefore little labour was employed to herd them. The farmer rebuilt part of his barn and part of his rudimentary pig sty and cattle kraal.

Man/days per family adult equivalent employed on the crops was high for the scheme, 232 (Table X) and was similar to that on the other two tobacco farms.

A.	<u>SURPLUS ON FARM OPERATIONS</u>		<u>NO. 10.</u>	£393.12. 1.
B.	<u>DEPRECIATION ON FARM CAPITAL</u>	<u>CURRENT VALUE</u>	<u>DEPRECIATION</u>	
	Buildings 15%	10. 0. 0.	1. 5. 0.	
	Tobacco Barn 25%	85. 0. 0.	21. 5. 0.	
	Implements 20%	31. 0. 0.	6. 4. 0.	
	Truck 15%	200. 0. 0.	10. 0. 0.	
	Livestock 12%	85. 0. 0.	9. 12. 0.	
	<u>TOTAL:</u>			<u>48. 6. 0.</u>
C.	<u>LEVY</u>			
	A.D.F. 10%	29. 4. 6.		
	Tobacco (commission & Levy) of 3%	16. 2. 8.		
	<u>TOTAL:</u>			<u>45. 7. 2.</u>
D.	<u>INTEREST</u> paid on Co-Op. Loans			<u>6. 9. 7.</u>
	<u>NET SURPLUS A-(B+C+D)</u>			<u>£293. 9. 4.</u>

BALANCE SHEET

	Value of Homestead at beginning of year	35. 0. 0.	
	Value of Farm Assets at beginning of year	<u>211. 0. 0.</u>	246. 0. 0.
<u>ADD</u>	Net Surplus		293. 9. 4.
	Family labour on construction		4. 19. 0.
	Sundry Income		50. 11. 0.
	Capital introduced to farm & homestead		<u>25. 10. 8.</u>
			695. 10. 0.
<u>LESS</u>	Produce consumed on farm		32. 18. 6.
	Family Expenditure (Less Keep P. Labourers)		100. 9. 5.
	Other expenses		<u>108. 15. 1.</u>
			242. 3. 0.
	<u>FARM CAPITAL AT END OF YEAR</u>		<u>£378. 7. 0.</u>

REPRESENTED BY:

	Fixed Assets O/Balance	246. 0. 0.	
<u>ADDITIONS:</u>	Farm Capital	250. 14. 0.	
	Homestead	-	
	Farm labour on construction	4. 19. 0.	
	Capital Surplus to Farm & Homestead needs	-	501. 13. 0.
<u>LESS</u>	Depreciation on Farm Assets	48. 6. 0.	
	H.P. Creditor	<u>75. 0. 0.</u>	
			<u>123. 6. 0.</u>
	<u>FARM CAPITAL AT END OF YEAR</u>		<u>£378. 7. 0.</u>

Depreciation on the truck has been charged for only the period it served the farm, four months. The farmer showed a profit on the hire of his truck of £30, roughly £10 a month, and he made £20 on the re-sale of green maize bought on the scheme and sold in Umtali. The repair to his truck after an accident, and a deposit for the lawyer cost £106. The truck cost £200, of which he had paid £125. The material and labour

hired to rebuild part of the barn cost £30. The largest item under family expenditure was travel, £22, most of it incurred in connection with the accident. The net value of the farm increased by £130 after deducting the £75 still owed on the truck. His large income had enabled him to buy the truck with the introduction of only £25 to the farm from the savings that he and his brother were collecting towards a store. He also paid the lease on the shop-site, £3. His success on the scheme had reduced his interest in the idea of the shop, but his brother, a waiter in Salisbury Hotel, remained more interested in the shop than in the farm.

The truck gave the farmer confidence in his ability to manage the farm. He planned to grow four acres of tobacco and four acres of cotton - no maize - the next season and to expand the number of pigs he sold to nearly twenty. He bought fifteen piglets for £9.9.0. from two villagers. Later in the year he planned to grow two or three acres each of ration beans and green maize which he would transport to Umtali on his truck.

Certain indices of performance abstract the numerous factors which cause individual farms to differ and they provide a means for direct comparison. Three accounting concepts adapted to meet the conditions of peasant farms may be utilized. The Rate of Return on Capital has been calculated using the formula:

$$R_c = 100 \left( \frac{Y - (L_1 + L_2)}{C} \right) \%$$

where Y = Net Surplus.

L1 = imputed value of family labour related to crop production and farm maintenance only.

L2 = imputed value of other unpaid labour.

C = capital value of farm assets, including a £200 valuation on the four acre plot.

The inclusion of the value for the plot would not be part of any calculation by the farmers as no rent had yet been charged.

The Return to Family Labour has been calculated as equal to:

$$R_f = Y - (i + L_2)$$

where Y = Net Surplus

i = imputed interest on capital (7%).

and The Return to Management which is the residual of the Return to Family Labour:  $R_m = R_f - (L_1 + L_2)$

TABLE XI

ACCOUNTING INDICES OF FARM PERFORMANCE.

Farm No.	1	2	3	4	5	6	7	8	9	10
Rc	-22.2%	-9.3%	46.6%	11.3%	19.1%	20.4%	5.9%	-12.1%	-9.4%	29.5%
Rf	£80	£95	£195	£141	£165	£179	£95	£103	£75	£263
Rm	-£63	-£45	£130	£30	£47	£77	£11	-£56	-£59	£170

1. The negative returns to capital result when the top line of the equation is negative ( $Y - (L1 + L2)$ ): when Net Surplus is less than the imputed value of family labour plus unpaid labour.

The indices appear in Table XI and can be examined together. The three tobacco farmers, No's 3, 4 and 10, and the two farmers who grew a variety of cash crops, Farmers No. 5 and 6, had considerably higher returns to capital, labour and management than did the other five farmers. Farmer No. 7 had positive results despite the untimely illness of his wife. Had the mission not enabled him to treat maize as a cash crop, from which he netted £48, his position would have been disastrous. Farmers No's 1, 2, 8 and 9 grew only cotton and seed-beans as cash crops, in effect only one cash crop, and Farms No. 1 and 2 employed considerable quantities of casual labour as part of a pattern in which old ties with the villagers were maintained.

The settlers at Nyamaropa who had severed traditional ties and were free to employ permanent rather than casual labour and who were able to grow and market a variety of crops, principally tobacco if their religious affiliations allowed them to do so, all performed well according to the indices. The very high return to capital on these five farms, particularly as the value of the four acre plot has been included in the calculation, suggest that the increased intensification of these farms would bring large returns. The capital to farm ratio had not yet reached an optimum. The return to marginal increments of capital would appear to be likely to remain high even if the capital employed on the farms were to be considerably increased. The farmers were aware of this and showed a willingness to plough savings back into the farm. Were the weaknesses in the extension, credit and marketing services removed, then every indicator would suggest that all the farms on the scheme would profit from the employment of additional capital.

On the other five farms, the small and the negative returns to capital might be disputed on the reasonable grounds that the valuation on the plot would not enter any calculations made by the farmer. However, the four returns that are negative would remain negative as the top line of each equation is negative; and, as is the way with negatives, the negative figure would increase. For instance, on farm No. 9 the rate of return on capital would be - 20%. It is an accurate reflection of performance: there is more honour in falling off a big horse than a little horse! Significantly, there is a positive correlation between all three sets of figures, particularly the rate of return on capital and

to management. The only farmer to differ in this respect is No. 10. His figures are all more than satisfactory and demonstrate that a larger acreage can bring a greatly increased return to family labour and to management.

The opportunity which the scheme offered to the farmers should be measured as Net Surplus plus sundry income where sundry income was expected regularly. Most of the farmers who earned sundry income expected to continue to derive income from that source. Had the farmers not joined the scheme, then their wives and children would normally have subsisted at their traditional homes. The opportunity cost to farming on the scheme is thus the Net Cash Income earned on the scheme (Net Surplus + Sundry Income - Produce Consumed on the farm). If we divide this by twelve, it represents the wage the farmer would have to earn in town to be approximately as well off as on the scheme. The resultant equivalent wage figure is, of course, devoid of any consideration of the rent, transport, return on capital or to Management, and the possible subsistence earning differences that may arise. The farmers were generally agreed that, were they to work in town, they would have to send money home to enable their families to purchase food basic to their needs. The amount necessary, the farmers stated, would vary from £1 to £2 per month. Table XII\* shows the opportunity cost of the scheme to the ten farmers.

Using the equivalent wages derived from their net cash income in comparison with their previous salaries it may be seen that five farmers were better off on the scheme, No's 1, 3, 4, 5 and 10; and one was indifferent, No. 2; it was likely that four farmers, No's 6, 7, 8 and 9 would have been able to improve their financial positions were they to find employment in jobs as remunerative as those which they had been in before joining the scheme. Of these farmers, farmer No. 9 had improved the performance potential of his farm by preparing to enter tobacco; farms No. 6 and No. 8 had the capital and the family labour to make a success of the stall-feeding that they planned to undertake and both enjoyed a varied and substantial diet from produce grown on their farms. Only farmer No. 7, who was characteristic of roughly 18% of the farmers on the scheme, would be unable to improve the potential of his farm without proper extension and credit assistance.

It is interesting that the four farmers who had attained the most advanced levels of work experience were the only farmers who, by comparison with their previous earnings, had not benefitted by joining the scheme.<sup>1</sup> Each of the four farmers had been self-employed prior to joining the scheme. On the scheme, each had filled leadership roles. During the survey year, three sat on committees and two were prominent churchmen. Each had joined the scheme because it seemed to offer he and his family the opportunity to

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1. See Table I.

\* Please turn over two pages.

build a better home than did their traditional homes or the towns. However, this social factor should not be relied upon to hold them on the scheme for much longer particularly as each had been on the scheme for at least three years. Savings accumulated prior to joining could not be expected to be used to meet the deficit between their actual income and their expectations based on previous earning capacity. The family expenditure of all four farmers would rise dramatically as their large families, six to eight children each, entered school and, possibly, moved up to secondary school.

At the time of the survey the scheme could not offer settlers of five years standing farming the standard four acre plot an income comparable with previous earnings above £15 - £16 per month. The husbands of the grass-widows, each of whom was earning over £30 per month, could only have considered joining their wives on the scheme if they were prepared to drop their income by at least a half!<sup>2</sup> The significance of the failure of the scheme to reach a level of performance capable in money terms of retaining or attracting Africans who had been or were relatively successful in the money economy cannot be ignored.

The ten farms analysed suggest that the farmers at Nyamaropa were investing their income to a considerable extent to improve the earning potential of their farms and to reduce or remove the limitations and barriers that they faced. Investment was being made in the knowledge that for most families education expenses were going to increase expenditure considerably in the years ahead. They did this almost despite the presence of Extension and other advisory and administrative personnel whose activities were mostly peripheral to their real needs. The farmers all displayed and expressed a clear knowledge of their business environment and most were beginning to control it to serve their own requirements.

The scheme appeared to have reached a stage akin to that of take-off. However, the introduction in three stages of rent and water rates up to £56 per annum for a four acre plot, or nearly £5 per month begun the year after the survey alters the picture of progress towards maturity dramatically. After deducting the total proposed rent, the equivalent wage in town that would draw the farmers away from the scheme left only one farmer, No. 10, with a clear alternative to stay (Table XII).

If the payment of the rent and water rates are included in the calculation of the accounting indices gloomy figures result (Table XIII). Only four of the ten farms, No's 3, 5, 6 and 10 now show positive returns to capital or to management - nearly half the number which showed positive

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2. They must have been in a dilemma anyway as their wives had been unable to make the farms pay.

returns before rent was deducted (Table XI). The return to family labour on five of the farms is below £50 for the year and the highest for the four acre farms is £136 which is roughly equivalent to a family income of £11 per month. The great majority of the farmers at Nyamaropa hoped to be able to put their children through secondary school. The return to family labour may, therefore, be evaluated in terms of the number of children it could support at secondary school. At approximately £60 p.a. for each pupil, five of the ten families would not have earned sufficient to enable even one child to attend secondary school and only three families sufficient for two children.

TABLE XII

THE OPPORTUNITY COST OF FARMING ON THE SCHEME

(all figures are £'s)

Farm No.	1	2	3	4	5	6	7	8	9	10
Net Cash Income	70	57	179	120	133	197	121	107	68	311
Equivalent wage in Town	6	5	15	10	11	16	10	9	6	26
Equivalent wage in Town after Rent deducted	1	0	10	5	6	11	5	4	1	16
Previous Salary	2	5	11	6	9	20	16	11	22	11

TABLE XIII

ACCOUNTING INDICES AFTER CHARGING RENT OF £56 p.a. PER FOUR ACRE PLOT

	1	2	3	4	5	6	7	8	9	10
Rc	-46.7%	-24%	24.9%	-2.6%	1.9%	9.6%	-15.8%	-28.9%	-23.9%	13.6%
Rf	£39	£24	£136	£85	£109	£123	£39	£47	£19	£151
Rm	-£119	-£101	£74	-£26	-£9	£21	-£41	-£112	-£115	£58

THE DISTRIBUTION OF LABOUR INPUTS OVER THE YEAR.

As we have already seen, difficulties surrounding transport, the paucity of the demand for food crops in the surrounding area, and the intrusion of the villagers' cattle onto the scheme had a marked adverse effect on the crops the farmers could grow and market. In other words no farmer on the scheme had been able to reach the maximum physical utilization of his four acre plot. Only farmer No.6 had, of all the fifty members of the sample, achieved an intensity of farming that was satisfactory in relation to the possible physical optimum use of his plot.

The extent of the deficit between actual performance and potential performance can be investigated by examining the labour input on the farms over the year. Four farms were selected for this purpose, three of which were examined in the previous chapter - Nos. 3, 4 and 5. Farmers No.3 and No.4 both grew tobacco, but differed considerably in their efficiency, family size and the non-crop activities that they undertook, principally farm and homestead construction. Farmer No.5 was barred from growing tobacco by his church. He grew more cotton than did most of the farmers, and he grew wheat, potatoes, green maize and vegetables for sale on the local market (Table II).<sup>1</sup> He also raised more chickens and minor livestock than did the great majority of the farmers, again for sale on the local market. The fourth farm to be examined was a Local A, a former villager. This farm was chosen because, having a large family (three adults and two children over fourteen who helped on the farm in their school holidays) the farmer was able to reduce his total dependence on the labour of the village women. However, he still used the women inefficiently when he did employ them. Like most of the Locals A, he did not hire permanent labour. Herding has been omitted from the profiles as the labour devoted to herding was subject to labour given in return for implements and the use of oxen, and often family groups shared the task.
















Farms No.3 and No.4 can be treated together. Farmer No.3 commanded little family labour as his wife was ill for three months of the year, part of August and September and most of November and December. As a result the farmer undertook little work outside of

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1. All tables referred to appear in the chapter on the Performance of the Farms.

# Seasonal Distribution of Labour Inputs by Operation and by Category of Labour.





## Legend

Crop Activities	Graphs A	Non-Crop Activities	Graphs B
Cotton		Farm Construction	
Maize		House Construction	
Tobacco		Labour Exchange	
Seed Beans		Fieldwork	
Wheat		Manure	
Potatoes		Care of Livestock	
Green Maize		Keeping Villagers' Cattle off Field	
Groundnuts			

## Labour

Family	
Permanent	
Casual	
Exchange	
Beer Group	
Church Group	

## Labour

Family	
Permanent	
Exchange	
Beer Group	

activities related to the crops (Graph I B). In November he re-thatched one side of his barn and in January he manured two bunds preparatory to planting potatoes. He and his wife assisted his father in July, and in August and September, working mostly on his own, the farmer cleared the canal serving his field, "winter" ploughed and manured two more bunds.

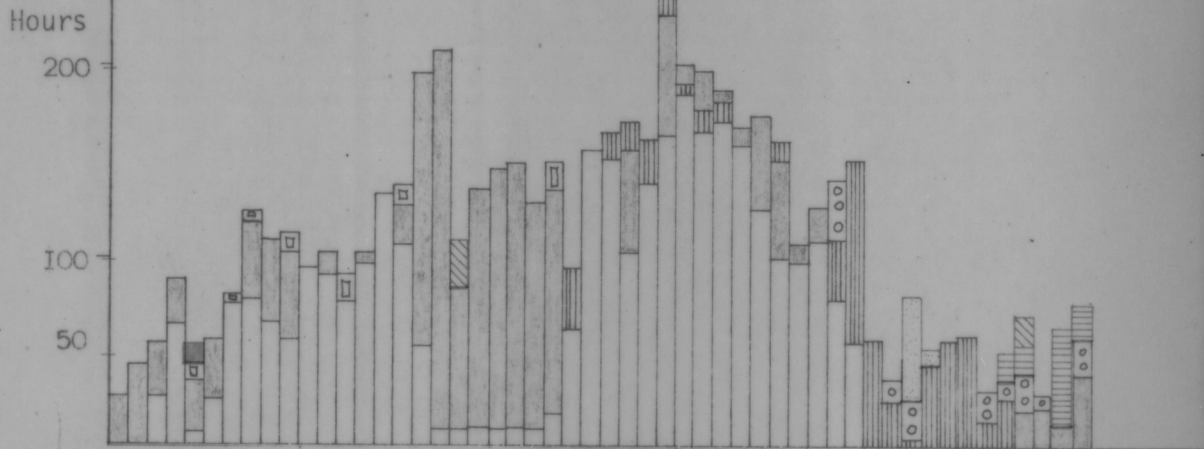
The most noticeable feature of his labour use profile is the way in which he was able to devote family and permanent labour almost exclusively to tobacco from the middle of January until the middle of March (Graph I A). In those seven weeks he completed the bulk of the reaping and processing of his tobacco. He devoted one morning, or ten hours a week, when he and a labourer sprayed the cotton. Farmer No.4, who grew five bunds of tobacco compared to No.3: seven bunds, devoted the same seven weeks almost exclusively to tobacco. However, it was his first season of tobacco and he worked slowly. Consequently he spent a considerable time in April and May working in his barn when No.3 was able to devote nearly all his labour to picking cotton (Graphs 2 A and I A).

Had farmer No.3's father owned a truck instead of a Land-Rover he would, he said, have planted ten instead of only five bunds of potatoes to transport and sell in Umtali and have kept on the permanent labourer that he had in June. As it was he busied himself sorting the poor bean crop, tending his potatoes and the tobacco seedbed.

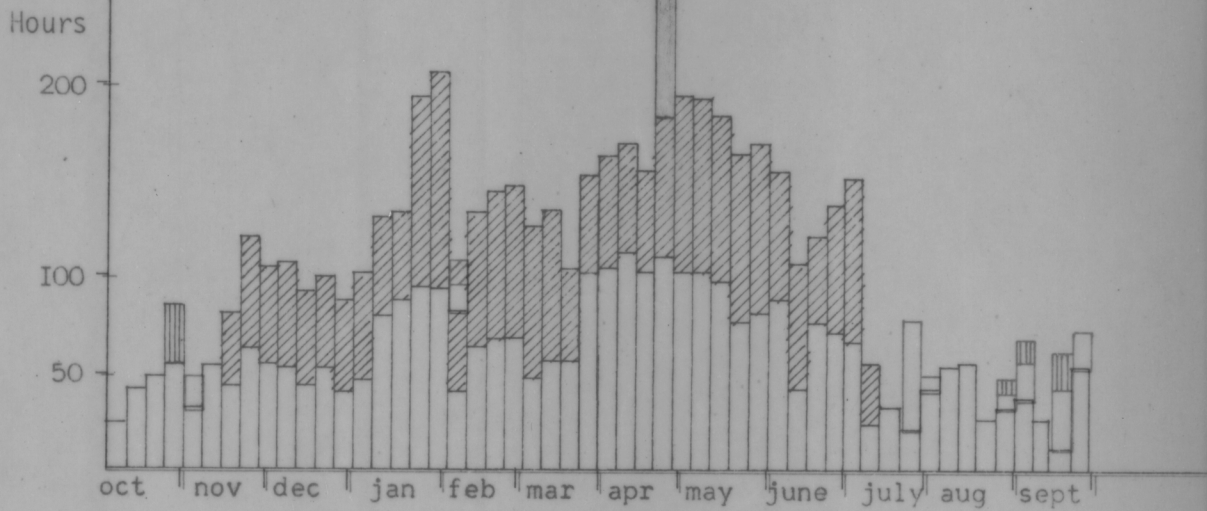
Farmer No.4 commanded more family labour than did No.3,  $2\frac{1}{2}$  adults v  $1\frac{3}{4}$ . He utilized his plot more fully than did No.3, 77% v 68% (Table III). His seed-bean yield was almost twice that of No.3 and consequently he expended considerably more labour sorting the beans. Potatoes, wheat, his tobacco seedbed and (Graph 2B) labour employed on farm and home construction, field preparation and manuring kept family and one permanent labourer fully occupied through the "off-season" of July, August and September. In September his wife brewed beer with which to attract men and women to help the family build up the ridges on which to plant out his next tobacco crop (Graph 2A). By September the beer drinks were in full swing in the villages and many of the farmers who were not busy on their own farms were away or resting in the shade after ploughing in the early morning to avoid the great heat of the pre-rain period. The only way to raise a labour force was by the offer of beer. Twenty eight people worked an average of three-and-half hours each and the ridges were made by noon. Farmer No.4 did not own a ridge plough. 13% of all labour was employed on construction.

Activities

Farm No. 3 Graph A



Labour



Activities

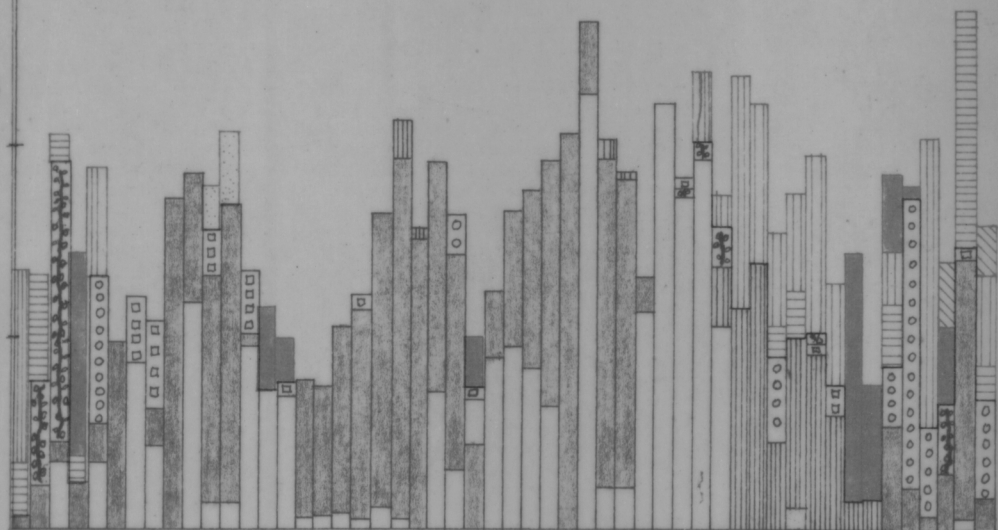
Farm No. 4

Graph A

Hours

200

100

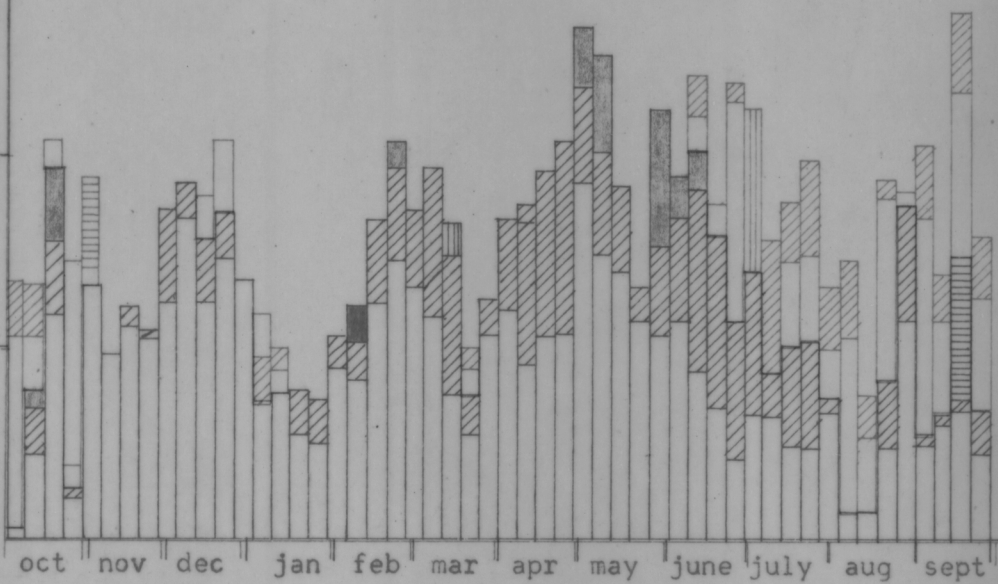


Labour

Hours

200

100



Farmer No.3 employed over 200 hours/week on only two weeks and on twenty-one weeks employed less than 100 hours. Farmer No.4 employed over 200 hours/week on eleven weeks and less than 100 hours/week on only four weeks.

The most noticeable feature of the labour profile of farm No.5 is that from January till the end of March there is a slot on Graph 3A into which the peak labour expended on tobacco by farmers Nos. 3 and 4 would fit quite comfortably. In other words, the labour arrangements over that period arrived at by farmers Nos. 3 and 4 were determined by the crops and not governed by the ability and labour commanded by the two tobacco growers. In the absence of tobacco farmer No.5 devoted more time to cultivation (his field of cotton was immaculate), to reaping green maize which he planted late in September to ripen during January and February and to non-crop activities. He employed little labour, and employed it early in the picking season with the result that the bulk of his cotton was either grade I or II. The whole family fell ill in turn during part of October and November so that he hired a labourer to help for four weeks at that time. He and his two wives were happy to work just under 200 hours/week when needed (60 hours a week each), yet the limitations to his ability to market crops prevented them from exceeding, with hired labour, 200 hours/week except on five weeks of the year. On fifteen weeks they worked less than 100 hours. All non-crop activities were performed by family labour.

Farmer X had a land-use pattern that was typical of the Locals A: two acres each of cotton and maize (fourteen bunds), with an acre and three-quarters of seed-beans and one-seventh of an acre of wheat replacing the maize in March and April. The most noticeable feature of farmer X's labour profile is the considerable variability in labour inputs. The farmer and his two wives worked from 100 to 160 hours a week (33 to 53 hours each) from the middle of December until August, over seven months (Graph 4A). When his two school-aged children were on holiday in December and May family labour input per week rose from 160 to 254 hours a week (again over 50 hours a week each). In the seven weeks from mid-January to mid-March when tobacco growers devoted most of their time to tobacco and farmer No.5 with only four bunds of maize had little to do, farmer X devoted 470 hours to cultivate his fourteen bunds of maize and 260 hours to reap it. He hired casual labour and brewed beer to attract more labour to complete the cultivation, all of which was done by hand. He farmed his maize extensively which

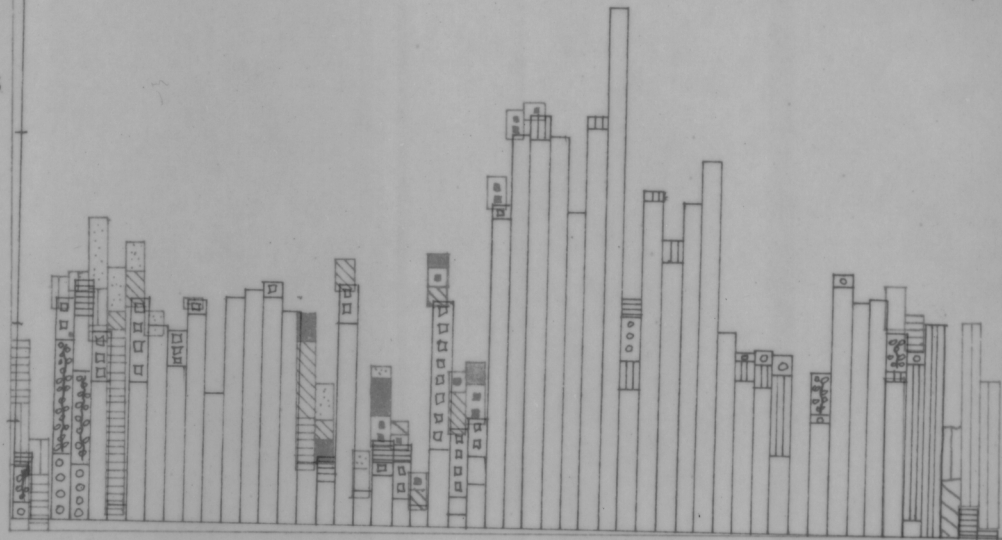
Activities

Farm No. 5 Graph A

Hours

200

100



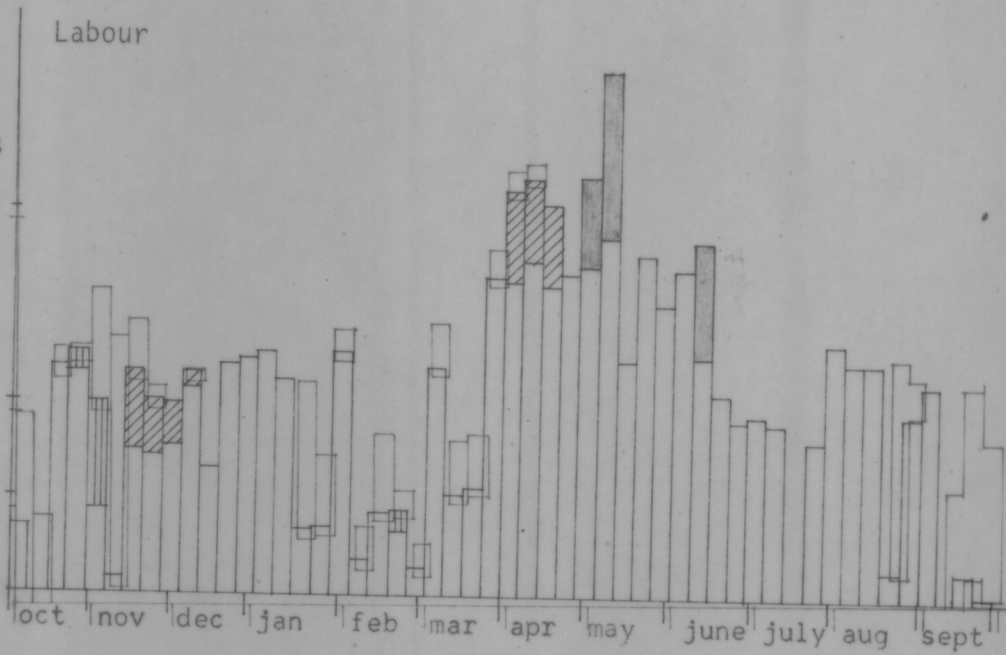
Labour

Hours

200

100

50



meant more cultivation per bag of maize produced. His yield was eleven bags/acre. No.5 on his four bunds reaped sixteen bags of maize or twenty-eight bags/acre. Because, like most of the former villagers, farmer X planted his cotton late, his major efforts to reap came in May and early June. This is over a month behind farmers No.3, 4 and 5 and fits in with the availability of casual labour in early May and particularly in June. Family labour inputs began to tail off from the middle of July on, only to be suddenly lifted to 300 hours per week when the village women came to help sort the beans. For half of August, the whole of September and part of October little work was done on the farm except to complete sorting the beans and to build a fence and re-build a hut. The farmer undertook no winter ploughing.

Farmer X had managed to spread his use of family labour over nine months and so reduced his dependence on the only labour which social forces ruled that he may hire. Once his fence was completed the demand for labour to husband the additional winter and spring crops which he could then grow would allow him to utilize family labour more fully and necessitate the earlier planting of cotton. By planting his cotton earlier he would not be able to rely on the village women as they would be forced to work on the scheme a month behind the peak reaping period. The fence could begin a process which might lead to farmer X's disassociation with the villagers through the hire of permanent labour.

Were farmer X to grow tobacco he would have to intensify his production of maize in order to lessen the labour demand in the seven weeks from January to March. The tobacco growers had realised this and a few of them had begun to drop maize altogether, seeking instead to buy their maize requirements in the local market.

We noticed, and the labour profiles support this, that the farmers exhibited a definite tendency to group farm tasks either side of a weekend. We recorded several instances in which the cultivation of one crop was left unfinished if by Saturday evening it had not been quite completed. On the following Monday morning the family would start on a new task. If they employed labour at the time the labourer might be given the task of completing the cultivation. After discussing this phenomena with the farmers I concluded that they regarded it as psychologically beneficial as the week was begun without the clutter of old work with which they were bored.

