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Is South Africa on the road to achieving sustainable agriculture?

An environmental law perspective.

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I hereby declare that I have read and understood the regulations governing the submission of Master's in Philosophy dissertations, including those relating to length and plagiarism, as contained in the rules of this University, and that this dissertation conforms to those regulations.

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Date: 23 February 2013

Is South Africa on the road to achieving sustainable agriculture?

An environmental law perspective.

By

Damian John Weldon

This minor dissertation completes the requirements of the Master's in Philosophy Degree specializing in Environmental Law offered by the Institute of Marine and Environmental Law, University of Cape Town. The views and opinions expressed here are the author's own and should not be attributed to the Institute of Marine and Environmental Law or the University of Cape Town.

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"What we do to the land, we do to ourselves."

Wendell Berry[#]

University of Cape Town

[#] Wendell Berry (born August 5, 1934) is an American man of letters, academic, cultural and economic critic and farmer.

Chapter 1: Introduction

1.1. Background to the study

The appearance and development of the concept of sustainable agriculture in international legal discourse has taken place in a period of human history characterised by elevated understanding of the complex relationship between humanity and its surrounding environment. The global population is expected to plateau at approximately nine billion people by roughly the middle of this century.¹ According to Charles et al. a major correlation exists between population growth deceleration and the emergence of a powerful global middle class exhibited by increased wealth and purchasing power. The consequence of this development is that demand for agricultural products such as meat, fish, dairy and processed foods is undoubtedly on the increase. Simultaneously, agricultural sectors the world over are experiencing greater competition for land, water and energy as well as increased pressure from both civil society and government environmental bodies concerned with negative environmental harms perpetuated by commercial farming practices.² Clearly, the rapidly changing demand for food from a larger and wealthier population has to be matched with an appropriate supply response which, not only is environmentally friendly and socially sustainable, but ensures that the poorest segment of the global population do not go hungry.³

With the evolution and adoption of the sustainable development paradigm, both internationally⁴ and domestically⁵, environmental issues have been galvanised into the public consciousness. The effect that agricultural practices have on the

1. Charles et al 'Food security: the challenge of feeding 9 billion people' (2010) 327 *Science* at 812.

2. Ibid at 812.

3. Ibid at 812.

4. See for example Dire Tladi *Sustainable development in International Law: An analysis of key enviro-economic instruments* (2007).

5. See Constitution of the Republic of South Africa, 1996 at s 24 and the National Environmental Management Act 107 of 1998 at s 2.

environment has not been immune to this process. More and more civil society is taking an interest in what they eat and drink, and more importantly, where and how their food is produced. This is most evident in the rise of the organic food industry worldwide. A concept that is gaining more and more recognition in legal and scientific literature is that of sustainable agriculture. Sustainable agriculture came about as a response to the fact that agricultural practices, especially commercial style agriculture (often termed industrial agriculture), have been linked to a variety of environmental harms.⁶ Currently in South Africa the concept of 'sustainable agriculture' is notably absent from any environmental or agricultural legislation. In this paper the notion of sustainable agriculture will be investigated. Like the idea of sustainable development before it, sustainable agriculture is a multi-faceted holistic approach to farming. It encompasses social, economic and environmental aspects whose interaction result in a complex system filled with uncertainty and novel emerging properties.

Currently, South Africa is home to a progressive suite of environmental legislation underpinned by the environmental right housed in the Bill of Rights in the Constitution of the Republic of South Africa. Due to the robust linkage between agricultural practices and the land on which it operates environmental legislation has a strong role to play in the governance of the agricultural sector. Likewise, effective legislation directly relevant to the agricultural sector in South Africa is a prerequisite for good governance and environmental protection. The purpose of this research paper is to evaluate the extent to which current environmental and agricultural legislation in South Africa is able to accommodate the emerging concept of 'sustainable agriculture'.

1.2. Rationale

Farmland accounts for 82.3 percent of the total land use in South Africa.⁷ The

6. Horrigan L, Lawrence RS & Walker P 'How Sustainable Agriculture can address the environmental and human health harms of industrial agriculture?' (2002) 110(5) *Environmental Health Perspectives* at 445.

7. Republic of South Africa 'Abstract of Agricultural Statistics 2012' available at: <http://www.daff.gov.za/docs/statsinfo/Ab2012.pdf> accessed on 09 November 2012 at Table 5.

agricultural sector is overwhelmingly dominated by private commercial farming enterprises (85.61 percent of all agricultural enterprises fall under this category).⁸ Increasingly, commercial farming methods of production have been linked to undesirable effects on the environment. The South African commercial farming sector is not immune to these allegations of environmental harm and degradation. Thus, if the goal of environmental protection and conservation is to be taken seriously by the relevant environmental authorities in South Africa, the incorporation of more sustainable agricultural practices needs to occur in the agricultural sector of the country. An obvious method of implementing sustainable agricultural practices is through the incorporation of the concept of 'sustainable agriculture' into South African law. This process necessarily warrants an investigation into the merits these types of agricultural production methods have in mitigating environmental harms perpetuated by industrial style agricultural practices. In addition, an investigation as to the compatibility of the 'sustainable agriculture' concept with contemporary South African environmental and agricultural law needs to take place. It is with these two aims in mind that this research paper seeks to critically analyse the extent to which contemporary environmental and agricultural legislation in South Africa is able to adopt the concept of 'sustainable agriculture'. The scope of this research paper, due to size constraints, will be confined to the environmental aspects of the sustainable agriculture paradigm.

1.3. Focal research question

To what extent does environmental and agricultural legislation currently in effect in South Africa support the adoption of the sustainable agriculture concept?

1.4. Methodology

This paper is a desktop study incorporating information obtained from public sources.

8. Republic of South Africa 'Abstract of Agricultural Statistics 2012' available at: <http://www.daff.gov.za/docs/statsinfo/Ab2012.pdf> accessed on 09 November 2012 at Table 5.

1.5. Chapter Outline

In this paper a theoretical understanding of the concept of sustainable agriculture will be presented together with the notion of agroecology (Chapter 2). Agricultural practices across the world manifest themselves differently depending on the prevailing conditions inherent in the countries in which they are practiced. Thus, the current agricultural situation in South Africa will be briefly summarised (Chapter 3). The compatibility of the sustainable agriculture concept with current environmental legislation will be examined looking specifically at the effect of the environmental right, the principle of sustainable development (as incorporated in the National Environmental Management Act), and the inclusion of incentive based environmental provisions contained in certain Specific Environmental Management Acts (Chapter 4). Agricultural legislation will form the focus of the Chapter 5. Here again the degree to which the current agricultural law regime is compatible with the concept of sustainable agriculture will be investigated. Finally, draft agricultural policy and strategy documents capable of promoting sustainable agriculture in South Africa will be examined and evaluated (Chapter 6). Concluding remarks will follow in Chapter 7 and Chapter 8 will contain a bibliography.

Chapter 2: Sustainable Agriculture

The term 'sustainable agriculture' does not appear in any environmental or agricultural legislation currently in effect in South Africa. As such, a theoretical description of the term 'sustainable agriculture' will form the bulk of this chapter. The related field of agroecology (a recognised method of achieving sustainable agriculture) will also be included in this section.

2.1. What is sustainable agriculture?

Sustainable agriculture is concerned with achieving three interdependent goals, namely: the promotion of agricultural technologies and practices that minimise harmful effects on the environment (whilst simultaneously providing positive side effects on environmental goods and services); the creation of an agricultural sector which is accessible to, and effective for, farmers; and ultimately, an increase in food productivity.⁹ Two core principles underpin sustainable agriculture, namely resilience and persistence. Resilience refers to the capacity of the agricultural sector to buffer shocks and stresses, whereas persistence refers to the ability of agricultural systems to continue over long periods of time.¹⁰ In many ways sustainable agriculture is an extension of sustainable development as it incorporates environmental, social and economic dimensions in a holistic and integrated fashion.

The concept of sustainable agriculture did not develop in a vacuum but rather came about as a response to the growing realisation that agricultural practices the world over have the potential to bring about environmental harm. There are two principle ways in which any agricultural activity can negatively affect the environment: through the overuse of natural resources or their use as a sink for pollution.¹¹ Environmental problems of this nature often come at a cost which do not appear in any formal

9. Pretty J 'Agricultural sustainability: concepts, principles and evidence' (2008) 363 *Philosophical Transactions of the Royal Society* at 447.

10. Ibid at 447.

11. Ibid at 452.

accounting systems and are therefore dubbed 'externalities' by economists.¹² Agricultural externalities are comprised of the following features common to all farming enterprises practiced across the globe:

“(i) their costs are often neglected, (ii) they often occur with a time lag, (iii) they often damage groups whose interests are not well represented in political or decision-making processes, and (iv) the identity of the source of the externality is not always known”.¹³

For example, a farmer applies excessive nutrients in the form of fertilizers on his or her land in order to boost crop productivity. Irrigation of the land coupled with heavy rainfall events lead to increased runoff which carries excess nutrients into a nearby river system. The increased nutrient concentration in the river leads to eutrophication thus negatively impacting upon downstream users of the water source. In this simplistic scenario the ecological cost of applying excess nutrients is not accounted for economically by the farmer. Secondly, downstream users bear the brunt of the polluting effect of the excess nutrient load entering into the system. Thirdly, it is not always possible to pin point exactly which farmer is responsible for the excessive nutrient loading. Lastly, the cost of the cleanup invariably is borne by the local government using funds acquired from the public principally through tax revenue income streams. In this scenario only the action of one farmer is described. However, in reality, agricultural areas are made up of multiple individual farms making use of a variety of agricultural inputs, of which the cumulative effect on the environment is often poorly understood.

From the above theoretical scenario the following conclusion may be derived: quantifying the potential negative effects agricultural activities have on the environment is a complex task. However, there are known detrimental environmental consequences associated with commercial farming practices. These include: the

12. Tegtmeier EM & Duffy MD 'External costs of agricultural production in the United States' (2004) 2(1) *International Journal of Agricultural Sustainability* at 1.

13. Pretty J 'Agricultural sustainability: concepts, principles and evidence' (2008) 363 *Philosophical Transactions of the Royal Society* at 453.

development of large-scale crop monocultures which lead to a decrease in biodiversity; the excessive use of synthetic chemical pesticides and fertilizers resulting in pollution of the land, water and atmosphere; accelerated soil erosion coupled with soil nutrient deficiencies; and the unsustainable consumption of water resources on many agricultural lands.¹⁴ The increasing prevalence of pesticides in the environment has been linked to many public health ailments such as elevated cancer risks and the disruption of the body's reproductive, immune, endocrine, and nervous systems.¹⁵ Of particular concern is the ability of certain pesticides to bioaccumulate in the environment elevating the potential level of risk the public is exposed to from eating foods higher up on the food chain such as meat, milk and eggs.¹⁶ Not only does commercial agriculture pose a direct threat to the environment, but certain commercial farming activities also tend to be wholly resource and energy inefficient. A well-documented example of these inefficiencies occur in large scale livestock farming. In these operations farmers make use of grain to feed their cattle. To produce one kilogram of cattle meat, seven kilograms of grain are required.¹⁷ Thus, a country's food supply becomes very resource inefficient if grain-fed animals are prioritised as an agricultural product as opposed to the local population eating the grains directly. Grain-fed livestock farming also perpetuates monoculture style agriculture which further exacerbates the negative environmental problems stated above.

It is with these known environmental harms perpetuated by commercial farming

14. Horrigan L, Lawrence RS & Walker P 'How Sustainable Agriculture can address the environmental and human health harms of industrial agriculture?' (2002) 110(5) *Environmental Health Perspectives* at 445.

15. Ritter et al 'Addressing the linkage between exposure to pesticides and human health effects – research trends and priorities for research' (2006) 9(6) *Journal of Toxicology and Environmental Health* at 444–447.

16. Walker et al 'Public health implications of meat production and consumption' (2005) 8(4) *Public Health Nutrition* at 350.

17. Woods et al 'Energy and the food system' (2010) 365 *Philosophical Transactions of the Royal Society* at 2994-2995.

practices that proponents of sustainable agriculture argue that farming activities should be about more than simply increasing food productivity for economic gain. They recognize that the agricultural sector stands in a unique position whereby the very operation of a farm may serve the greater public good. Thus, a farmer who successfully practices sustainable agriculture is able to produce food and other goods for consumption and sale, on both domestic and international marketplaces, as well as contributing positively to the attainment of valued public goods such as clean water, the maintenance and enhancement of biodiversity, the achievement of groundwater recharge, carbon sequestration and more aesthetic goals such as the use of the agricultural landscape for income generation through tourism attraction.¹⁸ The attainment of sustainable agriculture is dependent on farmers making the best use of the goods and services provided by nature coupled with the implementation of technologies and practices locally adapted to the prevailing conditions inherent in the region in which the farming activity takes place. Therefore, there does not exist a catch-all method of achieving sustainable agriculture, but rather, the practice will manifest itself in a myriad of different forms dependent on the local conditions at hand.

Agricultural activities are highly technical in nature and require a strong understanding of biological and ecological principles including sufficient understanding of nutrient cycling, nitrogen fixation, soil regeneration, competition theory and parasitism amongst other relevant processes. Therefore, sustainable agricultural methods of food production too must be inherently technical in order to be able to protect and conserve the environment. Recognised sustainable agriculture activities include the following:

- crop rotation practices which interrupt pest reproductive cycles and help to minimise the need for added fertilizer inputs (as one crop provides nutrients for the next crop);

18. Pretty J 'Agricultural sustainability: concepts, principles and evidence.' (2008) 363 *Philosophical Transactions of the Royal Society* at 451.

- cover crops which improve soil quality, prevent soil erosion, and minimise weed growth;
- no-till and low-till farming practices that minimise disturbances to the soil thereby increasing water retention and conserving soil nutrients and the topsoil itself;
- effective soil management which include the management of the chemical, biological and physical soil properties;
- the incorporation of organic matter and compost in the soil in order to provide a source of food for beneficial bacteria, fungi, nematodes, and protozoa;
- promoting biological diversity in agricultural landscapes by growing a variety of crops which in turn create more niches for beneficial insects and animal species;
- ongoing nutrient monitoring of the soil which allows farmers to apply sufficient fertilizer to meet the needs of their crops without incurring large nutrient losses through runoff into adjacent sources of water thereby helping to prevent eutrophication;
- integrated pest management strategies prioritising biological control methods including crop rotation, intercropping, utilisation of insect predators, and the use of plant varieties that demonstrate a naturally high resistance to pests, as opposed to the use of large chemical inputs such as pesticides and herbicides.¹⁹

Clearly, the introduction and successful implementation of sustainable agricultural practices into the mainstream commercial farming sector of a country cannot occur without the creation of sufficient training and support programs from either the public or private sector.