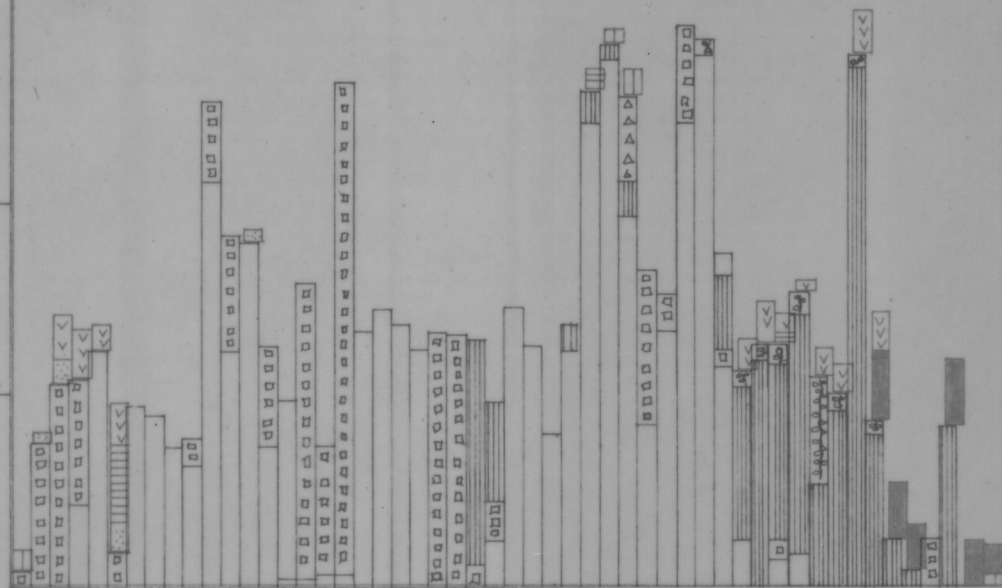
# Activities

Farm No. X

Hours

200

100

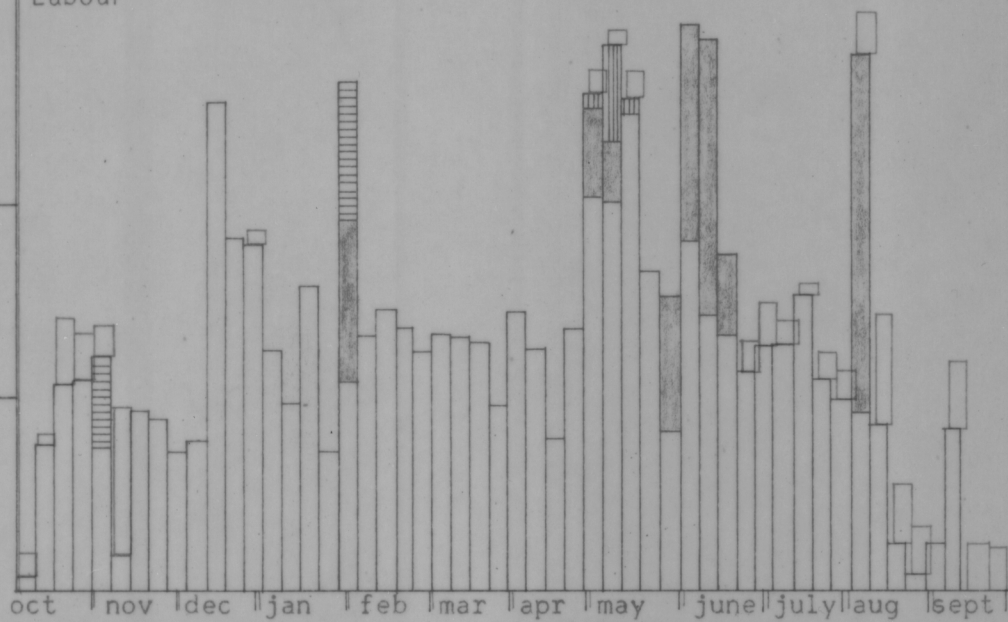


# Labour

Hours

200

100



oct

nov

dec

jan

feb

mar

apr

may

june

july

aug

sept

THE PRODUCTION OF COTTON.

Nyamaropa had earned a name for itself as one of the best cotton producing areas in Rhodesia prior to the survey year. The results for that year were roughly 10% poorer over the whole scheme than the year before.<sup>1</sup> Rene Dumont reported in 1966 that the "best African farmers have produced two tons of raw cotton per hectare without irrigation, and have exceeded three tons per hectare with irrigation".<sup>2</sup> The equivalent weight per acre with irrigation is 2,429 lbs. This yield is slightly higher than that obtained by farmers with the poorest results at Nyamaropa and is only slightly above half that (67%) of the best results; 3,600 lbs. odd. The Advisory Commission (1962) included a table of the estimated theoretical costs and returns of one acre of cotton grown under irrigation for three different yields. It is interesting that the highest yield for which they gave figures was only 2,500 lbs; a yield applicable to the bottom group of farmers at Nyamaropa. The Commission did not include off-farm expenses so that their Profit figure is really the Trading Surplus. Their table and a comparative table based on the results at Nyamaropa appear below, Tables I and II. In compiling Table II, I have left out the results of the former villagers as their extensive use of casual labour was not common to the majority of farms on the scheme.

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<sup>1</sup> I have never read of a survey undertaken in anything but a poor season.

<sup>2</sup> Dumont R. : op cit p. 138.

TABLE I. ADVISORY COMMISSION : ESTIMATED THEORETICAL COSTS AND RETURNS PER ACRE OF COTTON. <sup>1</sup>

	YIELD PER ACRE.		
	1,500 lbs.	2,000 lbs.	2,500 lbs.
Total Costs *	£ 37. 9. 0.	£ 38.18. 0	£ 40. 7. 0.
Total Returns	£ 42. 4. 0.	£ 56. 4. 0.	£ 70. 6. 0.
Profit +	£ 4.15. 0.	£ 17. 6. 0.	£ 29.19. 0.

\* Costs include seed, fertilizer and other materials, tractor, labour, irrigation and overheads.

+ in fact only a Gross Trading Surplus as off-farm expenses are not included.

<sup>1</sup> op cit. page 331.

TABLE II. ACTUAL COSTS AND RETURNS PER ACRE OF COTTON AT NYAMAROPA. (excluding former villagers).

Return to Labour  
Per Hour::

Proportion of farms in sample.	YIELD PER ACRE.		
	.45/- 2,500 lbs (36%)	.64/- 3,200 lbs (43%)	.70/- 3,500 lbs (21%)
Total on-farm Costs *	£ 36 - £ 40	£ 40 - £ 44	£ 44 - £47
Total Returns	£ 74 - £ 80	£ 96 - £104	£108 - £114
Gross Trading Surplus	£ 32 - £42	£ 58 - £ 63	£ 64 - £ 68
Off Farm Expenses +	£ 16	£ 21	£ 24
Net Surplus <sup>1</sup>	£ 16 - £ 26	£ 37 - £ 42	£ 40 - £ 44
Net Return to Family <sup>2</sup>	£ 34 - £ 44	£ 55 - £ 60	£ 58 - £ 63
Profit after Rent and Water Rate <sup>3</sup>	£ 9 - £ 19	£ 30 - R 35	£ 33 - £ 37

\* The same costs as included by the Commission less irrigation and overheads which were not charged at Nyamaropa.

+ Transport, marketing and the A.D.F. levy.

<sup>1</sup> Return to Management.

<sup>2</sup> The value of family labour employed per acre varies considerably depending on family size, acreage grown, competing labour demands and type and quantity of labour hired. £18. or 120 man/days of labour was, as a rough average, put into each acre of cotton by the families. This labour has been charged as a cost and is here added to the figure for profit after rent to give an approximate cash return to the family.

<sup>3</sup> Six months or half of £14 p.a. per acre = £7.

The estimated costs and returns of the Commission for a yield of 2,500 lbs (Table I) are fairly similar to those at that yield for Nyamaropa. If £7 is added to the on-farm costs at Nyamaropa to cover rent and water costs for half a year the Commission's costs appear to be somewhat low. Likewise, their return, at £70, is lower than that recorded at Nyamaropa, probably as a result of their accepting poorer grades as likely than those that occurred at Nyamaropa.

Well over half the farms at Nyamaropa, fell into the two higher yield categories and a fifth into the category of 3,500 lbs. These results are good and demonstrate that the majority of the farmers were capable of achieving high yields and satisfactory grades during a fairly poor season. The significance of the yields is that the poorest return to the family for labour and management £34, is £29 below the highest or only just over a half of the optimum return. On the usual two acre stand of cotton this represents £58, a considerable difference to family income. The optimum return from two acres of cotton is £126, which if rent and water are charged leaves the family with £112. This in itself is a satisfactory result, as indeed are the results for a yield of 3,200 lbs. The importance of these results for The Extension Service is twofold. There is a clear need to demonstrate to the farmers with poorer yields that higher yields bring greater returns to the family, though they may not bring a much higher return per unit of labour expended. As the return in shillings per hour can be expected to be .50/- or more the farmer should be encouraged to hire the necessary additional labour. The crucial relationship of poor quality cotton and the inefficient employment of labour to pick it must be brought home.

The only crop that would allow a comprehensive treatment of all the factors was cotton, the major cash crop grown by all the farmers. Table III shows the performance of each of the ten farms on the basis of one acre of cotton. Practically the whole scheme was hit by hail in early May. Although the hail fell fairly evenly, the amount of cotton standing in the fields differed from farm to farm. I calculated that the damage among the farms in the sample varied from roughly 5% to 20% of the crop with a minority of farms over 10%.

A return to all labour per hour has been calculated and may be compared to the cost per hour of hiring casual labour over an eight hour work day, 0.375/-.

TABLE III. COMPARATIVE PERFORMANCE ON THE BASIS OF ONE ACRE OF COTTON.

A. DIVISION OF LABOUR AS % OF TOTAL MAN/DAYS

FARM NO:-	1	2	3	4	5	6	7	8	9	10
HUSBAND	17	17	35	21	34	18	17	11	13	9
WIFE/WIVES	19	18	18	26	56	39	12	58	17	25
CHILDREN	22	25	-	16	-	-	15	13	29	-
PERM. LABOUR	-	10	43	32	5	42	12	5	30	50
CASUAL LABOUR	37	25	2	5	4	-	44	6	2	15
BEER GROUP	4	-	-	-	-	-	-	-	-	-
GIFT LABOUR	1	5	1	-	1	1	-	6	9	1
TOTAL 100% MAN/DAYS	357	360	189	172	222	260	290	283	278	168

B. CROP ACTIVITIES AS % OF TOTAL MAN/DAYS.

FARM NO:-	1	2	3	4	5	6	7	8	9	10
PLOUGH	2	2	2	1	1	2	2	2	1	2
PLANT	2	2	2	2	1	2	2	3	2	5
FERTILIZE	1	1	-	-	1	1	1	1	1	4
CULTIVATE	24	16	31	24	24	29	7	12	12	9
REAP	54	42	56	63	60	60	66	72	70	38
GRADE	13	33	7	7	10	1	18	5	10	34
SPRAY	2	2	2	3	3	3	3	3	2	7
WATER	-	-	-	-	-	-	-	1	-	-
STALKS	3	1	-	-	-	1	1	1	1	-
TOTAL 100% MAN/DAYS	357	360	189	172	222	260	290	283	278	168

C. FINANCIAL PERFORMANCE.

COTTON.	1	2	3	4	5	6	7	8	9	10
BUNDS. GROWN	14	14	16	14	17	18	14	14	12	24
SURPLUS	£70	£72	£70	£66	£148	£144	£47	£69	£96	£87
FAMILY LABOUR	£62	£66	£31	£30	£75	£57	£38	£70	£42	£30
RETURN TO MANAGE- MENT	£ 7	£ 6	£38	£36	£73	£87	£ 9	£ 1	£54	£57
RETURN TO ALL LABOUR SHILLINGS PER HOUR	.39	.35	.45	.53	.72	.63	.42	.39	.60	.52
YIELD/ACRE IN POUNDS	2712	3122	2625	2253	3270	3200	2833	2207	3584	2246
{ 1st GRADE	54	35	8	61	50	67	43	70	76	71
{ 1st (S & G)	16	18	29	16	28	17	27	8	5	10
% { 2nd GRADE	30	31	63	8	22	11	25	22	13	9
{ 3rd GRADE	-	16	-	15	-	5	5	-	6	9
GROSS VALUE/ACRE	£90	£92	£77	£69	£103	£102	£86	£70	£113	£77

D. ON-FARM INPUTS.

FARM NO:-	1	2	3	4	5	6	7	8	9	10
SEED	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	19.0.	1.0.0	1.0.0	1.2.8	1.1.4
FERTILIZER	6.1.1	7.0.0	10.4.0	7.0.0	8.3.0	612.0	12.1.6	5.2.8	8.12.0	8.3.4
MANURE	3.12.6	216.0	2.16.0	2.16.0	314.0	4.10.0	-	3.10.0	4.3.0	3.19.0
INSECTICIDE	3.14.0	3.19.0	3.19.0	3.19.0	3.19.0	3.12.6	3.19.0	3.19.0	4.2.0	5.3.2
HIRE OF EQUIP.	1.3.0	1.3.0	1.3.0	1.3.0	1.3.0	1.4.6	1.3.0	1.3.0	1.7.8	1.1.0
HIRED PLOUGHING	-	-	-	-	-	-	1.10.0	-	-	-
LABOUR: FAMILY & PERM. <sup>1</sup>	228.0	16.4.0	18.6.0	16.4.0	21.4.0	26.0.0	16.6.0	26.12.0	27.4.0	14.4.0
CASUAL	2114.0	25.7.0	10.0	1.7.0	1.7.0	-	19.1.0	2.8.0	18.0	3.15.0
TOTAL INPUTS	5912.7	57.9.0	37.8.0	33.9.0	40.10.0	4216.0	55.0.6	43.14.8	47.9.4	37.6.10

<sup>1</sup> Gift Labour is included in Family since it is a reciprocal payment.  
 Beer Group is included in Casual Labour as it is inefficient.  
 Family and Permanent Labour is costed at 2/- per 8 hours.  
 Casual Labour is costed at 3/- per 8 hours.

E. OFF-FARM EXPENSES.

FARM NO:-	1	2	3	4	5	6	7	8	9	10
GROSS TRADING SURPLUS	£31	£35	£40	£36	£62	£59	£31	£25	£66	£40
TRANSPORT	9.9.3	9.8.9	7.6.0	7.0.0	9.14.0	9.9.0	8.12.6	6.18.0	10.17.0	10.0.0
MARKETING	1.19.0	1.18.0	1.9.0	1.9.3	1.19.8	1.19.4	1.15.6	1.8.6	2.2.0	1.8.0
A.D.F. LEVY 10%	9.9.0	9.4.0	7.14.0	6.18.0	10.6.0	10.1.0	8.12.0	7.0.0	11.6.0	7.14.0
NET SURPLUS <sup>1</sup>	£11	£14	£24	£20	£40	£38	£12	£10	£42	£21

<sup>1</sup> As Family Labour has been charged, net surplus = return to Management.

<sup>2</sup> Includes nearly £3 worth of transport on the farm the farmer provided himself.

F. RETURN TO FAMILY.

FARM NO:-	1	2	3	4	5	6	7	8	9	10
VALUE OF FAMILY LABOUR	22.8.0	23.6.0	10.1.0	10.8.0	20.2.0	15.4.0	13.0.0	25.7.0	18.4.0	5.13.0
RETURN TO MANAGEMENT	11.0.0	14.0.0	24.0.0	20.0.0	40.0.0	38.0.0	12.0.0	10.0.0	42.0.0	21.0.0
TOTAL RETURN TO FAMILY	33.8.0	37.6.0	34.1.0	30.8.0	60.2.0	53.4.0	25.0.0	35.7.0	60.4.0	26.13.0

The great variety in yields, grades, gross values, returns to all labour per hour and the composition, total and use of labour (A, B and C) is striking. This variety differs markedly from the uniformity of most material inputs (D). Manure and fertilizer, taken together, range from £10 - £13, the only real variation; whereas total labour inputs differ in value from £17 - £43. Off-farm expenses, transport, marketing charges and levy, differ in proportion to the weight and value of the cotton (E). The Net Surplus shown in Table E is proportionately larger than the return to management in Table C as in the former family and permanent labour were charged at 2/- per eight hour day, not 3/- as in C. The reason for so doing was that family and permanent labour frequently worked a longer day than did casual labour and were usually more efficient.

The four farms with the lowest return to labour per hour (C) and the lowest return to management (C and E), farms No. 1, 2, 7 and 8 can be examined together. The difference in yields between the four farms is largely compensated by the better grades of the farms with poorer yields. The reaping and grading of poor cotton involves considerably more labour than does that for good cotton. An intangible, though real, depressing effect set in on most farms struggling to clean and grade poor cotton towards the end of the long harvest season. Farms No. 1 and No. 2, both Locals A, employed a considerable amount of labour on grading, particularly No. 2, 33% (B). Farm No. 7 with a lower total labour input, 290 days, due mainly to his absence while tending his wife in hospital at the end of the period of cultivation, represents an intermediate step from farm No. 2 to farm No. 1 both in improved grades and a reduction in the proportion

of labour expended on grading. The hail damaged much of his crop so that a considerable amount of labour had to be employed on cleaning and grading the picked cotton. Had the farmer not had to rely on casual labour to the extent that he did, most of the cotton could have been picked in grades. This would have reduced the labour on grading and the large labour bill. For three weeks the farmer cooked for his children, saw to it that they were washed and ready for school, supervised the ten or twelve village women in the field and later grading in his store-room and hunted desperately for permanent labour.

Farmer No. 8 went with two of his three wives to a church meeting four days before the hail came. During the four days the third wife tended the cattle. Consequently a lot of cotton was knocked to the ground by the hail and part of the crop partially damaged. The large amount of family labour, four adults and three children who helped in their school holidays soon after the hail, allowed the cotton to be picked by grade and the farmer to maintain pace with the ripening bolls.

Farmer No. 10, the other farm with a high proportion of labour expended on grading, followed a deliberate policy of picking and then grading, leaving the grading to his permanent labourers whom he could rely on. Where possible he asked his casual labour to pick one grade at a time, but this method was only possible in the early stages of the season. His high proportion of first grade cotton, 71%, and his low yield, 2246 lbs per acre necessitated only 168 man/days per acre. Fully occupied with his tobacco he relied almost entirely on his ox drawn cultivator to control the weeds. His return per hour of labour, .52/- and his return to management, £21 per acre (E), are below average for the ten farms, but satisfactory. The limit to his increased yield was a lack of sufficient permanent labour to engage in hand cultivation.

Farmer No. 3, the most efficient overall performer of the farms, conserved labour on cotton by not grading. He accepted poorer grades rather than reduce his labour on tobacco. Farmer No. 4, the third tobacco grower, used a similar approach to the use of labour. His yield was poorer, but his grades appreciably better and his return to labour per hour above average, .53/-. He controlled more labour than did No. 3 and his children devoted all their free time to reaping at the beginning of the season.

Farms No. 5 and 6 achieved the best return to labour figures. No. 6 took great pains over each stage of the crop and achieved good grades which required practically no grading. No. 5 applied less labour to the activities up to reaping and had to devote nineteen more days to grading his poorer cotton. Both farmers had high yields and employed a moderate amount of labour.

Farmer No. 9 had little cotton destroyed by the hail and less partially damaged than any other of the ten farms. He used more labour, particularly

to clean and grade, than did his closest rivals, Farms No. 5 and No. 6. He was able to do this as he grew less cotton than they did, 12 v 17 and 18 bunds. As a result his return to all labour per hour was lower than theirs, .60/- v .72/- and .63/-, but his net surplus per acre (E) was the highest of the farms, £42.

The technical and the economic performance indices, weight and grades (gross value per acre), and the returns to all labour, to management and to family figures, do not correlate. This can be most easily seen by comparing the return to all labour and the gross value per acre (C). Farms 1, 2, 3, 7 and 8 have low returns to labour but gross values that range haphazardly from £70 to £92. Farms No. 4 and No. 10 have inverse return to labour and gross value figures that the slightly better grades of No. 10 may explain. However, the composition and use of labour differed appreciably on the two farms although both have low total labour inputs (B & C). Their poor yields and relatively high return to labour figures contrast sharply with the results of Farms No. 1, 2, 3, 7 and 8. The three farms who outperformed the others, Farms No. 5, 6 and 9, would appear to have positive correlations between their technical and economic indices.

Two efficiency indexes may be constructed : a labour efficiency index (A) and a gross value efficiency index (B) using the formula:

$$A \quad \frac{\text{LABOUR HOURS PER ACRE}}{\text{AVERAGE LABOUR HOURS}} \times \frac{100}{1}$$

$$B \quad \frac{\text{GROSS VALUE PER ACRE}}{\text{AVERAGE GROSS VALUE}} \times \frac{100}{1}$$

TABLE IV: LABOUR AND GROSS VALUE EFFICIENCY INDEXES.

<u>FARM NO:</u>	1	2	3	4	5	6	7	8	9	10
LABOUR	139	140	73	67	87	101	113	113	112	66
VALUE	102	105	87	79	119	119	99	80	128	87

On the labour index, the lower the figure the more efficient the use of labour and on the gross value index, the higher the figure the more efficient the farm in terms of output. The two sets of results may be plotted on a diagram to ascertain whether any relationship may exist between the two. Three distinct groups appear with no likelihood of any correlation existing between the ten farms (diagram I). The two former villagers, farmers No. 1 and 2, lie well below (on the labour index) all the other farms and close to the leaders on the gross value index. Clearly their use of labour, characterized by their sole employment of the village women after the start of the reaping season, was inefficient. The three tobacco farmers, No's 3, 4 and 10, occupy positions at the other end of the relationship between labour and gross value. They all used labour with far greater efficiency and appear to have been prepared to maximise the return to labour rather than to land. This management decision is in keeping with their major interest in tobacco and their comparatively

heavy reliance on hired labour. The tobacco growers grew less maize than was usual on the scheme and a few of them had begun to drop maize altogether. As a result they were able to grow as much or more cotton than the majority of the farmers and land, in relation to cotton, was not the limiting factor. The five Newcomers for whom cotton was the sole summer cash crop, No's 5, 6, 7, 8 and 9 appear to have a relationship common to themselves. They lie midway along the labour axis and spread along the gross value axis.

Farms No. 7 and 8 had, respectively, illness and the need to rely on the village women, and a poor yield combined with abundant family labour. Better health and a better yield would have increased gross value and labour efficiency on both farms so that they would have appeared on the diagram further away from the origin, i.e. close to Farms No. 5 and 6. Farms No. 5, 6 and 9 had no setbacks other than the hail during the year.

DIAGRAM I.

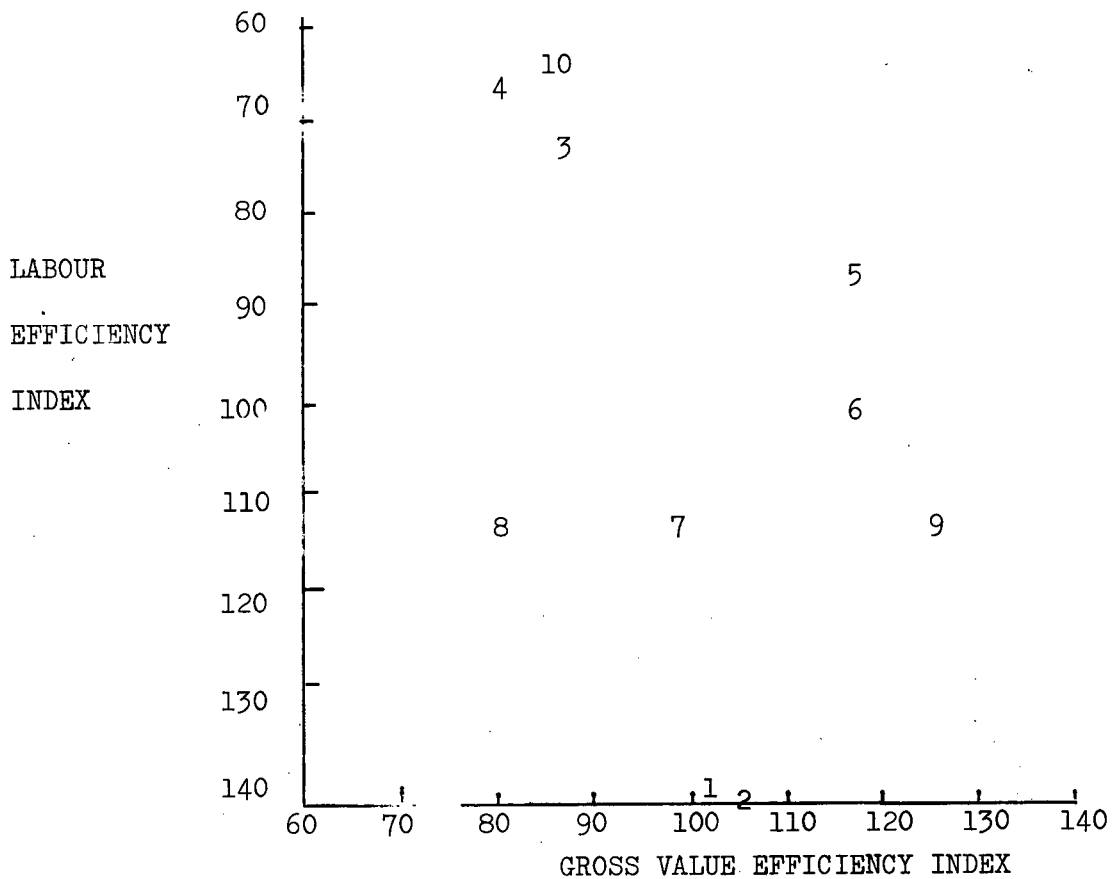
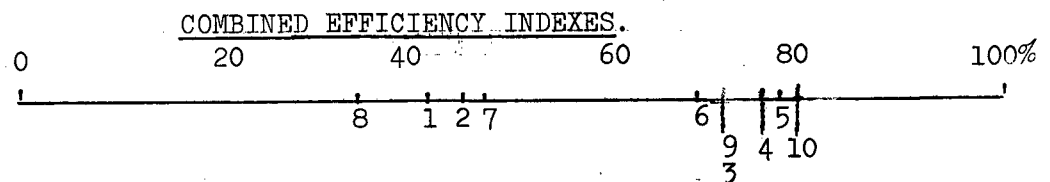


DIAGRAM II.



A combined efficiency index can be constructed by measuring each farm's distance from the origin, diagram 2. The usefulness of the index lies only in the comparison of the farms which it allows for. The tobacco growers sought

to maximise the return to labour and the other farmers the return to the land and, with farms No. 5, 6, 7, 8 and 9 to family. The tobacco growers and the leading cotton-only growers are closely bunched and farms No. 7 and 8 did no better than the former villagers. A rough scale from 0 - 100% efficiency has been included in the diagram. It measures the distance from the origin (140 labour, 60 gross value) to a hypothetical optimum position (60 labour, 140 gross value). The only significance to be derived from the scale is that the leading group performed twice as well as the other four farms and were, despite very different locations on diagram I, not far from the hypothetical optimum.

Data obtained from all the farms in the sample was utilized in a step-wise regression analysis to determine the significance of certain variables.<sup>1</sup> All the quantitative variables were used in turn as the dependent variable. The regression was performed by an iterative process until all significant variables were included in the regression set and the rest excluded. All variables with a calculated t statistic (21 degrees of freedom at the 5% level of confidence) = 2.080 were therefore included in the regression set. In a few cases a variable was deliberately excluded from entering the regression set in order to see whether any other variables could become significant and because the iteration tended to "cycle" with a particular dependent variable.

Two or more variables were added together to form a new dependent variable to see if this increased the effect of any of the other variables; e.g. the top grades, the bottom grades, family and permanent labour.

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Material inputs were excluded from the analysis as their use was fairly standard on all the farms. The variables are listed under table V.

TABLE V. REGRESSION ANALYSIS OF FACTORS AFFECTING THE PERFORMANCE OF COTTON.

(CO-EFFICIENTS SIGNIFICANT TO 95% LEVEL = t STATISTIC SIGNIFICANT ABOVE 2.080)

(DATA COMPILED FOR PERFORMANCE ON ONE BUND OF COTTON)

EQUATION NUMBER.	DEPENDENT VARIABLES.	EQUATION.	MULTIPLE CORRELATION CO-EFFICIENT.	
			UNCORRECTED.	CORRECTED. <sup>a</sup>
1	X <sub>1</sub> (t)	= .643 N <sub>a</sub> + .031G <sub>1</sub> + .0282G <sub>2</sub> + (2.676) (43.38) (16.284) .0303G <sub>3</sub> + .0271G <sub>4</sub> (18.059) (7.921)	0.9992	.99
2 <sup>1</sup>	L <sub>F</sub> (t)	= .828x <sub>2</sub> - .703 L <sub>C</sub> - .0037 N <sub>b</sub> (20.198) (-4.040) (-2.675)	0.9987	.99
3	L <sub>F</sub> +L <sub>P</sub> (t)	= 1.10RP + 1.09C - .992 L <sub>C</sub> (19.717) (9.545) (-9.187)	0.9969	.99
4	L <sub>1</sub> (t)	= 3.317A (6.546)	0.8067	.65
5	L <sub>2</sub> (t)	= .738RP - 35.029 N <sub>a</sub> - .126G <sub>1</sub> (3.728) (-2.479) (-2.481)	0.8874	.79
6	C (t)	= .307 L <sub>F</sub> + .425G <sub>4</sub> (11.649) (2.744)	0.9489	88.
7	P (t)	= .1909X <sub>2</sub> + 45.483 l <sub>a</sub> (3.013) (3.311)	0.9006	84.
8 <sup>2</sup>	P (t)	= 46.769 l <sub>a</sub> + 21.036 h <sub>3</sub> (3.702) (2.231)	0.9134	84
9	A	= { 14.860 } - .0258 L <sub>F</sub> + .0119G <sub>1</sub> + { 10.530 } (-3.947) (2.869) 0.343G <sub>2</sub> (3.922)	0.9909	99
10 <sup>3</sup>	G <sub>1</sub> (t)	= 2.155A - .854G <sub>2</sub> - .921G <sub>3</sub> - (3.349) (-15.237) (-19.323) .772G <sub>4</sub> (-7.759)	0.9985	99.
11	G <sub>2</sub> (t)	= 1.083P + 0.354G <sub>3</sub> (5.128) (3.091)	0.8726	78.
12 <sup>4</sup>	G <sub>1</sub> +G <sub>2</sub> (t)	= 13.260A + 110.321 N <sub>a</sub> (9.146) (2.793)	0.9360	87
13 <sup>5</sup>	G <sub>3</sub> +G <sub>4</sub> +G <sub>5</sub> (t)	= -.238C - 25.332 N <sub>a</sub> - (G <sub>1</sub> + G <sub>2</sub> ) (-2.299) (-3.720) (-20.628)	0.9921	99

FOOTNOTES TABLE. V.

- a The reliability of co-efficients of multiple correlation varies with the size of the sample and with the number of variables. The reliability increases with an increase in the number of variables and decreases with an increase in the size of the sample. In this regression analysis fifteen dependent quantitative variables and seven qualitative independent variables were used. The sample was not large, forty-nine, and thus little correction was required, particularly as the "fit" on most of the equations was good : e.g. the uncorrected co-efficient was 0.95 +. The corrected co-efficients were read off figure 17.5 in "Methods of Correlation and Regression Analysis" by Ezekiel M. and Fox K.A. John Wiley, N.Y. 1963. p.298.
- 1 excluding  $L_p$  (permanent labour)  
 2 excluding  $X_2$  (total hours)  
 3 excluding  $X_1$  (value) and  $X_2$   
 4 excluding  $X_1$   
 5 excluding  $X_1$

SYMBOLS. TABLE V.

<u>DEPENDENT VARIABLES. (QUANTITATIVE)</u>		<u>INDEPENDENT VARIABLES (QUALITATIVE)</u>	
$X_1$	Value.	$N_b$	Newcomers B.
$X_2$	Total hours.	$N_a$	Newcomers A.
$L_F$	Family labour.	$l_b$	Locals B.
$L_p$	Permanent labour.	$l_a$	Locals A.
$L_c$	Casual Labour.	$h_1$	Family health good.
C	Cultivation.	$h_2$	Family health average.
RP	Reaping and Processing.	$h_3$	Family health poor.
P	Processing (cleaning and grading).		
A	Total acreage.		
G1, G2, etc. Grades 1, 2, 3, 4, 5.			

Table  $\bar{V}$  shows the variables that entered the regression set for each of the quantitative variables when treated as dependent.

Equation 1. Total value ( $X_1$ ) was most strongly affected by the grades, particularly the better grades, and was also positively correlated with the Newcomers A. The significance of only the Newcomers A and not the Newcomers B entering the set suggests that the larger family size and the preponderance of tobacco growers who hired labour prior to the start of cotton reaping among the Newcomers A allowed them to reap more expeditiously and achieve better grades. The perfect fit of the two crops, as revealed by the labour profiles, enabled the tobacco growers to switch their labour to cotton at the start of the season and to pick at a more optimum rate than those farmers who did not grow tobacco. (diagram 1)

Equation 2. Family labour ( $L_F$ ) had a strong positive correlation with total hours and a negative correlation with the employment of casual labour and with the Newcomers B who, as a group, had the smallest families. Permanent labour was excluded from the regression set as it had a dominant negative correlation to the amount of family labour employed,  $t = -26.4$ .

Equation 3. Family and Permanent labour ( $L_F + L_P$ ) correlated positively with cultivation and markedly with total hours employed on reaping and processing (cleaning and grading). Notably, no significant result was scored for processing alone which suggests that on farms where there was a more than average amount of family and permanent labour the cotton was reaped in grades. To do this sufficient labour must have been present on these farms to pick expeditiously from the start of the season on. Family and permanent labour correlated negatively with the employment of the village women (casual labour).

Equation 4. The employment of permanent labour only correlated with the growth of a larger than average acreage of cotton. No other variable was close to entering the regression set. The equation does not necessarily state that the employment of permanent labour would cause or allow a farmer to expand his acreage of cotton. Undoubtedly farmers who had had experience of hiring permanent labour and who had established contacts through whom they might obtain labour would feel more confident of their finding the necessary labour to handle a larger crop. However, the desire to raise family income by growing more cotton is the more likely cause of the relationship between permanent labour and acreage.

Equation 5. The employment of casual labour correlated positively with high total hours for reaping and processing and negatively with the Newcomers A and with grade I. In other words, the village women were employed on farms on which a more than average number of hours per bund of cotton was employed to reap and process the cotton and that the women worked with little first grade cotton. The women did little work for the Newcomers A.

Equation 6. There was a high positive correlation between cultivation and family labour. As casual labour was seldom employed until after reaping had begun and as permanent labour was usually only engaged when tobacco was reaped or the reaping of cotton began (both tasks occurred after the cultivation of cotton) family labour undertook the bulk of the cotton cultivation. That cultivation should correlate positively with grade 4 is surprising. An opposite result was scored in equation 15 where cultivation was negatively correlated with the three bottom grades. The result in equation 6 must therefore be ignored as ambiguous, possibly caused by a small sample in that grade.

Equation 7. Processing measured separately (P) correlated positively with total hours and with the Locals A. When total hours ( $X_1$ ) was excluded from the set in equation 8 the Locals A remained significant and poor health entered the set. Both Locals and Newcomers were classified as having poor health. The result is therefore not merely a reflection of the work pattern of the former villagers. Although they did not hire labour until late in the reaping season and then utilized the most expensive type of labour, the village women, to reap and process poorer cotton, bad health may, it would appear, have affected the rate at which they worked. Moreover, poor health may also have affected mental effort and made the reaping of cotton in grades tiring. The Newcomers all complained that few village women could be relied upon to reap in grades and that several of them refused to do so. Permanent labour, though more closely supervised and, presumably, better motivated, did pick in grades. The better more balanced diets they received on the scheme may have increased their powers of concentration quite soon after their arrival.

Equation 9. Total acreage correlated negatively with family labour employed per bund of cotton. In other words, the more cotton grown the smaller the proportion of the crop handled by the family. It also, rather surprisingly, correlated positively with grades 1 and 2. The reason for this would appear to be in line with the results of equations 1, 4 and 12, that the farmers who grew the most cotton controlled the most family and permanent labour, and achieved the best grades.

Equation 10. Grade 1 correlated positively with acreage grown, as in equation 9, and, as would be expected, negatively with the other grades.

Equation 11. Grade 2, termed "soiled and grey" was introduced by the Cotton Board to fill a gap in the grade structure. Priced just under grade 1 it was in fact grade 1B. The farmers, following the damage by the hail, devoted a considerable amount of time to clean and sort damaged cotton so that it could be classified "s & g" and receive a higher price. Grade 2 correlated positively with processing and with grade 3. The relationship between the grades can have little meaning.

Equation 12. Grade 1 and grade 2 together were more highly correlated with acreage grown than was grade 1 alone, equation 10. It was also positively correlated with the Newcomers A, a result that corroborates equation 1.

Equation 13. The three bottom grades, when value was excluded from entering the set, correlated negatively with cultivation, with the Newcomers A and with the top grades.

#### DISCUSSION.

The results of the regression analysis of factors affecting the performance of cotton revealed the importance of commanding sufficient labour to reap at an optimum rate and of grading at the same time. However, the command of more than average family labour was not always the solution if that labour soon fell behind on optimum rate and if, as was suggested in equation 8, families with poor health found that to reap by grades was mentally exhausting. The one compounded the other. The most successful group were the Newcomers A. They had larger families than the Newcomers B and most of them were in tobacco. The complementary nature of the demand for labour of tobacco and cotton assisted the tobacco growers to reap their cotton at an optimum rate because they had at the start of the reaping season labour employed to work on the tobacco. Larger acreages resulted in better grades because the farmer concerned hired labour early in the season. The former villagers employed casual labour late in the season, employing the village women on poor cotton and working inefficiently. Consequently they devoted more than average hours to reaping and processing. The new grade, grade 2, "s and g" was responded to by nearly all the farmers who expended labour to clean grade 3 cotton and raise its grade to grade 2.

The difficulties surrounding labour and the entry of the farmers into tobacco had significant effects on the performance of cotton. The encouragement of burley tobacco, particularly if the limitations to the provision of long term credit and to working capital were rectified, could be expected to have two beneficial effects on the farms. Tobacco's high value per pound weight produced and its profitability when grown on a small scale would increase family incomes.<sup>5</sup> The demand for labour would begin earlier in the year so that fuller employment could be offered, from January to August: nearly eight months instead of the five month season common at the time of the survey. The additional labour commanded by the growers would, as the regression suggested, benefit the rate of cotton reaping, improve the grades and the total value and the return to labour. The latter is important because, as diagram I showed, once the farmers began to hire labour on an increased scale through the production of tobacco family income is maximized as a function of the return to labour. Without the need to employ labour on tobacco the family can maximize its return by not employing labour until absolutely necessary. The danger with this management approach is that if labour has

<sup>5</sup> See Appendix 11 .

to be employed it would work more efficient if employed at the start of the season. The approach, the exclusion of hired labour if possible, puts off the hire of labour until no alternative exists. In any case, after three months of reaping and of reaping progressively poorer and more labour demanding cotton the determination to complete the season using only family labour would weaken.

In equation 5 the employment of casual labour correlated negatively with the Newcomers A, but not significantly with the Newcomers B. The reason for this was that several Newcomers B, growing no tobacco, sought labour at the end of the reaping season and accepted the only labour seeking work for a short period, the village women.

The increased income from tobacco, even if only viewed as an additional cash crop should provide, as a few leading farmers exhibited, the security to cut the acreage of summer maize or even to abandon maize and to purchase in the local market. The competitive labour demands of cotton and maize had detrimental affects on many farms in the sample. The reaping of cotton at the prime reaping period had to be dropped in order to harvest the maize. Some families never made up the four to eight days lost to the maize.

THE FARMERS' APPRECIATION OF MARKET FORCES.

"In our many talks with African extension personnel and farmers we encountered widespread ignorance of the operations of the market and a naive confidence in the ability of governments to control market forces." 1

De Wilde's observation is part of the common view held by the majority of Africans that Government is all powerful. This is not surprising when one considers the enormous and seemingly arbitrary powers which Government officials have held in colonial Africa. There are real dangers inherent in such a view for the success or profitability of farming is regarded as largely dependent on Government's kind intentions rather than on efficiency aimed at competitiveness.

The farmers at Nyamaropa distinguished, however, between official markets and unofficial markets. With few exceptions, the farmers told us that the official prices for maize and cotton were fixed by Government so that few Africans could become rich. When we pressed them further we were given numerous examples of Government reducing the price of a crop which African farmers found paid them to grow. The most frequent example was that of maize.

The marketing and distribution of maize in Rhodesia is controlled by the Grain Marketing Board. The Board appoints stores as official agents in the Tribal areas who pay, for maize delivered to them a price net of handling, levy and transport to a Board depot. Invariably the agents undertake the transport themselves. To ease administration, the Board set a uniform transport charge regardless of the distance involved. Further, to cover average transport costs the uniform charge was high with the effect of eliminating locational advantage. Nyamaropa's distance from any Board depot, 110 miles, meant that the net price paid for maize was artificially high: for the first four years of the scheme's life it varied from 25/- to 27/6 a bag. In 1965 the Board altered the method of costing transport to a fixed rate per mile. The result, at Nyamaropa, was that the net price fell to 15/- a bag.

The farmers on the scheme had grown roughly equal proportions of cotton and maize in summer, determined by the preference of most for 2 acres of cotton. Although maize yields varied considerably, from 10 to

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1. De Wilde et al. op cit. Vol. 1. Page 103.

42 bags an acre, most farmers produced more than their consumption needs and regarded maize as both a food and a cash crop. After the dramatic fall in the official net price only two farmers on the scheme grew maize as a crop. These two farmers sold direct to the mission who paid 28/- a bag and transported the maize themselves. Both farmers were struggling to educate large families and the price offered by the Missionaries included an element of compassion.

The farmers interpretation of Government's reasons for cutting the price of maize so drastically is understandable since none of them knew of the issues which surrounded the alteration in the costing of transport. More difficult to understand was the similar suspicion which half the farmers held against the price of cotton. Cotton was the most valuable crop marketed through the Co-operative and it was against this crop that the farmers ordered materials for their subsidiary crops, principally maize and tobacco. The annual instalment on medium-term loans for implements was likewise charged against cotton. Consequently, when the farmers received payment for their cotton the net figure paid to them did not reflect the true performance of the crop. The year long wait between the ordering of materials for cotton and the payment for that crop may have helped them to forget all the expenses that they had loaded against cotton. We were able to show the farmers in our sample the correct cash performance of their cotton. These farmers, most of whom could follow our simple calculation, were interested and understood their mistake. However, the real problem that their suspicion against the price of cotton underscored was one of management and the overall performance of the farms.

Prices on the local market revealed quite sensitive changes as the conditions of supply and demand altered. One farmer, for instance, who bought green maize on the scheme which he transported and sold in Umtali, paid over the first two weeks that green maize came on to the market 1/- a dozen and 9d. a dozen. In the third week, when the supply of maize had increased considerably, he bought according to the size of the cob: 1/-, 6d. and 3d. a dozen. The price of a dozen eggs, 2/6d., did not alter during the year. At times of short supply no eggs could be bought. When the chickens were laying the farmers hoped that most of the eggs, if left, would hatch. Not all the farmers ate eggs and then only occasionally. In a sense the fixed price only operated in times of supply and since the demand was slight and every farmer owned a few chickens it obviated bargaining and eased the sale of the available eggs. A set of almost "standard" prices held throughout the year for different types and size of cattle and other livestock.

However, the market price of a particular beast would vary with its condition so that as it fattened after the rains it moved up into another category. The only exception to this orderliness occurred at the beginning of the year when parents were forced to sell a beast to meet their children's school fees. The sudden increase in the supply of animals that had to be sold and the impoverishment which school fees forced on most potential buyers caused prices to drop from 25% to 40% below the standard price.

The farmers and the villagers understood prices and the forces that acted upon them in the local market. A minority who marketed in the main centres understood and accepted the forces that caused frequent changes in the ruling prices. All the farmers understood the importance of grades and their relative prices. It must be assumed that the common failure of the farmers and the villagers to understand and accept the determination of official prices could and should be remedied by Government action. The majority of farmers believed that official prices aim at establishing a set of conditions which will determine their wealth. Leading African farmers must be appointed to official boards and, where sufficient staff exists, as at Nyamaropa, courses should be held to explain the determination of official prices to the farmers. However, it may well be that the character of official prices, long periods of little or no alteration followed by dramatic changes, can never be satisfactorily explained to farmers to whom the Government is not accountable.

Empirical studies have shown, fairly conclusively, that people in less developed areas do behave as "economic men" :-

Berg Elliot J. : "Backward Sloping Labour Supply Functions in Developing Economies - The Africa Case." Quarterly Journal of Economics. Vol. 75, August 1961, pp. 468 - 492.

Stern Robert M. : "The Price Responsiveness of Primary Producers" Review of Economics and Statistics, Vol. 44, May 1962, pp. 202 - 207.

Jones William O. : "Economic Man in Africa" Food Research. Institute Studies. Vol. 1, May 1960, pp. 107 - 134.

Baner P.T. and Yamey B.S. : "A Case Study of Response to Price in an Underdeveloped Country", Economic Journal. Vol. 69, No. 276, 1956, pp. 800 - 805.

## THE FARMERS AS MANAGERS AND ENTREPRENEURS

An analysis of the on-farm managerial ability and the innovational capacity of the farmers at Nyamaropa must take into account the fact that two different groups settled on the scheme. The villagers who settled, settled on land that in tribal terms was theirs and to which they did not have to move. Previously they had lived in a relatively unchanging environment and had had a traditional relationship to the soil. Year after year they had cultivated the same land and had grown the same subsistence crops using long established techniques. Within the limitations of their environment one may presume that they farmed efficiently.<sup>1</sup> The villagers farmed under a set of rigid constraints so that a re-allocation of inputs may not, by itself, have appreciably raised productivity. Migrant labour or wage employment on the construction of the scheme provided the only means to satisfy modern wants and to increase security short of altering the environment which the interplay of tradition, institutions and personality continually strengthened. The irrigation scheme introduced a variable to the narrow geometry of the villagers' management field. Those who joined were able to reallocate their existing inputs and to undertake new farm ventures with the help of the credit and marketing assistance available on the scheme and the greater security of food supply.

Two of the vicious circles in which they had operated were broken. The circle of low income, low savings, low investment and productive capital, as described by Nurske, was broken by their move to cash crops; and, more slowly, the circle revolving around limited personal assets or social security which led to an unwillingness to undertake risks so that output remained low, was eroded as the former villagers identified themselves both economically and socially with the scheme. The circle described by Gunnar Myrdal - under nourishment, low work output, small and poor food supply - remained largely intact, as did the institutional barriers to new attitudes, particularly the hiring of labour. However, the breaking of the first two circles did produce change that showed signs of being cumulative towards emancipation on the scheme and the achievement of a technically optimum position on the farm.

The Newcomers immigrated to the scheme and settled on land which they realised had been wrested from its former owners by Government. They were aware that they were dependent on Government to ensure their continued occupancy. In effect, the Newcomers had trespassed into an alien tribal

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1. Schultz, T.W. has stated that there "are comparatively few significant inefficiencies in traditional agriculture". "Transforming Traditional Agriculture". New Haven 1964 p. 68. Audrey Richards was struck by the dexterity, the economy of means and the knowledge of materials which Africans show in relation to their traditional occupations and needs. "Land Labour and Diet in Northern Rhodesia" O.U.P. 1939.

domain in order to realise new economic and social opportunities. Their long sojourns in the money economy, where a fair number had exhibited quite marked initiative in undertaking business activities, and their rejection of several of the pinions of tribal life had enabled them to do so. They regarded themselves as being superior to the villagers and several openly despised the Tribal Authority. The Newcomers had moved to a new environment: they had not attempted to refurbish an existing environment. Having decided to settle with particular goals in mind, the Newcomers could have been expected to adopt new crops, new techniques and new work relationships.<sup>2</sup>

All the settlers, as is still common with most Africans, had had experience as traditional subsistence farmers. It is interesting however, that none of the men in the sample had had any worth while work experience on European farms. A few had been herd boys as children before they had sought work in the towns. Writing on Kenya the World Bank team stated that, "European farms have stimulated improvements in African farming by pioneering certain crops and types of animal husbandry which have been adopted in increasing measure by Africans with labour experience on such farms".<sup>3</sup> Mellor's statement that, "Past farming experience is undoubtedly a necessary condition of success" would appear to have little relevance to Rhodesia at present where nearly all the African people maintain subsistence farms though most also engage in migrant labour.<sup>4</sup> Yudelman's finding, that "the most progressive producers are frequently those who have been in the wage economy for some time" could, at Nyamaropa, be qualified.<sup>5</sup> Experience in the wage economy was important not so much for the gaining of business acumen but for the savings that may have been built up and for the willingness to move away from traditional ties that the experience may have instilled.<sup>6</sup>

Apart from the former villagers who retained an expensive labour relationship with their relatives, the performance of the farms was largely dictated firstly by which crops the farmers could afford to grow and which they were able to market and, secondly, by their ability to manage labour. The limitations that they faced were not the result, with one exception, of "traditionalism" - a lack of economic rationality - but of factors that individually they could not control. The exception was what may be called a "money delusion". It was a weakness that the majority of the farmers and even the storekeepers displayed.

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2. It has been the experience in India that people who had moved into new areas showed more receptivity to improved agricultural practices (which shift the production function upward) than did the established population in the area - a break with their old environment apparently induced them to give up traditional agricultural techniques.
  3. de Wilde et al. op cit. vol. II p. 189.
  4. Mellor, J.W. "Economics of Agricultural Development", Cornell, N.Y. 1966. p. 189.
  5. Yudelman, M. op cit. p. 133.
  6. W. Elkan, in his study of migrants in Uganda, discovered that most migrants went to town in order to earn capital with which to improve their farms. In Rhodesia, African men are drawn more permanently into wage employment for a variety of reasons. The life histories of the settlers at Nyamaropa suggest that savings accumulated in town were not used primarily to improve their farms as the barriers to doing so were formidable.

The money delusion was expressed as a desire to gain the largest possible gross payment, even if it cost a considerable amount to achieve. In other words, they were non-profit maximizers. Before the Co-operative was founded the stores sold farm materials. There occurred, in the first two years of farming on the scheme, a costly avoidance of the stores for the purchase of fertilizer on the grounds that the storekeepers were profiteering. Many farmers used to catch the bus to Umtali or Rusape at £1. 8. 0. a round trip in order to save 2/9 on a bag of fertilizer, which they then had to pay 3/- or more to carry back on the bus. In money terms the attempt to by-pass the stores did not add up. There may well have been other factors involved, but the expensive denial of profit to the storekeeper (for a service performed) appears to have been illogical. I found several farmers who had done the trip to purchase fertilizer. None had undertaken the trip for any other purpose and each, looking back, realised that it had been fruitless. The only firm conclusion to be drawn is that fertilizer was then a new item handled by the stores and, until a process of trial and error had established otherwise, the farmers suspected the storekeepers of profiteering based not so much on previous ill-practices as on the farmers' initial reluctance to spend cash on farm inputs. They were used to earning cash with which to buy consumption goods at well established prices. Fertilizer as an input was regarded as a special good that should not be subject to profiteering, though the return it brought through the crop would happily be spent on consumption goods subject to a mark-up by the storekeepers.

The money delusion hampered the growth of specialization and even retarded the use of existing facilities. The storekeepers and one of the farmers with a truck occasionally bought produce to re-sell in Umtali. Understandably, if approached by farmers to sell their wares in market centres, they preferred to purchase the produce before transporting it so that they could avoid being responsible for the price obtained in town (market information was often days old). Moreover, by transporting their own produce they did not contravene the law as openly as when they carried for hire. Four times during the year I heard of farmers who refused to sell to the storekeeper or a farmer, and who then expended a great deal of effort and money to find transport to Umtali where the higher gross price did not warrant the exercise. I worked out with three farmers the finances of the operation, excluding food purchased on the trip. In each case the net price received at the farm gate was less than that offered by the storekeeper. Each farmer was surprised to learn that marketing costs reduced the profitability of his crops.

One storekeeper, in an attempt to occupy his assistants who were frequently idle, offered to buy rice from two farmers who grew it on the scheme and to clean, weigh and pack it for sale in the store. The storekeeper knew that rice sold well and he intended to sell the local rice well

under the price of the imported article. Both farmers declined to sell to the storekeeper. The storekeeper, when I saw him, was quite angry. His comment was, "They do not want to sell to me for one price and then to hear that I sell the rice for another price".

I visited both the farmers, one of whom was in the sample. The one had little rice above family needs that he was contemplating selling. He told me that the price offered by the storekeeper was the same as that which he could obtain elsewhere on the scheme. He understood that the storekeeper intended to clean the rice and to sell it in competition with rice packed in factories and imported to The Nyamaropa. He had refused to sell because he thought that the storekeeper would raise the price above that which "people could afford". The other farmer, a grass-widow, had grown two acres of rice and had nearly two bags, 400 lbs, to sell. She had declined the storekeepers offer because she wished to realise the top price by cleaning the rice herself. She did so, knowing full well that the labour involved was considerable and tiring and that she would have to employ a labourer to do most of it. I visited her several times in the next two months and enquired about the rice. She found that labourers refused to work for long cleaning the rice and one had left when she insisted that he spend a morning doing so. Afraid of losing her other labourer and unable to find another at the time, she had left the rice in her granary. Even then she would not think of selling to the storekeeper. Eventually she sold the rice in its uncleaned state to people on the scheme. She let it be known that she had rice for sale and so sold most of it at the farm gate. She took nearly 40 lbs. to a church meeting and sold 30 lbs. odd hawking it through the stands. The price she obtained was the standard price which had been offered to her by the storekeeper four months before.

The money delusions were interesting and, in each case, costly to the farmer and to the development of more productive relations. Experience will cause most of the delusions to vanish as they were in part the result of the farmers encountering novel situations. However, naivety was not the sole cause. Some delusions had more intractable origins which only the continued development of the scheme and area and the removal of certain anomalies will erase. Most of those that we came across had some link with the storekeepers. This may have been because the storekeepers represented, at Nyamaropa, one of the two major sources of contact with the world of business.

The resistance to dealing with the storekeepers appeared to be due, at least in part, to the effect that the official G.M.B. Agency business was having on local trade. When a farmer sold maize, groundnuts or millet to the stores he received the official price minus the levy, transport and handling charges. If the same farmer came back five minutes later and purchased what he had just sold he would have to pay a price which included the levy, transport and a handling charge. The farmer, in effect, was

able, five minutes later, to buy back only half what he had just sold. Consequently the price of maize in the largely self-sufficient local market was considerably above the purchase price and well below the re-sale price of maize at the stores. The official and the non-official market would only meet in a year of poor harvests when the farmers might be driven to purchase maize at the stores. The storekeepers were able to operate with prices at variance with those in the local market simply because the stores were the only major outlets for surplus maize.

The farmers were aware that the re-sale price of maize at the stores included a transport fee which, although the maize had not moved, was in effect charged twice. The store-keepers explained that this practice was obligatory for them as agents of the G.M.B. I know that one store-keeper bought maize at Nyamaropa for 14/- a bag and transported it forty miles to an area north of the scheme where food was short where he sold it for 42/- a bag. It is doubtful that he either registered the maize when it was delivered to the store or that he, therefore, paid the levy deducted by him to the collecting authority, the G.M.B. The official structure of the market enabled the store-keeper to retain a large profit without raising the supply price of maize which would have induced more maize on to the market and reduced the sale price in the area to the north. The only way that maize could have been imported economically into the area of acute demand would have been through avenues outside of the established facilities.

One farmer reported that a store-keeper not far from the scheme had refused to sell groundnuts to him because he had entered the delivery in a record book for the G.M.B. inspectors. The official market structure in Rhodesia, while encouraging production in remote areas in line with the demands of the national market, appeared to have a serious retarding effect on the growth of local markets and specialization. In the circumstances, local trade in The Nyamaropa had to be pioneered by the farmers and not by the store-keepers who had the facilities, the knowledge and the outlets to do it. Multiplied onto a national scale, where the official prices of staples have eroded over past years particularly in the more remote areas, the barrier to local pullulation was formidable and costly in development terms.

Traditional African subsistence farming, communal tenure under the tribe and the extended family system had evolved to provide group security within a harsh environment. The adoption of new practices and crops is still hampered or even prevented by the need to secure food supply first. Until a margin of security has been wrested from the soil or won in the form of savings through wage employment, innovation is impracticable and seldom rewarded.

Sixty-eight villagers in the Nyamaropa had recently begun to grow cotton. Most of them had been moved from Inyanga and therefore had some affinity with the majority of the settlers on the scheme. The success of cotton on the scheme had prompted many of them to adopt the crop. The Extension Officer and his staff who worked with the villagers feared, however, that many of the growers would not succeed with the crop. Yields and grades were disappointing, the management of the crop was frequently poor and few received much cash after all the deductions had been made.

One villager with whom I discussed the development of cotton in the villages argued that the Extension staff should concentrate more on helping the villagers to secure their food supplies before pressing for the adoption of cotton. He had just received £3.11. 6. net of all deductions for a quarter of an acre of cotton that he had grown for the first time. He told me that "the money was too little" and that he considered that it was not worthwhile growing less than an acre and a half.<sup>7</sup> He had, as he later explained, experienced a dramatic change in his farm pattern when he had undertaken to grow cotton. The low-cost subsistence features or, as Bauer termed them, "the no-cost features", disappeared and high cost features appeared.<sup>8</sup> His cash production costs raised the risk factor while the return was not sufficient to warrant his remaining at home (presuming that he could find work in town which was difficult at the time) and yet, without his presence his wife could not have handled the maize and the cotton. The extensive nature of the villagers' maize production demanded considerable hand hoeing that had to be performed expeditiously if the weeds were to remain under control. Maize farmed more intensively over a smaller acreage would have required less total cultivation and, if seed, manure and/or fertilizer were properly managed, it would have eased in terms of labour and of security the introduction of a cash crop.

On the scheme, the security of irrigation and the assistance rendered by family and church groups allowed nearly all the families to adopt cash crops immediately. A few farmers who joined from villages a few miles from the scheme and who had neither family on the scheme who might assist them nor sufficient capital, took up to three years to complete the move. For the first two seasons they remained based at their

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7. Johnson found that the introduction of a quarter acre of cotton to the crop mix on farms in Chitowa Purchase Area, a hundred miles to the north of The Nyamaropa, increased the Gross and Net Returns of his programmed crop combination by less than £1. He concluded that "at least an acre would be desirable" and that to do so the maize, groundnut and millet profits would have to be altered.  
Johnson, R.W.M. "The Labour Economy of Chitowa Native Purchase Area" U.C.R.N. Technical Paper in Agricultural Economics No. 21. 1965 p. 13.
8. Bauer, P.T. "The Rubber Industry", Longmans, London. 1948.

original homes where they grew the same subsistence crops as before. On the scheme they planted cotton and some followed with seed-beans, neither crop more than an acre. They were able to do this because they could obtain farm materials from the Co-operative on loan against the crop. They built rough huts on the scheme and camped there while working on their cotton whenever they were not tending their subsistence crops. Consequently, because of the distance involved and the competitive labour demands of the cash and subsistence crops, their cotton was poorly tended and brought little return. They were, in fact, high cost producers relative to their output. Most managed to complete the transfer but five failed and abandoned their plots to relatives from their villages who then began the same process.

Farming at Nyamaropa was characterized by fairly uniform applications of the recommended inputs of seed and fertilizer, and by a great variety of practices related to the dates of planting, the amount and type of labour and the managerial scope of each farmer as determined by social, economic and institutional factors. This resulted in a variety of returns, whether measured as returns to capital, to labour or to management.<sup>9</sup> As the returns were positively correlated but bore no clear relationship to yields, they suggest that on nearly half the farms the return to fertilizer was low and its marginal productivity close to zero. In other words the inputs were not always adequately serviced in terms of labour and management. Under such conditions one would have expected these farmers to have realized that they could have reduced their application of fertilizer without significantly reducing the value of their crops. The marginal productivity of fertilizer on their farms would have moved closer to or above its price and they would have effected a saving.

The Extension staff had instilled an understanding of the importance of enriching and maintaining the fertility of the soil, emphasising the use of manure and compost. Real limitations to the production of sufficient manure existed on most farms as few farms had the requisite number of beasts. The stall-feeding of oxen and the possible development of pig keeping offered the only way in which the on-farm production of manure could be expanded to meet the needs of the farm. Several farmers purchased manure in the villages, a sign that it was appreciated as a valuable input, but this development did not hold much promise as a solution as they all reported that it was difficult to find villagers prepared to sell manure as they had little surplus over and above their own needs.<sup>10</sup> The production of large quantities of

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9. See chapters on Performance of the Farms and Analysis of the Major Crop, cotton.

10. The possibility of manure developing into a commercial crop in the villages for supply to the scheme should be investigated. The temptation to sell manure required on the land in order to raise cash, rather than the planned production of manure surplus to the needs of the farm, could threaten the maintenance of fertility on many dry-land farms surrounding the scheme.

compost involves a certain discipline and a lot of labour. The farmers in the sample were therefore reluctant to start compost heaps. They also felt that the crop residues suitable for addition to the heap were useful as feed for their cattle. Fertilizer had two clear advantages. Its supply was not limited, particularly as it was obtained on credit, and its preparation and application required comparatively little labour.

There was some confusion as to the relative merits and value of manure, compost and fertilizer. Although the L.D.O. repeatedly stressed the basic importance of manure and compost, he likened them to the bread, and fertilizer to the butter of a sandwich; not all the farmers appreciated this. Consequently many of them adopted the recommended fertilizer inputs in the belief that they were in this way making up for deficiencies in their application of manure.

Whatever the reasons that caused many farmers to treat fertilizer in an inefficient manner, the effect it had on the performance of their farms cannot be ignored. Extension effort should be directed to increasing the supply of manure so that the practice of using fertilizer as a substitute can be stopped and its economic use can ensue. However, that would tackle only half of the problem on many of the farms. Where agricultural development through technological change occurs without major substitutions of capital for labour, then the labour input per unit can be expected to rise substantially. Mellor produced a table comparing the inputs on rice farms in West Bengal, India and in the Kinki district, Japan. The Japanese farmers used ten times the amount of fertilizer used by the Indian farmers and realised an output eight times greater. As important, the Japanese farmers put in four times as much labour than did their Indian counterparts.<sup>11</sup> Improved management, particularly in relation to the use and timing of labour and the treatment of the farm as an integrated unit, will have to be nurtured if fertilizer inputs are to yield their optimum returns.

A study reported by Edwards found that, under certain natural conditions and with an unlimited supply of capital, superior management could profitably use 800 lbs. of fertilizer per acre and poor management only 500 lbs.<sup>12</sup> At Nyamaropa many farmers had limited supplies of working capital and were, in purely economic terms, poor managers of labour. The recommended fertilizer applications may only have suited those farmers operating near an optimum position comparable to the one at the source of

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11. Mellor op cit. table 18 p. 161.

12. A report by Woodworth entitled, "Organizing Fertilizer Input - Output Data in Farm Planning". cited by Edwards D. op. cit. p. 263.

recommendation - usually a research station. For many farmers the recommended application involved a loss of income as it was suited to a combination of management and technical factors which they did not control or could not supply. The appropriate application of fertilizer for each farm or type of farm cannot be determined unless all the other factors are held constant. The only possible approach is to concentrate on all the other factors so that the level of farm practices will reach a stage compatible with the recommended application of fertilizer.

The decision of a few farmers to drop their summer maize crop, the traditional food crop, and to exchange vegetables and wheat for maize in the villages was an important development for the intensification of cash farming on the scheme and its impact on the area. They had had experience in exchanging wheat or vegetables for maize in the villages and had realised that these two crops enjoyed a substantial comparative advantage. Moreover, the use of wheat and vegetables to purchase maize freed additional land in summer on which to grow the major cash crops, tobacco and cotton, and occupied the land in winter and spring when there were few competing cash crops.

The decision to engage in trade with the villagers was, with two of the farmers, also an attempt to introduce a stabilizing element to the supply of labour. On the other farms the women had played a role in the decision. They liked to trade as they derived status from doing so and, as some villagers purchased with cash, an income which they controlled.

These few farmers sought to maximize their income and were prepared to purchase food on the local market. The majority of the farmers on the scheme still sought greater security, at the cost of a possible higher income, by growing their own food.