A particular concern raised by proponents of the conventional farming industry is the ability of farms utilising sustainable agricultural practices to meet current and projected global food demands. The argument against sustainable agriculture

19. Horrigan L, Lawrence RS & Walker P 'How Sustainable Agriculture can address the environmental and human health harms of industrial agriculture?' (2002) 110(5) *Environmental Health Perspectives* at 452.

revolves around the issue of food productivity. It is thought that the conversion to more sustainable agricultural methods will result in decreased yields and, thus, could lead to current and future global food shortages. A recent study, conducted by survey for the year 1999-2000, analysed 208 sustainable agricultural projects in 52 developing countries representing 3.0% of the 960 million hectares of arable and permanent crops grown across Africa, Asia and Latin America.²⁰ Of the 208 projects submitted, 89 produced reliable yield data, which when analysed, showed an increase in per hectare food production per sustainable agriculture project of 93%.²¹

According to the study:

“The most common mechanisms (that resulted in increases in food productivity) were yield improvements with regenerative technologies and new seeds/breeds, occurring in 60% of the projects, by 56% of the farmers and over 89% of the area. Better use of land and water, giving rise to increased cropping intensity, occurred in 14% of the projects, with 31% of the farmers and 8% of the area”. (own insert)²²

Although this study provides evidence for increased crop yields attributed to the incorporation of sustainable agriculture technologies and practices, it must be borne in mind that more targeted studies, that are location specific, are required to prove conclusively that the incorporation of sustainable agriculture will result in higher yields for farmers.

A final consideration is that, no matter how much time and effort is taken to ensure that farming adheres to sustainable agricultural principles, an environmental cost will always be felt. In reality it is simply impossible to say what is sustainable and what is

20. Pretty JN, Morison JIL & Hine RE ‘Reducing food poverty by increasing agricultural sustainability in developing countries.’ (2003) 95 *Agriculture, Ecosystems and Environment* at 217.

21. Ibid at 217

22. Ibid at 221

not.²³ This is because farming is practiced on a variety of differing landscapes incorporating a myriad of diverse ecosystems. A farmer that puts in measures which seek to increase productivity, decrease environmental harm, and ensure public health is on the road to sustainability. Ultimately, sustainability is a judgment call dependent on what baselines are chosen.²⁴

2.2. Agroecology

Similar to sustainable agriculture, but with subtle differences, is the concept of agroecology. Agroecology can be defined as the integrative study of the ecology of the entire food system, encompassing ecological, economic and social dimensions, and as such, agroecology is a method with which the aims and goals of sustainable agriculture can be achieved.²⁵

Agroecology is premised on the fact that:

“Natural ecological systems have evolved over centuries to take efficient advantage of natural resources. Interacting plant and animal species survive well together in each given environment, including its climate and soils. They provide a model of survival and relative stability on which we can model modern agroecosystems. Natural ecosystems are essentially local, and they are most often biologically diverse. Clues gleaned from natural systems can be blended with attentive human innovations to design future food systems”.

²⁶

The term agroecology may have different definitions depending on the context within which it is used. Clearly, the blending of ecological principles and methods of food

23. Pretty J ‘Agricultural sustainability: concepts, principles and evidence.’ (2008) 363 *Philosophical Transactions of the Royal Society* at 453.

24. Ibid at 453

25. Francis et al ‘Agroecology: the ecology of food systems’ (2003) 22(3) *Journal of Sustainable Agriculture* at 101.

26. Ibid at 101.

production call for a scientific definition of agroecology. In this respect agroecology shares most of the principles and practices of sustainable agriculture such as persistence and resilience. However, recently, the term 'agroecological movement' has become more and more commonplace. In this context agroecology forms part of the mechanism needed to achieve a larger ideological aim such as food security, food sovereignty, or the extension of alternative agricultural practices into current, specialised agricultural production systems.²⁷

Approaching agriculture from an agroecological lens is more than simply looking at the efficiencies of resource use in production, short-term environmental impacts, and annual economic returns. Of greater importance are the energy and material flows (including waste generation) at each step in the food chain, from farm to dinner plate, taking into account complex relationships and emergent properties of the entire agricultural system.²⁸ Thus, fundamental to agroecology are the dominant driving forces that include economics at the farm, national and international levels; the environmental effects of farming activities on the ecosystems in which they are embedded; as well as the social impacts, including human health and wellbeing considerations, on the people who rely on the agricultural systems and outputs for their survival.²⁹ The discipline of agroecology is a complex mosaic of environmental, economic and social considerations which mirrors the complexities inherent in sustainable agriculture and ultimately sustainable development.

A crucial difference between sustainable agriculture and agroecology does exist. Sustainable agriculture does not rule out any use of technology or practices on ideological grounds.³⁰ The aim of sustainable agriculture is to improve productivity

27. Wezel et al 'Agroecology as a science, a movement and a practice. A review' (2009) 29 *Agronomy for Sustainable Development* at 511.

28. Francis et al 'Agroecology: the ecology of food systems' (2003) 22(3) *Journal of Sustainable Agriculture* at 104.

29. Ibid at 104.

30. Pretty J 'Agricultural sustainability: concepts, principles and evidence' (2008) 363 *Philosophical Transactions of the Royal Society* at 451.

whilst simultaneously decreasing undue harm to human health and the environment. Thus, the incorporation of a genetically modified crop into the agricultural landscape is not seen as unsustainable per se unless it negatively effects the environment, human health or results in reduced productivity. However, agricultural systems premised on agroecology explicitly reject any form of bio-engineering resulting in the adoption of any genetically modified organisms into the agricultural landscape. Thus, when developing agricultural policy, it is with care that law makers understand the nuances between sustainable agriculture and agroecology.

2.3. Summary

Sustainable agricultural production methods offer a holistic approach to farming which takes into account environmental, social and economic considerations. The above theoretical description of sustainable agriculture emphasises the significant environmental benefits associated with this style of agricultural production. These include the ability to minimise harmful effects on the environment whilst simultaneously promoting positive side effects on ecosystem services. It is these noteworthy environmental benefits associated with the adoption of sustainable agricultural practices that form the focus of this research paper. The attainment of a sustainable agricultural sector is a complex undertaking. It requires, amongst other factors, the agricultural community to seriously rethink the role of agriculture in society. Agricultural practices need to become more than simply a means to produce food for economic gains. In order for the successful incorporation of sustainability practices into the agricultural sector to occur, the potential barriers to its implementation need to be acknowledged. These hurdles to sustainable agriculture will manifest themselves differently depending on the local characteristics of a particular locality. It is with this point in mind that the agricultural sector in South Africa will be examined.

Chapter 3: Agriculture in South Africa

Agriculture in South Africa is a complex mosaic of economic, social and environmental factors. The purpose of this chapter is to briefly describe these three elements as they manifest themselves in the South African agricultural sector so as to give a context within which the concept of 'sustainable agriculture' would be required to operate. As has been stressed before, the focus of this paper is confined to environmental considerations. However, a research paper on sustainable agriculture would be incomplete without briefly touching upon the social and economic driving forces which shape the current South African agricultural landscape.

3.1. Agriculture in numbers

As of 1991 farmland in South Africa accounted for 100 665 792 ha. To put this figure in perspective the total land area of South Africa is 122 320 100 ha. Therefore, farmland accounts for approximately 82.3% of the total land use in South Africa.³¹ Of the land used for agriculture, 16 737 672 ha is considered potentially arable (i.e. for the growing of crops) accounting for 13.7%.³² Furthermore, the land designated as farmland can be divided into commercial agriculture (accounting for 85.61%) and developing agriculture in the former homelands (making up 14.38%).³³ Agriculture in South Africa is quite clearly heavily skewed toward commercial farming practices. Of the number of small scale farm units in the former homelands the data is particularly sparse and only includes the following years:

1993: 57 980

1996: 60 938

31. Republic of South Africa 'Abstract of Agricultural Statistics 2012' available at: <http://www.daff.gov.za/docs/statsinfo/Ab2012.pdf> accessed on 09 November 2012 at Table 5.

32. Ibid at Table 5.

33. Ibid at Table 5.

2002: 45 818

2007: 39 966.³⁴

From the limited data available it would seem that a downward trend is visible with the number of small scale farms in the former homelands on the decrease.

Economically speaking the contribution of the agricultural sector to the GDP of the country in 2011 amounted to R63 billion. Although this amount is significant, it must be borne in mind that it only amounts to 1.9% of the total GDP of the country.³⁵ Exports generated an estimated value of R69 881 million during the 2011/2012 fiscal year with the Netherlands (R5 918 million), the United Kingdom (R5 394 million), Zimbabwe (R5 305 million), Mozambique (R3 212 million) and Japan (R2 984 million) making up the big five countries South Africa exports to.³⁶ The estimated value of imports into the country amounted to R64 924 million during the same period. The five largest trading partners with respect to South African bulk imports include Argentina (R5 305 million), China (R5 075 million), Brazil (R4 931 million), Germany (R4 112 million) and the United States (R3 861).³⁷ From a national perspective the status of international trade of agricultural products in South Africa seems healthy and productive.

To gain a better insight into the current domestic agricultural situation it is useful to briefly highlight the status of maize production during the 2010/11 fiscal year. Maize is by far the most important grain crop grown in South Africa as it is both a major feed grain (yellow maize accounts for 58% of all maize grown in the country) and a

34. Republic of South Africa 'Abstract of Agricultural Statistics 2012' available at: <http://www.daff.gov.za/docs/statsinfo/Ab2012.pdf> accessed on 09 November 2012 at Table 6.

35. Republic of South Africa 'Economic Review of the South African Agriculture 2011/12' available at: <http://www.daff.gov.za/docs/statsinfo/EcoRev2011-12.pdf> accessed 09 November 2012.

36. Ibid at 10.

37. Ibid at 10.

staple food crop (white maize).³⁸ In monetary terms the gross value of maize produced in the 2010/2011 period amounted to R 15 086 million.³⁹ South Africa's commercial producers of maize produced an estimated yield of 10 679 million tons.⁴⁰ In comparison the estimated production of maize in the non-commercial sector accounted for only 564 335 tons.⁴¹ The bulk of the maize grown in the non-commercial sector can be attributed to subsistence farming occurring mainly in the former homelands (a contribution of only 5% to the total production of maize).⁴² The comparison between the commercial and non-commercial production of maize reveals that most South Africans receive their maize for consumption from the commercial farming sector. However, since the deregulation of the South African agricultural market,⁴³ the price of maize has become subject to the following factors:

- international maize price;
- international exchange rates;
- local production (influenced by weather and the total area planted);
- local consumption;
- production levels in the neighbouring Southern African Development Community (SADC) countries; and
- existing stock levels both internationally and domestically.⁴⁴

38. Republic of South Africa 'Trends in the Agricultural Sector 2011' available at: <http://www.daff.gov.za/docs/statsinfo/Trends2011.pdf> accessed 09 November 2012 at 9.

39. Ibid at 10.

40. Ibid at 11.

41. Ibid at 11.

42. Ibid at 11.

43. Marketing of Agricultural Products Act 47 of 1996 at s 27.

44. Bonti-Ankomah S 'Addressing food insecurity in South Africa' (2001) The National Institute for Economic Policy. Paper presented at the SARPN Conference on Land Reform and Poverty Alleviation in Southern Africa, Pretoria, 4th and 5th June 2001 at 2.

Considering the fact that South Africa is grappling with gross poverty and increasing unemployment the question to be asked is whether the price of maize, the staple food crop of the country, should be left to the whims of the open market? To answer this question it is useful to briefly delve into socio-economic features of the South African population.

3.2. Societal considerations relevant to agriculture

An understanding of the social aspects of South Africa's food production system is vitally important if the goal of a sustainable agricultural sector is to be achieved. This is because sustainable agriculture is underpinned by the holistic integration of social, economic and environmental considerations. The fact that the agricultural landscape is heavily skewed towards commercial farming practices has far reaching effects on the ability of the majority of South Africans to acquire food. Central to this discourse is the idea of household food security. Bonti-Ankomah defines household food security as access by all households, at all times, to adequate safe and nutritious food for a healthy and productive life.⁴⁵ Household food security is made up of two components, namely the ability to be self-sufficient in food production through own production, or the ability to access markets and purchase food items, or a combination of the two.⁴⁶ Bonti-Ankomah eloquently makes the link between national food production and household food security:

“The socio-economic conditions play an important role in food security or insecurity. National food self-sufficiency should not be used as a proxy for household food security or as an index of national welfare. While South Africa produces sufficient food, this in no way ensures food security at the individual household level. This is because ensuring access to food at the household level depends not only on secure food supplies, but also on stable demand or

45. Bonti-Ankomah S 'Addressing food insecurity in South Africa' (2001) The National Institute for Economic Policy. Paper presented at the SARPN Conference on Land Reform and Poverty Alleviation in Southern Africa, Pretoria, 4th and 5th June 2001 at 2.

46. Ibid at 2

purchasing power. If families are unable to grow or purchase enough food, and social welfare nets are absent or ineffective, there may be hunger".⁴⁷

The Income and Expenditure of Households National Survey conducted by Statistics South Africa for the period 2005/06 revealed that expenditure on food, beverages and tobacco accounted for 22,8% of the total household expenditure of black African households. In contrast coloured, Indian/Asian and white household expenditure on food, beverages and tobacco was less at 20.9%, 10.5% and 8.5% respectively.⁴⁸ In the rural context household expenditure on food amounted to 24.8% of the total household budget compared to urban households who spend 12.5% of their total household income on food.⁴⁹ These statistics point to two overall trends. Firstly, inequality exists between black and white headed households (the two being at the opposite ends of the scale) with black households spending a far greater proportion of their earnings on food. Secondly, rural households, likewise, spend a large proportion of their income stream on food when compared to urban households. When we overlay the estimated average annual household income for white and black households at R280 870 and R37 711 respectively,⁵⁰ an alarming picture presents itself. Quite clearly black households across the country are far more likely to feel food insecure at any one time. The results of the survey correspond well with a study by Rose and Charlton who found that food poverty rates in rural areas of South Africa was 62% compared with 27% in urban areas.⁵¹ The authors defined a household as being in food poverty if the amount of money the household spends is

47. Bonti-Ankomah S 'Addressing food insecurity in South Africa' (2001) The National Institute for Economic Policy. Paper presented at the SARPAN Conference on Land Reform and Poverty Alleviation in Southern Africa, Pretoria, 4th and 5th June 2001 at 2.