The ultimate development, one the farmers had not foreseen but which any growth in the trade relations between the scheme and the villages should reveal, could be the complementary use of productive factors for the stall-feeding of oxen. The villagers, once they supply the scheme with summer maize, could expand their production to meet the demand for maize-on-the-cob and for maize stalks with which to feed the oxen. Fodder crops could be grown in winter on the scheme to complement the maize for stall-feeding and to support the animals used for traction and could become cash crops, through the sale of the fattened oxen and possibly by sale to the villagers should they too fatten oxen. The potential for the expansion of the production of maize in the villages and fodder crops (including green maize) on the scheme is such that their price on the local market should not rise appreciably. Even should this happen, the complementary economies and the exchange of the crops should leave the farmers indifferent and it should have the effect of drawing other farmers and villagers into the expanding web of increased production and specialization.

Relations with the dry-land, the integration of the cattle into the farm and increased security for the farmers and the villagers so that they

will accept the risk of purchasing food on the local market are inter-related factors that will affect the impact that the scheme has on the area. There is a danger that the scheme will offer to the surrounding area little more than labour employment. In effect, it could act as an export-orientated industry which, as several economists have noted in the development of colonial territories, may provide little or no stimulus to development in the surrounding areas and which, in terms of trade and political ties, may remain closer to the mother country - at Nyamaroma, Umtali and Rusape. Farmers in the sample with whom I discussed such developments were always excited by the prospect, though none had thought that far. An alert, far thinking management should be able to sow and nurture the seed of such developments.

Before adopting recommended practices or crops, the farmers frequently assessed them in relation to their own needs and circumstances. The majority of the farmers displayed caution, even though they talked freely of the benefit of a crop or practice. The most common example was that of tobacco. Although it was an admirable crop for the farmers to grow, many hesitated in order to learn from the pioneers just what the outcome was likely to be. They clearly wished to weigh the probable benefit against the risk and uncertainty involved. Three factors acted to delay the move of many farmers into tobacco. The first was that the results of the tobacco crops were reported by the growers only in terms of gross income. No farmer, until the survey, had kept even a rough account of the expenses involved. Everyone knew that tobacco was "expensive" to grow and that it required a lot of labour and a fair degree of good management. The crop was pioneered by odd family groups and pockets of neighbours as close contact gave the prospective grower a chance to evaluate the crop, and as growers often sponsored family members. Secondly, lack of capital with which to build a barn and to hire labour delayed several farmers from entering tobacco. The final factor was the fairly general insistence that farmers in debt should content themselves with tried practices and crops and not borrow money to enter new ventures. Farm planning and a more imaginative approach to loans by the Co-operative would, in the circumstances prevailing at Nyamaropa, have considerably furthered the adoption of tobacco and with it the development of the scheme.

A general complaint by the farmers was that farming made excessive demands on their time. At first the complaint appeared to reflect a desire for more leisure without a reduction in income. In fact, however, the farmers were concerned with a separate problem which had nothing to do with leisure. Their concern was that it was difficult for most of them to undertake improvements to the farm or home without forsaking income generating work in the fields. Most wished to reach a greater intensity of farming so that they could afford to employ additional labour, builders and carpenters to relieve them of construction work and allow them to remain in the fields. The opportunity cost of construction was high for most farmers.

A few farmers reported that they regarded themselves as specialists and would prefer, if it were possible, to grow cash crops all year round and to employ others to build for them. The scheme had already attracted several builders and carpenters. Its continued development should increase the demand for specialist services.

The extra discipline of cash crops created sanctions within the individual farm that encouraged the efficient use of time and rewarded long hours. Some tobacco growers worked from 6 a.m. till 10 p.m. at the peak of the season, resting for two hours, one at mid-day and one for the evening meal. Older children frequently worked from the moment they arrived home from school until the family stopped at night. Simple paraffin wick lamps were used to throw a dim circle of light in which tobacco was sorted and tied. I lent pressure paraffin lamps to two farmers who were so delighted with them that they insisted on my selling them to them when I left. One of the two farmers worked with his wife and labourer till after mid-night for four weeks on end, a total of fifteen hours a day each. The store-keepers reported that several farmers had asked them to obtain pressure lamps for them, but that, with the sanctions applied against Rhodesia after Independence, they could not obtain any. The willingness of labourers to work long hours alongside the farmer was a notable feature of life on the scheme.

Roder reported the resistance of farmers on Nyanyadzi in the 1940's to a management proposal that they irrigate at night in order to utilize the full run of the river.<sup>13</sup> The frustration of the L.D.O's proposed solution to a severe water shortage by the farmers was in marked contrast with the willingness of the majority of the farmers at Nyamaropa to irrigate at night when necessary. One farmer, hearing water running in the middle of the night in the canal that bordered his home decided that the farmer whose turn it was must have overslept. He woke his wife and together they crept off to make the most of the water before the farmer to whom it had been allotted should wake.

The most traumatic event of the survey year was the failure of the seed-bean crop and the decision by the seed-merchants not to deal with the farmers again. The disease which attacked the crop was never identified although specimen plants were sent to Salisbury for analysis. Certain factors contributed to its spread and the destruction which it wrought. Almost half the farmers, because they were busy reaping maize and tending their cotton, planted after the period recommended by the Extension staff. Just before the disease appeared, a hail storm damaged much of the cotton then standing in the field and the farmers had to concentrate on rescue

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13. Roder, W. : op cit. p. 115.

operations. When the disease appeared on several farms the Extension staff advised the farmers to spray, but few did so. Although many of the farmers had insecticide left over from their cotton spraying, few had sufficient of the recommended variety with which to spray their beans. The Co-operative, used to delivering insecticide along with the other farm materials, carried little or no insecticide from day to day. One farmer told me that the recommended insecticide was not in stock when the farmers were advised to spray. I know that there was some a week later. Only two farmers in the sample sprayed their beans, and then with insecticide in their possession.

It soon became evident that the disease was a serious threat to the seed-bean crop. The farmers reacted with a curious apathy. The poor sense of communal discipline allowed delays to occur at each stage from the outbreak of the disease, its report, to the advice to spray. The Extension staff's relationship with the farmers was not strong enough to rouse them into action and they enjoyed no power to enforce a practice vital to the health of the scheme. Within a week of their advice to spray, the disease had spread to most of the farms. Several farmers in the sample told us that the use of insecticide would only involve them in greater expense which they were unlikely to recoup.

Had the merchants not decided to place their business elsewhere, the farmers may, in the subsequent season, have adopted a stricter regime and have sprayed. The destruction on a few stands of tobacco by eel worms led the tobacco growers, on the advice of the Extension staff, to order E.D.B. with which to treat their land before the next season. The growers were delighted to learn that they could control eel worm as they had been worried lest tobacco be lost to them as well as beans. The cost of applying E.D.B. was roughly £7 per acre and it had to be done from four to six weeks before the tobacco was planted out.<sup>14</sup>

A structured relationship between the farmers and the Extension staff, suitable tenurial arrangements so that discipline over farm practices that affect the community could be enforced and a closer identity on the part of the farmers with the working of the scheme might well have saved the seed-bean crop. The loss of the crop represented a severe blow to both the farmers and to the ability of the scheme to meet the proposed rent and water rates. Even in terms of the national interest, the risks engendered on the scheme were too great.

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14. D. Edwards reported that in an area in Jamaica the farmers were forced at the risk of losing their tomato crop to purchase a pesticide, of which they had just heard, to spray on the crop. "If the previous year's crop had not been totally destroyed the farmers would not have risked their labour, the few shillings spent on the pesticide, and the danger (in their minds) that the pesticide might actually harm the crop". Op cit. p. 257.

There was little evidence at Nyamaropa to suggest that some farmers had more managerial and innovational ability than had others. The environmental factors that demarcated the farmers' managerial field and degree of security appeared as paramount in determining their on-farm managerial ability. Once the provision of a favourable environment had allowed them to begin to exercise control over the productive factors and to gain confidence, then previous experience and innovational capacity played a more decisive role in the performance of the farms by pushing out the boundary of management activity and control.

Social and institutional factors and problems related to identity and security were as important as any purely economic assessment in the decision making process. On individual farms and among family groups where the environment was favourable, change was rapid and the goal of a maximum income prevalent. The aim was to maximize the total return to all factors owned by the family. Not, as in the theory of the firm, to maximize entrepreneurial profit. On the majority of farms the goal of minimizing risk was combined with that of maximizing satisfaction - a wider and less Western concept than that of income.

McClelland has argued that "The desire for gain, in and of itself, has done little to produce economic development. But the desire for achievement has done a great deal." <sup>15</sup> His advice, as a psychologist, for the promotion of economic development is: "Pay attention to the effects that your plans will have on the values, motives and attitudes of people because in the long run it is these factors that will determine whether the plans are successful in speeding economic development." <sup>16</sup>

Experience at Nyamaropa suggests that McClelland's injunction is sound. Without an approach to the scheme as a community, and one that will inevitably seek trade, labour and political relations with its neighbours, many avenues for identity, security and status were denied the farmers. As a result development efforts were, in a basically promising environment, thwarted or even prevented. The situation on the older Sabi schemes - where the leadership effect of a few better farmers appeared to be minimal - may have been due to the same regarding factors. The danger that some farmers would succeed at Nyamaropa without carrying the others with them was not far away.

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15. McClelland David G: "The Achieving Society" Van Nastrard, Princeton, 1961.

16. *ibid.* Page 393.

## SAVINGS, INVESTMENT AND EXPENDITURE

Increasing wants and changing consumption patterns are dynamic forces in economic development. They are usually associated with increased income per head, education or contact with other cultures, usually through migratory labour or more permanent movement to the urban areas. Without the expansionary effects of changing consumption patterns development may prove difficult, even impossible, to initiate. The lack of wants, a high preference for leisure and the absence of developed local markets and consequently of specialization are commonly mentioned in the literature as retarding development.

Baldwin concluded that the lack of economic incentives in terms of wants amongst the settlers on the Niger Agricultural Project was a major cause of the projects failure.<sup>1</sup> The Nigerian Cocoa Marketing Board in 1956 concluded that "the Yoruba farmer and his wives are not prepared to maximize income in cash or kind at the cost of leisure time, social life, and their accustomed tempo of work".<sup>2</sup> An earlier report, 1948, of the Sabi-Lundi Development Committee took a more pessimistic view of African aspirations. "In his present state of development, increased income is not sufficient to induce the average Native to increase his output. Despite the steady profits available to a family working four acres on the existing irrigation schemes in the Sabi, the insistence on good farming practices has resulted in a drift away from the irrigated land to the peace and quiet of a two-bag-per-acre existence in the bush."<sup>3</sup> Unfortunately the Committee did not discuss whether the men there became migrants or whether, being migrants, they left the schemes in the Sabi rather than conform to the regulations one of which laid down permanent residence by the head of the family as a condition of tenure. The plots may have been abandoned in order to realise greater cash needs, not because the plotters lacked wants.

More recently, 1955, the F.A.O. reported, "That the economic incentive is not as powerful in Africa as in most industrialised Western countries is unquestionably correct. But the facile judgements about laziness and lack of ambitions were only partly true in the past and are much less true today."<sup>4</sup> In Kenya, where cash farming has gained considerable ground in the last fifteen years, a farm study conducted in 1963

1. K.D.S. Baldwin. "The Niger Agricultural Project". Oxford. 1957.
2. "Nigerian Cocoa Farmers". Nigerian Marketing Board. London 1956. quoted by Wickizer, V.D. "The Smallholder in Tropical Export Crop Production". Food Research Institute. Stanford Feb. 1960. p.59.
3. Sabi-Lundi Development Committee. Interim Report 1948. Salisbury. p. 47.
4. F.A.O. "Cocoa: Commodity Series Bulletin No. 27.". Rome Nov. 1955. Quoted by Wickizer. op cit. p. 59.

stressed the lack of wants as a cause of failure on many farms. "The basic needs of the families were not large or increasing with sufficient inevitability to warrant the effort, physical and mental, to utilize the resources near the maximum."<sup>5</sup>

The process of transfer from "traditional to economic man" has received close attention for many years. The relationship between wants and income earning opportunities has not always been appreciated. Non-economic goals may have appeared to have been paramount for social and cultural reasons when perhaps more economic goals were, in fact, only attainable at great cost in terms of effort and risk. Unfortunately, the term "traditional man" can have emotive overtones and its use can preclude the analysis of factors that determine behaviour in the economic sphere and that raise the cost of possible expansion. Undoubtedly the social system, patterns of land tenure and taxation have important effects on efforts towards greater income and on expenditure preferences.

Moore, in an analysis of the growth of markets, wants and non-financial incentives at the early stages of economic development, argued that, "the 'economic' share of total human motivation is likely to be small, because of the meagreness of goods and services available through market transactions."<sup>6</sup>

In Rhodesia a farm scheme at Chiweshe, near Salisbury, through which European farmers have sought to assist neighbouring African villagers to raise the productivity of their holdings ran very quickly up against an apparent lack of wants on the part of the villagers who had joined the scheme. With their sudden increase in spending power, the villagers did not accrue "any material benefits".<sup>6</sup> Rather, they used their increased income to buy an additional wife, a practice which the European Chairman of the scheme deplored as "putting them in a worse position, as with each passing year they have an additional mouth to feed, clothe and school". The problem, the Chairman argued, should be tackled at the expenditure end: "If we are to maintain the interest of the plot-holders, we must see that he has reasonable facilities at his disposal ... a clear need for services - post office, banking, community hall, more sophisticated shops." The Chairman stated that the tribal system "encourages the habitual scrounger." It would appear that the members of the scheme had, in an otherwise unchanged environment, adopted minimum goals of security and increased status, both goals being realised by the acquisition of an additional wife. The alternative of purchasing labour saving implements would not appeal to the vill-

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5. Farm Economic Survey Unit. Report No. 13. Nairobi. April 1963. p. 90.

6. Stanning, T.: "Some Human Problems Encountered by African Farming Development." Rhodesian Journal of Economics, Vol. 1. No. 1. August 1967. p. 28.

agers if those implements reduced the demand for labour only on certain operations and left seasonal peaks untouched. Burley tobacco had been introduced under the scheme and no implement exists to reduce the heavy demand for labour at the period of reaping and grading. As at Nyamaropa, the villagers may have found it difficult to find and to keep hired labour, particularly as they lived amidst many European farms and close to Salisbury - two large markets for regular and seasonal employment. An additional wife may well have been an economic necessity in the circumstances if the advantages that membership of the scheme offered were to be realised.

The introduction of capital and of new crops through the scheme had increased the earning potential of the farms without, it would seem, having removed many of the barriers that had hindered the development of the villagers' farms in previous years. After three years of encouraging progress, the barriers seem to have reasserted themselves. The Chairman concluded his report: "The whole exercise will collapse if we cannot find the right social and economic foundations upon which to build a new society."

In Jamaica, Edwards found that increased incomes brought a measure of increased prestige, but that it could also earn resentment.<sup>7</sup> In Kenya, farmers were reported to have undertaken non-farm activities that brought rewards of social prestige but not of cash. Trading and the acquisition of motor-cars which the farm could not support were the most common activities.<sup>8</sup>

The Nyamaropa Irrigation Scheme promised to offer a useful model for the study of the effects of different cultural, educational and income levels on expenditure patterns and for the analysis of the forces that promote and reward effort and risk. The marked differences in the backgrounds and in the former and current economic performance of the Locals and the Newcomers suggested that comparisons could be drawn that were of significance.

The overall use to which families put their income is shown, for the ten farms analyzed under Performance, in Table I. Eight of the ten farmers, including both Locals, farms No. 1 and No. 2, drew on past savings or additional credit from the stores to meet the difference in the shortfall in their income. The farmers ploughed back from 3% - 73% of net family income into the farm. Only four invested less than 10%, without including the value of family labour, in both the farm and the homestead: and four invested between 53% and 80% of net family income in the farm and the home.

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7. Edwards, D. op cit. p. 252.

8. Farm Economic Survey Unit. op cit. p. 28.

(The lobola payment of farmer No. 6 to the parents of his second wife and the bicycle bought by farmer No. 1 could have been included in additions to farm assets and would have added considerably to the re-investment rate.) The table shows that the farmers were willing to invest in their farms and to build up their homes to a remarkable degree. The average rate of investment on farm assets as a proportion of net family income for the sample was 17.3% and on the homestead 14%: a total of 31.3%.

TABLE I.

EXPENDITURE AND INVESTMENT PATTERNS AS PERCENTAGE  
OF NET FAMILY INCOME.

FARM NO:	1	2	3	4	5	6	7	8	9	10
NET SURPLUS	£93	£89	£199	£155	£178	£194	£99	£120	£90	£293
Sundry Income	-	£1	-	-	£1	£53	£47	£38	£12	£51
Net Family Income	£93	£90	£199	£155	£179	£247	£146	£158	£102	£344
% of net Family Income	%	%	%	%	%	%	%	%	%	%
Produce Consumed	32	38	11	22	25	25	17	30	41	10
Family Expenditure	87 <sup>1</sup>	72	58	31	28	47 <sup>2</sup>	92	55 <sup>3</sup>	130	30 <sup>4</sup>
Other Expenditure	11	-	-	2	-	55	-	22	-	31 <sup>4</sup>
Additions to Farm Assets	53	9	7	16	18	3	4	13	37	73
Additions to Homestead	-	-	-	64	-	5	3	-	26	-
TOTAL PERCENTAGE	183	119	76	135	71	130	116	120	234	144
CREDIT AT STORE % NFI.	12	5	3	3	3	1	17	6	11	2
SAVINGS INTRODUCED % NFI.	71	14	-	32	-	29	-	14	123	42

TABLE I. Footnotes.

1. Bicycle.
2. Lobola payment.
3. Mechanical fees and spares for his small bus.
4. Repairs and Legal Expenses after accident with his truck.
5. Farmer No. 6 built a store-room without making cash payments.

Actual cash savings were made by only two of the ten farmers. The second last line of the table shows the proportion of net family income obtained in credit or loan from the storekeepers most of which remained outstanding at the end of the year. Savings introduced into the farm and family business is thus the difference between the credit figure and the total percentage figure for expenditure less 100%. The savings introduced by farmers Nos. 1 and 2 went partly towards family expenditure; on five farms it went entirely into investment on the farm (including No. 6's lobola payment); and farmer No. 7 managed to reinvest 7% of net family income only because he increased his indebtedness to the stores by 17% of net family income.

There is no consensus of opinion in the literature on saving in agriculture, particularly on the savings of peasant farmers. It has sometimes been claimed that savings are small or nearly zero in less developed

countries and that savings made in the normal process of farming may be hoarded or saved to be used for some unproductive though socially satisfying purpose - one that may act to ensure a degree of security within the community. Similar reasoning lay behind the formulation of the A.D.F. Levy which was intended to force savings and investment in African agriculture.<sup>9</sup>

On the other hand, Panikar found that in three regions of India net saving (in cash) was at least 8% of gross income.<sup>10</sup> Some of the saving may have been hoarded and may not have entered the agricultural system, in which case 8% may have been appreciably higher than the real saving/investment figure. There are unfortunately very few data on consumption investment and savings among African farmers. Comparison between findings in agriculture would, in any case, present problems as seasonal changes substantially affect results.

At Nyamaropa, the great variety in farm and family expenditure needs and in the patterns of social and farm organisation precluded a compilation of income elasticities of demand for various foodstuffs and for other items of family expenditure or for the marginal propensity to consume additional income. Once more essential expenditure on the farm and the home and on education, clothing, household items, medical treatment and travel had been met, there would appear to have been a high income elasticity of demand for food and, with it, a fairly low marginal propensity to consume as income creating investments, and security were valued.<sup>11</sup> A very large sample would have been necessary in order to ensure reliable results. Further, the scheme was clearly undergoing a period of rapid change which, allied to the failure of the seed bean crop, considerably affected decisions as to the extent to which income was either consumed or saved, and the use to which savings were put.

Investment in the farms and homes did not appear to have been retarded by the poor season experienced during the survey year. Decisions to invest were usually taken prior to the season so that the necessary bricks could be made, other materials acquired and the crop pattern altered to

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9. See Report of the Secretary for Native Affairs and of the Chief Native Commissioner, 1948. Government Printer 1949; quoted by Yudelman, M. op cit. pp. 165 and 272.
  10. Panikar, P.C.K. "Rural Savings in India". Economic Development and Cultural Change Vol. 10. Oct. 1961. pp. 64 - 84.
  11. Doreen Warriner writing on peasant farming in Europe noted that "peasants in all regions where a money economy is established tend to save a very high proportion of their income, even when the income is much smaller than that of a wage-earner. But these savings are invested in land purchase." Economics of Peasant Farming, Oxford 1939. p. 163.  
In India, Major Jack and Scarlett Epstein both reported similar propensities to save towards the purchase of land. At Nyamaropa many of the more successful farmers talked of their desire to be able to purchase more land, both for security and to raise their income potential.

accommodate additional demands for labour. The majority of the farmers were intent upon improving the income earning potential of their farms and most chose to go ahead with their investment plans even after it was obvious that the bean crop was a failure. The ability and willingness of most of the farmers to complete their plans when their income fell drastically was surprising. After questioning the farmers, we concluded that as most investments represented fairly large sums and since they could not be financed through the Co-operative, only farmers who already had cash resources had planned to increase the asset value of their farms or homes. Having committed themselves, most of them cut down on luxury items, particularly of food, when faced with the crop failure. The most common investment items were "lumpy"-tobacco barns, houses, granaries, fencing, oxen and other livestock, and second hand trucks. Each item represented a large proportion of net family income.

The farmers who undertook little investment had few or no cash resources and no source of loans for that type of expenditure. During the survey year their family expenditure and the value of produce consumed formed, with few exceptions, nearly 100% or more of net family income. In other words, they had been able to save and invest far less than had other farmers and the income potential of their farms was not being appreciably increased. The lumpiness of most investments made their position more difficult.

Before joining the scheme, those who had accumulated cash resources had had few other opportunities to utilise their savings to increase their income and improve their status except in trade in which many of the Newcomers and a few Locals had become involved. Almost all the men who had had cash resources on joining were among the most successful and progressive farmers on the scheme because they had been able to use their capital to surmount some of the barriers which hindered the development of the farms. Although they had had experience in trade and after a few years had originally intended, so most of them claimed, to combine farming with the management of a store or butchery, almost without exception they had lost interest in trade as either a subsidiary or minor occupation. Instead they showed a marked willingness to devote their resources and their current savings to develop their farms. Experience in trade must have taught them that most African areas were over-traded and that success was difficult to achieve. Having overcome some of the initial barriers in farming, they realised that further investments were likely to bring greater rewards on the farm than in trade. A wealthier minority had come to regard the ownership of a truck as being beneficial to the farm and as a profitable subsidiary business.

The farmers who had little or no capital had found it difficult to move into tobacco and to surmount most of the barriers. They entertained a certain insecurity on the scheme which many of them exhibited by

planning and saving towards entering trade. Rather than save slowly towards overcoming some of the barriers to the fuller development of their farms, they had, by and large, decided that their savings could more easily and more profitably be used to rent stores. The men would run a business, leaving their wives to run the farm with the help of a permanent labourer. During the year, four farmers entered into negotiations concerning the renting of two stores, a bakery and a butchery - one was a Local B, two were Newcomers A and one a Newcomer B. Only one actually entered trade - the farmer whose advent into store-keeping is written up in the chapter on The Stores. One of the others found employment locally as a builder and another went to Salisbury in search of a job as he could not raise the capital he required.

Trade was still held paramount in terms of status and advancement for Africans in Rhodesia and kin were often prepared to help finance trading ventures. Two factors appeared to promote the interest in trade of the less successful farmers. They were looking for alternative sources of livelihood should they not be able to meet the rent and water charges, the introduction of which was imminent, and therefore have to leave the scheme. They could foresee no action on the part of management to remove or lower any of the barriers that prevented them from totally committing themselves to the scheme.

The tendencies of some farmers who had few cash resources and no experience in trade to find entry into trade attractive and the tendencies of others who had once been in trade and who had subsequently come to regard cash farming as a more profitable field for investment of their resources and enterprise were consistent with the parameters of their effective management control. Increased security and increased income were their common goals. As we saw under Performance, the return to capital on the more developed farms was high and the return on additional increments of capital appeared likely to remain high. On poorly developed farms the returns to capital were uniformly low or negative. The farmers with more developed farms displayed a greater commitment to the scheme while the others were forced to consider alternative uses for their capital. Varying degrees of commitment had retarded the growth of communal cohesiveness, identity and leadership.

The large returns to the tenants on the Gazira scheme in 1947 and 1948 revealed one structural deficiency in the economy of that scheme and the region. "Little opportunity for or knowledge of private capital investment, except in retail trade existed."<sup>12</sup> At Nyamaropa retail trade usually represented a poor investment: a fact to which the number of failures testified. Healthier investment opportunities existed on the scheme, as the more successful farmers had demonstrated, but entry was blocked by barriers which few farmers or the community could surmount. Rather than an investment of surplus resources, entry into trade was a search for alternative

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12. Gaitskell, A. op cit. p. 257.

sources of security and the return did not have to promise to be high.

As the great majority of the farmers appeared to have saved and reinvested a substantial proportion of their incomes in efforts to achieve higher income levels and greater security, it seemed likely that expenditure during the year on consumption items could not be regarded as being representative of a typical year. If barriers are eased or removed and the scheme continues to develop, total expenditure on consumption might increase rapidly in subsequent years. However, the different backgrounds, farm patterns, levels of education and income, and social and religious affiliations suggested that the expenditure patterns between the groups may differ significantly. The Newcomers may have been expected to exercise a leadership function in this field.

To ascertain the significance of possible differences in expenditure patterns an analysis of variance was carried out on two sets of data: one containing expenditure on major consumption categories (Table II) and the other expenditure on all items of food by each group of families in the sample (Table IV). Both sets of data were compiled from the weekly family expenditure sheets.

In the analysis of Table II a two way layout without interaction was assumed to test whether the Locals A and the Locals B differed significantly in their expenditure patterns; similarly whether the Newcomers A and B differed: and a three way layout without interaction was assumed to test whether the Locals and the Newcomers differed significantly in their patterns of expenditure.

TABLE II.

GROUP COMPARISON OF AVERAGE FAMILY EXPENDITURE - IN SHILLINGS.

	Food	Milling	Household	Clothing	Cigarette/ Beer	Furniture/ Appliances	House Repairs	Education	Travel	Medical	Gifts: Cash	Gifts: Kind	Personal Tax	Other	TOTAL
LOCALS A	184	46	62	443	38	48	1	321	52	57 <sup>1</sup>	16	6	20	5	1286
LOCALS B	139	44	43	178	11	30	0	123	51	59	5	36	20	3	742
NEWCOMERS A	269	43	56	501	28	124	5	159	115	37	37	6	20	13	1413
NEWCOMERS B	336	35	76	327	23	104	41	381	116	30	4	2	20	20	1505

1. An average of 13/- was spent on Local African doctors' fees.

SYNOPSIS OF RESULTS. TABLE II.

Using A to denote the categories of expenditure: food, milling, etc.

1. The Null Hypothesis was that there was no difference between the Locals A and the Locals B in regard to their patterns of expenditure. That is,

$$H_0 : B (\text{Locals A and B}) = 0$$

$$\text{The } H_0 \text{ could be rejected if } \frac{SS_B}{SS_{AB}} > F_{1.13} \text{ at}$$

.05 level of confidence.

$$\text{The result was } 6.6743 > 4.67$$

The  $H_0$  can be rejected at the .05 level of confidence. It therefore seems likely that the average expenditure patterns were significantly different for Locals A and B.

2.  $H_0 : B (\text{Newcomers A and B}) = 0$

$$\text{reject if } \frac{SS_B}{SS_{AB}} > F_{1.13} \text{ at } .05 \text{ level of confidence}$$

$$\text{The result was } .1070 < 4.67$$

Therefore, the  $H_0$  that the average expenditure patterns were not significantly different for Newcomers A and B cannot be rejected.

3.  $H_0 : BC = 0$       B = Locals      C = Newcomer

$$\text{reject if } \frac{SS_{BC}}{SS_{ABC}} > F_{13.13} \text{ at } .05 \text{ level of confidence}$$

$$\text{The result was } .6886 < 2.57$$

Therefore, the  $H_0$  that the average expenditure patterns were not significantly different for the Locals and the Newcomers cannot be rejected.

DISCUSSION. Table II.

In that the Locals and the Newcomers displayed marked differences in their social and church affiliations, educational levels, work experiences and family patterns, it seemed possible that significant differences in their patterns of expenditure would be revealed by the analysis. That no significant difference existed between the two major groups was therefore surprising. It did, however, support the impression we had gained during the survey that few families spent money on anything but essential goods. Not only was the marginal propensity to consume low - a proposition supported by the storekeepers who regarded the farmers as being mean spenders - but the failure of the seed bean crop and the perseverance of many with planned investments necessitated a judicious use of residual income to cover basic family needs. In fact, after August, when the extent of the crop failure was realised, family

expenditure on several items of food, on confectionary, cigarettes and beer dropped appreciably with most families in the sample.

Expenditure under what may be termed the essential categories - education, clothing (much of which was for school children), milling, household,<sup>13</sup> medical expenses and tax formed quite high proportions of total family expenditure. These proportions appear in Table III below, column A.

TABLE III. Essential Expenditure as % of Family Expenditure.

	$\frac{A}{\%}$	$\frac{B}{\%}$	$\frac{C}{\%}$	$\frac{D}{\%}$
Locals A	76	12(88)	6(94)	6(100)
B	61	20(81)	11(92)	8(100)
Newcomers A	63	14(77)	17(94)	6(100)
B	58	22(80)	16(96)	4(100)

If we then add food to the list of essential categories we get essential expenditure forming from 77% - 88% of total family expenditure, column B. The Newcomers spent considerably more on furniture and appliances, house repairs and travel than did the Locals, column C. This was not surprising as their homes were more substantial and they travelled more frequently to visit relatives, attend church or just to get away from the scheme in the off season. Column D shows the proportion spent on cigarettes, manufactured beer, gifts given in cash and in kind and small items that belonged to no major category.

The low total average expenditure figure (Table II) for the Locals B was due to two factors. Three, or half the number in the sample, built tobacco barns during the year; as a group their rate of reinvestment was the highest as a proportion of net family income. The cash output for the three barns represented an average expenditure for the group of 308/-. The other factor was that one of the Local B farmers received from an elder son a total of £53 which he sent to support a brother in secondary school, or 176/- per family in the group.

The only other adjustment that should be noted was that three children from two Newcomers B families were also supported in secondary school by older brothers. The contributions totalled £151.17. 4., or 276/- per family in the group. The Newcomers A had the smallest and the youngest families of the four groups with only one child in secondary school and five of the thirteen families had only one child old enough to attend school. The education column with the contributions included appears below:-

<u>Average Expenditure per Family.</u>	<u>Education (shillings)</u>
Locals A	321
B	299
Newcomers A	159
B	657

13. Household items were comprised almost entirely of soaps (particularly "blue soap" the cheap coarse soap used for washing clothes), paraffin, candles, matches and occasionally items such as lamp wicks or batteries for torches or radios.

TABLE IV.

GROUP COMPARISON OF AVERAGE EXPENDITURE ON FOOD - IN SHILLINGS.

	<u>STORES</u>													<u>NEIGHBOURS' MARKET</u>							GRAND TOTAL			
	Sugar	P' Milk	Beverages	Bread	Margarine	Cooking Oil	Yeast, Flour, Baking Powder	Salt	Meat	Fish	Baby Food	Confectionery, Soft Drinks.	Other	On Account: Unspecified	TOTAL	Meat	Wheat	Maize	Vegetables	Fruit		Rapoko	Other	TOTAL
LOCALS A	52	3	3	11	1	7	4	5	13	3	1	7	1	5	116	20	15	6	2	2	22	1	68	184
LOCALS B	61	10	6	8	1	7	3	4	16	1	0	3	0	3	123	7	0	0	1	0	8	0	16	139
NEWCOMERS A	98	21	20	14	1	11	4	5	15	4	9	5	1	38	246	2	6	9	2	2	2	0	23	269
NEWCOMERS B	116	31	23	17	4	20	7	5	17	3	21	12	4	40	320	8	0	0	2	1	2	3	16	336

1. Tea made up nearly 80% of all beverages purchased.  
Coffee 12%, orange squash 5% and cocoa 3%.

Table IV shows the average expenditure on food of the four groups. The table is divided into two parts : food purchased at the stores and from neighbours on the scheme or in the villages. As with Table II, an Analysis of Variance was carried out on this model. A two way lay out without interaction was assumed to test whether the Locals A and the Locals B, and the Newcomers A and the Newcomers B, differed significantly in their patterns of expenditure on food : first with regard to purchases made at the stores and then with purchases made both at the stores and in the neighbours' market. A three way lay out without interaction was assumed to test expenditure differences between the Locals and the Newcomers.

SYNOPSIS OF RESULTS. TABLE IV.

Using A to denote the categories of expenditure on food: sugar, powdered milk, etc.

1A The Null Hypothesis was that the average expenditure patterns on food purchased at the stores were not significantly different for Locals A and B. That is,

$H_0: B \text{ (Locals A and B)} = 0$  Stores only.

The  $H_0$  could be rejected if  $\frac{SS_B}{SS_{AB}} > F_{1.13}$  at

the .05 level of confidence.

The result was .0702  $>$  4.67

Therefore, the  $H_0$  cannot be rejected.

1B  $H_0 : B \text{ (Locals A and B)} = 0$  Stores and neighbours' market  
reject if  $\frac{SS_B}{SS_{AB}} > F_{1.20}$  at .05 level of confidence.

The result was 3.2801  $>$  4.35

Therefore, the  $H_0$  that the average expenditure patterns on all food purchases were not significantly different for Locals A and B cannot be rejected.

2A  $H_0 : B \text{ (Newcomers A and B)} = 0$  Stores only. Reject if  $\frac{SS_B}{SS_{AB}} > F_{1.13}$  at .05 level of confidence.

The result was 14.0900  $>$  4.67

The  $H_0$  can be rejected at the .05 level of confidence.

It therefore seems likely that the average expenditure patterns on food purchased at the stores were significantly different for Newcomers A and B.

2B  $H_0 : B \text{ (Newcomers A and B)} = 0$  Stores and neighbours' market.  
reject if  $\frac{SS_B}{SS_{AB}} > F_{1.20}$  at .05 level of confidence.

The result was 6.3275  $>$  4.35

The  $H_0$  can be rejected at the .05 level of confidence.

It therefore seems likely that the average expenditure patterns on all food purchases were significantly different for Newcomers A and B.

3A  $H_0 : BC = 0$       B = Locals      C = Newcomers  
Stores only.

reject if  $\frac{SS_{BC}}{SS_{ABC}} > F_{13.13}$  at .05 level of confidence.

The result was .1820  $>$  2.57

Therefore, the  $H_0$  that the average expenditure patterns on goods purchased at the stores were not significantly different for Locals and Newcomers cannot be rejected.

3B  $H_0 : BC = 0$       B = Locals      C = Newcomers  
Stores and neighbours' market.

reject if  $\frac{SS_{BC}}{SS_{ABC}} > F_{20.20}$  at .05 level of confidence.

The result was 10.0766  $>$  2.12

The  $H_0$  can be rejected at the .05 level of confidence. It therefore seems likely that the average expenditure patterns on all purchases were significantly different for Locals and Newcomers.

#### DISCUSSION. TABLE IV.

For the same reasons as had made differences in the expenditure patterns of groups across all categories of family expenditure seem possible, it seemed likely that significant differences in their patterns of expenditure on food at the stores would be revealed by the analysis. It also seemed likely that the groups would have different patterns of expenditure for food bought in the neighbours' market as there were marked differences in the food that the groups grew and consumed on the farms and stands. The differences were largely determined by the cattle problem, which prevented most of the Locals from growing enough wheat and other food crops for their needs, and by the locale of their stands on the barren hillsides. The Newcomers lived below the scheme where the soil was good and water off the plots convenient for fruit and vegetable production. The Locals may well have purchased what they could not produce themselves.

The most marked difference revealed by the analysis was that between the expenditure at the stores of the two groups of Newcomers (2A). The Newcomers B spent more on food under each category except salt, fish and beverages. The analysis revealed a smaller but still significant difference when expenditure on food in the neighbours' market was included (2B). Conversely, expenditure in the market strengthened the difference between the two groups of Locals, but neither set of patterns - at the stores (1A) and then including the neighbours' market (1B) - was significant.

Once more, surprisingly, there was no significant evidence that the Newcomers had exhibited leadership through spending differently, even though their total average expenditure on food at the stores was double that of the Locals. Once purchases in the neighbours' market were included in the analysis a significant difference in the expenditure patterns of the Locals and the Newcomers emerged. The reason for this was that, as expected, the Locals purchased more in the neighbours' market than did the Newcomers. The proportion of total expenditure on food reflected inversely the self-sufficiency of their farms: Locals A 39%, Locals B 11%, Newcomers A 8% and Newcomers B 4%. Both groups of Locals, but particularly the Locals A, entertained in the traditional manner holding occasional large feasts to which all kin were invited and at which beer and maize meal (sudza) with meat was served. Rapoko was a major ingredient in the beer and, as few families grew it on the scheme, most purchased their requirements from the villages.

The Newcomers entertained in a more intimate fashion, usually with tea and occasionally with a small pot of sweet (non-alcoholic) or fermented beer. Their expenditure on sugar, powdered milk and beverages was considerably higher than that of the Locals.<sup>14</sup> Beer drinking within a small circle was enjoyed by most church members. Even those who professed a great liking for beer seldom dared to venture to the larger beer drinks held by the Locals and they very rarely attended those held by the villagers as they were often ceremonies connected with traditional religion.

The only other items on which the Newcomers spent considerably more were cooking oil and baby foods, usually Lactogen. However, the total expenditure under the two categories was small and neither involved altered patterns of cooking or child feeding. In fact, as we have seen, Lactogen and powdered milk was used so sparingly in feeding infants that frequently the children were worse off as it was used as a substitute rather than an additive.

Expenditure on food appeared to be residual to expenditure on more essential family and farm needs. The small variety of food purchased covered every category of food stocked by the stores although not many tins of food- meat, fish, beans, milk - were bought as they were considered to be expensive compared with the local produce. Most of the Newcomers and a few of the Locals purchased relatively large amounts of goods while in town. They enjoyed selecting from a far wider range and most articles were cheaper than in the Nyamaropa stores. The greater part of expenditure

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14. Thomson, B.O. found in Northern Rhodesia that the higher income households tended to increase their consumption of "luxury" foods, particularly tea, sugar, tinned milk and cooking oil. "Two Studies in African Nutrition: an urban and a rural community in Northern Rhodesia." Rhodes-Livingstone Institute Paper No. 24. 1954.

in town went on clothes and particular brands of padlocks, lamps and other articles that the farmers liked but that were not stocked at Nyamaropa. Most families brought home food purchased in town : they did so to save a few pennies on each item as, without exception, the same items were stocked by the stores.

Increased income would, it appeared, go first to essential expenditure and to savings and then to more of the same food, principally the "luxury" items. One farmer in the sample enjoyed a non-farm income of £132 p.a., over twice the non-farm earnings of any other farmer. He was the L.D.O's messenger and a Local A. He spent £17 more on food than did the next highest spender among the Locals : 160/- on sugar, 84/- on bread, 42/- on wheat, 38/- on meat, and 18/- on powdered milk. He drank very little tea. He also spent 177/- more on cigarettes and 41/- more on beer bought at the stores than did any other farmer in the sample (five times and four times as much). He was the only Local A to build a brick house, the total cost of which was £34. Otherwise his family expenditure and investment patterns were similar though somewhat higher than those of the other Locals A. His exceptional non-farm income necessitated the removal of his expenditure data from the compilation of tables II, III, and IV as the sample was too small to accomodate such a difference in income and expenditure.

At random periods throughout the year we interviewed two thousand and sixty six people who visited the stores in the Nyaruwaka shopping centre adjacent to the scheme. The aim of the interviews was to ascertain what impact or leadership the farmers on the scheme might be expected to have had on expenditure patterns in the surrounding area. Each customer was identified as coming from on or off the scheme and according to whether he or she was a father, mother, son or daughter, and items purchased were recorded and later analysed under six categories, (Table V).<sup>15</sup> Three thousand purchases were made under the six categories although more than one item per visit was frequently bought under the categories of food and household items. Customers from on the scheme spent an average of 3.7/- on an average of 1.44 categories per visit : those from off the scheme spent an average of 4/- on an average of 1.47 categories per visit. Only one purchase was omitted from the data which forms Table V. On returning from working in town, a villager paid £20. 0. 0. as part payment on a scotchcart that he had bought previously through one of the stores. The purchase was excluded because farmers on the scheme used the Co-operative and not the stores for the purchase of implements.

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15. Only four of all those interviewed described themselves as labourers. Most labourers visited the stores after receiving their wages at the time of the cotton payment, a period when we were fully engaged recording the financial transactions of the farmers. Undoubtedly more than four labourers were interviewed by us but replied that their homes were off the scheme and that they were sons or daughters. However, I do not think it likely that their number was significant.

TABLE V.

EXPENDITURE PATTERNS OF CUSTOMERS FROM ON AND FROM OFF THE SCHEME AT THE STORES.

	FOOD				CLOTHES				HOUSEHOLD				CONFECTIONARY AND SOFT DRINKS				OTHER				CIGARETTES AND TOBACCO				TOTAL					
	Number of persons inter- viewed.		% who bought		Average expendi- ture shillings		% who bought		Average expendi- ture shillings		% who bought		Average expen- diture shillings		% who bought		Average expen- diture shillings		% who bought		Average expen- diture shillings		% who bought		Average expen- diture shillings					
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF		
Fathers	405	237	49	45	3.6	2.6	13	23	18.6	25.5	28	29	1.9	1.3	17	24	.6	.8	23	19	4.5	2.8	10	13	.9	1.1	140	153	4.2	5.4
Mothers	286	235	52	47	2.8	2.3	26	25	15.2	11.3	35	32	1.4	1.9	22	22	.4	.3	14	14	4.0	6.3	2	3	.7	1.3	152	143	4.3	3.9
Sons	349	186	45	37	2.6	1.9	15	17	15.8	16.6	31	32	.8	1.2	27	29	.6	.6	17	20	2.3	3.3	11	15	.9	.7	145	150	3.1	3.1
Daughters	201	167	50	47	2.1	2.6	23	23	10.1	11.8	29	31	1.1	1.2	24	28	.5	.3	10	12	2.3	2.2	4	2	.6	.7	140	143	2.9	3.3
TOTAL	1241	825	49	44	2.9	2.4	18	22	15.1	16.4	31	31	1.3	1.4	22	25	.5	.5	17	16	3.6	3.7	8	8	.9	.9	144	147	3.7	4.0

An Analysis of Variance was carried out on this model. A three way layout without interaction was assumed. Three tests were made to determine whether there were significant differences in the expenditure patterns of customers (being either fathers, mothers, sons or daughters) in buying various categories of goods according to whether they came from on or off the scheme.

SYNOPSIS OF RESULTS. TABLE V.

Using A to denote Fathers, Mothers, Sons and Daughters.

Using B to denote ON and OFF the scheme.

Using C to denote the categories of expenditure : food, clothes, etc.

1. The Null Hypothesis was that there was no significant difference in the expenditure patterns of those from ON and OFF the scheme according to whether they were fathers, mothers, sons or daughters.

$$H_0 : A = 0.$$

The  $H_0$  could be rejected if  $\frac{SS_A}{SS_{ABC}} > F_{3.15}$  at the .05

level of confidence.

The result was 4.9869 > 3.29

The  $H_0$  can be rejected at the .05 level of confidence.

It therefore seems likely that there was a significant difference in the expenditure patterns of those from ON and OFF the scheme according to whether they were fathers, mothers, sons or daughters.

2.  $H_0 : B = 0.$

reject if  $\frac{SS_B}{SS_{ABC}} > F_{1.15}$  at .05 level of confidence.

The result of .0352 > 4.54

Therefore the  $H_0$  that there was no significant difference in the expenditure across the categories by customers according to whether they came from ON or OFF the scheme, cannot be rejected.

3. Further tests were conducted to determine whether there were any significant difference in expenditure by people from ON and OFF the scheme under each category (food, etc.), that is, group expenditure per category. The analysis of differences under all six columns and under total expenditure gave results well below the critical values at both the .01 and the .05 levels of confidence. None of the seven null hypotheses - that there were no significant differences in expenditure under each category by the two groups from ON and OFF the scheme - can therefore be rejected.

4.  $H_0 : BC = 0.$

reject if  $\frac{SS_B}{SS_{BC}} > F_{1,5}$  at .05 level of confidence.

The result was .0833  $\nabla$  6.61

The  $H_0$  that there was no significant difference in expenditure patterns ON and OFF the scheme in the different categories for fathers, mothers, sons and daughters, cannot be rejected.

DISCUSSION. TABLE V.

The analysis of the expenditure patterns revealed that there were no significant difference between the spending of people who came from on the scheme and the spending of people who came from off the scheme. In other words, the people from on the scheme exhibited no particular leadership in the amount nor in the pattern of spending per visit to the stores although in many respects they appeared to be the elite of the area.

The only significant difference revealed was between the expenditure patterns of fathers, mothers, sons and daughters from on and off the scheme. With the prevalence of migratory labour among the men off the scheme such a finding seemed likely. However, further treatment of the data reveals some interesting aspects of the pattern.

Table VI shows pictorially the relative weights of the fathers, mothers, sons and daughters in the composition of the groups from on and off the scheme. Opposite each flag or box a figure of 100 should be read. In diagram A which gives the proportion of the F.M.S.D's who visited the stores, for every 100 fathers from off the scheme sample weighting showed the proportion of fathers in the group from on the scheme to be that much greater than the proportion of the fathers from off the scheme : 118 v 100. Fathers and sons from on the scheme played more active roles in shopping than did their counterparts from off the scheme. Mothers and daughters from off were more active than those from on the scheme.

TABLE VI.

ALL PURCHASES.

	Position of groups.		Who bought.		Average amount.		Total amount per visit.	
	A ON	A OFF	B ON	B OFF	C ON	C OFF	D ON	D OFF
Fathers	118			109		129		132
Mothers		122	106		110		117	
Sons	122			103				103
Daughters		125		102		114		119
				102		110		112

In diagram B, the total number of purchases by category (food, etc) is shown; in diagram C the average amount spent; and in diagram D the total amount spent. In diagram B, C and D the figures are not proportioned in relation to the group but only in relation to the patterns of purchases of the counterpart (e.g. fathers on v fathers off). It should be remembered that the difference in expenditure between the counterparts were shown to be significant in test one of the analysis of variance. Here we marry those figures with the figures for the frequency with which the F.M.S.D. on and off bought in the various categories. For every 100 purchases made by a father from on the scheme, a father from off the scheme would make 109 purchases. If the average value of each purchase by a father on the scheme was 100, then the father from off the scheme spent 129 units. Since the father from off spent more on average per article and purchased more articles at each visit the total amount spent in the store was nearly a third as much again as that of the father from on, 132 v 100. Only the mothers from on the scheme spent more on more items than did their counterparts from off the scheme. Overall those from off were better customers than those from on: they spent 112 v 100 units at each visit, but bought only 102 v 100 articles by category.

Table VII shows similarly weighted results for the three major categories. For every 100 fathers from off the scheme who bought food, 110 fathers from on the scheme bought food and they spent an average of 150 v 100 units on food per visit to the stores. In effect, for every father from off the scheme who spent 100 units on food at each visit to the stores, the father from on the scheme spent 163 units. The mothers and sons from on the scheme were also more active purchasers of food than their counterparts. Only the daughters from off the scheme were bigger purchasers of food than their counterparts. Overall, the people from on the scheme spent a third more on food at each visit to the stores than did those from off the scheme.

TABLE VII.

	Who bought		<u>FOOD.</u>		Total amount.	
	ON	OFF	Average Amount		ON	OFF
			ON	OFF		
Fathers	110		150		163	
Mothers	111		122		134	
Sons	122		137		167	
Daughters	106			124		132
	111		121		134	

TABLE VII (Cont.)

CLOTHES.

	ON	OFF	ON	OFF	ON	OFF
Fathers		177		137		243
Mothers	114		135		154	
Sons		113		101		114
Daughters				116		106
		122		109		133

OTHER.

	ON	OFF	ON	OFF	ON	OFF
Fathers	121		161		193	
Mothers				157		154
Sons		118		143		175
Daughters		120	105			115
	106			103	103	

The picture is very different for clothes. Men from off the scheme purchased far more frequently and more expensively on clothes than did the fathers from on the scheme. For every father from on the scheme who purchased a 100 units of clothing at each visit to the stores, fathers from off purchased two and a half times that amount, 243 units. Many of the purchases of clothing made by the fathers from both on and off the scheme were for their wives and children. The difference is largely explained by the phenomena that migrants on returning home re-established their standing with the store-keepers by purchasing quite heavily in the store to which they were nominally attached. Mothers from on the scheme were more frequent and bigger buyers of clothes than were their counterparts, and the children off more than the children on. Overall those from off spent a third more on clothes per visit than did those from on the scheme: the reverse of the overall result for food.

The items that fell under the category Other were mainly items for the farm and the home: nails, small hand tools, padlocks, insecticides (usually D.D.T. which was used to protect the grain stored in the granaries), knitting needles, stamps, writing paper and envelopes. It is interesting that the women and the children from off the scheme played a comparatively bigger role in the purchase of these commodities, while the men on the scheme purchased nearly twice as much per unit than did those from off the scheme. The practice of migrant labour may well account for this as a large proportion of the women from off the scheme would have been in charge of their homes and farms. Overall expenditure per visit under Other was just higher for those from on the scheme. This was surprising

as the Co-operative sold some of the "other" items and was an alternative source of supply only open to those from on the scheme. Incidental expenditure on the farm and home may have been considerably higher for those on the scheme than for those from off the scheme unless the returning migrants brought back many of these items.

Members of the families on the scheme appeared to share more evenly not only in the number of trips to the stores but in the value of purchases they made across the categories. Unfortunately it proved too difficult to include a question on the frequency of visits to the stores. The store-keepers were happy to allow us into their stores to conduct the interviews, but only if we did not drive customers away. During the first day of interviewing customers we learnt that information could be obtained with little trouble until we asked when last they had visited a store. The question, whether put at the beginning or at the end of the interview roused hostility and suspicion among many customers from off the scheme who did not know us. I could only presume that it was taken as an indication of a possibly harmful purpose behind the check and that they or the stores would suffer through raised taxes or prices. At the store-keepers' insistence we dropped the question. It was remarkable how quickly the customers, many of whom could neither read nor write, spotted the question that sought to multiply their one visit to the stores into a picture of their spending over a longer period.

While working with the sample and during the store-checks we suspected that the farmers on the scheme were more frequent visitors to the stores than were the villagers although we had no data to support the suspicion. The store-keepers supported our observation. The stores were more convenient to the scheme than to the majority of villages which they served. The families on the scheme took smaller amounts of maize and wheat to be ground at the mill than did the villagers. They usually carried the grain on their heads or on bicycles or, particularly if the men took the grain to the store, they used wheelbarrows. The villagers on the other hand used scotchcarts fairly frequently and shared transport among several families. The weight of grain milled per visit appeared to be heavier for the villagers. If so, it would necessitate less frequent visits to the stores to have grain milled. In the villages, as with the Locals A, hand grinding machines were still common and many may have been still in use though few had been bought in recent years. If the people on the scheme visited the stores more frequently than did those from off, this would increase their heavier expenditure on food and on items under Other and decrease the "lead" of those from off the scheme on clothes. The difficulty in drawing any definite conclusions even if the customers had accepted the question on their frequency of visits to the stores, was that migrants presumably brought back many goods from town and many of the farmers on the scheme displayed a preference for buying clothing

and larger items when visiting the towns.

The women on the scheme played a different role from those off the scheme. It also appeared that most of the families on the scheme had family goals which promoted greater sharing in the decision making process and in the final choice of expenditure items. The nuclear nature of family units on the scheme had one important result that many of the farmers talked about. The farmers and their families had joined the scheme as small family units with fairly specific family goals. Income from the farm was a reward for increased family effort and initiative along traditional lines, not an income derived from work in the modern sector where earlier financial support from members of the extended family had largely determined the workers level of education and subsequent earning capacity. It was considered right that older children should contribute towards the education of their younger brothers and sisters until their own children entered school, but not necessary for the farmers on the scheme to contribute to children who had left the fold or to relatives within the extended family unless elderly or otherwise dependent in which case settlement on the scheme was usually advocated.

In that we have examined expenditure patterns on an irrigation scheme in Rhodesia, we can draw from it certain lessons for the organisation and management of agricultural development schemes. The most striking of which is the clear need for the provision of adequate banking systems. At Nyamaropa, there were no means, formal or informal, whereby the more successful farmers could advance the scheme for the benefit of the less successful farmers. Even the acquisition of second-hand trucks by some could not ease the marketing difficulties which hindered the commercialization of minor crops. There were small but significant interplays of capital within family groups which allowed for the optimization of the use of capital across more than one farm. Should rigid screening of applicants for plots on subsequent schemes be applied, the schemes may not be characterized by family group settlement and each farmer's capital may not be able to realise its optimum employment except on that one farm or else in public savings institutions where its employment would be lost to the scheme.

Either management must ensure the provision of adequate credit facilities or suitable institutions must be established. Channels offering the necessary incentives and security for the lender must be provided to attract local savings which can be utilized through loans to achieve optimum development on all the farms. A Credit Union would fulfill this function.

The barriers to the development of the farms and of the scheme and the lumpiness of many investment items had the effect of raising the return to capital once a certain level of development had been achieved. Below this level, or critical threshold, returns on investment were small or even negative. This fact has significant implications. It means that farmers with poorly developed farms had unattractive investment opportunities on

their farms although these opportunities had to be taken if the farms were ever to progress. Their only source of capital with which to undertake investment was their own savings, though invariably they earned little above essential family needs and so saved little. Once this threshold of development was reached, returns to further capital inputs were very high. In such a situation it would appear unlikely even through a Credit Union that the wealthier farmers would make capital available for loan to the owners of less developed farms as that capital could bring high returns if invested on their own farms.

The problem was real and its solution vital to the economic health of the scheme. The provision of loans for the long term development of the farms by a public body working with the Extension Staff was essential. However, until management places itself in a position to see the problems that the farmers face, planned development of the farms may not assist them to reach the level of the threshold. Once Management becomes aware of the problems and acts to lessen or remove them, the level of the threshold should drop appreciably. Blind, routine financing may only lead the farmers into debt and dishearten all those concerned with promoting agricultural development.

At Nyamaropa, there was no lack of wants. The farmers aspired to the ownership of more substantial homes, to the provision for the educational needs of their children and to security typically sought through the management of viable farm businesses. A lack of wants may have appeared to have been prevalent only if the obstacles that the farmers faced and the sacrifices that they were making to overcome them were neither realised nor fully understood. Traditional man does not remain traditional by preference, he remains only as a prisoner of circumstance.

THE FAMILY AND THE ROLE OF THE WOMEN

*"The truth is that family life will never be decent, much less enobling, until this central horror of the dependence of women on men is done away with."*

Bernard Shaw.

Smelser and Lipset have suggested that the social criteria for development include: the breakdown of traditional ties; a considerable degree of flexibility in role relationships; a willingness to treat market forces and individuals impersonally; and an adoption of positions based on universalistic and achievement criteria.<sup>1</sup> Nyamaropa represented a community which had moved from a traditional home and family setting - characterized by security at the subsistence level and status derived from close economic and social ties within the village and by the absence of men on migrant work - to a novel environment in which production for cash, the discipline of the market and close Government administration prevailed.

The issue over land resulted in the scheme being largely settled by families drawn from areas some distance from the scheme. Unlike the few settlers who came from nearby villages and who were encumbered by traditional ties, they were not. The great majority of the families on the scheme were elementary families. The few that retained extended family ties, mostly with relatives living on the dryland, had become increasingly aware of the cost of maintaining them and sought to reduce their occurrence. Most elementary families maintained their security through tightly knit family and church groups. Others relied on financial security and the hire of labour and services when needed.

The prevalence of the nuclear family reduced the number of family relations on or, for most, near the scheme and threw the farmers and their wives back on the small family and larger church groups for companionship and status. The Newcomers and Locals B in the sample maintained a small circle of friends whom they saw frequently, most of them family. In what was a fairly small community the lack of knowledge of or acquaintance with the other farmers was surprising. The farmers and their wives travelled quite extensively to visit family and old friends during the off-season and took delight in being visited on the scheme.

1. Smelser N. and Lipset S.M.: "Social Structure, Mobility and Development" Routledge and Kegan Paul. 1964 p.42.

Robert Netting found that the organisation and composition of the household "is ecologically adapted to certain features of the subsistence technology and the physical environment".<sup>3</sup> Within a similar physical environment nuclear families at Kofyar farmed intensively and extended families extensively. The nuclear family maintained productivity on its small holding close to the homestead by the fission of children when adult. When a new area was opened up and nuclear families took up additional land they farmed on an extensive scale and began to expand the size of the family through increased polygamy and the retention of adult sons within the family unit. Netting does not explain exactly why this happened: it would appear to have resulted from the distance of the additional land from the original home and farm which was retained.

Dr. Epstein's study of two villages in South India was particularly instructive as to the effect which the advent of irrigation in the one village, Wangala, and the pattern of migratory labour in the other, Dalena, had had on the role and status of the women.<sup>2</sup> In Dalena the women continued to cultivate in a traditional manner and remained subservient to their husbands while their men went to town to engage in "modern" economic activities and political relations. In fact a situation akin to that in much of Africa. The women of Wangala, on the other hand, had improved their status, having virtually abandoned fieldwork for animal husbandry and petty trade. Wangala had several basic features that were similar to those in force at Nyamaropa. The family lived and worked together as a unit until their increased income and the supply of hired labour allowed the women to assume new roles that enhanced both the status and the economic position of the family. A similar development at Nyamaropa would hinge on an improvement in the supply of labour to the scheme; the integration of the scheme with the wider economy so that food crops, of which women are traditionally the custodians, become cash crops in a local market in which the women can operate; the increase in the shared control of the family budget; and the further development of the roles of the women in the churches and in the homes.

3. Netting Robert McC. "Household Organisation and Intensive Agriculture: The Kofyar Case". Africa Vol. XXXV No. 4. Oct. 1965. p. 422.
2. Epstein T.S.: "Economic Development and Social Change in South India". Manchester University Press, 1962.

African women traditionally derive satisfaction, status and companionship from the mesh of extended family relations and less significantly from the marriage partnership. The relationship between husband and wife in Shona society was similar to that which Audrey Richards noted amongst the Bemba. "Companionship between man and wife is, in fact, a happy accident in Bemba society, not the universal ambition of every boy and girl." <sup>4</sup>

The advent of the money economy and the breakdown of the extended family, particularly in town, has reduced the number of important relationships that formed and defined the women's role. In a very short period many African women lost the varied and balanced kin relations of the extended family and became largely reliant on "the one kinship relationship in which she is traditionally weakest" <sup>5</sup> - marriage. For the majority of women at Nyamaropa the decision to settle on the scheme had involved a significant diminution in the strength of her kinship ties. They moved, with a few close family who were usually their husbands relatives, to a new community in which their role became that of co-operator in the farm enterprise, in time of illness or their husbands' absence manager of the farm and partner in a fairly general commitment to improve family life and educate the children.

The change in the parameters of the women's world introduced tensions into family relations that none could have clearly perceived when the decision to settle at Nyamaropa was taken. The majority of the women faced increasingly complex contradictions in their relationship with their husbands. In effect they and their husbands had to make a set of compromises on the continuum between tribal and Western patterns of marriage. The difficulty that both partners faced was that it was virtually impossible to adopt similar positions on the continuum and to harmonise all the other relationships that each entered into outside of marriage. Their adopted positions were not internally consistent.

The men formed new relationships and found sources of status and satisfaction more rapidly than did the women and this created tension. The men's earlier sojourn in the money economy and contact with town attitudes towards marriage and family life assisted them in dealing with the other farmers, the store-keepers

4. Richards Audrey: "Bemba Marriage and Present Economic Conditions". Rhodes-Livingstone Paper No.4 1940 p.23.

5. Holleman I.F.: "The Changing Roles of African Women" in "Africa in Transition" editor Smith P. Max Reinhardt. London 1958. p.72.

and in forging new friendships at Nyamaropa. The women remained confined to the home, the field and the companionship of their few relatives and, for some, fellow church women. In many households husband and wife did not share identical value systems and conflict accordingly arose.

The women were rendered impotent in any attempt to resolve the problem by several factors, the major one of which appeared to be an insistence by many of the men that one part of their lives, marriage, retain its traditional mould. They wanted their wives to continue to behave in a traditional manner: a manner which conflicted with their new role on the scheme.

Several incidents occurred during the survey year which resulted from the predicament in which the women found themselves and the dichotomy of values inside marriage.

Mai Musarira.<sup>6</sup>

Mai Musarira realised that her husband was having an affair with the wife of one of his friends, who was working in town at the time. Rather than tackle her husband, she decided to approach the woman. So she wrote a letter to her which she asked a man who lived in the same village to deliver. The man took the letter and while walking home decided that for Mai Musarira to write to her neighbour must mean that it was a "trouble" letter. So he returned, found Mai Musarira's husband, and gave him the letter to read explaining that he was afraid to deliver it to the woman to whom it was addressed. Mr. Musarira read the letter, no doubt with the other man looking over his shoulder. Realising its portent, Mr. Musarira took it to the husband of the woman concerned who was home on leave and rejected the accusation in the letter. He said that luckily the letter had come into his hands so that he could now prevent the letter from fulfilling its purpose - to cause two friends to fall out. The proof that the accusation contained in the letter was fallacious was that he had brought the letter himself. The woman's husband, his friend, accepted Mr. Musarira's explanation. Subsequently Mai Musarira was taken by her husband and his friend to the tribal court, found guilty of attempting to destroy a friendship and fined £6 which was for her a large sum. The money had to be paid to the other woman whose dignity she had assailed. The incredible reversal of Mai Musarira's fortunes, from plaintiff to accused, occurred in a small society in which her husband's liaison with his friend's wife was known and which was never seriously denied.

Mai Musarira's experience illustrates the severity with which the acts of women which embarrass their husbands were dealt. This has been found to be common in many primitive societies and the punishment was usually a beating. It also illustrates the degree to which society at Nyamaropa still catered to the men and how difficult it was for women to break through the web of masculine exclusiveness.

6. This is a pseudonym.

The ambiguity in the role expectations of the women at Nyamaropa caused frustration. Many women wished to alter their position and role, and implicit in their desire was a conflict of values: tradition, society and the security of habit harnessed them against change. The women displayed little overt reaction to strain for three reasons. They suppressed strain in the daily routine around which family activities pivoted; they willingly accepted the difficulties in order to assist the family to achieve other goals related to settlement, primarily the education of the children; and they participated in church activities which lent support and rationale to their negative acts of submergence.

Each church had either a Mothers' Union or a mid-week prayer meeting for the women. The Mothers' Unions and the prayer meetings frequently dealt with marriage and family life in sermons and in prayers. The position of the women as wives and mothers was lauded and this must have added a vital element of recognition and importance to the women's basic roles. The Mothers' Unions opened avenues for leadership and through membership, which was sometimes distinct from church membership, a means to influence overall church policy. At Nyamaropa the Unions displayed a vital interest in tackling secular issues. However, they were limited by their inability to provide the knowledge and the leadership required.

In congregational activities which included the repentance of sins, healing, testimonies and spontaneous prayer and hymn leadership, the women played a full part. Within the churches founded by Africans there was, at the time, greater opportunity for the women to express themselves in religious leadership, both formal and informal, than in those of European origin.

Although the many churches that operated on the scheme had a divisive effect on the community, their importance for the women cannot be exaggerated.

Partly in response to the need for change to acquire an African garb and to meet more immediate problems the women joined their husbands in church to identify themselves with change and to participate in its direction. The Churches can play, and most likely will play, a major role in helping the men and their wives to provide each other with greater companionship. There appears to be an opening here for sensitive direction from church leaders.

A few of the women, among whom were nearly all the grass-widows, talked of "romantic love" and set themselves and their marriages apart from those of the other women. "Romantic love" was that force that allowed men and women to seek out their own marriage partners and that sustained the marriage without recourse to the guardianship of family and kin. The women in this quite small group had been to school and most of them had lived in town where they had worked and had been financially independent. They did not belong to one church in particular though all were active church members. Most of them disliked the scheme and would have preferred to live in town which one stated was "modern, full of shops and things to do". However, the advantages of the scheme as a home, even if only in the future when the grass-widows' husbands left the towns to settle, was recognized by them and their lives appeared to be closely tied to the fortunes of the scheme. In time, they intended to assume leisure roles and as a group of independent thinking women they may have an effect on the development of family life and values.