48. Republic of South Africa 'Income and Expenditure of Households 2005/2006' available at: <http://www.statssa.gov.za/ies/docs/P01002005.pdf> accessed 09 November 2012 at 14.

49. Ibid at 9.

50. Ibid at 9.

51. Rose D & Charlton KE 'Prevalence of household food poverty in South Africa: results from a large, nationally representative survey' (2002) 5(3) *Public Health Nutrition* at 385.

inadequate to purchase a basic, nutritionally adequate diet.⁵² The study also revealed that food poverty rates were highest among black households at 56% and lowest for white households at 3%.⁵³

Given the above statistics and study results, clearly food insecurity continues to be a major problem in South Africa even though at a national level the South African Government has embraced neo-liberal agricultural policies⁵⁴ that free up the agricultural market and favour the large-scale commercial farming industry. According to Baiphethi and Jacobs:

“Virtually all economists had upheld a supply-side view (with respect to food security), in which they focused on national-level food production, availability and access. (...) However, over time the emerging consensus was that sufficient agricultural output did not automatically result in reduced food insecurity, either transitory food shortages or chronic hunger.”⁵⁵

Therefore a combination of supply-side and demand-side considerations is important when evaluating food security. The importance of demand-side considerations is fundamental to understanding why so many South Africans find themselves in a position of food insecurity. Essentially demand-side considerations fall within the realm of socio-economic policy decisions. An effective sustainable agricultural regime in South Africa would necessarily need to incorporate the issue of food security as one of its primary objectives. As this research paper is primarily focused on the environmental considerations relevant to the attainment of sustainable agriculture in South Africa, the integration of the socio-economic goals related to

52. Rose D & Charlton KE 'Prevalence of household food poverty in South Africa: results from a large, nationally representative survey' (2002) 5(3) *Public Health Nutrition* at 384.

53. Ibid at 386.

54. Republic of South Africa 'Agricultural Policy in South Africa 1998' available at: <http://www.daff.gov.za/docs/Policy/policy98.htm> accessed 09 November 2012.

55. Baiphethi MN & Jacobs PT 'The contribution of subsistence farming to food security in South Africa' (2009) 48(4) *Agricultural Economics Research, Policy and Practice in Southern Africa* at 462.

food production cannot be fully investigated. Nonetheless, more concerted research in this regard is a necessary prerequisite for the implementation of an effective sustainable agriculture policy in South Africa.

3.3. Environmental harm attributed to agricultural practices in South Africa

One of the goals of creating an enabling environment for the implementation of sustainable agricultural practices in South Africa is the potential minimisation of environmental harms attributed to agricultural practices. However, for any sustainable agricultural strategy to be effective the contemporary environmental issues relevant to the South African agricultural landscape need to be highlighted and understood. In South Africa a number of environmental harms have been attributed to the agricultural sector. The most prevalent of these harms are linked to land and soil degradation as well as the process of eutrophication.

3.3.1. Land degradation

According to the United Nation's Convention to Combat Desertification the term 'land degradation' may be defined as the:

“reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as:

- (i) soil erosion caused by wind and/or water;
- (ii) deterioration of the physical, chemical and biological or economic properties of soil; and
- (iii) long-term loss of natural vegetation.”⁵⁶

Given that Southern Africa south of 15 degrees South is generally characterised by

56. United Nations Convention to Combat Desertification 1994 available at: <http://www.unccd.int/Lists/SiteDocumentLibrary/conventionText/conv-eng.pdf> accessed 15 February 2013 at art 1 (f).

semi-arid conditions,⁵⁷ large tracts of land in South Africa may be considered particularly at risk from land degradation processes. The definition alludes to the fact that land degradation may result from a combination of both natural and human-induced factors. The definition specifically points out that land degradation can have negative effects on rainfed and irrigated cropland as well as land used for grazing. Thus, land degradation poses a direct threat to the agricultural sector of South Africa. Ironically, land degradation has, in many cases, come about as a result of agricultural activities. Therefore, it is in the best interest of the agricultural sector to prevent instances of land degradation from occurring.

One of the ways in which land degradation may occur is through the conversion of natural ecosystems for other uses, notably agriculture.⁵⁸ A change in the natural land cover of a particular area may have many detrimental environmental effects including the destruction and/or fragmentation of natural habitats resulting in associated loss of biodiversity, ecosystem health and ultimately an alteration in the provision of ecosystem services.⁵⁹ Fragmentation of natural habitats poses a severe obstacle to conservation efforts concerned with protecting natural biodiversity. A case in point is the status of the South Coast Renosterveld biome (a vegetation type characterised by shrubby grassland forming part of South Africa's Cape Floristic Region). A study conducted in 2000 revealed that over 80% of the South Coast's Renosterveld natural range had been replaced by agricultural land.⁶⁰ More importantly, the remaining land dedicated to Renosterveld was highly fragmented into 394 separate pockets scattered throughout the landscape.⁶¹ A broader investigation into the entire Cape Floristic region revealed that thirty percent of the

57. Cr tat et al 'Recurrent daily rainfall patterns over South Africa and associated dynamics during the core of the austral summer' (2012) 32 *International Journal of Climatology* at 261.

58. Musvoto C 'Emerging issues paper: land degradation, 2008' Department of Environmental Affairs and Tourism at 2.

59. Ibid at 2.

60. Kemper et al 'Landscape fragmentation in South Coast Renosterveld, South Africa, in relation to rainfall and topography' (2000) 25 *Austral Ecology* at 183.

61. Ibid at 182.

entire area has been transformed in one way or another.⁶² Agriculture, including commercial forestry plantations, is by far the largest contributor to the transformation of the Cape Floristic region accounting for 25.9%.⁶³ Natural habitat fragmentation, as a result of land conversion to agriculture, poses a number of difficulties to conservation efforts targeted at safeguarding natural biodiversity. Firstly, conventional farming practices are designed to promote the growth of a targeted species, i.e. such as maize, in order to produce a harvest for economic gain. Therefore the colonisation capacity of natural plant species such as Renosterveld onto cultivated land is almost zero.⁶⁴ Secondly, vast amounts of agricultural land form substantial barriers between pockets of natural vegetation. Therefore, land dedicated to growing crops significantly reduces the dispersal potential of genetic material of indigenous vegetation and thus, ultimately, increases the risk of indigenous species extinction.⁶⁵ Fragmentation of natural habitats countrywide continues to be an acute and persistent conservation issue in South Africa.

Agricultural activities such as livestock farming can also be a significant cause of land degradation.⁶⁶ The extent to which a rangeland or veld is at risk from land degradation has been linked to several factors including the number of livestock allowed to graze on a particular portion of land, the timing of the grazing, and the choice of stock species, amongst other factors.⁶⁷ In South Africa 82.3% of the total land use is dedicated to agricultural activities. However, the vast majority of this land is used for livestock grazing (amounting to approximately 68.6% of all agricultural

62. Rouget et al 'Current patterns of habitat transformation and future threats to biodiversity in terrestrial ecosystems of the Cape Floristic Region, South Africa' (2003) 112 *Biological Conservation* at 70.

63. Ibid at 71.

64. Kemper et al 'Landscape fragmentation in South Coast Renosterveld, South Africa, in relation to rainfall and topography' (2000) 25 *Austral Ecology* at 183.

65. Ibid at 183.

66. Musvoto C 'Emerging issues paper: land degradation, 2008' Department of Environmental Affairs and Tourism at 4.

67. Ibid at 4.

land).⁶⁸ Therefore, the potential for inappropriate use of rangeland leading to overgrazing and subsequent land degradation is high. The status of the Little Karoo region in South Africa is a prime example of this environmental problem. The Little Karoo is a semi-arid region associated with three biomes unique to South Africa, namely the Succulent Karoo, Fynbos and Subtropical Thicket.⁶⁹ Unfortunately, inappropriate browsing and grazing of domesticated livestock has resulted in extensive overgrazing and degradation of more than 50% of the region.⁷⁰ Ironically, another 10% of the Little Karoo has been converted to cultivated land for the purpose of growing livestock feed in order to safeguard against periodic grazing shortages experienced throughout the region.⁷¹

3.3.2. Soil degradation

Soil degradation is seen as the precursor to land degradation. Soil degradation, as a result of inappropriate agricultural practices, may manifest in numerous ways on South African agricultural land including soil acidification, increased soil salinity, depletion in organic matter, soil compaction, soils deficient in nutrients, chemical contamination and increased erosion potential.⁷² One mechanism whereby chemical contamination of soil may occur is through the inappropriate use of fertilizers. The South African fertilizer industry annually supplies upwards of 2 million tons of fertilizer products with an approximate market value of R3 billion.⁷³ To decrease production costs and increase financial profits some chemical manufactures of fertilizers have been known to minimize the purification process necessary to ensure

68. Republic of South Africa 'Abstract of Agricultural Statistics 2012' available at: <http://www.daff.gov.za/docs/statsinfo/Ab2012.pdf> accessed on 09 November 2012 at Table 5.

69. Egoh et al 'Safeguarding biodiversity and ecosystem services in the Little Karoo, South Africa' (2010) 24(4) *Conservation Biology* at 1023.

70. Ibid at 1023.

71. Ibid at 1023.

72. Musvoto C 'Emerging issues paper: land degradation, 2008' Department of Environmental Affairs and Tourism at 3

73. Ibid at 96.

that harmful impurities are not present in their products.⁷⁴ Thus, the application of these fertilizers has in certain cases resulted in soil contamination. Pineapple growers in the Eastern Cape experienced heavy metal contamination of their yields after applying a zinc-phosphate fertilizer to their plantations in 2004.⁷⁵ Large crop losses translated into massive financial losses not only for the growers themselves but also for secondary industries such as the processors, transporters and distributors.⁷⁶ The excessive application of fertilizers onto agricultural land has been linked as one of the factors driving the increased incidence of eutrophication occurring in freshwater bodies across the country.

3.3.3. Eutrophication

Eutrophication is a term used to describe the process of nutrient enrichment and the associated excessive aquatic plant growth in water bodies.⁷⁷ Eutrophication can occur as a result of natural processes or through anthropogenic actions such as agricultural activities. Nutrient enrichment is associated with a number of negative side effects directly related to the environment. Firstly, nutrient enrichment has the ability to alter the natural competitive balance between plant species within a water body. In extreme cases this may cause wide scale degradation of aquatic plant communities in a locality through the reduction of habitat diversity and integrity.⁷⁸ Secondly, nutrient enrichment culminates in elevated primary production, i.e. excessive algae and macrophyte growth, resulting in severe algal blooms and

74. Hill G, Fraser G & Baiyegunhi L 'The impact of contaminated fertilizer on pineapple growers in the Eastern Cape, South Africa' (2012) 7(27) *African Journal of Agricultural Research* at 3900.

75. Ibid at 3898.

76. Ibid at 3898.

77. van Ginkel CE 'Eutrophication: present reality and future challenges for South Africa' (2011) 37(5) *Water South Africa* at 693.

78. de Villiers S & Thiar C 'The nutrient status of South Africa rivers: concentrations, trends and fluxes from the 1970's to 2005.' (2007) 103 *South African Journal of Science* at 343.

ultimately oxygen deficient conditions on a long enough time line.⁷⁹ Finally, in certain cases, cyanobacterial blooms may occur which are acutely toxic to human beings and animal life.

One of the main contributing factors of nutrient enrichment, leading to eutrophication of South Africa's fresh water bodies, is excessive fertilizer runoff from cultivated lands.⁸⁰ These fertilizers contain concentrated amounts of inorganic nitrogen and phosphorus both of which are primary plant nutrients.⁸¹ The issue of eutrophication is further complicated by the fact that rivers and reservoirs have the natural ability to trap nutrients in their sediments. Thus, eutrophication episodes may occur long after the initial input of nutrients into the system, as natural processes cause trapped nutrients to be released into the water body periodically where they are readily taken up by nuisance algae and macrophytes.⁸² A recent review of the overall nutrient status of the twenty largest river catchments in South Africa (looking specifically at dissolved inorganic nitrogen and phosphorus values) using data collected by long-term water quality monitoring by the Department of Environmental Affairs and Forestry was conducted in 2007.⁸³ The results of this study indicated that nutrient levels exceeding recommended water quality guidelines for aquatic plant life were observed in all of the major rivers in South Africa except one. Additionally, dissolved

79. van Ginkel CE 'Eutrophication: present reality and future challenges for South Africa.' (2011) 37(5) *Water South Africa* at 693.

80. Oberholster PJ & Ashton PJ 'Parliamentary Grant Deliverable 2008 – State of the Nation Report. An overview of the current status of water quality and eutrophication in South African Rivers and Reservoirs.' at 3.

81. de Villiers S & Thiar C 'The nutrient status of South Africa rivers: concentrations, trends and fluxes from the 1970's to 2005.' (2007) 103 *South African Journal of Science* at 343.

82. Oberholster PJ & Ashton PJ 'Parliamentary Grant Deliverable 2008 – State of the Nation Report. An overview of the current status of water quality and eutrophication in South African Rivers and Reservoirs.' at 11.

83. de Villiers S & Thiar C 'The nutrient status of South Africa rivers: concentrations, trends and fluxes from the 1970's to 2005.' (2007) 103 *South African Journal of Science* at 343.

phosphorus levels exceeded recommended concentrations in all but six of the catchments studied.⁸⁴ Clearly, the enrichment of South Africa's fresh water bodies continues to be an acute environmental issue that is in need of a targeted remedy.

3.4. Summary

The agricultural sector in South Africa is the single biggest land user in the country and is heavily dominated by commercial style farms. This sector contributes 1.9% to the total GDP of the country and employs a significant proportion of the workforce in South Africa. The sector is characterised by a free market economic policy designed to boost international trade in agricultural goods. However, issues such as food insecurity continue to be a persistent societal issue in South Africa as the volatility of the international agricultural marketplace often causes the domestic prices of agricultural goods to fluctuate extensively.