The role of the women in the family at Nyamaropa had not yet developed a pattern peculiar to the scheme. The majority of women worked alongside their husbands on nearly all farm tasks and in many families the women put in more labour on the farm than did their husbands. Besides farm labour, the women performed all the household chores. Most women said that the daily task of fetching water and the frequent search for kindling and sometimes firewood was trying although little more than half an hour was usually required. A third of the families in the sample collected firewood once or twice a year transporting it in a scotchcart or a truck. The family laundry was washed during the weekend, usually on or before the day appointed as the Sabbath by the church to which the family belonged. Nearly all the families worked a six day week so that many women spent a good part of their one day off tending to their housework. Work on the Sabbath was prohibited by the two African churches and, as they celebrated on Saturday, the women members went home early on Friday afternoon to launder and prepare the house and the food for the following day.

Cooking at mid-day and in the evening was a social and family affair so that, although it took several hours each day, it was a period of relaxation for the women. Other women and children from nearby homes would drop in to chat and friends of the husband's would exchange greetings. Although traditionally the men were served and ate separately from their wives and

children, at Nyamaropa the practice was followed in only a few houses. The family ate together seated on the floor or on the low wall seat fitted around part of the circular kitchen hut. In many families friends of the husband's would be entertained in the kitchen, the men being served first.

A rumour circulated that some of the men, all of them leaders in some capacity, were "not proud" of their wives. These few men, none of whom belonged to the African churches, seldom entered the kitchens where their wives worked and never ate in the family circle. This resulted in a strange anomaly: some of the most accomplished of the men treated their wives in a subservient manner that had an ill-effect on family life. Their wives reported that they felt themselves to be inadequate and wished to improve themselves in order to achieve status in the eyes of their husbands. Without the kinship system from which they had previously derived status and companionship, they felt lonely and unhappy. Two of the women demanded that their husbands pay for them to attend a course on homecraft run by a Mission near Salisbury. Their attendance would necessitate leaving their husbands and children for six months. That they were prepared to leave home for so long and to brave a new world, demonstrated their desire to improve their image as "modern" wives in order to meet the status demands of their husbands.

During the year several family rifts occurred over the control and distribution of income. One man's wife and grown daughter went on strike, refusing to work in the field until he gave them an income of ten shillings a month for household luxuries, principally tea, milk, and sugar, and an assurance that they would get clothes twice a year. He capitulated. Three divorces took place during the year. One of them was due to the mental illness of the wife, but the other two followed a long series of fights and beatings. Although one of the farmers concerned was a heavy drinker, the basic cause of both divorces was dispute over the control of money. In each case the woman left returning to her parents home, and opinion on the scheme was in sympathy with her. Most frequently conflicts over money occurred in the polygamous households of the Locals. The conflicts arose among the wives who, without the independent sources of income and status which they had formerly enjoyed in the villages where they controlled the food supply, were intensely jealous and flared up over any suspicion of favouritism of another wife or her children. Two junior wives left their husbands

and returned to the villages leaving behind what were in effect monogamous marriages. The significance of these conflicts would only become apparent over a longer period than the year of the survey.

The polygamous households of the Apostles had happier atmospheres - the Apostle Church encouraged polygamy amongst its members. Obedience to the senior wife and mutual trust within the family was taught, and the structure was strengthened through the holding and performance of church offices and ritual leadership.

The Apostles were generally better off than most families on the scheme and all those in the sample had savings allocated to help meet the later education needs of their children, most of whom were not at the time of school age. The senior wife invariably chose the second and, in some families, the third wife so that the women formed a team. Their attractive, well kept homes and their accumulated savings lent them a sense of achievement as a family unit.

In some of the households the women cooked in turns for the whole family under the supervision of the senior wife. In others each wife had her own kitchen and cooked at night for her children and herself and in turn for their husband. The mid-day meal was usually prepared by one wife, perhaps in her kitchen, for the whole family as it saved duplicating labour. Consequently the concept of separate kitchens was undermined and frequently at night the whole family ate in the kitchen of one of the wives. Fieldwork was undertaken by the family as a group - the wives did not have their own field or crop, rather, under the senior wife they had the control of the food crops. The amount of local trade undertaken by these families was far more than in monogamous families.

The farmers in the sample were impressed by our interest in their use of money and many attempted to manage their budgets more efficiently. Our concern with the performance of the family as a unit and our attempts to include the woman in the recording sessions, appeared to enhance their status as partners in the farm business. At the farewell meeting one farmer thanked us for having "taught me not to waste money and explaining that our women are our best labourers. Now we must give them a share in the spending of money so that they will work hard for the family. I want to tell everyone that I have given my money to my wife to keep. When I want money for beer or cigarettes I must ask her. I am only a little sorry that now there is no money to buy presents for my girl-friends!".

During the year, several farmers gave a crop to their wives to manage, the proceeds of which would be theirs. A few tobacco farmers even handed over the management of cotton to their wives. Others gave their wives control over all the food crops including the sale of surpluses. Noticeable among these was wheat, a crop for which there were signs of increasing demand in the local market. Fifty farmers opened savings accounts for their wives with the Credit Union which also suggested that a desire existed to give the women more say in money matters and to allow them a greater degree of financial independence.

A few farmers were consciously aware that role relationships within and between families were in a state of flux. One of the most lucid on the topic was a store-keeper/farmer who was secretary of the Anglican Church. During the year his daughter married the youngest brother of another store-keeper. The wedding, he felt had to be used to "show the people how these things should be done properly". The preparations took several weeks and were on a scale never before seen in the area.

A "marquee" was built outside the church with wood transported from Inyanga. It was roofed with grass to provide shade and rough tables and benches were made out of off-cuts. The materials cost £50 excluding transport. The store-keeper sold most of the timber to tobacco farmers after the wedding and so recouped over half the sum. Children from the scheme were formed into a choir by the miller and they practised several times before the wedding.

The store-keeper hoped to set the pattern for a new standard of conduct at public gatherings. He told the friends who came to help build the "marquee" that when the reception began they were "please to sit with their wives at the tables". The bridal group was to sit at the high table. The lay out was designed by a brother of the store-keeper who had worked in a large hotel in Johannesburg, which catered for European wedding receptions. The store-keeper explained to me that it was to have the dignity of a church affair and that the guests were to be invited - on roneed invitation cards - as families.

The reception was magnificent. Although the families of the bride and groom were non-drinkers, they provided locally brewed beer for their guests. There was meat, bread, sudza, tea and sweet beer in abundance.

A few stalwart friends sat with their wives during the service but their example was not followed. The women sat on the left side on mats on the floor as they always did in church. The

reason was basically practical. Half the women brought infants with them and during the services, which lasted well over an hour and sometimes two hours, they fed, played with and cuddled the babies. There was also much coming and going of the mothers during the services.

After the service the men led the way into the marquee and sat at the tables. Quite quickly the two hundred places were taken up almost exclusively by the men. The majority of the women squatted outside under a few trees which, significantly or not, happened to be the site used by the Mothers' Union. Two women who sat with their husbands were very critical of the other women for "acting like sheep", but their husbands, who perhaps felt circumscribed by their wives presence explained that as the men and women worked together in the fields they wanted to "be free of each other and to be with their friends at gatherings". Old patterns, it would seem, not only die hard but are often sustained by their original inherent logic. Certainly the behaviour of the families in public belied the changes that circumstances had largely altered inside the home and farm.

## SOCIAL CHANGE AND ECONOMIC DEVELOPMENT

Until quite recently economic development theory either treated the individual as a constant or it discounted his significance. Two important books published in 1957 and 1960 stressed the political and social climate or economic milieu of the social unit, not of the individual.<sup>1</sup> In the early 1960's there was a sudden rush of authorities who assigned a prominent role to the individual.<sup>2</sup> Their emphasis on the individual has opened up a new field that is exciting and promises much but which requires considerable investigation and validation before it can become a practical tool. Their contribution has still to be wedded to theories of economic development which do not deal with the individual or the group, but rather with the abstracts, the social or political climate.

The proponents of the new school raise difficulties in that they assume that the determinant and therefore the explanation of human behaviour is dependent on the individual's internal state. Consequently, if the individual's or the groups behaviour pattern is not conducive to economic development, then the internal state of his or the group's mind must be altered. Spengler illustrates this in a key passage of the article cited below: "The state of a people's politico-economic development, together with its rate and direction, depends largely upon what is in the minds of its members, and above all upon the content of the minds of its elites, which reflects in part, as do all civilizations, the conceptions men form of the universe".<sup>3</sup>

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<sup>1</sup> Meier G.M. and Baldwin R.E. : "Economic Development, Theory, History and Policy". New York, John Wiley 1957 and  
Rostow W.W. : "The Stages of Economic Growth". Cambridge University Press 1960.

<sup>2</sup> Hagen E.E. : "On the Theory of Social Change". The Dorsey Press, Illinois 1962.  
Martindale D. : "Social Life and Cultural Change". Princeton : Van Nostrand 1962.  
McClelland David C. : "The Achieving Society". Princeton : Van Nostrand 1961.  
Morgan James N. : "The Achievement Motive and Economic Behaviour" in Economic Development and Cultural Change, Vol. XII, No. 3, April 1964. P.243-267.

<sup>3</sup> Spengler F.F. : "Theory, Ideology, Non-Economic Values and Politico-Economic Development" in Braibant and Spengler editos, op cit, p.4.

Neither those who think in terms of the abstract social climate nor those who think in terms of the internalised state of the individual's mind, explain how national and individual psychologies can be changed to fit the needs of development. As yet neither school has adopted one set of definitions and the resulting vagueness of much of the work reduces its practical value. The tools of the second school, the individual's values, attitudes, personality and the Freudian process of internalization, are largely descriptive and would seem to have limited use when applied to situations in which change is sought or in which rapid change is present.

Dr. Scarlett Epstein in her valuable study of change in two Indian villages, <sup>4</sup> analysed the differences in the social and economic development of the villages after the introduction of irrigation to one of the villages twenty-four years previous to the study. In the village with irrigation, Wangala, the agricultural base had been strengthened; in Dalena, the village without irrigation, the men divided their time between subsistence farming and wage employment in the nearby town. In her analysis of the process of change in the two villages Dr. Epstein failed to distinguish clearly the relationship between values as they affect the economic life of each village and the economic life and circumstances of the villages as they affect values. Writing about the village without irrigation, Dalena, she claims that "The persistence of the value attached to farming reflects both the instability of the wider economy and the resistance to change in values". <sup>5</sup> Later, she elaborates this position until values take on a causal or determining power. "It is this persistence of the value attached to farming that is largely responsible for the fact that Dalena has not been swallowed up in the wider system but continues to have a social identity of its own. Once villagers give higher preference to working in the town than to being farmers, Dalena will probably become a dormitory for men working in Mandya .... the high priority Dalena men still give to farming indicates that there is a time lag between a change in the economic environment and in economic values which slows down the rate of social change. The value attached to farming strengthened Wangala's traditional economic system (the village with irrigation) and delayed the breaking up of Dalena's social system". <sup>6</sup> The economic values of both groups of

<sup>4</sup> Epstein T.S. : op cit.

<sup>5</sup> ibid p.327.

<sup>6</sup> ibid p.328.

villagers become in fact their attachment to farming and her use of this as a determining factor in her analysis of the persistence of farming in both villages weakens her argument considerably.

Surely, the persistence of subsistence farming in Dalena can satisfactorily be explained by "the instability of the wider economy" - much as is the case with the majority of Africans in southern Africa. An earlier failure of the water supply, which had forced everyone back to subsistence farming to secure a livelihood, must have strengthened the Dalena villagers reliance on their farms.

Dr. Epstein successfully describes the change in the social structure of the two villages despite her final conclusion that economic values were causal factors in both the form and the rate that change took. Dr. Epstein belongs to the second school. To understand the process of change in the villages, Kathleen Gough has suggested that in order for Dr. Epstein to have arrived at her conclusions, a study of personality would have been necessary.<sup>7</sup>

Hagen has analysed a cycle of events within family life that over several generations, he argues, will transform the authoritarian personality of traditional societies.<sup>8</sup> The process has three stages involving the withdrawal of "status respect", the appearance of retreatism and the final emergence of an innovational personality, which may take 175 to 400 years to evolve. In his study of social change, Hagen concentrated on "the first half dozen years of life. He did so although, "The various individuals who have counselled with me concerning personality formation all recognise the importance of these later periods (the periods of latency and adolescence) as do I".<sup>9</sup>

The result is a highly interesting book, but one which leaves a certain pessimistic feeling that little constructive work can be done to further economic development until the 400 year process has run its course.

Hagen experiences some difficulty in explaining the short time period analysed by Dr. Epstein during which considerable innovational changes took place. "We must assume that changes in traditional society had occurred in Dalena before the 1930's, for that the changes in personality necessary for the behaviour noted in the 1950's could occur in one generation is contrary to much other evidence. The case merits further study".<sup>10</sup> The advent of irrigation resulted in the

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<sup>7</sup> Gough, Kathleen. : "Critique of Economic Development and Social Change in South India" in "Economic Development and Social Change" Vol. XIII, No. 3, April 1965. pp. 358-362.

<sup>8</sup> Hagen E.E. : op. cit. p.501.

<sup>9</sup> *ibid* p. XII.

<sup>10</sup> *ibid* p. 199.

economic expansion of the area which created jobs in the town. A fact that was treated by both Epstein and Hagen as secondary to the Dalena men's concern not to fall behind their neighbours in Wangala "as they saw irrigation making their neighbours richer".<sup>11</sup>

Hagen includes in his book four case studies on the transition to economic growth and two on the colonial case. In the first section there is a chapter written by Clifford Geertz on the origins of entrepreneurs in two Indonesian towns. David C. McClelland, reviewing Hagen's book, noted that the chapter differed from the rest of the book since it demonstrated the thesis, "that it is not personality changes that produce social changes, but the social need for new types of organisation".<sup>12</sup>

In the second section Hagen deals with the Sioux Indians on the Reservations. He used the same source material as did Erik H. Erikson for an earlier study and he draws on Erikson frequently.<sup>13</sup> Hagen and Erikson noted the same facts related to child upbringing but differed significantly in their analysis. Hagen saw the Sioux as retreatist, as having rage beneath their apathy, and an "intense hostile dependence" attitude towards the Bureau officials.<sup>14</sup> He concludes his analysis with the observation that "some Indian mothers on the reservations now take command of the family .... if the apathy of the men in a traditional society deepens and the nurturance of women increases, creativity may begin to appear out of retreatism. We do not know that Sioux women who dominate the home are nurturant during the child's early years, but some of them may be; if they are, they may be breeding innovational leaders".<sup>15</sup>

Hagen's emphasis on the early life of the Sioux child is very similar to the emphasis of a study done in 1946.<sup>16</sup> Erikson refers

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11 *ibid.*

12 McClelland David C. : "A Psychological Approach to Economic Development" in *Economic Development and Cultural Change*, Vol. XII, No. 3, April 1964. p.321.

13 Erikson, E.H. : "Childhood and Society". Penguin Books A754. 1965.

14 Hagen E.E. : *op cit.* pp. 495-497.

15 *ibid* p. 497. A.O. Hirschman has made the comment that "Hagen's ejected groups may well make for economic development, but development in turn creates an esprit de corps among its principal agents and welds them into an identifiable group with a personality and perhaps an ideology of its own. Ex post, it may look therefore as though the separateness of the groups was a cause of development when in actual fact it was its result".

"Reflections on Economic Development Policy" reprinted in Eicher K and Witt *op cit.* p.394.

16 MacGregor G. : "Warriors without Weapons". University of Chicago Press, 1946.

to this study which came to the "main conclusion that the 'crippled and negative' state of Dakota child personality, and its rejection of life, emotion, and spontaneity, are due to 'repressive forces set in action early in the child's life' ".<sup>17</sup> Erikson refutes this conclusion, finding instead that "early childhood .... is a relatively rich and spontaneous existence which permits the school child to emerge from the family with a relative integration - i.e. with much trust, a little autonomy, and some initiative". When the child enters puberty he faces the dichotomy of the Sioux peoples' position in America and "it becomes inescapably clear only in puberty that what initiative has been salvaged will not find an identity. Emotional withdrawal and general absenteeism are the results .... the infantile rage which is still provoked in early child-training (is left) unused and undiverted".<sup>18</sup> Remnants of a once integrated cultural pattern persist in child-training practices and "change to advantage only where the universal trend towards larger cultural entities is sustained".<sup>19</sup>

Erikson has, in effect, adapted a more open approach. Current behaviour and responses to change are not determined so exclusively by what happened to the individual in the past. Dramatic changes inside a generation or two are not precluded. Kathleen Gough extended the period of influence on the individual to his present existence. "Values .... it seems, (are) at any given time resultants of the individuals' life experiences, including, however, most particularly their experience of the total ecological and social setting in which they are living and learning day by day".<sup>20</sup>

The belief that changes in character are prerequisites for development has not only led social scientists of the calibre of Epstein into error, it has lead into blind alleys of theory and action. "This is so because there is no generally recognized definition of (their) terms which include elements other than behaviour or inferences based upon it, since the components of these terms are often unclear and since there are no generally recognised procedures for altering what are said to be a persons values or personality".<sup>21</sup>

The environment within which an individual's social and economic activities take place can be altered in certain selected aspects which are relevant to the learning of new behaviour. Hagen, in the discussion following a paper of Papanek's which discounted personality

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<sup>17</sup> Erikson E.H. : op cit. p.157.

<sup>18</sup> *ibid.*

<sup>19</sup> *ibid* p. 159.

<sup>20</sup> Gough K.L. : op cit. p.362.

<sup>21</sup> Kunkel J.H. : "Values and Behaviour in Economic Development" in *Economic Development and Cultural Change*, Vol. XIII, No. 3, April, 1965. p.267

changes, allowed that personality changes may not become significant until an, "institutional change suddenly eliminates former barriers and creates new economic opportunities".<sup>22</sup> Kunkel, taking the point further, has argued that the behavioural approach which emphasises "the shaping of behaviour by means of differential reinforcement and punishment, opens a way not only to the testable explanation and prediction of behaviour, but also to its alteration".<sup>23</sup>

Sociologists analyse man's relationships and the impact of his social environment and its structure on his behaviour. In doing so they can reveal barriers which hinder the formation of productive behaviour and work patterns. One aspect of their study is to investigate the part that rewards and punishments play in conditioning the individual search for achievement. The rewards and punishments he experiences, even in the home, are determined by the social structure within which he lives.<sup>24</sup> The sociologists' function is similar to that of the economic planner who is primarily concerned with the delineation and removal of bottlenecks. Moreover, the market system operates by rewarding and punishing performance within a given economy, much as the social system does within a given society.<sup>25</sup> The parallel interests of the two disciplines suggest that they can both contribute to the understanding of the process of development and work fruitfully together on development projects.

The "behavioural" school, whose proponents stress that the actions of individuals depend upon the present social environment, allows in its theory for rapid social change following on the removal of social bottlenecks. Its greater flexibility and utility in analysing development is enhanced by its similarity of approach to the economic concept of planning as the removal of bottlenecks. The

<sup>22</sup> Papanek Gustav F. : "The Development of Entrepreneurship" American Economic Review, Vol. LII, No. 2, May 1962. p.46-58. Discussion, Hagan. p.60.

<sup>23</sup> Kunkel J.H. : op cit. p.267.

<sup>24</sup> McClelland's "need - achievement" is based on the relationship of the child to his parents, particularly their reaction to his attempts at different tasks. The internalizing process involved does not appear to be of practical significance and McClelland does not attempt to understand it. McClelland, D. : op cit.

<sup>25</sup> There is a wide range of literature related more specifically to education which supports the thesis that praise and blame does effect changes in the performance of individuals within a given society. One example is Thompson G.C. and Hunnicutt C.W. : "The Effect of Repeated Praise or Blame on the Work Achievement of 'Introverts' and 'Extroverts' ". Journal of Educational Psychology, May 1944. Vol. 35, No. 5. p.257-266.

complimentary nature of the two approaches suggests that social and economic structures and their patterns of reward and punishment should be viewed, broadly, together.

Several leading authorities on agricultural development have adopted pessimistic views of the likelihood of being able to promote progress amidst traditional farmers. Schultz has stated that, "typically, farmers in traditional agriculture will not search for improvements"<sup>26</sup> and, by extending an argument derived from his study of American agriculture, he placed great emphasis on human development through education as the means to initiate development.<sup>27</sup> However, educationists and sociologists are, it would appear, less enthusiastic as to the potency of education in development. On the other hand, adult education has come to be held in high regard as capable of having "remarkable effects on agricultural productivity, at low cost, as well as ensuring that the whole population is reached by modern ideas".<sup>28</sup> Edwards discounted both education and adult education as effective measures in relation to the present generation of farmers in Jamaica : "Although an attempt should be made to educate the present farmers in management as well as providing them with facts, it would seem that the brightest prospects lie in training the future generation of farmers before they become established and experienced in the farming ways of their forebears".<sup>29</sup>

Myrdal has argued that, at least in South Asia, economists and planners have failed to recognise the forces of stagnation that exist in the form of received attitudes and institutions, "which are not easily or rapidly moved in either direction".<sup>30</sup> Myrdal dismissed the importance of opportunities. The crucial factor was the lack of the will to seize opportunities as they arose, a phenomenon Myrdal described as, "to strive for nothing other than to preserve their customary low levels of living!"<sup>31</sup> Primary changes in economic

<sup>26</sup> Schultz T.W. : "Transforming Traditional Agriculture" New Haven 1964, p. 177.

<sup>27</sup> Schultz T.W. : "Economic Growth and Agriculture" McGraw Hill, N.Y. 1968, chapter 7.

<sup>28</sup> Lewis W. Arthur : "Development Planning". George Allen & Unwin. p.109.

<sup>29</sup> Edwards D. : op cit. p. 265.

<sup>30</sup> Myrdal Gunnar : "Asian Drama : An Inquiry into the Poverty of Nations" Pantheon New York, 1968 (paperbound edition) p. 1873.

<sup>31</sup> *ibid.* p. 1872.

conditions, he suggested, had proved inadequate to push the social system into a cumulative process of change as the economic instruments of development had effects which were "alien to a mentality whose aspirations are limited by custom and tradition, and it presupposes an institutional system in which efforts are matched by rewards".<sup>32</sup>

Myrdal concluded his study of Asian development by insisting that "direct" policies for changing attitudes and institutions should be the centerpiece of planning and of development strategy in poor nations. Unfortunately Myrdal did little more than list the "direct" policies, most of which are on the statute books already.<sup>33</sup> He neither entered into a full discussion as to how they may be effected, nor did he illuminate the process by which undesirable attitudes and institutions should be changed in a desirable direction.

Myrdal's analysis of the economic situation in South Asia led him to make a prognosis that is little different from the prognoses of Schultz and of Edwards. Myrdal concluded that a lack of wants, unsuitable institutions, attitudes and value systems for development are prevalent and are maintained and compounded by the forces of tradition, religion, and vested interests.

The position in Africa appears to be more flexible and altogether more hopeful. African society does not have the hierarchical and self-perpetuating elite structures of Asia. Rather, African society has exhibited an ability to accommodate profound changes.

In Southern Africa the movement of Africans to wage employment in the towns has dominated the whole pattern of social change. This movement, particularly as most of the men are debarred, for economic or political reasons, from settling in town with their families, has created grave social and economic problems. Successful adaptations to commercial farming on tribal land are few in number. There is one as yet little known scheme under which a promising start to the development of tribal areas has begun. Its aim is to modernise the economic structure of African villages in Mocambique.

The scheme, started by Eng. Homero Ferrinho is called "Co-

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<sup>32</sup> *ibid.* p. 1872.

<sup>33</sup> Governments' determination and courage to "take the necessary steps and accept the consequences" of : effective abolition of caste; measures to increase mobility and equality, such as land reform and tenancy legislation; a rational policy for husbandry; eradication of corruption at all levels; enforcement of tax laws; effective taxation on income from land; an attack on the "educated unemployed" who refuse to do manual work; effective birth control programme; and the mobilisation of underutilized agricultural labour to create social capital. pp. 1909 - 1910.

operativissimo", the philosophy of co-operation.<sup>34</sup> It works through the basic land holding and communal unit, the village. The village, through its elders, has to request assistance before Govt. offers its services. To introduce the people to the idea of the scheme, selected villagers are trained for a short period as "agents". When a problem arises, perhaps a food shortage or the desire for a school which Government or local funds cannot support, the "agent" suggests that they ask for the assistance of a "friend" who has helped other villages to solve similar problems.

Personnel of the department visit the village as invited guests. During the course of discussing the particular problem that brought them there, they attempt to reveal the basic structural faults in the system, particularly in regard to practices of land use, farming and diet. They offer to help solve the problem in question but point out that the remedy will be short-lived unless related weaknesses are tackled. After several meetings, each called by the villagers, the village may decide to accept all the proposals of the personnel. The cardinal condition to which they must agree is that the land becomes vested in a Co-operative, of which the tribal elder is the Honorary Chairman. Strict legal contracts are entered into between the co-operative and the villagers who in effect rent their land from the community. Revenue for communal purposes is thus raised by means of an assets tax.

To complement and to secure the aims of the villagers' undertaking, Government provides a teacher and a social worker, helps to finance the building of a school and a social centre, sends in experts to survey and contour the fields and to teach improved farm methods, and provides loans through the Co-operative.

The strength of the "Co-operativissimo" scheme is that each village makes its own decision whether or not to join the scheme; that it works through the basic social unit, that it is both social, institutional and economic in its approach; and that, being an integrated whole, it replaces one set of working relations with another more productive set without threatening the security of the individual. It also sets out to satisfy individual and communal goals. Though the scheme is still young, requests for assistance are snowballing. Its

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<sup>34</sup> The scheme is financed by the Instituto do Algodao and administered by the Centro Mocambique de Estudos Co-Operativos. I visited Eng. H. Ferrinho in Lourenco Marques and toured some of the villages. As yet there is no published material on the scheme except handbooks used to promote the scheme in the villages.

expansion is limited by shortage of trained staff to handle requests as thoroughly and as patiently as the process demands. The request of many villages, where absence of roads or local markets makes their commercialisation difficult, have had to be turned down in preference for villages with greater economic potential.

I was told by Eng. Ferrinho that in some villages the (elected) Co-operative Committee had expelled villagers for continued failure to comply with basic farm practices or to pay the rent due on their lands. In only a few years the concept of security under the tribe has given way to a modern concept based on economic performance. Conditions have been applied to the use of land in terms of performance and maintenance. A villager must earn his right to land and to a share in the community's progress. The introduction of improved methods and new crops and the increased commercialization of farming has altered the land use pattern in most villages. In a few villages a market for land has arisen, but has not yet become formalized. There is also evidence in a few villages that the Co-operatives charge an increased rental for land above the village norm; in effect a progressive land tax similar to the one suggested by J.W. Mellor.<sup>35</sup>

Sociologists and social-anthropologists have in recent years sought to understand the process whereby primitive people become actively engaged in seeking and promoting economic development. W.E. Moore has written, "What we are dealing with is a large measure of adult socialization in the behavioural aspects of economic development. That is, prior to the establishment of industrial traditions and their presumable perpetuation from generation to generation, we are interested in precisely the departures from traditional norms and canons of behaviour, and the process whereby adults - even if typically young adults - become involved in and perhaps emotionally committed to novel social situations".<sup>36</sup> The promise of the Mocambique scheme should repay careful study. It has already demonstrated the adaptability of the tribal system to novel ends when rejuvenated as a whole. The dramatic impacts on resource use and attitudes suggests that, at least in Mocambique, tribal limitations do frustrate individual aspirations - aspirations which may, perhaps, not be evident under the cloak of the old system. "Departures from traditional norms and canons of

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<sup>35</sup> "The Economics of Agricultural Development." Cornell N.Y. 1966. P.89.

<sup>36</sup> "The Social Framework of Economic Development" in "Tradition, Values and Socio-Economic Development". ed. Braibanti & Spengler. P. 78.

behaviour" may be more real than is apparent in much of Africa.<sup>37</sup>

Until some similar scheme can offer the villagers in Rhodesia avenues to progress, the necessary changes must be won by individual villagers who seek a fuller and more productive way of life. The grave situation in many of the tribal areas demands the introduction of effective measures to liberate the system from its limitations.

Over much of Rhodesia, the family units live in kraals sited near their fields and there are few villages. The provision of facilities such as water, electricity and all-weather roads cannot be undertaken economically until villages are built. At present the dispersal of the population involves long journeys on foot to schools and clinics that may serve only a few hundred families. The costs involved in the re-ordering of village life to permit the provision of facilities cannot be considered until the people can pay for much of it themselves, perhaps in the form of labour. The emphasis must, therefore, be placed on creating a viable farm system to provide the surpluses and the economic security required to undertake the construction of villages. The "Co-operativissimo" scheme could be used because it deals with the smallest land holding unit, not necessarily with a village. The co-operative and the social centre could heighten the communal inter-action of the various kraals so that the decision to live together in a village may follow naturally.

The dominant movement to the urban areas has received the attention of many authorities, often to the exclusion of considerations which force Africans to leave the tribal areas and seek a livelihood in town. As a result a life on the land is regarded by them as unattractive to Africans. Gutkind, writing of Rhodesia, argued that ".... even where (rural activity) is high and rewarding .... an agricultural way of life is no longer considered compatible with progress".<sup>38</sup> He supported this view with the fact that in recent years there has been a "sharp drop in labour turnovers in a number of African countries". Gutkind's interpretation may be questioned. In Rhodesia the increasing pressure on jobs may well be the major determinant of any fall in labour turnover as the costs of resignation and the period of likely

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<sup>37</sup> Holmberg has reported how in Peru the removal of certain obnoxious aspects of the hacienda system and the provision of new economic opportunities for the Indians when working for themselves instilled a willingness to change and to assume responsibility for the running of public services.

Holmberg A.R. : "Changing Community Attitudes and Values in Peru" in Social Change in Latin America To-day edited by Richard N. Adams. et al. Harper New York, 1960.

<sup>38</sup> Gutkind P.W.C. : "African Responses to Urban Wage Employment". International Labour Review, Vol. 92, No. 2, February 1968.

unemployment rise. Moreover, Barber has shown that Africans respond to urban opportunities in rough inverse measure to the crop and livestock rewards of the areas in which they live.<sup>39</sup> That it is employment opportunities and not a disdain for farming that keeps youth from the land is suggested by a study based on a questionnaire given to 700 Ghanaian male students in twenty highly selective academic secondary schools. Twenty five occupations were checked according to occupational prestige and perceived income. Farming was placed, respectively, sixteenth (above middle and primary teaching and office work) and tenth. However, only 1% considered farming as a career while 34% considered primary and middle teaching.<sup>40</sup> The problem as with so much in life, centres around the question of opportunity and its provision.

At present the rewards offered by the tribal areas in Rhodesia are those of subsistence farming in often deteriorating conditions of soil fertility and range cover. As the creation of employment opportunities in the towns continues to lag behind the demand for employment, a livelihood based on the tribal areas will increasingly become the only prospect for many Africans who aspire to a more abundant life. The bulk of Rhodesia's resources, people and land, is locked in the tribal areas in an unproductive manner. "It is .... in the disintegration and decay of the traditional economy and the channelling of its resources into the modern economy .... that the crux of the country's (Rhodesia) major development problem lies".<sup>41</sup> In other words development must cater increasingly to the awakening will of the African people, if it is to be meaningful and sustained.

The life histories of the Newcomers who settled at Nyamaropa contained a number of testimonies to the existence of a novel type of African. A type that had found it difficult to become committed to town life. For the majority it was the high social and familial cost which prevented them from becoming fully committed.

<sup>39</sup> Barber W.J. : "Economic Rationality and Behaviour Patterns in an Underdeveloped Area". op cit.

<sup>40</sup> Foster P.J. : "The Vocational School Fallacy in Development Planning" in 'Readings in the Economics of Education', Unesco, Paris, 1968.

<sup>41</sup> Taylor : "The Development of Rhodesia and Nyasaland " in 'Economic Development for Africa South of the Sahara'. editor Robinson W.G. Oxford, 1962, p.221.

Although they had all worked in town with some degree of success, they had of necessity maintained their domestic lives in the tribal areas. Even the grass-widows, who had lived in town with their husbands and whose husbands were more successful than the great majority of Africans in wage employment, had found the social and familial costs too high. The real problem with which this class of African was confronted was that nowhere could they combine family life with a cash income.