Commercial farming in South Africa is associated with much environmental harm. Due to the semi-arid to arid conditions prevalent throughout much of the country the risk of land degradation is high. Environmental harms associated with land degradation specific to South Africa manifest themselves in the fragmentation of natural habitats, the persistent problem of overgrazing, and soil degradation in the form of chemical contamination. Eutrophication of South Africa's fresh water bodies also continues to be a persistent and acute environmental issue partially perpetuated by the inappropriate fertilizer application of farmers on cultivated land.

The prevalence of these environmental harms in the South African environment, as a result of commercial farming enterprises, necessitates the incorporation of more sustainable agricultural practices. As has been highlighted in Chapter 2 the incorporation of sustainable agriculture has the ability to mitigate these numerous environmental harms perpetuated by the South African agricultural sector. One strategy to create a more sustainable agricultural sector is by incorporating the principles and practices associated with sustainable agriculture into law. Unfortunately, the concept of sustainable agriculture is currently absent in South

84. de Villiers S & Thiar C 'The nutrient status of South Africa rivers: concentrations, trends and fluxes from the 1970's to 2005.' (2007) 103 *South African Journal of Science* at 343.

Africa law. However, the suite of progressive environmental law currently in force in South Africa is imminently suited to promote the incorporation of the concept of sustainable agriculture into the South African legal landscape.

Chapter 4: Constitutional considerations and environmental legislation relevant to agriculture

Agriculture is intimately linked with the land on which it is practiced. Thus, agricultural systems rely heavily on the stock of natural assets available to them. Not only do agricultural systems rely on these resources to function effectively, they too directly influence and affect the quality and quantity of these very same assets. The regulation, management and conservation of these natural assets fall under the auspices of environmental legislation in South Africa. Therefore, although environmental legislation often does not expressly concern itself with agricultural activities per se, it can be argued that the significant influence agricultural activities have on the environment does warrant the inclusion of environmental law in any sustainable agriculture discourse. Therefore, the purpose of this Chapter is to highlight environmental legislation relevant to the agricultural sector in South Africa capable of promoting the concept of sustainable agriculture.

4.1. The environmental right

The Constitution is the supreme law of the land in South Africa.⁸⁵ Included in the Constitution is the Bill of Rights. The state is obligated to respect, protect, promote and fulfill the rights in the Bill of Rights.⁸⁶ Of particular relevance to the agricultural sector is the environmental right listed under Section 24 of the Bill of Rights. The environmental right states that:

“Everyone has the right—

(a) to an environment that is not harmful to their health or well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—

(i) prevent pollution and ecological degradation;

85. Constitution of the Republic of South Africa 1996.

86. Ibid at s 7(2).

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".⁸⁷

The significance of the inclusion of the environmental right in South African law has been expressly recognized by the courts. Olivier JA had the following to say during *Director: Mineral development, Gauteng Region, and another v Save the Vaal Environment and others*:

"Our Constitution, by including environmental rights as fundamental, justiciable human rights, by necessary implication requires that environmental considerations be accorded appropriate recognition and respect in the administrative processes in our country. Together with the change in the ideological climate must also come a change in our legal and administrative approach to environmental concerns."⁸⁸

Section 24 (b) specifically places an obligation on the state to enact reasonable legislation and other measures (these may include the establishment of agencies, policies, capacity building, education schemes and so on) in order to give effect to this right. The qualifying term 'reasonable' was elucidated further by Yacoob J in *Government of the Republic of South Africa and Others v Grootboom and Others*:

"The State is required to take reasonable legislative and other measures. Legislative measures by themselves are not likely to constitute constitutional compliance. Mere legislation is not enough. The State is obliged to act to achieve the intended result, and the legislative measures will invariably have to be supported by appropriate, well-directed policies and programs implemented by the Executive. These policies and programs must be

87. Constitution of the Republic of South Africa at s 24.

88. *Director: Mineral development, Gauteng Region, and another v Save the Vaal Environment and others* 1999 (2) SA 709 (SCA) at para 20.

reasonable both in their conception and their implementation. The formulation of a program is only the first stage in meeting the State's obligations. The program must also be reasonably implemented. An otherwise reasonable program that is not implemented reasonably will not constitute compliance with the State's obligations.”⁸⁹

Although Section 24 (b) expressly obligates the State to enact reasonable legislation and other measures, the duties implied by the environmental right do not only apply to the State, but to all natural and juristic persons.⁹⁰ It has been suggested by Glazewski that the nature of the environmental right is imminently suited to both horizontal and vertical application.⁹¹

Notably, the environmental right contains reference to the concept of sustainable development. In the *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province and Others*, Ngcobo J explained the significance of including sustainable development in the environmental right:

“The Constitution recognises the interrelationship between the environment and development; indeed it recognises the need for the protection of the environment while at the same time it recognises the need for social and economic development. It contemplates the integration of environmental protection and socio-economic development. It envisages that environmental considerations will be balanced with socio-economic considerations through the ideal of sustainable development.”⁹²

89. *Government of the Republic of South Africa and Others v Grootboom and Others* 2001 (1) SA 46 (CC) at para 42.

90. Constitution of the Republic of South Africa at s 8.

91. Glazewski J *Environmental law in South Africa* 2 ed (2005) at 75.

92. *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province and Others* (CCT67/06) [2007] ZACC 13; 2007 (10) BCLR 1059 (CC); ; 2007 (6) SA 4 (CC) at para 45.

The inclusion of sustainable development as the legal lens through which the environment is to be viewed necessarily implies a holistic, people-centered approach to the interpretation of any environmental legislation enacted to give effect to this right.

The agricultural sector of South Africa is undoubtedly a socio-economic enterprise which is reliant on, and can potentially negatively affect, the environment. Section 24 (b) expressly states that the environment is to be protected by preventing pollution and ecological degradation from occurring. From an agricultural perspective, certain farming activities directly contribute to the accumulation of pollutants in the environment. For example, the release of pesticides, herbicides and fungicides as a conventional method of controlling pest species on croplands may often target unintended species such as vital pollinators necessary for maintaining ecological integrity. Likewise, conventional farming practices often exert a considerable level of control on the surrounding environment and thus are often out of sync with the ecosystems in which they are embedded. Section 24 (b) also mandates that conservation initiatives are to be promoted. Farmlands are often devoid of any natural vegetation. This is because farmers are driven to maximize their crop yields in order to derive a desirable profit margin on the sale of their agricultural goods. Conservation objectives on agricultural land necessarily implies that a portion of the land is to be left undeveloped in order encourage the growth and protection of indigenous flora and fauna species. However, less land dedicated to the primary purpose of cultivating crops equates to potentially less economic rewards, and as such, conservation initiatives and the use of land for agricultural activities often result in a clear conflict of interest. The inclusion of the environmental right in the Constitution, nonetheless, mandates that environmental considerations are to be included in socio-economic activities. The agricultural sector is not excluded from this Constitutional mandate. However, given the implications of the inclusion of the sustainable development paradigm in the environmental right, the concept of sustainable agriculture is arguably imminently suitable to the achievement of the objectives of the environmental right. This is because sustainable agriculture is concerned with achieving three interdependent goals, namely: the promotion of agricultural technologies and practices that minimise harmful effects on the environment (whilst simultaneously providing positive side effects on environmental

goods and services); the creation of an agricultural sector which is accessible to, and effective for, farmers; and ultimately, an increase in food productivity. In many ways sustainable agriculture is an extension of sustainable development as it incorporates environmental, social and economic dimensions viewed in a holistic and integrated fashion. The State has taken its Constitutional obligation to enact suitable environmental legislation capable of achieving the objects of the environmental right seriously. The environmental provisions relevant to the agricultural sector of South Africa will be further unpacked in Section 4.2.

4.2. Environmental legislation relevant to agriculture

4.2.1. National Environmental Management Act

Effect has been given to the environmental right through the enactment of the National Environmental Management Act (NEMA). The NEMA is the framework environmental legislation in South Africa. The NEMA defines the environment as the:

“Surroundings within which humans exist and that are made up of—

- (i) the land, water and atmosphere of the earth;
- (ii) micro-organisms, plant and animal life;
- (iii) any part or combination of (i) and (ii) and the inter-relationships among and between them; and
- (iv) the physical, chemical, aesthetic and cultural properties and conditions of foregoing that influence human health and well-being”.⁹³

This definition, by specifically highlighting the inter-relationship between the different components listed, implies that the environment should be viewed through an ecological lens. The construction of the definition permits a broad interpretation of

93. National Environmental Management Act 107 of 1998 at s 1.

the term environment. Clearly, agricultural activities would fall under this definition of the environment and thus the provisions of NEMA are directly relevant to the agricultural sector.

Sustainable development is the underlying legal principle through which all environmental legislation must adhere to. Direct reference is made to it in Section 24 (b) of the Constitution. Sustainable development is defined in the NEMA as the:

“integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations”.⁹⁴

In this model of development the environment represents one of three competing spheres which need to be taken into account when evaluating any given activity. The qualifying term ‘integration’ is vitally important. Ngcobo J alludes to the importance of not evaluating each sphere separately in *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province and Others*:

“Economic and social development is essential to the well-being of human beings. This Court has recognised that socio-economic rights that are set out in the Constitution are indeed vital to the enjoyment of other human rights guaranteed in the Constitution. But development cannot subsist upon a deteriorating environmental base. Unlimited development is detrimental to the environment and the destruction of the environment is detrimental to development. Promotion of development requires the protection of the environment. Yet the environment cannot be protected if development does not pay attention to the costs of environmental destruction. The environment and development are thus inexorably linked.”⁹⁵

94. National Environmental Management Act at s 1.

95. *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province and Others* (CCT67/06) [2007] ZACC 13; 2007 (10) BCLR 1059 (CC); ; 2007 (6) SA 4 (CC) at para 44.

Thus, the integration of each sphere is the key to the successful implementation of any sustainable development initiative. The definition highlights the importance of intra- and inter- generational equity. This basic principle of environmental law, i.e. present development must not erode the capability of future generations to develop, is mirrored in the two dominant principles of sustainable agriculture namely persistence and resilience. Resilience refers to the capacity of the agricultural sector to buffer shocks and stresses, whereas persistence refers to the ability of agricultural systems to continue over long periods of time.

Of particular importance to the achievement of sustainable agriculture is the following sustainable development considerations: the disturbance of ecosystems and/or loss of biological diversity are to be avoided or minimised at the very least; polluting activities together with activities that lead to the degradation of the environment are to be avoided or mitigated against; the production of waste is to be avoided or in cases where it cannot be avoided should be minimised, reused or recycled, and only as a last resort, disposed of in a responsible manner; the use of renewable resources is undertaken in such a way as to not jeopardise the integrity of the ecosystem which they form a part of; and application of the precautionary principle where insufficient scientific information is available regarding a particular activity which could potentially result in environmental degradation is to be adhered to.⁹⁶ Another potentially powerful principle housed in the NEMA is the 'polluter pays' principle. It places a responsibility on those who cause pollution or environmental degradation to pay for the costs of remediation and to put in measures to prevent, control or minimise further environmental damage.⁹⁷ In a similar vein the NEMA also places responsibility for the assurance that a policy, programme, product, process, service or activity is undertaken in a manner that is environmentally friendly and does not pose a danger to human health throughout its entire lifecycle.⁹⁸

Integrating the above sustainable development considerations into agricultural

96. National Environmental Management Act at s 2.

97. Ibid at s 2(4) (p).

98. Ibid at s 2(4) (e).

activities can be achieved if land dedicated to agriculture is viewed as part and parcel of the ecosystems within which they operate. Thus, from a sustainability perspective, agriculture should be more than simply looking at the efficiencies of resource use in production, short-term environmental impacts, and annual economic returns. Of greater importance are the energy and material flows (including waste generation) at each step in the food chain, from farm to dinner plate, taking into account complex relationships and emergent properties of the entire agricultural system. None of the environmental principles listed above form a barrier to the implementation of sustainable agriculture in South Africa. Quite the contrary, these principles could arguably be viewed as the ingredients, blended with agricultural specific considerations, necessary to the successful implementation of agricultural legislation and policy able to achieve sustainable development.

The NEMA specifically places a legal requirement in the form of a 'duty of care' provision (Section 28) which creates a clear obligation on all South Africans to comply with the law with respect to the prevention or minimisation of environmental pollution and degradation. The NEMA 'duty of care' provision is as follows:

“Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.”⁹⁹

The 'duty of care' provision applies to all persons and therefore all people employed in the agricultural sector are subject to its stipulations. The measures contemplated to prevent pollution or environmental degradation is qualified by the adjective 'reasonable'. What constitutes reasonableness in this context is of course subject to a certain amount of subjectivity. O'Regan J in *Bato Star Fishing (Pty) Ltd v Minister of Environmental Affairs and Tourism and Others*, listed factors relevant to determining whether or not a decision taken could be considered 'reasonable'.

99. National Environmental Management Act at s 28(1).

These included:

“the nature of the decision, the identity and expertise of the decision-maker, the range of factors relevant to the decision, the reasons given for the decision, the nature of the competing interests involved and the impact of the decision on the lives and well-being of those affected.”¹⁰⁰

The inclusion of the reasonableness criteria is vitally important in an agricultural context. This is because agricultural sustainability is ultimately a judgment call dependent on what baselines are chosen. All agricultural activities will exert some form of environmental harm to a greater or lesser extent. The question to be asked is at what point does the pollution or degradation of the environment, as a result of the normal operation of a farm, constitute a breach of Section 28. The answer lies in the qualifying term ‘significant’. Here again, only when the polluting activity or environmental degradation is categorised as significant does the ‘duty of care’ provision kick in. Once again the term ‘significant’ is subject to a certain amount of subjectivity. Section 28 of the NEMA ultimately reinforces the notion of sustainable development as it allows any human activity the freedom to pollute or cause environmental degradation, in pursuit of an economic or social objective, unless that polluting activity or level of environmental degradation is deemed ‘significant’. Thus, if an agricultural activity is to be considered sustainable it would have to pass the ‘significance’ and reasonableness’ test as laid down in Section 28.

Finally, the NEMA promotes the principle of cooperative governance and calls for the harmonisation of policies and legislation which are applicable to the environment.¹⁰¹ This is important given the fact the NEMA is administered by the Department of Environmental Affairs whereas agricultural legislation is administered by the Department of Agriculture, Forestry and Fisheries. Clearly, the mandates of these two departments will overlap due to the close relationship agriculture has to the land on which it is practiced.

100. *Bato Star Fishing (Pty) Ltd v Minister of Environmental Affairs and Tourism and Others* (CCT 27/03) [2004] ZACC 15; 2004 (4) SA 490 (CC); 2004 (7) BCLR 687 (CC) at para 45.

101. National Environmental Management Act at s 2(l).

4.2.2. Specific Environmental Management Acts

Included under the designation Specific Environmental Management Act (SEMA) is the National Environmental: Protected Areas Act (NEMPA)¹⁰² and the National Environmental: Biodiversity Act (NEMBA).¹⁰³ These Acts, amongst others, fall under the auspices of the NEMA and its list of governing principles.

According to the environmental right the State is obligated to promote conservation through the use of reasonable legislation and other measures.¹⁰⁴ A major stumbling block to the effective conservation of biodiversity is the fact that 84 percent of the land in South Africa is privately and communally owned.¹⁰⁵ It would be fair to say, given the fact that farmland accounts for approximately 82.3% of the total land use in South Africa¹⁰⁶, a large proportion of the privately and communally owned land would be possessed by the farming community. A fundamental principle of sustainable agriculture is the promotion of biological diversity in agricultural landscapes.¹⁰⁷ The central dilemma faced by environmental authorities is how to promote conservation measures aimed at securing and enhancing biodiversity on land that is not owned by the State. The answer lies in the use of 'other measures' as contemplated in the environmental right, more specifically, the development and implementation of an incentive-based approach to environmental regulation. According to Paterson:

“One of the most significant reforms affected in South Africa’s environmental

102. National Environmental: Protected Areas Act 57 of 2003.

103. National Environmental: Biodiversity Act 10 of 2004.

104. Constitution of the Republic of South Africa at s 24 (b).

105. Paterson AR 'Legal framework for protected areas: South Africa.' (2009) 81 *IUCN-EPLP* at 36.

106. Republic of South Africa 'Abstract of Agricultural Statistics 2012' available at: <http://www.daff.gov.za/docs/statsinfo/Ab2012.pdf> accessed on 09 November 2012 at Table 5.

107. Horrigan L, Lawrence RS & Walker P 'How sustainable agriculture can address the environmental human health harms of industrial agriculture?' (2002) 110(5) *Environmental Health Perspectives* at 451.

regime during the course of the last decade is the shift towards an incentive-based approach to regulation. Nowhere is this more evident than in the biodiversity sector, where several incentives have been recently implemented to encourage particularly private and communal landowners to voluntarily assume conservation activities and practices on their land. The fundamental rationale underlying the introduction of these incentives is to try and increase the percentage of South Africa's diverse landscapes subject to formal protection, and to share the responsibility and costs of such protection with private and communal landowners.”¹⁰⁸

The incentives contemplated in the biodiversity sector are financial in nature and come in the form of tax deductions and exemptions.

Territory dedicated to conservation in South Africa is made up of the following kinds of protected areas: national parks, nature reserves (including wilderness areas), special nature reserves, protected environments, marine protected areas, specially protected forest areas, forest nature reserves, forest wilderness areas, and finally mountain catchment areas.¹⁰⁹ According to the Local Government: Municipal Property Rates Act¹¹⁰ a municipality may not levy a rate on “those parts of a special nature reserve, national park or nature reserve within the meaning of the National Environmental Management: Protected Areas Act (....) which are not developed or used for commercial, business, agricultural or residential purposes”.¹¹¹ This is essentially a property tax exemption which could incentivise farmers to contract out land characterised by high levels of biodiversity for conservation purposes into these forms of protected areas thereby avoiding property tax liabilities.¹¹² In this way the

108. Paterson AR ‘Legal framework for protected areas: South Africa.’ (2009) 81 *IUCN-EPLP* at 35-36.

109. National Environmental: Protected Areas Act at s 9.

110. Local Government: Municipal Property Rates Act 6 of 2004.

111. *Ibid* at s 17.

112 Paterson AR ‘Legal framework for protected areas: South Africa.’ (2009) 81 *IUCN-EPLP* at 36: Box 12.

amount of land formally protected by the State is increased whilst simultaneously providing a monetary incentive for farmers wishing to promote conservation.

According to the NEMBA, a biodiversity management agreement may be entered into between the Minister (the Cabinet member responsible for national environmental management) and any person, organisation or organ of state with the sole purpose of implementing a biodiversity management plan.¹¹³ A biodiversity management plan may be tailored towards the conservation of an ecosystem, indigenous species or migratory species.¹¹⁴ Once a farmer has entered into a biodiversity management agreement with the State that farmer qualifies for certain tax deductions according to the Income Tax Act.¹¹⁵ Accordingly, if a taxpayer incurs expenses as a result of implementing conservation measures as per the requirements of a biodiversity management agreement, those expenses are deemed to be expenditure incurred in the production of income and are thus subject to income tax deductions.¹¹⁶ These tax deductions are only applicable to biodiversity management agreements that are implemented for a duration of five years or more.¹¹⁷ Two types of deductions are designed to incentivise landowners who are willing to contract out a portion of their land for extended periods of time. Firstly, landowners who voluntarily contract a portion their land out into a national park, nature reserve or protected environment,¹¹⁸ for a duration of thirty years or more, may deduct the cost of implementing the biodiversity management plan from their annual taxable income.¹¹⁹ Secondly, landowners who voluntarily declare a portion of their land as a national

113. National Environmental: Biodiversity Act at s 44.

114. Ibid at s 43.

115. Income Tax Act 58 of 1962.

116. Ibid at s 37C (1).

117. Ibid at s 37C (1) (a).

118. National Environmental: Protected Areas Act at s 20 (3), 23 (3) and 28.

119. Income Tax Act at s 37C (3).

park or nature reserve in terms of an agreement under Section 20 (3) or 23 (3) of the NEMPA, for a minimum period of 99 years, may deduct 10 percent of the cost or market value of the land contracted out for the purposes of calculating their annual income tax.¹²⁰ Much the same as the financial incentives provided for in the Local Government: Property Rates Act, these income tax incentives seek to reward landowners for not pursuing development of their land at the expense of biodiversity and conservation efforts.

4.3. Summary

The inclusion of the environmental right in the Constitution of South Africa obligates the State to enact reasonable legislation and other measures designed to protect the environment by preventing ecological degradation, promoting conservation and securing sustainable development. Sustainable development is the overarching principle which governs environmental management in South Africa. As such, sustainable development envisages a blending of environmental, social and economic considerations in a holistic and integrated fashion in the pursuit of environmental management. There are considerable similarities between sustainable agriculture and sustainable development. Sustainable agriculture is concerned with increasing productivity (an economic consideration), ensuring a safe and healthy environment for farm workers (a social consideration), whilst simultaneously encouraging environmentally friendly agricultural activities. It has been suggested that the principle of sustainable development together with other relevant principles listed in the NEMA, the framework environmental legislation enacted to give effect to the Constitutional environmental right, do not pose a barrier to the implementation of a sustainable agriculture regime.

The enactment of environmental legislation alone is not enough to achieve the ideal of sustainable development. As such, the development of an incentive based approach to environmental regulation is being implemented. Most of the land in South Africa is privately and communally owned. Conceivably, a large proportion of this land would be owned by farmers. Thus, to encourage conservation efforts

120. Income Tax Act at s 37C (5) (a) and (b).

designed to safeguard and promote biodiversity on these privately owned lands, a series of tax deductions and exemptions have been put in place. These tax schemes have the ability to economically reward farmers wishing to promote conservation efforts on their lands. Thus, the continuing development of these types of incentive schemes is a step in the right direction in the pursuit of achieving a more sustainable agricultural sector in South Africa.

Chapter 5. Legislation directly relevant to the agricultural sector

Large strides have been made in the development of environmental law in South Africa. The same cannot be said for legislation directly relevant to agriculture. The two principle Acts which govern agriculture in South Africa, namely the Conservation of Agricultural Resources Act (CARA) ¹²¹ and the Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Fertilizer Act) ¹²², came into effect prior to the adoption of the Constitution of the Republic of South Africa. As such, the effect of the environmental right, as well as the adoption of the sustainable development paradigm in environmental management, did not exist at the time these Acts were developed. It is the contention of this paper that the CARA and the Fertilizer Act pose a severe obstacle to the achievement of sustainable agriculture in South Africa. The bulk of this Chapter is dedicated to showing why this is the case.

Another Act directly relevant to agriculture is the Genetically Modified Organisms (GMO) Act ¹²³. The GMO Act actively promotes the use of genetically modified organisms, mostly in the form of genetically modified agricultural crops, in South Africa. The introduction of these forms of crops into the South African agricultural landscape has met with considerably resistance especially from proponents of agroecology and organic farming practices. Therefore, a discussion as to the possible obstacle the GMO Act may pose to the attainment of a sustainable agricultural sector in South Africa will be included.

5.1. Conservation of Agricultural Resources Act

The CARA is the principle Act tasked with the regulation of the agricultural sector in South Africa. The Act has a strong environmental focus as its stated objective is to provide for the conservation of South Africa's natural agricultural resources.¹²⁴ A basic principle of legal drafting is the attempt to create clarity through

121. Conservation of Agricultural Resources Act 43 of 1983.

122. Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act 36 of 1947.

123. Genetically Modified Organisms Act 15 of 1997.

124. Conservation of Agricultural Resources Act at s 3.

the use of appropriate wording. The principle manner whereby clarity may be achieved in a legal document is through the extensive insertion of relevant definitions pertaining to the subject matter governed by the law in question. The CARA's list of definitions is decidedly lacking in content as well as clarity. The stated object of the CARA is the conservation of South Africa's natural agricultural resources which are defined as the soil, water sources and vegetation found on agricultural land.¹²⁵ These objectives point to the very technical nature of the Act. However, the terms 'soil', 'water sources', 'vegetation' and 'agricultural land' are not defined in the Act. This creates uncertainty and confusion for the reader. Although the ordinary meaning of the terms 'soil', 'water resources', 'vegetation' and 'agricultural land' imply a simplistic interpretation, the undertaking of an agricultural activity is decidedly not simplistic at all. According to the Council of Europe soil is defined as:

“(...) an integral part of the earth's ecosystems and is situated at the interface between the earth's surface and bedrock. It is subdivided into successive horizontal layers with specific physical, chemical and biological characteristics. From the standpoint of history of soil use, and from an environmental point of view, the concept of soil also embraces porous sedimentary rocks and other permeable materials together with the water that these contain, and the reserves of underground water.”¹²⁶

From the above definition it becomes clear that the concept of soil is entrenched with layers of complexity. Embedded in this definition is the term 'ecosystem'. An understanding of the notion of an ecosystem has become crucially important in the modern conception of environmental management. The fact that the CARA does not once mention the term 'ecosystem' makes it clear that this legislation does not acknowledge soil, water and vegetation as vitally important terrestrial ecological elements. According to Hannam and Boer it is imperative that any legislation enacted for conservation, maintenance and use of soil in a sustainable manner must

125. Conservation of Agricultural Resources Act at s 1.

126. Council of Europe 'European Conservation Strategy – Recommendations for the 6th European Ministerial Conference of the Environment.' (1990).

take into account the inherent ecological characteristics and limitations of soil bodies as the premise for land-use decisions.¹²⁷ In fact, the CARA does not even define the term 'environment' or make any mention of the term 'sustainable development'. The reason for this lies in the fact that the CARA came into effect 1 June 1984. Therefore, the CARA was developed and enacted during the Apartheid era well before the introduction of the new Constitutional dispensation of South Africa which includes the environmental right (Section 24) which expressly mandates the adherence to the environmental principle of sustainable development in all matters pertaining to environmental management. Thus, the CARA does not operate in accordance with a holistic, ecological approach as posited by our post-Constitutional suite of environmental legislation.

The object of the CARA is divided into three core objectives, namely the maintenance of the production potential of the land; combating erosion and pollution of water resources; and the protection of vegetation through combating weeds and invader plants.¹²⁸ The principle manner in which the objects of the Act are to be achieved is through the prescription of control measures by the Minister of Agriculture (Minister). The control measures envisaged by the Act are phrased broadly and may relate to any one of the following: irrigation of agricultural land; the utilization of cultivated land; the prevention of waterlogging or salination of land; the regulation of the flow pattern of run-off water; grazing capacities; prevention and control of veld fires; control of weeds and invader plants; and the construction and maintenance of soil conservation works¹²⁹ amongst others.¹³⁰ The list of control

127. Hannam I & Boer B *IUCN Environmental Law Programme* (2004) at 5.

128. Soil conservation work is defined as any work which is constructed on land for the prevention of erosion or the conservation of land which is subject to erosion; the conservation or improvement of the vegetation or the surface of the soil; the drainage of superfluous surface or subterranean water; the conservation or reclamation of any water source; or the prevention of the silting of dams and the pollution of water, but not a work which is constructed on land in the course of prospecting or mining activities. Conservation of Agricultural Resources Act at s 1.

129. Conservation of Agricultural Resources Act at s 3.

130. *Ibid* at s 6 (2) a – p.

measures available is further broadened by the inclusion of the Minister's discretion in implementing any other measure which he or she deems necessary for the fulfillment of the objects of the Act.¹³¹

A key deficiency of the CARA, with respect to the use of control measures, is the lack of forward thinking characterised by a notable scarcity in soil planning provisions. The Act is essentially reactive as it addresses soil issues *ex post facto*. Only once inappropriate use of the land has resulted in excessive soil erosion does the Act prescribe the use of a control measure such as a soil conservation work or the issuing of a directive by an officer of the Department of Agriculture. The inclusion of planning provisions has become standard practice in environmental legislation as exemplified in the NEMBA. The NEMBA prescribes the development and implementation of a Biodiversity Framework¹³², the objective of which is to "provide for integrated, coordinated and uniform approach to biodiversity management by all organs of state in all spheres of government, non-governmental organizations, the private sector, local communities, other stakeholders and the public" at the national level.¹³³ NEMBA further embeds plans within plans as Section 40 prescribes the designation of Bioregions and Bioregional Plans at the provincial level. NEMBA even goes one step further as the development of Biodiversity Management Plans at the ecosystem or indigenous species specific level may be formulated for conservation purposes.¹³⁴ This type of planning strategy is absent from the CARA. In order for effective soil conservation to occur across agricultural lands legislation must include the presence of statements, functions, activities or programmes that allow for the assemblage of knowledge in the form of ecological distribution maps of soil which include the overall health status of the soil and potential vulnerability to soil erosion,

131. Conservation of Agricultural Resources Act at s 6 (2) p.

132. National Environmental Management: Biodiversity Act at s 38.

133. National Environmental Management: Biodiversity Act at s 39 (a)

134. Ibid at s 43.

standards, soil zoning planning as well as monitoring and implementation plans.¹³⁵ It is only through the effective use of planning provisions that legal responses to issues such as soil degradation may become proactive and lead to sustainable agricultural practices.