In the tribal areas this type of African faces formidable difficulties in altering traditional patterns. Individual initiative has found few outlets except in church activities and in economic activities outside of the tribal experience, notably in trade. The action of Government in buttressing the Tribal Authority and in thwarting political activity amongst Africans has limited the opportunities for leadership. Even in areas in which Community Boards have been formed no new leadership group has emerged that, as yet, has proved vital enough to alter the use of resources. The pressures on the existing resources in the tribal areas may have caused the African people to perpetuate the tribal arrangements in order to avoid individual hardship and possible chaos.

Hagen might see in such a situation the prospect of a group emerging which has experienced fairly rapid change in its relationship which the tribal society of which it is a part and which regards itself as having a leadership function amidst an "unenlightened" or "heedless" community. The significance of this type of African is that they may re-organise the customary, established means of their society to attain novel ends. This is very similar to Schumpeter's definition of development as consisting "primarily in employing existing resources in a different way, in doing new things with them, irrespective of whether those resources increase or not".<sup>42</sup> The solution to the grave social and economic problems of Southern Africa will depend largely on whether "new, socially acceptable patterns of co-operant behaviour"<sup>43</sup> arise in the tribal areas from the innovative activities of the type of African the Newcomers exemplified.

The rejuvenation of life in the tribal areas is a complex "substitutive" problem. Old patterns of response and behaviour will remain active. Individual initiative and development programmes are likely to encounter an apparently inflexible society. The process

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<sup>42</sup> Schumpeter J.A. : "The Theory of Economic Development". Harvard University Press. 1949. p. 68.

<sup>43</sup> Frankel S.H. : op cit. p. 74.

of renewal is complex and delicate: "like replacing the wheels of a train while it is in motion rather than rebuilding a house on new foundations".<sup>44</sup> Policies and programmes will have to fit traditional norms and ideology more consciously to the purposes of development.

The significance of the Newcomers is that their experience suggests that, scattered throughout the hundreds, perhaps thousands, of villages, a "disparaged" innovative class has emerged. Unable to find fulfilment in the towns, they have been increasingly forced back onto the tribal areas which offer little beyond basic security and which, as individuals, they have as yet been unable to rejuvenate.

The importance of Nyamaropa is that, as a settlement scheme, it offered the Newcomers an opportunity to join the money economy in "the preferred way", away from the difficulties of town life and outside of tribal limitations. On the scheme the Newcomers provided innovative and managerial leadership that, in the absence of a suitable administrative structure and any close identity with or commitment to the scheme by the Locals, gave impetus to the scheme's development.

Despite considerable obstacles, both administrative (transport, credit, cattle) and environmental (labour and the lack of a local market), the Newcomers had tackled a number of the limitations to farming on the scheme with a fair degree of imagination and persistence. They had pioneered new crops and were beginning to activate a local market, partly in an attempt to stabilize and enlarge the supply of labour to the scheme. The Co-operative had derived all its active support from the Newcomers and only Newcomers had sat on the Committee for the first three years of its existence. However, family incomes were not, generally, comparable to their former wages, particularly if the proposed rent and water charge were deducted. The scheme had not, after six years, developed sufficiently to attract efficient and reliable labour or to tackle areas of difficulty both on and off the scheme as a community.

The lack of development of the scheme and, more specifically, the problems surrounding labour and the intrusion of the villagers' cattle had hindered the Locals from identifying themselves closely with the scheme. However, membership of the scheme had altered their circumstances and they exhibited a clear desire to participate more fully in

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Manheim Karl : "Man and Society in an Age of Reconstruction".  
Routledge and Kegan Paul. 1954. p. 12.

its advantages.<sup>45</sup> The weaknesses most generally displayed by the former villagers were institutional or organizational rather than technical. The performance of the Locals farms was largely governed and adversely affected by their close association with the villagers and by the cattle problem. Once these barriers are lessened or removed and management tackles credit and transport, the Locals should be able to alter appreciably and with little difficulty the productive structure of their farms. The improvement in output that these changes could bring about would create, in the process the additional resources required to handle the transition, to secure their emancipation on the scheme and to ease the possible severance of ties with the villagers.

The decision to build the scheme at Nyamaropa and the duplication of an administrative structure that had failed to promote development on the Sabi schemes suggests that Government approached the institution and management of the scheme as a farm and a control problem. Were the scheme built simply because the site was there, to produce more grain, as its relations with Government would suggest, then Nyamaropa was built for the wrong purpose. Additional grain could be grown elsewhere without the paraphernalia and cost of an irrigation settlement scheme.

The settlers, led by the Newcomers, had seized upon the scheme as a means to achieve a fuller, more abundant life. They had done so even though the means that the scheme would place at their disposal were not clear at the time they settled. Individual and ultimately communal goals should emerge more clearly when experience and, hopefully, the institutional framework allow an awareness of the scheme and, with it, the area's potential to materialise. The process of development is not an intellectual exercise. It is a question of how natural desires to widen horizons from previously small self-contained or limited worlds can be furthered by and stabilized through sympathetic and flexible administrative and institutional action.

The scheme, properly viewed, must be seen as a tool for the creation of opportunities and the development of people: a demonstration to the area that progress and fulfilment are possible. Until Government exhibits imaginative direction and faith in the capacity of the farmers it will dampen their spirit rather than channel their efforts into more productive

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"It is realised that a change in a person's circumstances may not result in instant behavioural changes either, but the person's receptivity to change is likely to be significantly increased". Rempson J.L. : "School-Parent Programs in Depressed Urban Neighbourhoods" in "The Urban R's" edited by Robert Dentler. Praeger, New York, 1967, p.146.

relationships and activities.

Settlement at Nyamaropa had occurred not so much from any conviction of the scheme's merits but rather on the basis of personal acquaintance and confidence in the early personnel and, in turn, the original settlers. The scheme had had a beneficial affect on the area in promoting the adoption of cotton and burley tobacco on some sixty odd holdings; again, apparently, as a result of personal contact and confidence. The continued development of the area will, as a subsequent process, depend increasingly on the financial and social results obtained on the scheme and by the original innovators on the dry-land. Certainly Saryamaropa's villagers were aware that settlement on the scheme had not yet provided the great majority of farmers with increased incomes commensurate with the risk and effort involved. They were also aware that few of the innovators on the dry-land had achieved either a standard or a scale of cash farming that warranted the permanent residence of the man and that migrant labour remained a less risky alternative. Moreover, leadership of the scheme will depend to a great extent on the role the Newcomers are enabled to play in the wider area.

Until the farmers on and off the scheme are assisted to reach what on the scheme was a definite critical threshold in the development of their farms, sustained development would appear to be remote. The danger of apathy arising cannot be far away, particularly as the rent and water rate was to be introduced with no consideration as to the ability of the farmers to meet the charge or with any accompanying measures to assist the farmers in accelerating their drive towards the possession of viable farm businesses. Institutional and environmental factors were more active barriers to development than any limitation specific to human nature. The scheme and, with it, The Nyamaropa appeared poised for take-off. One cannot avoid the charge that Government regulations and inactivity had hindered the area's development and threatened to contain the slow evolution through which the farmers sought to control their environment. To continue to stifle such evolution is to court a possible breakdown of the scheme and to curb development in the area.

Initially, economic development requires that several basic institutional changes take place. Institutions as the end products of human responses are of primary importance. The difficulty is that in any period of rapid social change institutions become increasingly irrelevant to the needs of the people and hindrances to development. This is particularly so in the tribal areas where old institutions appear to have been maintained by the people as a bulwark against possible chaos. The changes required to shape institutions to the ends of development devolves largely on Government since it is a task individuals who operate through the market or who live in a plural society can seldom perform. At Nyamaropa the institutional life was at one and the same time vital, adaptive, disintegrative

and circumspect. In short it served group interests in a vacuum of communal activity without the ability to tackle problems that the farmers were aware of but of which Government, operating in a self-made vacuum, was not aware.

Altered individual and community attitudes towards change do not themselves promote development. Avenues to progress must be created by suitably adjusting the administrative and institutional environment in which the people live. Professor Seers summed up a discussion of the weaknesses of contemporary approaches to development by economists by stating that, "In brief, institutions are taken as given, whereas the question is precisely what institutions to change and how".<sup>46</sup> To this may be added - and the administrative structure too.

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<sup>46</sup> Seers D. : op cit. p.3.

Recently Adelman I and Morris C.T. have constructed "An Econometric Model of Socio-Economic and Political Change in Underdeveloped Countries". Using a step-wise regression they found that the majority of multipliers above the median in importance for development are non-economic in nature.

American Economic Review, December, 1968. pp. 1184 - 1218.

## THE SIZE OF THE PLOTS, RENT AND THE CONDITIONS OF TENURE

In 1952 a report estimated that "the acreage of irrigated land which can be handled by a native family was eight acres under a single crop rotation, with reductions, probably down to four acres, if market garden cropping played a major part".<sup>1</sup> The standard plot adopted, four acres, is the minimum size suggested by the report even although new crops have altered conditions considerably since 1952.

Colin Clark and Margaret Haswell have argued that the desired plot size increases with cash cropping. "After introduction of cash cropping, land requirements per man increase, for two separate reasons: firstly, the increasing proportion of the working year which each man is willing to devote to agriculture, and secondly the technical improvements, which increase the area which he can handle in a given time".<sup>2</sup>

The controversy over plot size immediately becomes fraught with wider national economic and political goals when the size is a standard size. In a multi-racial society in which one race governs, a fixed size of plot is open to endless accusations, that, while initially untrue, may gain currency as crops, markets, technology, productivity or the family's desired income alter.

A standard plot places a real barrier as to how far a peasant farmer may go, particularly when the standard size is as small as four acres. Significantly, the only farmer who, after deducting the proposed rent and water rate, was better off on the scheme than in his previous employment was farmer No. 10. He farmed two plots. Any additional land on the scheme could be expected to raise substantially the return to the family in the form of a management fee as, on all but a few farms, the average return to labour was above the price of the most uneconomic labour.

Many of the farmers were aware of the benefits that would flow from the control of additional land and they talked of the plot as a permanent barrier to their progress. In the prevailing conditions the farmers were correct. The alternative method to the achievement of increased family incomes through the employment of more labour was the intensification of farming on the scheme. Transport, capital, the villagers cattle and the lack of a developed local market debarred the majority of farmers from any real expectations of intensifying their farms in the next year or two before the rent charge was introduced. Consequently they regarded the expansion of their acreage as the most convenient and practical form of raising their income.

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<sup>1</sup> Report on Large-Scale Irrigation Development in Southern Rhodesia. Govt. Printer Salisbury, 1952, para 72.

<sup>2</sup> op cit. p.113.

Additional land was not, however, expected by the farmers as the existing scheme was fully taken up. The emphasis, to the continual development of the scheme, must therefore be placed on the intensification of farming on the four acre plot.

One of the major difficulties at Nyamaropa, and one which allowed Management to work divorced from the problems the farmers faced, was the lack of any tenurial arrangement. As a result there was no element of stability or of contract in the relationship between the two parties. Management could not elicit clear cut responses to important matters of discipline as the farmers had never undertaken to maintain certain minimum standards of farming. The lack of any communal spirit or leadership left the Management with recourse only to threats of fines or expulsion which soured the relationship.

The question of tenure was thus, in its absence, a central issue to the future of the scheme. Up until the period of the survey there had existed no element of contract between the farmers and Management as the farmers were not asked to pay a rent or water fee. In effect, once they had secured permission to settle from the District Commissioner and had "bought" Sanyamaropa, they enjoyed an undefined right to a plot. The proposed introduction of the rent and water charge alters the position dramatically for it introduces an element of contract as to the farmers' performance on the scheme.

The proposed rent and water charge, £14. per acre per annum, was determined some years ago. The basis of its calculation is not certain, though I was able to learn that it was based on figures taken from Nyanyadzi.

A service charge on the capital cost at Nyamaropa of 9% or 10% would, on £77,000, work out at almost £4 per acre. The Advisory Commission costed maintenance and the amortization of capital per acre on the Sabi schemes as follows:-

Maintenance	£ 4. 0. 0.	3
Water rate	1. 5. 0.	
Amortization	2.15. 0.	
plus interest at 10%	4.10. 0.	
	<u>£ 12. 0. 0.</u>	

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Advisory Commission. table 114, p.313 and p.318 op cit. Maintenance at Nyamaropa of £5,000 per annum once the scheme was fully taken up.

Where, at Nyamaropa, the deficit of £2 is to be included in the make up of the £14 charge I could not elicit. If it is to cover Extension and other services of a social overhead nature it would breach a sound and accepted principle that social overheads should be borne by the nation. If it is added to the amortization fee it reduces the period of repayment of the initial capital. Moreover, as the initial capital is repaid the interest charge will be reduced, raising the deficit. In any event the structure of the charge leads to an end of rent; a fact that ought to be made known to the farmers. At £4 per annum this would take less than fourteen years if, as an annuity, the reduction in the interest charge over time were added to the amortization figure. In other words Government must offer the farmers the prospect of realizing their plots in the not so distant future. Otherwise the farmers are being misled.

The time to clarify the whole situation would have been before the rent was introduced. Unfortunately the rent, subsequent to the survey, has been introduced on all schemes in the first of three progressive instalments. Does the Government envisage private ownership? Or does it intend to lower the charge after repayment is completed? If neither course is intended, then Government is liable to the serious charge of expediency and profiteering. Were the scheme settled by Europeans the anomalous position would not have arisen.

The proposed rent is to be applied uniformly on all schemes in the tribal areas. In other words its application will ignore the differing costs and the advantages and disadvantages of the various schemes. Schemes built in the south of the country to provide a source of food in areas subject to periodic drought have already been subject to the same charge. On these schemes, typically quite small, the standard plot is only two acres. The farmers have therefore to use these plots intensively and to grow valuable crops if they are to successfully meet the charge. Remote from urban markets, the increased production of food on the local market lowered prices appreciably. It is highly unlikely that a farmer farming a two acre plot in an area of drought will devote more than a small part of his land to non-food cash crops. Moreover, the standard plot and charge was in no way equitable as several of the schemes have more than one type and class of soil. Not surprisingly many plot-holders have, I understand, left the schemes.

The rate of interest that should be charged to service the capital expended can have no precise calculation. Prest and Turvey concluded a discussion on the choice of the interest rate thus, "The truth of the matter is that, whatever one does, one is trying to unscramble an omelette, and no-one has yet invented a uniquely superior way of doing this".<sup>4</sup> A short

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<sup>4</sup> "Cost-benefit analysis : A Survey", in 'Survey of Economic Theory', Vol. lll, American Economic Association and Royal Economic Society. McMillian 1967, p.172.

answer would be to adopt the opportunity cost price of that capital calculated in respect of either the whole economy or of alternative expenditure in the tribal areas. The ability of irrigation settlement schemes in Rhodesia to carry any service charge depends to a large extent on their proper constitution and the quality of the social overhead expenditure related to them. Similarly, the calculation of a repayment charge must be based on the expected gestation period. No irrigation scheme in the tribal areas has so far attained maturity. Confidence cannot be placed on a fairly arbitrarily determined period until the serious weaknesses of management and the barriers to development on-and-off the schemes are removed.

Government ought to accept the principle that when it decides to build a scheme it undertakes a business venture. The financial success of the scheme remains the responsibility of Government.<sup>5</sup> It cannot charge what it feels such investments should earn nor decide over what period the investment should be repayed without servicing the investment effectively. The only valid criterion, except when a scheme is built for other than economic development reasons, is that the farmer must be left with what he could earn in alternative occupations. There are opportunity costs for both farmers and Government.

The size of the plot as a determinant of the farmers' performance on the scheme will be particularly important in remote areas away from developed markets and will vary inversely with the quality of the administrative and institutional environment. It is impossible to separate rent, the size of the plot and the tenurial arrangements.<sup>6</sup>

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<sup>5</sup> At Nyamaropa, although the scheme was only half taken up, the supply of water in the crucial planting months of October and November had to be rationed. The farmers were, quite rightly, concerned about the supply should the other half be settled before Government acted on the problem. Had a contract existed between the farmers and Government they may well have been in a position to seek an injunction against further settlement until the water supply was increased.

<sup>6</sup> At Nyamaropa three churches forbade their members from handling tobacco, an injunction that adversely affected their potential performance. Once the rent is introduced these farmers will find it difficult to remain on the scheme although in many respects they were better farmers than most of the tobacco growers.

A large body of literature on the significance and role of differing systems of land tenure exists. At Nyamaropa the farmers had previously experienced traditional tribal tenure under which, as members of a community, they had a right to land. Part of the frustration with their tribal homes was that it was difficult for individuals to alter their concept of land from that of a source of security to that of an asset capable of producing a marketable surplus. The Co-operativissimo scheme in Mocambique would appear to have succeeded because it began by altering the relationship between the farmer and his land. <sup>7</sup>

Once on the scheme the farmers, particularly the Newcomers, displayed a relationship to their land that was productive. We observed the workings of a small local market for land in which land was treated as a marketable asset. Farmers hired out land which they controlled when ill or when payment for services rendered by other farmers could not be made in cash or in kind. The additional flexibility that this use of land introduced was important. It oiled the interaction of the farmers, was a source of some security and allowed a farmer to retain control over his land while treating it as an asset for loan or income purposes. Individual tenure and a market for land had become part of the farmers' approach to land.

The position was ripe for the introduction of suitable tenurial arrangements. The introduction of the rent and water rate charge required it, if only to clarify the position of both parties. Any arrangement would have to have three properties aimed at securing the financial viability of the scheme. It must be flexible so that farmers can optimise their holding of land and so afford the rent charge: the marginal productivity of additional land was high. The contract must operate as a permanent set of regulations defining the obligations of the farmers towards their land and towards the scheme - an instrument of discipline. Fulfilment of specified farm standards should enable the farmer to graduate to a Master Farmer rank, as at present, and to the right to acquire land above a set ceiling - an incentive to better farming standards and leadership on the scheme.

The basic tenurial contract should cover rotations, water use, maintenance of fertility, disease prevention and control, animal husbandry practices and the maintenance of the home and stand in an hygienic manner. The important management function of the women suggests that both the farmer and his wife sign the contract. Failure to comply with the provisions

<sup>7</sup> In Rhodesia the Land Husbandry Act, in South Africa the Tomlinson Commission and in Kenya the Royal Commission (1955) all regarded the question of land reform as central to development in the tribal areas. All three proposed individual ownership of land and the encouragement of a market for land.

should lead to a thorough investigation as to farm and family weaknesses, the joint formulation of a farm plan by Management and the farmer and a written warning that continued failure to comply will result in expulsion.

Farmers awarded the Master Farmer certificate should be allowed to acquire land above the stated ceiling. (The ceiling should at Nyamaropa be at least five acres until such time as many of the barriers to more intensive farming are removed or lessened by Government). The farmer, on acquiring additional land above the ceiling should, as part of the basic contract, sign a further contract related to more advanced farming practices which could include farm planning, the treatment of labour and the integration of cattle. No limit to the acreage a Master Farmer may control can be stipulated now. It would seem unlikely that more than ten or twelve acres would be attractive to the farmers in the foreseeable future. The difficulties surrounding labour alone would restrict the management capacity of the farmers.

The land at present farmed by Nyamaropa's villagers would, if a flexible approach were adopted, have to be held "in trust" for the farmers and settlement frozen for a few years to allow the incentive of additional land to become operative. The final details will have to seek to achieve a balance. A balance that holds the settlers and that draws the best from both them and their land. However, without the effective Management of the scheme tenure alone will not provide a panacea.

### CONCLUSION

*"The physiognomy of a government may best be judged in its colonies, for there its features are magnified and rendered more conspicuous. When I wish to study the merits and faults of the administration of Louis XIV, I must go to Canada; its deformity is there seen as through a microscope."*

*de Tocqueville.*

After six years of settlement Nyamaropa was not a viable scheme and its future must be considered to be in doubt. Of greater importance, the scheme's considerable economic and social potential had been stunted on the barren ground of Government inaction. The depressing history of the Sabi schemes may be repeated at Nyamaropa, particularly in view of the introduction of rent without any careful assessment as to whether the farmers could meet the charge or whether their performance was handicapped by factors which they could not control.

The sophistication of the farmers within their effective management field and their willingness to save and invest heavily to surmount the real barriers that they faced at Nyamaropa was the brightest aspect of the scheme. It suggested that the scheme was operating well below the capabilities of the farmers. Were management to tackle the problems they faced but which individually or as a community the farmers could not attempt to solve, a dramatic impact on the performance of the scheme could be expected.

The paucity of economic studies of farm organisation and management has allowed advisory and other services to concentrate on technical problems. The result of the approach at Nyamaropa was a complete breakdown in communication between Management and the farmers. The farmers realised that their problems were managerial and often arose as a result of the vacuum of institutional relationships both on and off the scheme. Nyamaropa illustrated the need for a structured relationship if Management is to become aware of the farmers problems and of their real abilities. Though recommended practices were appropriate in the technical sense, the farmers adjusted the recommendations to make them practical, though not always with success. In the absence of any effective contact the Extension staff mistook novel practices for laziness. Unable to see the numerous difficulties the farmers encountered, the staff took on the garb of a watch-dog body, treating the farmers as children. In this way the lack of a formal structure and of avenues of communication was justified.

A more human approach would have allowed Management to see problems from the same vantage point as the farmers and would have suggested numerous areas of effective action. De Wilde has argued that on settlement schemes "Personnel are normally more important than organisations".<sup>1</sup> At Nyamaropa an officer of ability might have created an atmosphere and an organisation in which all the parties on the scheme would have joined together to better the scheme. The barriers external to the scheme (transport, grazing, and labour, trade and political relations with the wider area) and those which fell under different Government departments (notably credit and issues related to tenure) may, however, effectively frustrate even an excellent officer.

There was a clear need for a single authority to combine the agricultural, financial and social aspects of the scheme's management. Such an authority would have to be provided with adequate legal and financial power to cut-across departmental red tape and lack of interest. Its objective should be a wider economic and social purpose than has been achieved to date.

Shortly after the completion of the fieldwork at Nyamaropa the management of African irrigation schemes was taken over by the Ministry of Internal Affairs. The post of Manager was created to replace the ambiguous position held by the L.D.O. The Extension staff were relieved of their control function and left free to act in their advisory capacity only. The step would appear to be logical and beneficial. However, the change over does not promise any immediate improvement for the original weaknesses remain. Even if the Extension staff enjoyed a more effective relationship with the farmers it is doubtful that they could act on any of the areas of real difficulty. Moreover, the advent of a Manager in place of the L.D.O. coincided with the first instalment of the rent and water rate charge and with a tightening of the regulations and of the power of Management on the scheme.

The basic need for a practical and equitable administrative structure and institutional environment along which the scheme can progress at its own pace with the increased participation of the farmers in the management of the scheme has been ignored. After thirty years of irrigation settlement schemes in Rhodesia little understanding of the co-efficients involved in the development of the schemes would appear to exist.

At the same time Government re-ordered the plans for the large Chisumbanje scheme that is to be built on the lower Sabi river. Chisumbanje, as part of the Sabi-Limpopo project, was the responsibility of the Semi-autonomous Sabi-Limpopo Authority. With a potential irrigated acreage of 100,000 acres, Chisumbanje when completed will be over thirty times larger

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<sup>1</sup> De Wilde et al. op cit. Vol. I, p. 182.

than most existing schemes. The Authority gave considerable thought to the role of the scheme in the economic and social development of Rhodesia. The Authority decided that the scheme should enable its settlers to aspire to high incomes by allowing progressive farmers to control an increasing acreage from six to sixteen acres. Detailed and enlightened management and tenure proposals were formulated. The scheme was to be mechanised and the contractual arrangements between the management company and the tenants were not unlike those worked out on the Gezira.

Several key issues remained unsolved. Where were so many settlers to come from? Should they have a common tribal allegiance? What type of settler should the scheme try to attract and what, if any, form of selection should there be? From where, in a sparsely populated area, was sufficient labour to be attracted? Could the company provide the major and the minor traction requirements of the farmers without the "clock-watching mentality that was a natural consequence .... of large scale mechanised farming?"<sup>2</sup> Or should the farmers be allowed to keep some animals for minor traction purposes to be partly fed off crop residues?

Experience at Nyamaropa suggests that in Rhodesia a life on the land is not inconsistent with the aspirations of Africans if that life can be financially and socially rewarding. If a start on a pilot scheme were made with settlers chosen for their interest in both the possible financial and social rewards offered by the scheme their advertisement should attract worthwhile successors. Much of the financial, organisational and innovative dynamism at Nyamaropa resulted from the family and church groups. These groups and the early more intimate management achieved a notable degree of co-operation that, as the scheme came of age, was frustrated by the vacuum of structural relationships and defined rights and responsibilities. Good staff can be expected to have a favourable impact at the beginning, but their talents will prove a wasting asset unless supported by suitable arrangements on the scheme. "The early history of the Syndicate reveals .... how vital is the adventurous spirit in the human beings who handle the process".<sup>3</sup> The women should also sign all documents related to settlement and should attend the Authorities proposed farm school prior to the tenants occupation of a farm.

Unless the Tribal Authority is to play a large part of the scheme, which would appear to be inadvisable, settlers could be drawn from a wide area. Settlers of the calibre and background of the Newcomers will be necessary if new, more productive relationships and arrangements are to be

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<sup>2</sup> Baldwin K.D.S. : op cit. p.69-70

<sup>3</sup> Gaitskell A. : op cit. p.77.

formed. "The intrusion of tribal consideration in the selection of colonists often seriously affects the possibility of maximizing output".<sup>4</sup>

Considerable difficulties over the hire of labour can be expected, particularly if the scheme is to be mechanised so that families can have ploughed and sown large acreages which they may have to reap by hand. Seasonal labour demand peaks may therefore be heavy and short-lived, factors which may adversely affect the employment of a stable labour force. Tribal considerations may prove a serious handicap to the development of healthy attitudes on the part of both the employer and the employee. Chisumbanje's size suggests that as the scheme is taken up labour will have to be attracted from further afield and the ability of the farmers to offer year round employment will become increasingly important.

The vital role that labour will play on the scheme suggests that the farmers undertake as many farm activities as possible. Given a comparatively large acreage the maintenance and use of cows pooled by groups of farmers for traction purposes would be possible. The likely benefits, as at Nyamaropa, are numerous. Of particular significance would be the additional beef crop such a farm could raise during the months August to October when little other work is to be done. The use of tractors and more complex machinery could then be used only when more efficient than the farmer using his own animal draught : the major summer ploughing, combine harvesting of wheat and the removal of the cotton stalks after reaping. A degree of flexibility would be introduced that may allow the farmers to feel that they are masters on their own farms and not just employees of the Company if they are not reliant on the Company every time they wish to transport a bag of maize or cultivate a minor crop.

At Chisumbanje it was proposed that the Company build houses for the settlers and provide all the necessary capital equipment against later repayment. Lewis has noted that in underdeveloped countries settlers have been able to build houses for themselves at a fraction of the cost at which government or settlement agencies could perform the same task.<sup>5</sup> At Nyamaropa the farmers strong feelings of ownership of their plot and stand appeared to derive largely from the fact that they had built their own buildings. Had Government provided houses it is doubtful if the farmers would have identified themselves with the scheme to the degree that they did in the absence of security derived from proper tenural arrangements.

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<sup>4</sup> De Wilde et al. op cit. Vol. II, p.241.

<sup>5</sup> Lewis W.A. : "Thoughts on Land Settlement", Journal of Agricultural Economics, June, 1954.

Even the farmers with the most education and experience in the money economy were prepared to start life on the scheme by living in a simple hut, the construction of which hardly clashed with the labour demands of the farm. An agency built house may place a financial burden on the farmer right from the start before he has discovered what expenditure of this nature the farm can support.

At a meeting to finalise the Authorities proposals for Chisunbanje in 1967 the Minister concerned threw out all the basic points. He insisted that the Tribal Authority be drawn into the administration of the scheme and the selection of settlers and that a standard plot of two acres be adopted.<sup>6</sup> In fact an insistence on the negation of all lessons so painfully learnt in Rhodesia and throughout Africa.

Chisunbanje could have met some of the dire social and economic needs of Rhodesia and demonstrated the opportunities on the land for her large African population. A secure middle-class African with the means to provide business and political leadership of a moderate, enterprising nature has been sacrificed for the maintenance of a tribally orientated and economically impotent mass of petty farmers. Two acres cannot be expected to allow a return to the family sufficient to enable rent and water rates to be charged. Chisunbanje would appear to be headed for a long history of subsidy with little or no potential for a cumulative development effect on the region or on the economy. Little confidence can be placed on the ability of an impoverished scheme to attract sufficient settlers or to nurture the essential cultural transformation and social change necessary if new, more productive relationships are to arise.

As with all the existing schemes in Rhodesia, settlement rather than development is to be the aim. In fact, fearing the financial fiasco that may well result, the management of part or all of Chisunbanje as an estate farm employing African labour has been put forward within Government. The failure of the earlier schemes, in an accounting and a developmental sense, is to be perpetuated without any attempt to match the abilities and rising aspirations of Africans.

The more one becomes involved with a particular community, so the more one must become concerned with heterogeneity. At Nyamaropa the real differences between the social and economic environments of the groups of farmers testified to this. The differences were sufficiently strong to determine the performance potential of each group of farms, whether characterized by their relationship to the villagers, past savings, their crops or the ability to provide transport for themselves. Blanket approaches to one scheme must have deleterious affects when homogeneity is, in all important respects, absent. When applied rationally the

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<sup>6</sup> This information is derived from conversations with several of the personnel involved.

result can be expected to retard development.

Many recent production studies have revealed substantial potentials for increasing the productivity of peasant farms utilizing available resources. Such studies have usually dealt with quite large aggregates and have been content with loosely defined variables. Mellor, commentating on some of the studies stated that ... "the inefficiencies measured commonly reflect deficiency in the measures rather than in farming itself".<sup>7</sup> In studies of communities which were undergoing little change at the time, as with traditional patterns of farming, the farmers have been shown to have evolved efficient farm practices.<sup>8</sup> Even at Nyamaropa where conditions were altering rapidly, the farmers were economic men, though only within their own effective management fields. Their choice of enterprises was close to optimal within the given conditions.

Eric Clayton has produced a programmed optimum plan for family farms which he studied in the Nyeri district of Kenya.<sup>9</sup> There he found that labour and not land was the factor limiting increased production. In his solution fallow land is thus consistent with maximum profit. Technical and economic efficiency can diverge. Clayton's solution doubled the available labour by the hire of labour until the point where  $MR = MC$  of the last input of labour. Net income as a result of the solution was almost double that actually achieved by the families. The greatly improved result suggests that either the farmers were poor managers or that labour was in fact a limiting factor. Clayton assumed relatively elastic supply conditions and did not enter into any discussion as to where the additional hired labour would come from or what wage would have to be offered to induce that much more labour to be forthcoming.

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<sup>7</sup> Mellor J.W : op cit p.135.

<sup>8</sup> Mellor's and Moorti's "Farm Business Study of Thirty Farms in the Agra District reported by Mellor. ibid pp. 136 - 144.

Schultz and Richards are two authorities already quoted in the text.

<sup>9</sup> Clayton E : "Economic Planning in Peasant Agriculture" Wye College, University of London, 1963.

Experience elsewhere and at Nyamaropa suggests a failure by Clayton to understand labour and possibly other barriers to the development of the farms for such a large difference between actual and potential performance using available resources.

Robin Johnson used linear programming techniques to determine the relative proportions of land that should be devoted to three standard crops grown on an African Reserve near Salisbury.<sup>10</sup> Johnson assumed for an average farm that the farmer would be unlikely to command more than 110 hours per acre over a ten day period, that the area of land remained unchanged, that yields remained unaltered, that labour requirements per acre remained constant, and he accepted no change in the market prices for the three crops. In effect a highly simplifying set of assumptions.

Johnson's optimum solution increased labour expended on the farm from 1252 hours per acre to 1418 hours, or 13.1%, and increased the value of output by 14.5%. Although the more even spacing of labour would ease the need to expend more labour over the season, no account was taken of other competing labour uses: herding, repairs, vegetables, social, religion, etc. The solution reduced total maize output from 3276 lbs. to 2425 lbs. or by 26%. Such a large reduction may have represented a serious infringement of security of food supply, particularly when the price of maize varied in the Reserve from 19/- to 30/- a bag. Should a poor maize season follow, the farmers would have to all purchase in the local market and the price of maize could be expected to rise above 30/-. The increase in the expected value of total output, + 14.5%, may not be sufficient to secure the possible deficit in the maize requirements of the families.

The solution increased the output of millet from 298 - 483 lbs. or 62%, in a market in which the local price was "far in excess of the official price at all times of the year".<sup>11</sup> Johnson recorded little exchange of millet and considered that the increased supply would not lower the local price appreciably. The local price adopted (60/-) was 230% above the official G.M.B. price (26/-). An increased supply of 62% in an inactive local market would severely reduce the local price close to that of the official (support) price. Similarly, groundnut production was to be increased 85%. No transactions were recorded during the survey year and so the price adopted was the official price.