The CARA expressly states that the combating of weeds and invader plants is a priority of the Act. The Minister may, by means of regulations, declare any plant to be either a weed or invader plant throughout the entire Republic of South Africa or in one or more chosen regions within the country.¹³⁶ Once a plant is listed as a weed it cannot be possessed, sold, exchanged, or dispersed by any person in South Africa.¹³⁷ The Act does not make it clear whether the intention of listing weed and invader plants is to safeguard agricultural crop species or for the protection of indigenous non-crop species found on agricultural land. Under the NEMBA, species which pose a direct threat to biodiversity in South Africa are listed.¹³⁸ In this respect two distinct categories of species are included: alien species and invasive species. Alien species are species that are not indigenous to South Africa,¹³⁹ whereas, invasive species are indigenous species whose spread outside of their natural distribution could threaten ecosystems, habitats or other species.¹⁴⁰ The terms 'weed' and 'invader plants' are not defined in the CARA. Therefore, it is difficult to assess just how similar weed and invader plants are to alien and invasive species. If the purpose of listing weed and invader plants under the CARA is to safeguard indigenous species found on agricultural land, which seems a likely interpretation of the CARA's objective of

135. Hannam I & Boer B *IUCN Environmental Law Programme* (2004) at 9.

136. Conservation of Agricultural Resources Act at s 2(3).

137. *Ibid* at s 5 (1) (a – b).

138. National Environmental Management: Biodiversity Act at Chapter 5.

139. *Ibid* at s 1.

140. *Ibid* at s1.

conserving natural agricultural resources, then the duplication of listing of species which threaten biodiversity under the CARA and the NEMBA seems superfluous. In order for the CARA to be in line with current environmental legislation in South Africa, the listing of weeds and invader plants should be integrated with the alien and invasive species lists housed under NEMBA. The combination of these categories into one coherent source would aid in the development of creating a more sustainable agricultural sector.

An agricultural officer's primary compliance tool to achieve the objectives of the CARA is the directive. A directive may be issued on a land user in order to ensure compliance with a control measure which is binding on him or her or if, in the opinion of the agricultural officer, the requirements of the directive will aid in the protection of natural agricultural resources.¹⁴¹ In order for the directive to be legal it must be published by the executive officer by notice in the Government Gazette or contained in a written notice served in a prescribed manner.¹⁴² Not only is the directive binding on the present land user but also extends to his or her successor in title in relation to the land cited in the directive.¹⁴³ Failure by a land user to receive a directive or adhere to the requirements laid down will be guilty of an offence.¹⁴⁴ The CARA provides for extensive powers of investigation to the executive officer and any other officer of the Department of Agriculture. These powers include the ability to enter any agricultural land, at a reasonable time, in order to ascertain the erosion status of the land; whether or not weeds or invader plants occur on the land; whether there is evidence of overgrazing on pastures; the status of natural vegetation on the land; to what extent the natural water sources are being polluted; to ascertain whether a soil conservation work is required to rectify gross soil erosion; to determine if an obligatory control measure, directive, soil conservation work or scheme is being complied with; and in general ascertain whether or not the use of the land is not

141. Conservation of Agricultural Resources Act at s 7(1).

142. Ibid at s 7(3).

143. Ibid at s 7(4) (a).

144. Ibid at s 7(6).

causing undue harm on the natural agricultural resources present.¹⁴⁵ The CARA makes it incumbent on the land owner to give any reasonable assistance to the authorised agricultural officer in order for that person to adequately perform the duties expected of him or her.¹⁴⁶

Given the extensive investigatory powers of the agricultural officers, together with their ability to issue directives on a wide range of circumstances, one would expect the agricultural sector to be characterised by a lack of compliance and enforcement issues. This is not the case. The reason for the lack of compliance and enforcement in the agricultural sector is not directly attributed to the actual wording of the CARA, but rather to a lack of regulatory inspectors employed by the Department. According to the Department of Agriculture, Forestry and Fisheries Annual Report for the period 2011/2012 a total of 231 regulatory inspectors were employed out of a required 273 posts for compliance and enforcement purposes.¹⁴⁷ To put into perspective just how inadequate this amount of regulatory inspectors are the number of producers of maize will be highlighted. In South Africa maize is produced by approximately 9000 commercial farmers who provide direct employment for an estimated 128 000 people.¹⁴⁸ Thus, only taking into account commercial maize farming operations, it becomes clear that compliance and enforcement of the CARA by the limited number of regulatory inspectors in the sector represents a serious hurdle to achieving the conservation of agricultural resources and ultimately the achievement of sustainable agriculture.

145. Conservation of Agricultural Resources Act at s 18 (1).

146. Ibid at s 18(2) (c).

147. Republic of South Africa 'Department of Agriculture, Forestry and Fisheries Annual Report, 2011/2012' available at http://www.nda.agric.za/docs/AnnualReports/2011_12/AR2012.pdf accessed on 23 January 2013 at 164.

148. Republic of South Africa 'Department of Agriculture, Forestry and Fisheries Fact Sheet: Maize Profile.' available at <http://www.nda.agric.za/docs/FactSheet/maize.htm> accessed on 23 January 2013.

According to the Department of Water Affairs the agricultural sector is the largest user of water in the country.¹⁴⁹ It therefore becomes incumbent on agricultural users of water to ensure that their practices do not cause undue harm to the very resource that they depend on. This is not only reserved to the use of water but extends to all agricultural resources. This implies that a ‘duty of care’ should exist on all farmers to ensure that their practices are not harmful to the environment. In legal terms a ‘duty of care’ provision includes terminology, functions, activities, policies and strategies that convey a legal responsibility, based on ethical considerations, to take reasonable and practical steps to achieve a required outcome.¹⁵⁰ In this case the required outcome is the achievement of sustainable agricultural practices. The NEMA ‘duty of care’ provision is as follows:

“Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.”¹⁵¹

This provision creates a clear duty on all South Africans to comply with the law with respect to the prevention or minimization of environmental pollution and degradation. NEMA further qualifies what constitutes an offence under the duty of care provision:

“No person may — (a) unlawfully and intentionally or negligently commit any act or omission which causes significant or is likely to cause significant pollution or degradation of the environment;

149. Republic of South Africa ‘Department of Water Affairs National Water Resource Strategy, 2012’ available at:

<http://www.dwaf.gov.za/nwrs/LinkClick.aspx?fileticket=d-cvjKg1lJl%3d&tabid=72&mid=435> Accessed 23 January 2013 at Chapter 4, p 1.

150. Hannam I & Boer B *IUCN Environmental Law Programme* (2004) at 9.

151. National Environmental Management Act at s 28(1).

(b) unlawfully and intentionally or negligently commit any act or omission which detrimentally affects or is likely to affect the environment in a significant manner (...).¹⁵²

A person found in contravention of the above provision is guilty of an offence and is liable on conviction to a fine not exceeding one million rand or to imprisonment for a period not in excess of one year or, in the most extreme case, a fine and imprisonment simultaneously.¹⁵³ The CARA does not include a 'duty of care' provision. Thus, there exists no legal duty on farmers to ensure that the agricultural resources under their care are looked after and conserved. The CARA does, however, impose liabilities in the form of offences whose penalty is a fine not exceeding five thousand rand or imprisonment for a period not exceeding two years or both a fine and imprisonment. These penalties are reserved for contraventions of the CARA in the form of failure to comply with a control measure or directive issued by the Department of Agriculture, Forestry and Fisheries or the provisions relating to weeds or invader plants amongst others. Lesser fines of five hundred rand or imprisonment for a period not exceeding three months may also be granted for lesser contraventions of the Act.¹⁵⁴ The penalties and fines prescribed by the CARA do not impose a significant disincentive not to act in contravention with the law. When compared to the fine of up to one million rand imposed by the NEMA it is clear that the liability provisions in the CARA are outdated and do not reflect the seriousness with which environmental pollution and degradation are viewed today.

The establishment of conservation committees¹⁵⁵, regional conservation committees¹⁵⁶ and the conservation advisory board¹⁵⁷ is the principle way in which

152. National Environmental Management Act at s 28(14).

153. Ibid at s 28(15).

154. Conservation of Agricultural Resources Act at s 23.

155. Ibid at s 15(1).

156. Ibid at s 16(1).

157. Ibid at s 17(1).

the CARA actively includes the voice of the farmers in the agricultural sector. However, mechanisms designed to incorporate the voice of the general public is decidedly absent. Public participation is a vital component of any environmental legislation and, given the environmental flavour of the CARA, should be incorporated into the Act. According to NEMA:

“The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people’s common heritage.”¹⁵⁸

Agricultural land forms a part of the environment and as such it falls onto the government to regulate its use and ensure that it is used for the good of the public at large. This necessitates the establishment of a two-way communication stream between those whose livelihood stems from the agricultural sector and the citizens of the country who wish to express concern over the manner in which the land is used. For the process of public participation to successfully occur, a legal instrument must include provisions that enable general capacity building, improve awareness of potential agricultural related issues, allow for the distribution of knowledge and skills and include mechanisms which allow for stakeholders and interested and affected persons to have a formal platform from which they may air their concerns and grievances.¹⁵⁹ The CARA does make provision for the establishment of conservation committees consisting of land owners and representatives of local farmer’s associations and unions in a particular area. However, the input from such a conservation committee could potentially be biased towards the view of the farming community in that area and may not necessarily be an effective platform through which negative environmental practices will be reported or commented on. This is because farmers have an economic incentive to increase the productivity of their lands. This pursuit of increased productivity for economic gain may lead to farmers to administer excessive fertilizers, shorten the fallow period’s in-between crop rotations, make use of poor quality irrigation waters, make excessive use of heavy machinery which may lead to soil compaction, and the pollution of their soil resources through

158. National Environmental Management Act at s 2(4) (o).

159. Hannam I & Boer B *IUCN Environmental Law Programme* (2004) at 9.

the use of excessive chemical additives.¹⁶⁰ Therefore, it is imperative that the public at large are included in the decision making processes regarding the implementation of control measures designed to conserve natural agricultural resources. The level of public participation in the CARA is insufficient in this regard.

5.2. Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act

The Fertilizer Act came into effect 1 June 1948. Similar to the CARA, the enactment of the Fertilizer Act predates the Constitutional era in South African law. As such, the Fertilizer Act does not adequately address Constitutional requirements in relation to the Bill of Rights (such as the environmental right), as well as the prerequisites of an open Democracy such as access to information, openness, transparency, public participation in decision-making and just administration action.¹⁶¹

According to the preamble the object of the Fertilizer Act is to establish a registrar who is tasked with the registration of all fertilizers, farm feeds, agricultural remedies, stock remedies, pest control operators and sterilizing plants in order to regulate their use and operation in the Republic of South Africa. Fertilizer is defined as any substance whose use is intended to improve or maintain the growth of plants or the productivity of the soil.¹⁶² A farm feed is essentially any food substance (including any bone derivative) which possesses, or alleges to possess, a nutritional benefit, obtained through the process of crushing, grinding or gristling, and is produced for the intended sale for domestic animal or livestock consumption. It can also be an additive, such as a vitamin or mineral substance, or come in the form of a stock lick.¹⁶³ An agricultural remedy is a chemical or biological remedy whose intended effect is the elimination of any unwanted organisms such as microbes, insects, fungus, plant and animal species. It also includes substances such as plant growth regulators,

160. Hannam I & Boer B *IUCN Environmental Law Programme* (2004) at 4.

161. Pesticide Management Policy of South Africa 2010 in GG 33899 GN 1120 at 41.

162. Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act at s 1.

163. *Ibid* at s 1.

defoliant and desiccant.¹⁶⁴ In layman's terms pesticides, herbicides and insecticides fall under the definition of an agricultural remedy. A stock remedy covers any medical substance designed to diagnose, prevent, treat or cure any animal (including both domestic and livestock species) diseases and infections. Included in this category are substances which maintain or improve the health, growth, production, and working capacity of these categories of animals.¹⁶⁵ Clearly, the number of substances which would qualify under the definition of a fertilizer, farm feed, agricultural remedy or stock remedy is conceivably large.

The Fertilizer Act is administered by the Department of Agriculture, Forestry and Fisheries and the Minister of Agriculture is the designated government official tasked with its implementation. This designation has not been without criticism. The dual role of the Department of Agriculture with respect to the promotion of agricultural production and the responsibility to regulate the registration of pest control operators and pesticides has led to a real conflict of interest which manifested itself in a culture of non-interference by the registrar during the Apartheid years. This culture of non-interference was exaggerated due to the overall goal of the National Party to woo the vote of the rural white Afrikaner farmer by instituting policy that elevated the promotion of agricultural production above that of mechanisms designed to minimize the harmful effects linked to the use of pesticides, thus letting slide environmental and human harms perpetuated by inappropriate pesticide use.¹⁶⁶

The primary purpose of the registrar is to administer the registration process of any fertilizer, farm feed, agricultural remedy and stock remedy for use in the Republic of South Africa. Only if the substance or proposed operation brought before the registrar, through the appropriately prescribed application process, is deemed to be suitable and sufficiently effective for the purpose for which it is intended, and is not

164. Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act at s 1.

165. *Ibid* at s 1.

166. London L & Rother H-A 'People, pesticides, and the environment: who bears the brunt of backward policy in South Africa.' (2000) 10(4) *New Solutions* at 341-342.

contrary to the public interest, then that substance or operation shall be registered under the appropriate category as defined by the act.¹⁶⁷ A lack of public participation in the administration of the registration process is evident from the Act. The legislative framework does not make any provision for the public, interested and effected persons, or worker groups to appeal against any decisions of the registrar. The Fertilizer Act further entrenches this lack of public participation by treating any information relating to the registration of pesticides or pest control operators as propriety.¹⁶⁸ Thus, it is an offence under the Fertilizer Act for any person who is in the employ of the registrar to disclose any information acquired by him or her during the execution of their duties and functions in relation to the business affairs of another person (i.e. a company seeking to register a pesticide).¹⁶⁹ This lack of public participation is interesting given the fact that pesticides are designed to be biologically active and therefore their release into the environment has been linked to a number of undesirable side effects:

“These include adverse effects on workers, consumers, community health and safety, groundwater, surface waters, and non-target wildlife organisms. In addition, pesticide use raises concerns about the persistence and accumulation of pesticides in food chains quite distant from the original point of use, and about the role of certain pesticides in causing reproductive failure and endocrine system abnormalities in both wildlife and humans and other species that are not their intended target. It is therefore, important to control the use of pesticides, by carefully weighing the benefits that they confer against any possible adverse effects.”¹⁷⁰

167. Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act at s 3(2) (a).

168. London L & Rother H-A ‘People, pesticides, and the environment: who bears the brunt of backward policy in South Africa.’ (2000) 10(4) *New Solutions* at 342.

169. Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act at s 17.

170. Pesticide Management Policy of South Africa 2010 in GG 33899 GN 1120 at 40.

Remarkably, given the number of undesirable effects the use of pesticides may result in, one would expect to find a wealth of court jurisprudence relating to damages as a result of harm, either to the environment or human health, linked to the use of pesticides by the agricultural sector. The exact opposite is true. In fact, a review of recent court jurisprudence, with direct reference to the Fertilizer Act, reveals that the most important recurring bone of contention created by the Act is in the resolution of patent disputes by companies who market agricultural remedies in South Africa.¹⁷¹ Most of the cases on record involve large agrochemical companies concerned with maintaining and safeguarding their earning potential from the marketing of their patented agricultural remedies in South Africa. Of course, the registration of an agricultural remedy does facilitate an economic function whereby companies with vested interests in supplying agricultural remedies to the agricultural sector are able to gain legitimacy and a certain level of protection in the eyes of the law. However, the lack of jurisprudence related to environmental and human health harms perpetuated by irresponsible use of agricultural remedies by the agricultural sector may be attributed to the lack of public participation mechanisms found in the Fertilizer Act. This lack of public participation necessarily perpetuates ignorance on the part of civil society as to the potential negative side effects of pesticide, herbicide and insecticide use on agricultural land.

Over and above the lack of public participation a number of deficiencies with respect to the registration of pesticides in the Fertilizer Act are evident. Firstly, the registrar is only compelled to act against a pesticide if it deems that the registration, sale and use of the pesticide in South Africa would not be in the interests of the citizens of the country. The prevailing interpretation of what constitutes a 'public interest' by the Department of Agriculture has been linked to increased national agricultural

171. See: *Stauffer Chemical Company v Agricura Limited* 1979 BP 168 (CP); *Monsanto Company v Stauffer Chemical SA (PTY) Limited, Chemical Products Division of Cheesebrough - Pond's (PTY) Limited and the Registrar of Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies* 1986 BP 568 (CP); *Stauffer Chemicals Chemical Products Division of Cheesebrough - Pond's (Proprietary) Limited v Monsanto Company* 1987 BP 37 (T); *Sumitomo Chemical Co Ltd and another v Natural Crop Protection (Pty) Ltd and others* 2005 BIP 536 (T).

production in the pursuit of increased food security objectives.¹⁷² As has been stated above, increased national agricultural production does not necessarily correlate well with greater food security at the local level. Thus, this interpretation of the 'public interest' may do more harm than good from an environmental and human health perspective. Secondly, there is no requirement for the review of registered pesticides or re-evaluation of old chemicals.¹⁷³ Finally, the Act does not adequately encourage registration of pesticides that favour lower risk products and the promotion of farming techniques that have a reduced reliance on pesticides overall that are more in line with the principles of sustainable agriculture.¹⁷⁴

The powers granted to the registrar with respect to the compliance and enforcement of the Fertilizer Act are widely construed.¹⁷⁵ However, the penalties laid down in the event of a person found guilty of contravening any of the provisions of the Act are grossly out of sync with the gravity of the offences committed.¹⁷⁶ For example, minor offences such as hindering the registrar in the execution of his or her duty will result in the guilty person paying a fine not exceeding five hundred rand or imprisonment for a period not exceeding twelve months.¹⁷⁷ A more serious offense, such as a person failing to comply with an order issued by an officer of the registrar, could result in that person facing a fine not exceeding one thousand rand or imprisonment for a period not exceeding two years.¹⁷⁸ Thus, the penalties prescribed in the Fertilizer Act do not pose a significant deterrent to would be offenders. In a similar vein the Fertilizer Act does not include provisions which compel the registrar to put in

172. London L & Rother H-A 'People, pesticides, and the environment: who bears the brunt of backward policy in South Africa.' (2000) 10(4) *New Solutions* at 345.

173. Pesticide Management Policy of South Africa 2010 in GG 33899 GN 1120 at 42.

174. *Ibid* at 41.

175. Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act at s 15.

176. London L & Rother H-A 'People, pesticides, and the environment: who bears the brunt of backward policy in South Africa.' (2000) 10(4) *New Solutions* at 343.

177. Fertilizer, Farm Feeds, Agricultural Remedies and Stock Remedies Act at s 18(1) (l) (i).

178. *Ibid* at s 18(1) (l) (ii).

place effective monitoring systems capable of reliable data collection pertaining to potential levels of exposure of farm workers and the general public to pesticides or the quantities of pesticides manufactured or used in the country.¹⁷⁹ Without this baseline knowledge in place the compliance and enforcement of the relevant provisions of the Act designed to safeguard human health and the environment will continue to be problematic.

The inherent flaws in the Fertilizer Act have not been overlooked by the Department of Agriculture. According to the Adoption of Pesticide Management Policy for South Africa the Fertilizer Act is in need of immediate revision, or is to be repealed in its entirety, subject to the development of a new set of provisions/laws governing the registration, sale and use of farm feeds, fertilizers, agricultural remedies and stock remedies in South Africa.¹⁸⁰

5.3. The Genetically Modified Organisms Act

Another critical dimension to the agricultural sector in South Africa is the active incorporation of genetically modified organisms (GMOs) into the agricultural landscape. The World Health Organization defines GMOs as:

“organisms in which the genetic material (DNA) has been altered in a way that does not occur naturally. The technology is often called ‘modern biotechnology’ or ‘gene technology’, sometimes also ‘recombinant DNA technology’ or ‘genetic engineering’. It allows selected individual genes to be transferred from one organism into another, also between non-related species”.¹⁸¹

The overall goal of genetic engineering, with respect to agricultural crops, is to incorporate desirable traits such as insect repellence or drought resistance in order

179. London L & Rother H-A ‘People, pesticides, and the environment: who bears the brunt of backward policy in South Africa.’ (2000) 10(4) *New Solutions* at 342 -343.

180. Pesticide Management Policy of South Africa 2010 in GG 33899 GN 1120.

181. World Health Organization available at:

<http://www.who.int/foodsafety/publications/biotech/20questions/en/> accessed 12 August 2012.

to increase the potential yield of the crop grown. South Africa has actively adopted certain genetically modified (GM) crops. These include GM HT (herbicide tolerant) soybeans which account for 85% of the total soybeans planted in 2009 (amounting to 202 000 hectares of land used exclusively for this crop).¹⁸² GM HT maize, likewise in 2009, was planted on 727 000 hectares of land effectively accounting for approximately 25% of the total plantings for that year.¹⁸³ GM IR (insect repellent) maize in 2009 accounted for 83% of the total maize planted in the country.¹⁸⁴ It is clear from these figures that growing GM crops in South Africa is not a fringe activity but rather accounts for a significant portion of the countries agricultural yield. There are other GM crops currently in use in South Africa but it is not within the scope of this study to mention them all. In fact the GM farming industry does not seem to be losing momentum. During the period January 2007 and July 2008 the government body responsible for the issuing of GMO permits granted 425 new permits for general and trial release, import, export and commodity clearance.¹⁸⁵ The majority of the permits were granted for GM maize usage.¹⁸⁶ Other applications include one for GM potatoes, ten for GM soybeans, three for GM cassava and sixteen for GM cotton.¹⁸⁷ The figures quoted above allude to the fact that GMO farming practices are widely accepted in the South African agricultural sector and, judging from the

182. Brookes G & Barfoot P 'GM crops: global socio-economic and environmental impacts 1996-2009.' (2011) *PG Economics LTD UK* at 36.

183. *Ibid* at 43.

184. *Ibid* at 56.

185. Swanby H 'GMOs in South Africa: Overview of current status, 2008.' African Centre for Biosafety. Available at:

http://www.globalbioenergy.org/uploads/media/0812_The_African_Centre_for_Biosafety_-_GMOs_in_South_Africa.pdf accessed 09 August 2012.

186. *Ibid*.

187. *Ibid*.

amount of applications submitted to the responsible government agency, many more GM crops could soon enter the South African market. Due to their prevalence in the agricultural sector the South African government has sought to regulate their use.

The Genetically Modified Organisms (GMO) Act was assented to 20 May 1997 and came into effect 1 December 1999. The GMO Act is the framework legislation which regulates GMOs in South Africa. In the preamble it is stated that the Act seeks to regulate the development, production, use and application of GMOs in a manner which takes into account possible adverse impacts GMOs may have on biodiversity, human and animal health.¹⁸⁸ All the possible impacts associated with the use of biotechnology are not yet understood and therefore this paper is in agreement with Feris who states that the production, development or release of a GMO may well lead to some form of injury to either a person, property or the environment.¹⁸⁹ The GMO Act applies to the following:

- “(a) the genetic modification of organisms;
- (b) the development, production, release, use and application of genetically modified organisms (including viruses and bacteriophages); and
- (c) the use of gene therapy”.¹⁹⁰

However, the word ‘activity’ is defined in the Act as “any activity with genetically modified organisms but is not limited to the importation, exportation, transit, development, production, release, distribution, use, storage and application of genetically modified organisms only”.¹⁹¹ Thus the scope of application of the GMO Act is considerably wide to include all activities associated with GMOs.¹⁹² The GMO

188. Genetically Modified Organisms Act preamble.

189. Feris L ‘Risk management and liability for environmental harm caused by GMOs – the South African regulatory framework’ (2006) 9(1) *Potchefstroom Electronic Journal* at 1.

190. Genetically Modified Organisms Act at s 2(1).

191. *Ibid* at s 1.

192. *Ibid* at s 1.

Act sets up the creation of an Executive Council of Genetically Modified Organisms (Council) ¹⁹³ the role of which is to advise the Minister of Agriculture on all matters pertaining to activities involving GMOs. ¹⁹⁴ The Council is tasked with receiving applications from persons who wish to engage in GMO activities and need a valid permit to do so. ¹⁹⁵ The Council on receiving an application may decide whether or not an environmental impact assessment (EIA) should be undertaken. ¹⁹⁶ The procedure for an EIA is laid down in Section 24 of the National Environmental Management Act (NEMA) as well as its regulations. ¹⁹⁷ Therefore, although all activities pertaining to GMOs could potentially qualify for an EIA, it falls to the discretion of the Minister as to whether or not the particular application warrants it. The wide powers of discretion afforded to the Minister is undesirable given the highly technical nature of the subject matter as well as the uncertainty as to the long term effects of the release of many GM crop products in South Africa. In terms of the EIA process decision makers are required to take into account environmental, social and economic considerations in line with the concept of sustainable development when faced with any GMO application submitted to the Council. ¹⁹⁸

The incorporation of GMOs into the agricultural sector of South Africa is not necessarily considered an unsustainable form of agriculture. However, according to agroecology and organic farming principles the use of GMOs is strictly forbidden. There are a number of reasons as to why proponents of these types of agricultural practices take this stance. The most pervasive arguments revolve around the potential harm the release of GMOs may have on the environment. Possible negative effects of GMOs can be grouped into two main categories depending on if

193. Genetically Modified Organisms Act at s 3(1).

194. Ibid at s 3(4).

195. Ibid at s 5(1) (a).

196. Ibid at s 5(1) (a).

197. National Environmental Management Act at s 24 and Environmental Impact Assessment Regulations GNR.543 of 18 June 2010 GG No. 33306.

198. National Environmental Management Act at s 2(3) & 2(4).

their impact is felt directly or indirectly. A direct impact on the environment may come about as a consequence of the presence of the GM crop species itself in the agricultural landscape, or due to the potential transfer of the modified genetic material (known as the transgene) into a wild relative species.¹⁹⁹ A potential negative impact of a GM crop in the environment is that that crop acquires a competitive advantage (i.e. pest resistance for example) compared to the surrounding wild species, thus allowing it to become invasive.²⁰⁰ Invasive species are recognised as one of the major threats to biodiversity worldwide. If a GM crop transfers its competitive advantage to wild relatives (i.e. through the transfer of the transgene), those wild relatives could become invasive and pose a threat to indigenous ecosystems.²⁰¹ One of the mechanisms through which this transfer may come about is through the process of horizontal gene transfer (HGT). According to Keese:

“Horizontal gene transfer is the stable transfer of genetic material from one organism to another without reproduction or human intervention. Transfer occurs by passage of donor genetic material across cellular boundaries, followed by heritable incorporation to the genome of the recipient organism”.

²⁰²

HGT is a natural occurring process. This possibility of HGT between GM crops to other crop varieties, associated weeds and wild relatives has been postulated as a major ecological threat and is a central argument against the commercial release of GM crop varieties.²⁰³ A mechanism through which HGT can take place is through

199. Hails RS ‘Assessing the risks associated with new agricultural practices’ (2002) 418 *Nature* at 685.

200. Ibid at 685.

201. Ibid at 685.

202. Keese P ‘Risks from GMOs due to horizontal gene transfer’ (2008) 7(3) *Environmental Biosafety Research* at 123.

203. Messeguer J ‘Gene flow assessment in transgenic plants’ (2003) 73 *Plant Cell, Tissue and Organ Culture* at 201.

the release of pollen and dispersal of seeds.²⁰⁴ Gene flow from dispersed pollen is vitally important, as plant populations which are restricted from inputs of pollen from multiple sources may go through the process of genetic bottlenecks, thus exposing the plants to high levels of inbreeding, which eventually may result in reduced genetic diversity and possible reduced fitness.²⁰⁵ For the purposes of this paper it is sufficient to point out that transfer of genetic material from GM crops to other unintended organisms is a reality and therefore is a factor which must be taken into account when governments authorise the release of GMOs into the environment.