<sup>10</sup> Johnson R.W.M. : "The Labour Economy of the Reserves". Occasional Paper No. 4. U.C.R.N. 1964. Chapter IV.

<sup>11</sup> *ibid* p. 38.

The main weakness of Johnson's programme is that it related to an average farm on which marginal adjustments can improve the utilization of labour and increase the value of farm output, using very simple assumptions. It did not, and indeed could not, take into account the effect such changes would have on the market should many farmers adopt the proposed changes. It in fact assumes that the farmers were not optimizing their overall position by assuming that a rearrangement of existing resources would improve gross output.

Johnson commentating on the solution stated that, "The whole impression given in these results thus runs entirely counter to the subsistence pattern of production, and must indeed be regarded as a set of possibilities which might prevail if peasant cultivators were not subsistence minded".<sup>12</sup> Johnson based his programming on an assumption "that market values determine cultivators action",<sup>13</sup> and concluded by claiming that "it is quite clear that the cultivators do not respond to market values as the proportions of the three crops grown stay remarkably constant over all farm sizes and family sizes".<sup>14</sup> There is an expected correlation between increase in work group and increase in area cultivated which, for this argument is not seriously weakened by the fairly common finding of Johnson's that as acreage increases so yield per acre, with more extensive farming, tends to drop. (Table II, 3 p.40)

Johnson used prices for maize and millet that favoured millet over maize. His millet price was possibly up to 130% too high and his maize price from 50 - 100% too low. It would appear that the farmers understood the market better than did Johnson and were not subsistence minded. Johnson did see the programme as exploratory and the results as tentative. Later he wrote that, "The variability of labour use is so high that cross-sectional analysis as used (in the programme) possibly hides more differences than it explains".<sup>15</sup>

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12  
ibid p. 44.

13  
ibid p. 48.

14  
ibid p. 49.

15  
ibid p. 63

Linear programming requires carefully collected and valid data. The importance of social and institutional forces, of heterogeneity and of barriers to the development of individual farms and of communities would suggest caution when data is treated in this fashion unless the results are to corroborate other information related to the farmer's actual or realisable potential management field. The complexity and the validity of constraints acting on the farmers is a more worthwhile field of study than the mechanical reallocation of resources which of necessity simplifies away significant and ever governing factors.

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APPENDIX 1.

TABLE X.

DIVISION OF LABOUR ON CROPS

A.

<u>HUSBAND</u>										
<u>FARM NO:-</u>	1	2	3	4	5	6	7	8	9	10
PLOUGH	9	11	4	7	3	5	7	5	3	8
PLANT	3	4	2	10	2	3	5	2	13	8
FERTILIZE	4	2	1	1	2	1	4	1	1	5
CULTIVATE	34	20	23	17	20	21	19	16	8	7
REAP	18	21	36	32	51	51	34	58	30	11
PROCESS	29	29	22	23	15	15	21	12	39	50
WATER	1	-	1	1	2	2	4	3	1	4
SPRAY	3	2	1	3	4	2	6	3	1	-
SEED-BED/ BIRD WATCH	-/1	-/1	10/-	5/-	-	-	-	-	-/3	7/-
MAN/DAYS 100% <sup>1</sup>	189	214	279	192	232	189	152	94	156	180
% OF TOTAL CROP LABOUR	17%	20%	38%	21%	33%	18%	19%	11%	18%	10%

1. "crop man days" of 8 hours.

B.

<u>WIFE/WIVES.</u>										
<u>FARM NO:-</u>	1	2	3	4	5	6	7	8	9	10
PLOUGH	7	7	-	5	1	2	4	4	-	2
PLANT	3	3	2	8	3	3	5	4	9	8
FERTILIZE	3	2	1	2	2	1	3	3	1	3
CULTIVATE	31	30	19	20	25	28	27	20	11	12
REAP	38	27	41	32	50	46	24	51	35	25
PROCESS	17	27	36	29	16	20	34	11	43	45
WATER	-	1	-	1	1	-	-	3	-	1
SPRAY	1	1	-	1	1	-	3	3	-	-
SEED-BED/ BIRD WATCH	-	-/1	-	1/1	-	-	-	-/1	-	4/-
MAN/DAYS 100%	276	243	137	263	391	407	127	525	154	345
% OF TOTAL CROP LABOUR	26%	23%	19%	29%	55%	39%	16%	63%	17%	20%

DIVISION OF LABOUR ON CROPS (continued)

C.

<u>CHILDREN</u>										
<u>FARM NO:-</u>	1	2	3	4	5	6	7	8	9	10
PLOUGH	4	4	-	5	6	-	4	2	2	-
PLANT	4	4	-	13	-	-	4	3	9	-
FERTILIZE	2	1	-	3	-	-	1	-	3	-
CULTIVATE	35	20	-	21	48	-	9	7	18	-
REAP	38	42	-	19	46	-	55	71	24	-
PROCESS	13	23	-	37	-	-	23	15	41	-
WATER	-	-	-	-	-	-	-	-	-	-
SPRAY	2	2	-	2	-	-	3	-	1	-
SEED BED/ BIRD WATCH	-/2	-/4	-	-	-	-	-	-/2	-/2	-
MAN/DAYS 100%	298	260	-	137	13	-	120	89	362	-
% OF TOTAL CROP LABOUR	27%	25%	-	15%	2%	-	15%	11%	41%	-

D.

<u>PERMANENT LABOUR</u>										
<u>FARM NO:-</u>	1	2	3	4	5	6	7	8	9	10
PLOUGH	-	-	1	6	7	3	-	3	-	2
PLANT	-	-	3	6	3	2	-	2	-	-
FERTILIZE	-	-	-	2	1	1	-	-	-	-
CULTIVATE	-	-	21	12	31	19	-	30	2	4
REAP	-	55	48	42	55	49	82	60	87	19
PROCESS	-	45	25	36	1	18	18	-	11	70
WATER	-	-	-	-	-	1	-	-	-	-
SPRAY	-	-	2	1	1	4	-	5	-	3
SEED BED/ BIRD WATCH	-	-	-	1/-	-	-/2	-	-	-	1/-
MAN/DAYS 100%	-	72	281	279	32	437	69	48	126	806
% OF TOTAL CROP LABOUR	-	7%	39%	31%	5%	42%	9%	6%	14%	46%

DIVISION OF LABOUR ON CROPS (continued)

E.

CASUAL LABOUR

<u>FARM NO:-</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
PLOUGH	-	-	-	-	-	-	-	-	-	1
PLANT	-	-	-	-	-	100	-	-	-	25
FERTILIZE	-	-	-	-	-	-	-	-	-	11
CULTIVATE	-	1	-	-	-	-	4 <sup>1</sup>	-	-	13
REAP	88	63	37	55	82	-	70	100	67	15
PROCESS	12	36	63	45	14	-	26	-	33	35
WATER	-	-	-	-	-	-	-	-	-	-
SPRAY	-	-	-	-	4	-	-	-	-	-
SEED-BED	-	-	-	-	-	-	-	-	-	-
MAN/DAYS 100%	285	201	24	29	27	2	319	34	12	391
% OF TOTAL CROP LABOUR	26%	19%	3%	3%	4%	-	40%	4%	1%	23%

1. Half of the time, 7 man days, spent in clearing field for inspection for Maize Prize.

F.

GIFT LABOUR

<u>FARM NO:-</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
PLOUGH	-	-	42	80 <sup>2</sup>	11	5	-	-	-	24
PLANT	14	16	58	-	78	74	100	13	88	13
FERTILIZE	-	4	-	-	-	6	-	-	-	23
CULTIVATE	29	25	-	-	-	15	-	6	12	-
REAP	2	25	-	20	-	-	-	81	-	9
PROCESS	14	30	-	-	-	-	-	-	-	-
WATER	41 <sup>1</sup>	-	-	-	-	-	-	-	-	19
SPRAY	-	-	-	-	11	-	-	-	-	-
SEED-BED	-	-	-	-	-	-	-	-	-	12
MAN/DAYS 100%	49	55	6	11	8	7	6	38	17	18
% OF TOTAL CROP LABOUR	4%	5%	1%	1%	1%	1%	1%	5%	2%	1%

1. Cutting Cotton Stalks.

2. Making ridges by hand on which to plant tobacco.

APPENDIX I.

FARM NO. 1.

<u>A. GROSS FARM INCOME</u>	<u>CONSUMED ON FARM</u>	<u>SOLD OFF FARM</u>	<u>HARVEST</u>
Tobacco			-
Cotton		178.14. 3.	178.14. 3.
Maize	16.15. 0.	4.18. 8.	21.13. 8.
Maize - green		-	
Seed Beans	1.10. 6.	22. 0.10.	13.11. 4.
Ration Beans	-	-	-
Wheat	1.17. 0.	-	1.17. 0.
Potatoes	-		-
Sweet Potatoes	2. 3. 0.	-	2. 3. 0.
Vegetables	3. 1. 0.	-	3. 1. 0.
Fruit	14. 6.	2. 1.	16. 7.
Eggs	10. 7.	-	10. 7.
Chickens	1. 5. 0.	-	1. 5. 0.
Pigs			-
Other Livestock		1.12. 6.	1.12. 6.
Garlick Onions			-
Fish		-	-
Milk			
Rapoko	1.15. 0.	-	1.15. 0.
<b>TOTAL</b>	<u>£29.11. 7.</u>	<u>£207. 8. 4.</u>	<u>£236.19.11.</u>

<b><u>B. CURRENT FARM EXPENDITURE</u></b>		<u>£106.16. 9.</u>
Seed		6.16. 2.
Fertilizer		23. 6.11.
Manure		-
Insecticides		3. 7. 5.
Transport		20.11. 9.
Marketing Charges		2. 1. 0.
Hire of Equipment		1.10. 0.
Sundries		2. 6.
Ploughing		-
Pig Protein		-
Cattle Tax		1. 1. 0.
Wages:		
Permanent	-	-
Casual		48. 0. 0.
Beer Group	5. 3. 0.	<u>5. 3. 0.</u>

**C. SURPLUS ON FARM OPERATIONS** £130. 3. 2.

FARM NO. 2.

A. GROSS FARM INCOME

	<u>CONSUMED ON FARM</u>	<u>SOLD OFF FARM</u>	<u>HARVEST</u>
Tobacco			-
Cotton		182.18. 6.	182.18. 6.
Maize	18.10. 0.	4.10. 0.	23. 0. 0.
Maize - green			
Seed Beans	15. 6.	21.10. 6.	22. 6. 0.
Ration Beans			-
Wheat	1.12. 6.	-	1.12. 6.
Potatoes	2. 5. 0.		2. 5. 0.
Sweet Potatoes	7. 3.	-	7. 3.
Vegetables	2. 4. 0.	14. 0.	2.18. 0.
Fruit	15. 0.	-	15. 0.
Eggs	1.16. 0.	-	1.16. 0.
Chickens	1.15. 0.	2. 5. 0.	4. 0. 0.
Pigs			-
Other Livestock			-
Garlick Onions	5. 6.	12. 0. 0.	12. 5. 6.
Fish			-
Rapoko	3.10. 0.	-	3.10. 0.
<b>TOTAL</b>	<b>£33.15. 9.</b>	<b>£223.18. 0.</b>	<b>£257.13. 9.</b>

B. CURRENT FARM EXPENDITURE

			<u>£119.18. 4.</u>
Seed			7.11. 2.
Fertilizer			35.12. 6.
Manure			-
Insecticides			7. 7. 8.
Transport			21. 8. 8.
Marketing Charges			2. 4. 8.
Hire of Equipment			4. 8. 6.
Sundries			3.10.
Ploughing			-
Pig Protein			-
Cattle Tax			1. 4. 0.
Wages:		Keep	
Permanent	3.13. 4.	1. 8. 0.	5. 1. 4.
Casual	32.17. 0.		32.17. 0.
Beer Group	1.19. 0.		1.19. 0.

C. SURPLUS ON FARM OPERATIONS

£137.15. 5.

FARM NO. 3.

A. <u>GROSS FARM INCOME</u>	<u>CONSUMED ON FARM</u>	<u>SOLD OFF FARM</u>	<u>HARVEST</u>
Tobacco	-	162.19. 8.	162.19. 8.
Cotton	-	154.12. 0.	154.12. 0.
Maize	4.12. 0.	6. 0.	4.18. 0.
Maize - green	2. 0. 0.		2. 0. 0.
Seed Beans	1. 3. 3.	29. 8. 2.	30.11. 5.
Ration Beans	-		-
Wheat	-		-
Potatoes	2. 0. 0.	19.11. 6.	21.11. 6.
Sweet Potatoes	15. 0.		15. 0.
Vegetables	5. 0. 0.	5. 0.	5. 5. 0.
Fruit	3. 0. 0.		3. 0. 0.
Eggs	19. 0.		19. 0.
Chickens	1.10. 0.		1.10. 0.
Pigs			
Other Livestock			
Garlick Onions / Rice			
Fish			
Milk			
TOTAL	<u>£20.19. 3.</u>	<u>£367. 2. 4.</u>	<u>£388. 1. 7.</u>

B. CURRENT FARM EXPENDITURE

Seed		<u>12. 0. 3.</u>
Fertilizer		49.11. 5.
Manure		-
Insecticides		10.17. 0.
Transport		35.19. 3.
Marketing Charges		7.11. 5.
Hire of Equipment		4. 1. 0.
Sundries		2. 8. 9.
Ploughing		-
Pig Protein		-
Cattle Tax		3. 0.
Wages:		
Permanent	11. 3. 0.	Keep 5.17. 7.
Casual	1. 7. 0.	17. 0. 7.
		<u>1. 7. 0.</u>

C. SURPLUS ON FARM OPERATIONS

£247. 1.11.

FARM NO. 4.

A. GROSS FARM INCOME

	<u>CONSUMED ON FARM</u>	<u>SOLD OFF FARM</u>	<u>HARVEST</u>
Tobacco	-	130. 9. 9.	130. 9. 9.
Cotton	-	138. 7.10.	138. 7.10.
Maize	11. 0. 0.	5.15. 0.	16.15. 0.
Maize-green	2. 0. 0.	1. 0.	2. 1. 0.
Seed Beans	15. 0.	34.17. 4.	35.12. 4.
Ration Beans	-	-	-
Wheat	9.15. 0.	-	9.15. 0.
Potatoes	2.10. 0.	12. 0.	3. 2. 0.
Sweet Potatoes	14. 0.	-	14. 0.
Vegetables	2.10. 0.	-	2.10. 0.
Fruit	3. 5. 0.	16.10.	4. 1.10.
Eggs	1. 8. 0.	-	1. 8. 0.
Chickens	15. 0.	10. 0.	1. 5. 0.
Pigs		-	
Other Livestock		-	
Garlick Onions / Rice		-	
Fish			
Milk			
	<u>£34.12. 0.</u>	<u>£311. 9. 9.</u>	<u>£346. 1. 9.</u>

B. CURRENT FARM EXPENDITURE

		<u>£135.10. 2.</u>
Seed		11.15. 3.
Fertilizer		51. 7. 6.
Manure		-
Insecticides		9.19. 5.
Transport		33. 1. 4.
Marketing Charges		4. 6. 1.
Hire of Equipment		3.18. 6.
Sundries		2. 0. 9.
Ploughing		-
Pig Protein		-
Cattle Tax		1. 4. 0.
Wages:		
Permanent	11. 7. 6.	Keep 2. 0.10.
Casual	4. 9. 0.	13. 8. 4.
		<u>4. 9. 0.</u>

C. SURPLUS ON FARM OPERATIONS

£210.11. 7.

FARM NO. 5.

A. <u>GROSS FARM INCOME</u>	<u>CONSUMED ON FARM</u>	<u>SOLD OFF FARM</u>	<u>HARVEST</u>
Tobacco	-	-	-
Cotton	-	250.14.10.	250.14.10.
Maize	5.12.6.	16.6.0.	21.18.6.
Maize-green	4.17.0.	4.3.3.	9.0.3.
Seed Beans	1.15.0.	9.16.3.	11.11.3.
Ration Beans	-	-	-
Wheat	7.10.0.	1.10.9.	9.0.9.
Potatoes	2.3.0.	16.6.	2.19.6.
Sweet Potatoes	1.5.0.	-	1.5.0.
Vegetables	4.15.0.	4.0.	4.19.0.
Fruit	1.15.0.	-	1.15.0.
Eggs	5.0.0.	6.5.8.	11.5.8.
Chickens	10.10.0.	3.17.6.	14.7.6.
Pigs	-	-	-
Other Livestock		17.10.0.	17.10.0.
Garlick Onions / Rice			
Fish			
Milk			
	<u>£45. 2. 6.</u>	<u>£301. 4. 9.</u>	<u>£346. 7. 3.</u>

B. <u>CURRENT FARM EXPENDITURE</u>		<u>£125. 7. 5.</u>
Seed		10.12.6.
Fertilizer		33.8.8.
Manure		15.12.6.
Insecticides		9.4.7.
Transport		26.16.6.
Marketing Charges		2.7.9.
Hire of Equipment		5.10.0.
Sundries		3.6.
Ploughing		-
Pig Protein		-
Cattle Tax		12.0.
Wages:		
Permanent	12.19.8.	Keep 16.9.5.
Casual	4.10.0.	4.10.0.

C. SURPLUS ON FARM OPERATIONS £220.19.10.

FARM NO. 6.

A. GROSS FARM INCOME

	<u>CONSUMED ON FARM</u>	<u>SOLD OFF FARM</u>	<u>HARVEST</u>
Tobacco	-	-	-
Cotton	-	261.19. 7.	261.19. 7.
Maize	10. 4. 0.	-	10. 4. 0.
Maize-green	4. 5. 0.	64. 7. 0.	68.12. 0.
Seed Beans	3. 0. 0.	11.16. 3.	14.16. 3.
Ration Beans	-	-	-
Wheat	9.10. 0.	-	9.10. 0.
Potatoes	2.15. 0.	58. 8. 0.	61. 3. 0.
Sweet Potatoes	1. 0. 0.	-	1. 0. 0.
Vegetables	5. 0. 0.	1.15. 0.	6.15. 0.
Fruit	7.10. 0.	2. 4.10.	9.14.10.
Eggs	2. 5. 0.	-	2. 5. 0.
Chickens	2.10. 0.	-	2.10. 0.
Pigs	-	-	-
Other Livestock	2.10. 0.	2.10. 0.	5. 0. 0.
Garlick Onions / Rice	3. 0. 0.	-	3. 0. 0.
Fish	6. 0. 0.	-	6. 0. 0.
Milk	2.10. 0.	-	2.10. 0.
	<u>£61.19. 0.</u>	<u>£403. 0. 8.</u>	<u>£464.19. 8.</u>

B. CURRENT FARM EXPENDITURE

			<u>£185. 9. 5.</u>
Seed			11. 9. 0.
Fertilizer			27. 0. 1.
Manure			-
Insecticides			9. 4. 7.
Transport			76. 8. 6.
Marketing Charges			2. 9. 7.
Hire of Equipment			5.10. 0.
Sundries			3. 6.
Ploughing			-
Pig Protein			-
Cattle Tax			18. 0.
Wages:		Keep	
Permanent	46.10. 0.	5.10. 2.	52. 0. 2.
Casual	6. 0.		6. 0.
			<u>£185. 9. 5.</u>

C. SURPLUS ON FARM OPERATIONS

£279.10. 3.

FARM NO. 7.

A. <u>GROSS FARM INCOME</u>	<u>CONSUMED ON FARM</u>	<u>SOLD OFF FARM</u>	<u>HARVEST</u>
Tobacco	-	-	-
Cotton	-	171.18. 6.	171.18. 6.
Maize	10.14. 0.	60. 2. 9.	70.16. 9.
Maize-green	2. 8. 0.	-	2. 8. 0.
Seed Beans	3.14. 0.	28.14. 5.	32. 8. 5.
Ration Beans	-		
Wheat	-		
Potatoes	-		
Sweet Potatoes	15. 0.		15. 0.
Vegetables	6. 0. 0.	1. 9. 8.	7. 9. 8.
Fruit	1. 0. 0.	2. 6.	1. 2. 6.
Eggs	5. 0.		5. 0.
Chickens	11. 0.		11. 0.
Pigs	-		
Other Livestock	-		
Garlick Onions / Rice	-		
Fish	-		
Milk			
	<u>£25. 7. 0.</u>	<u>£262. 7.10.</u>	<u>£287.14.10.</u>

B. <u>CURRENT FARM EXPENDITURE</u>		<u>£155.18. 4.</u>
Seed		8.17. 0.
Fertilizer		53. 4. 1.
Manure		-
Insecticides		8.17. 8.
Transport		19.11. 9.
Marketing Charges		2. 0. 0.
Hire of Equipment		4. 6. 0.
Sundries		2. 6.
Ploughing		5.19. 6.
Pig Protein		-
Cattle Tax		-
Wages:		
Permanent	8. 0. 0.	Keep 10.10.
Casual	44. 9. 0.	8.10.10.
		<u>44. 9. 0.</u>

C. SURPLUS ON FARM OPERATIONS £131.16. 6.

FARM NO. 8.

A. GROSS FARM INCOME

	<u>CONSUMED ON FARM</u>	<u>SOLD OFF FARM</u>	<u>HARVEST</u>
Tobacco	-	-	-
Cotton		141. 7. 9.	141. 7. 9.
Maize	11.14. 0.	1. 8. 9.	13. 2. 9.
Maize-green	1.10. 0.	3. 2. 0.	4.12. 0.
Seed Beans	8.10.	11.16.11.	12. 5. 9.
Ration Beans	-	-	-
Wheat	9.17. 6.	8.10. 1.	18. 7. 7.
Potatoes	-	-	-
Sweet Potatoes	1.15. 0.		1.15. 0.
Vegetables	9.12. 0.	7.17. 1.	17. 9. 1.
Fruit	2. 5. 0.	13. 7.	2.18. 7.
Eggs	-		-
Chickens	-		-
Pigs	-		-
Other Livestock		19. 0.	19. 0.
Garlick Onions / Rice	4. 0. 0.		4. 0. 0.
Fish	10. 0. 0.		10. 0. 0.
Milk			
	<u>£51. 2. 4.</u>	<u>£175.15. 2.</u>	<u>£226.17. 6.</u>

B. CURRENT FARM EXPENDITURE

		<u>£69. 8. 7.</u>
Seed		7.18. 9.
Fertilizer		22.18.11.
Manure		-
Insecticides		7. 9. 8.
Transport		14.18. 6.
Marketing Charges		1.10. 3.
Hire of Equipment		3.16. 0.
Sundries		2. 0. 0.
Ploughing		
Pig Protein		
Cattle Tax		12. 0.
Wages:		
Permanent	4. 0. 0.	Keep 4.17. 6.
Casual	5. 5. 0.	5. 5. 0.

C. SURPLUS ON FARM OPERATIONS

£157. 8.11.

FARM NO. 9.

A. GROSS FARM INCOME

	<u>CONSUMED ON FARM</u>	<u>SOLD OFF FARM</u>	<u>HARVEST</u>
Tobacco	-	-	-
Cotton	-	192. 8. 8.	192. 8. 8.
Maize	14.10. 0.	19. 0.	15. 9. 0.
Maize-Green	12. 0.	-	12. 0.
Seed Beans	1. 0. 0.	14. 0.10.	15. 0.10.
Ration Beans	-	-	-
Wheat	12.10. 0.	3. 0. 0.	15.10. 0.
Potatoes	-	-	-
Sweet Potatoes	10. 0.		10. 0.
Vegetables	7.15. 0.		7.15. 0.
Fruit	15. 0.		15. 0.
Eggs	1.10. 0.	-	1.10. 0.
Chickens	2.15. 0.	1.11. 6.	4. 6. 6.
Pigs			
Other Livestock			
Garlick Onions / Rice			
Fish			
Milk			
	<u>£41.17. 0.</u>	<u>£212. 0. 0.</u>	<u>£253.17. 0.</u>

B. CURRENT FARM EXPENDITURE

		<u>£102.18. 8.</u>
Seed		8. 8. 9.
Fertilizer		38. 1. 7.
Manure		-
Insecticides		7. 7. 8.
Transport		19.10. 0.
Marketing Charges		1.13. 0.
Hire of Equipment		4. 6. 0.
Sundries		2. 8.
Ploughing		-
Pig Protein		-
Cattle Tax		15. 0.
Wages:		
Permanent	19. 2. 6.	Keep 21. 0. 0.
Casual	1.14. 0.	1.14. 0.

C. SURPLUS ON FARM OPERATIONS

£150.18. 4.

FARM NO. 10.

A. GROSS FARM INCOME

	CONSUMED ON FARM	SOLD OFF FARM	HARVEST
Tobacco	-	483. 5. 1.	483. 5. 1.
Cotton	-	250. 9. 7.	250. 9. 7.
Maize	27. 8. 0.	-	27. 8. 0.
Maize - green	-	-	-
Seed Beans	7. 0.	41. 5. 7.	41.12. 7.
Ration Beans	1.16. 6.	40.16. 1.	42.12. 7.
Wheat	-	-	-
Potatoes	-	-	-
Sweet Potatoes	-	-	-
Vegetables	1.10. 0.	-	1.10. 0.
Fruit	1. 0. 0.	-	1. 0. 0.
Eggs	12. 0.	-	12. 0.
Chickens	5. 0.	-	5. 0.
Pigs		18.18. 9.	18.18. 9.
Other Livestock			
Garlick Onions / Rice			
Fish			
Milk			
	<u>£32.18. 6.</u>	<u>£834.15. 1.</u>	<u>£867.13. 7.</u>

B. CURRENT FARM EXPENDITURE

		<u>£463. 1. 6.</u>
Seed		31.13. 5.
Fertilizer		92. 1. 0.
Manure		40. 2. 6.
Insecticides		23. 6. 6.
Transport		113.15.10.
Marketing Charges		12. 5. 4.
Hire of Equipment		6. 2. 6.
Sundries		4. 3. 8.
Ploughing		-
Pig Food; Maize		5. 0. 0.
Pig Protein		5.12. 0.
Cattle Tax		-
Wages:		
Permanent	54.12. 1.	Keep 12.10. 8.
Casual	61.16. 0.	
		<u>67. 2. 9.</u>
		<u>61.16. 0.</u>

C. SURPLUS ON FARM OPERATIONS

£393.12. 1.

APPENDIX II.

A.

MAIZE.

	1	2	3	4	5	6	7	8	9	10
Bunds	14	13	5	9	4+4 <sup>1</sup>	4+5 <sup>2</sup>	12	10	5	13
Surplus	£14	£13	£2	£9	£12	£46	£48	£6	£4	£15
Family labour	£24	£24	£1	£3	£6	£5	£11	£14	£6	£12
Return to management	-£10	-£12	£1	£6	£6	£40	£37	-£8	-£2	£4
Return to all labour: shillings per hour	.23	.19	.56	1.00	.68	2.10	1.37	.15	.24	.47
Yield/Acre in bags - 200 lbs.	11.0	12.9	15.4	14.8	28.0 /245 doz.	28.0 /742 doz.	42.0	12.6	23.8	15.4

1. Four summer maize, four green maize.

2. Four summer maize, five green maize.

B.

SEED BEANS.

	1	2	3	4	5	6	7	8	9	10
Bunds	12	11	11	10	7	5	12	10	11	30
Surplus	-£5	-£12	£4	-£8	-£6	-£3	-£2	-£11	-£6	-£24
Family labour	£24	£10	£8	£7	£8	£18	£14	£11	£12	£10
Return to management	-£29	-£22	-£4	-£15	-£14	-£21	-£16	-£22	-£18	-£34
Return to all labour: shillings per hour	-	-	.16	-	-	-	.08	-	-	-

C.

TOBACCO.

	3	4	10
Bunds	7	5	17
Surplus	£95	£73	£237
Family Labour	£18	£41	£35
Return to management	£77	£32	£202
Return to all labour: shillings per hour	1.17	.49	.87
Yield/Acre in pounds	1873	1915	1573
Average price in pence/lb	23d	24.2d	27.5d
MAN/DAYS/ACRE	250	543	396

D.

WHEAT.

	1	2	4	5	6	8	9
Bunds	2	1	6	6	3	7	5
Surplus	-£1	-£2	£5	£4	£5	£13	£8
Family labour	£3	£3	£4	£3	£5	£8	£8
Return to Management	-£4	-£5	£1	£1	£0	£5	£0
Return to all labour: shillings per hour	-	-	.43	.40	.43	.64	.37
Yield/Acre: in bags - 200 lbs.	2.6	3.5	3.5	3.2	7.0	7.0	8.8

E.

POTATOES.

	2	3	4	5	6
Bunds	1	5	2	3	14
Surplus	0	£8	-£1	-£2	£27
Family labour	0	£2	£5	£3	£4
Return to Management	0	£6	-£7	-£4	£24
Return to all labour: shillings per hour	-	2.15	-	.17	1.40
Yield/Acre: in pounds	1064	1207	472	280	1320

APPENDIX III.

Footnotes to Table I, DIET.

- a. I used Barley's Coefficient: all persons over 15 were treated as adults, those from 10 - 14 as half-adults, those from 2 - 9 as quarter adults.
- b. One study put the average calorie intake in Rhodesia and Nyasaland as 2,500. (Clark and Hazwell, p. 17). The U.N.O. Statistical Year Book for 1964, pp 372-5 gave the following figures:-

	Average Calories per day, per person.	Average grams of protein per person per day.
Brazil	1800	42
Ghana	1900	51
India	2590	60

"The whole manner of life is adapted to an insufficient supply of calories, with results that are socially undesirable: lack of drive and initiative; avoidance of physical and mental effort; excessive rest." F.A.O. quoted by C. & H. p. 18.

- c. For heavy labour an additional 11 gms. are recommended for men and women. "Although not essential (beyond very small quantities) animal proteins are.... more efficacious than vegetable protein". Clark and Hazwell, p. 3. Proudfit and Robinson state that only milk, cheese, egg and fish and meat have "complete protein", the rest is "incomplete and of little value". p. 49. At Nyamaropa the bulk of the protein intake was from cereals. Maize is a source of largely poor quality protein because it contains so little of the two essential amino acids, lysine and tryptophan. P. & R. p.857.
- d. Milk is the only outstanding source of calcium and the only source of lactose, P. & R. p. 59. Few families ever had fresh milk, and powdered milk was used sparingly in tea. When given to babies it was invariably over-diluted and used as a substitute food rather than just an additive. This led to marasmus - not enough to eat - in two year olds.
- e. The families all had plenty of iron, most of it from vegetables and maize. They must also have derived iron from the cooking pots.
- f. Dietary carbohydrate has a protein sparing action. When the caloric level through a liberal intake of carbohydrates is adequate for the body's needs, "dietary protein will not be used as a source of energy". P. & R. p. 58. No recommended intake of carbohydrates is given by any recent authority. It would vary with the work to be undertaken, with the quantity and quality of the protein intake and with the quantity of riboflavin, vitamin B<sub>2</sub>. The recommended figures come from Modern Home Medical Advises, Editor M. Fishbein. Garden City Publishers. N.Y. 1935.
- g. Only animal and plant foods with high green or yellow colouring are sources of vitamin A. Important for skeletal growth, teeth, reproduction and lactation, affects vision in dim light. The body can store a great quantity of vitamin A.

- h. Most families had sufficient Thiamin (vitamin B<sub>1</sub>) as unsifted grain is a source. However, "The individual who is deprived of small amounts of thiamine daily builds up an increasing deficiency state which may be characterized by fatigue, lack of interest in his affairs, emotional instability, irritability, depression, anger, fear, and loss of appetite, weight and strength." P. & R. p. 143.
  - i. Riboflavin is derived from dairy products, liver and kidney and, less important sources, eggs and green leafy vegetables. All the families were deficient in vitamin B<sub>2</sub> which is important in the enzyme system. "It is an essential link in the metabolism of amino acids, fatty acids and carbohydrates; it serves in the utilization of food for energy and also the synthesis of body substance". P. & R. p. 143.
  - j. Maize is a poor source of nicotinic acid (vitamin B).
  - k. The main point related to vitamin C is that the body cannot store this vitamin. The recommended intake must be eaten regularly, preferably daily. The two families with a more than sufficient average intake of vitamin C did not have a regular supply of the vitamin as most of the sources were seasonal, i.e., fruit. A deficiency of vitamin C affects the skin, allows the bones to soften and weakens the muscles.
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