Indirect impacts come about as a result of management practices accompanying GM crop utilization.²⁰⁶ An example of an indirect threat to the environment is related to the use of HR crops. A major problem for farmers is the eradication of weed species from their crop fields. The traditional way of dealing with this problem is to make use of herbicides. However, herbicides also have adverse effects on the crops themselves often stunting their growth and resulting in a reduced yield for the farmer. HR crops were designed so that herbicides could be applied to them in order to eradicate weed species, but at the same time, would not undermine the growth of the crops themselves. A consequence of this is that farmers who would otherwise use herbicides sparingly on their crop fields are now able to apply herbicides in abundance.²⁰⁷ This increased herbicide use on GM crop fields results in more harmful chemicals entering the environment.²⁰⁸ A second consequence of increased herbicide use is the possibility that weed species may evolve HR biotypes which may

204. Messeguer J 'Gene flow assessment in transgenic plants' (2003) 73 *Plant Cell, Tissue and Organ Culture* at 202.

205. *Ibid* at 208.

206. Hails RS 'Assessing the risks associated with new agricultural practices' (2002) 418 *Nature* at 685.

207. Paoletti MG 'Impact of genetically modified organisms' (2001) *Encyclopaedia of Life Sciences* at 1.

208. *Ibid* at 1.

become invasive themselves and pose a threat to indigenous ecosystems.²⁰⁹ Another indirect negative impact has been attributed to engineered plants which contain the *Bacillus Thuringiensis* (BT) toxic protein designed as a pest control mechanism.²¹⁰ Pollen produced by GM crops which contain BT may threaten bees and other beneficial pollinating species such as butterflies.²¹¹

Not only do the presence of GM crops pose a direct threat to environmental integrity they also have the potential to negatively affect farmer's who have not incorporated GM crops on their farms from an economic perspective. For agricultural products exclusively destined for non-GM markets, HGT through the process of pollen dispersal from GM crop varieties as well as the germination of GM seeds dropped, blown or inadvertently planted, remains a large concern for the producers of such products.²¹² In South Africa AFRISCO, which falls under the international organic agricultural industry umbrella organization IFOAM, takes a zero tolerance stance towards foods which contain any form of GMOs.²¹³ What this ultimately means is that an organic farmer stands to lose his or her organic certification if the presence of any GMO material is detected in their products. A loss of organic status for a farmer constitutes a unique economic loss for a number of reasons. In order for a farmer to achieve organic status considerable time, effort and capital investment must be undertaken.²¹⁴ Initially, a farmer must undergo a transition period in which all

209. Paoletti MG 'Impact of genetically modified organisms' (2001) *Encyclopaedia of Life Sciences* at 5.

210. Ibid at 6.

211. Ibid at 6.

212. Messeguer J 'Gene flow assessment in transgenic plants' (2003) 73 *Plant Cell, Tissue and Organ Culture* at 202.

213. The International Federation of Organic Agriculture Movements (IFOAM) available at <http://www.ifoam.org/growing-organic/definitions/doa/index.html> accessed 20 January 2013 and Africa's Farms Certified Organic for the South African Market available at <http://www.afrisico.net> accessed 20 January 2013.

214. Repp RA 'Biotech pollution: assessing liability for genetically modified crop production and genetic drift' (1999-2000) 36 *Idaho Law Review* at 594.

synthetic fertilizers, herbicides and pesticides are forbidden which ultimately leads to loss of productivity as a result of reduced yields.²¹⁵ During this time period the products produced cannot be labelled as “organic” but rather as “transitional” and therefore cannot be sold at an elevated price able to cover the costs of production. Due to the fact that the organic food industry forms part of a niche market (especially in South Africa) their products are sold at a premium price relative to the same products produced using conventional farming practices. Thus, a loss of organic certification constitutes a significant economic loss to the organic producer in terms of past monetary investment during the transitional phase (coupled with a loss of productivity) as well as losses related to revoked organic labelling rights which allow the organic producer to sell their products at a premium price on the marketplace.²¹⁶ In fact, if the contamination of the organic produce amounts to there being five percent or more GM material detected, under the Consumer Protection Act Regulations, the product then has to be labelled as ‘containing genetically modified organisms’.²¹⁷ Under this scenario the organic producer will not only have lost the financial advantages associated with his or her products labelled as certified organic but will legally be obliged to label the products as produced from GMOs further limiting the organics producers economic viability. The organic farmer could also lose his or her reputation in the market place as a responsible organic producer leading to further economic losses. Therefore organic farmers stand to lose significantly from GMO contamination.

5.4. Summary

Agricultural legislation in South Africa, namely the CARA and the Fertilizer Act are in need of significant revision. They are examples of outdated Apartheid era legislation. Concepts such as sustainable development and an ecological, holistic and integrated approach to environmental management are decidedly absent. The

215. Repp RA ‘Biotech pollution: assessing liability for genetically modified crop production and genetic drift’ (1999-2000) 36 *Idaho Law Review* at 594.

216. *ibid* at 595.

217. Consumer Protection Act Regulations GNR.293 of 1 April 2011 at s 7(3).

continued reliance of the Department of Agriculture, Forestry and Fisheries on these two Acts for the effective protection of the environment poses a significant barrier to the effective implementation of an agricultural sector premised on sustainable agriculture principles.

The promotion of the use of GM crops, as advocated by the GMO Act, likewise poses a significant barrier to the development and implementation of a sustainable agriculture regime characterised by agroecology and organic farming principles. The use of GMOs in agriculture does not necessarily imply a lack of sustainability as one of the goals of sustainable agriculture is the achievement of increased productivity. However, proponents of agroecology and organic farming, who expressly reject the incorporation of GMOs into the agricultural landscape, point out the potential environmental harm which may come about, either directly or indirectly, as a result of GMO usage. From an economic perspective, organic farmers whose crops are contaminated by GM material stand to lose not only their organic certification status, but also revenue as they would not be able to sell their products at a premium price necessary to cover the extensive costs of producing genuine organic products.

Agricultural land is a complex mosaic of different farming practices. Proponents of conventional farming practices will undoubtedly find themselves alongside farmers incorporating agroecology and organic farming principles. This is a recipe for conflict. The goal of achieving sustainable agriculture in South Africa necessitates the development of agricultural policy which is able to accommodate these differing modes of agricultural production. This is not an easy task. However, this process has begun in South Africa with draft policies and strategies currently in circulation which look specifically at organic farming and agroecology in South Africa.

Chapter 6: The road to sustainable agriculture

The South African government is not blind to the fact that there is a need to incorporate more sustainable practices in the agricultural sector. In this regard the government is currently in the process of developing a national strategy on agroecology and an organic farming policy. Both the national strategy and policy position are still in draft stage, but nonetheless, represent a clear intent on the part of the Department of Agriculture, Forestry and Fisheries to come to grips with the evolving nature of sustainable agricultural practices necessary to achieve the ideal of sustainable development.

6.1. The National Strategy on Agroecology

The National Strategy on Agroecology (NSA) is currently in its fourth draft. The NSA defines agroecological farming as:

“a whole-systems approach to food, feed, and fibre production that balances environmental soundness, social equity, and economic viability among all sectors of the public, including international and intergenerational peoples. Inherent in this definition is the idea that sustainability must be extended not only globally but indefinitely in time, and to all living organisms including humans”.²¹⁸

According to the NSA agroecological farming practices seek to increase agricultural productivity whilst simultaneously decreasing environmental harm and promoting socially responsible farming practices. More specifically, the NSA links agroecology to climate change. In this respect the adoption of agroecological farming practices is believed to strengthen farmer’s resilience to climate change, reduce agriculturally sourced greenhouse gas contributions, and increase carbon storage on farmlands.

²¹⁹

The NSA highlights a number of contemporary problems directly relevant to the

218. Republic of South Africa “National Strategy on Agro-ecology, 4th draft” Available at: <http://www.nda.agric.za/> accessed 12 January 2013 at 2.

219. Ibid at 2.

agricultural sector in South Africa. Firstly, there is a lack of availability and accessibility of appropriate information regarding agroecological practices available to farmers. This problem is particularly acute in the case of smallholder farmers.²²⁰ Secondly, the current chemical culture characterized by the wide scale use of pesticides, herbicides, and artificial fertilizers is firmly entrenched in the commercial farming sector and, as such, changing the mindset of the farmer's utilizing these types of inputs presents a significant difficulty in the implementation of agroecology practices.²²¹ Thirdly, the agricultural sector is in direct competition for land from the industrial sector (notably the mining sector) and the conversion of land for the development of residential areas. This loss of land will lead to increased pressure on the existing agricultural sector to increase productivity levels as a direct result of increased population growth in the country. Thus, the use of artificial inputs may be on the rise unless an alternative strategy is implemented.²²² Fourthly, pollution of South Africa's water resources is reaching critical proportions and as such limits the range of available options with regard to sustainable agricultural practices. Quite frankly polluted water cannot be used for the irrigation of farmland sustainably. Given that the agricultural sector of South Africa is the largest user of fresh water in the country the issue of water pollution mitigation is of paramount importance.²²³ Fifthly, land degradation is a poignant environmental problem rife throughout South Africa that has come about due to commercial farming practices such as monoculture cereal production, intensive tillage, and limited crop rotation. Other factors relevant to increased land degradation include excessive fuel wood collection, inappropriate land use, increased population densities and overgrazing.²²⁴ Finally, South Africa is characterized by low levels of annual rainfall. Approximately eighty percent of the

220. Republic of South Africa "National Strategy on Agro-ecology, 4th draft" Available at: <http://www.nda.agric.za/> accessed 12 January 2013 at 11.

221. Ibid at 11.

222. Ibid at 11.

223. Ibid at 11 -12.

224. Ibid at 12.

country is considered to be either arid or semi-arid. The availability of fresh water is seen to be the limiting factor to the future socio-economic development of the country.²²⁵ The NSA proposes a number of strategic actions with which the implementation of agroecological farming practices may be achieved in the agricultural sector of South Africa. These include:

- the development and implementation of information and promotion campaigns designed to inform consumers, public institutions, schools and other interested and affected parties about the benefits and merits of agroecology;
- the establishment of communication channels between government departments through which agroecological knowledge and information may be distributed;
- the development of training programs for agricultural officers and farmers about the merits of agroecological farming;
- the development of and adoption of crop species that are adapted to the local conditions inherent in a particular area taking into account the social and economic circumstances of the farmer;
- promoting the adoption of integrated pest management schemes;
- reducing the dependence of farmer's on inorganic fertilizers and agro-chemicals through the increased use of organic alternatives;
- encouraging the adoption of innovative approaches such as the use of cover crops, minimum tillage practices, crop rotation, and the incorporation of organic matter into the soil;
- recognizing the importance of traditional knowledge of indigenous farmers with respect to resource management;
- implementing the development of a database of all suitable agricultural land;
- the promulgation of legislation to enforce the zoning of identified suitable agricultural land;
- the development of incentive schemes for farmers who adopt agroecological farming practices;

225. Republic of South Africa "National Strategy on Agro-ecology, 4th draft" Available at: <http://www.nda.agric.za/> accessed 12 January 2013 at 12.

- the establishment of a fund dedicated to the agroecology sector;
- the prioritization of public and private funding for research in agroecology; and
- the development of programs aimed at the mitigating the harmful effects of climate change such as increased drought tolerance and pest and disease resistance.²²⁶

The implementation of these action strategies aim to create an agroecological farming sector founded upon principles of public participation that is globally competitive but also contributes to the goals of poverty reduction, job creation, increased food security and economic development.²²⁷

6.2. The National Policy on Organic Agriculture

According to the National Policy on Organic Agriculture (NPOA):

“Organic farming refers to the type of farming that is done without the use synthetic chemicals such as pesticides, fertilizers, fungicides and insecticides or genetically modified seeds. The organic farmers use a range of techniques that help sustain ecosystems and reduce pollution, while improving both the production and quality of nutrition, linked to improved social and economic viability. In case of plant production it involves the use of crop rotation, natural composting, approved environmentally friendly pest control and homeopathic remedies to produce food that is free of all artificial additives. In case of animal production, the animals raised on organic farms must be allowed to range as freely as possible and eat only organically produced feeds. Most critically, organic food production is based on genuinely sustainable systems”.

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226. Republic of South Africa “National Strategy on Agro-ecology, 4th draft” Available at: <http://www.nda.agric.za/> accessed 12 January 2013 at 13-16.

227. Ibid at 4.

228. Republic of South Africa ‘National Policy on Organic Agriculture, 8th draft’ available at <http://www.nda.agric.za/daaDev/sideMenu/plantProduction/doc/National%20Policy%20on%20Organic%20%20Production%20%20Draft%208.pdf> accessed 10 January 2013 at 3.

As such, the organic farming movement is an extension of agroecology as it views the production of food holistically and through an ecological lens. The ban of all synthetic chemicals together with the ban on the use of genetically modified organisms makes this type of farming practice extremely challenging and risky.

Nonetheless, South Africa is home to a number of organic farmers whose value of organic produce is estimated to be in the region of between R200 million and R400 million annually (based on 2005 national figures).²²⁹ According to estimates there are roughly 45 000 hectares of land, accounting for 0.05% of all agricultural land, dedicated to organic farming in South Africa.²³⁰ A significant proportion of the organic produce produced in South Africa is exported to the European Union.²³¹

The NPOA lists a number of compelling reasons as to why the South African government should develop and implement a policy on organic farming. Firstly, the South African government recognizes that one of its central roles is the protection of its citizens from unfair practices. Due to the lack of a regulatory system for organically produced products, many agricultural products on the South African market are falsely labeled as organic. These products are then sold at a premium price on the marketplace. Consumers bear the brunt of these unscrupulous practices by paying elevated prices for conventionally produced agricultural products.²³² Secondly, due to the fact that organic farming practices do not make

229. Republic of South Africa 'National Policy on Organic Agriculture, 8th draft' available at <http://www.nda.agric.za/doaDev/sideMenu/plantProduction/doc/National%20Policy%20on%20Organic%20%20Production%20%20Draft%208.pdf> accessed 10 January 2013 at 14.

230. IFOAM & FiBL 'The World of Organic Agriculture. Statistics and Emerging Trends 2006' (2006) International Federation of Organic Agriculture Movements (IFOAM), Bonn & Research Institute of Organic Agriculture (FiBL), Frick, at 27–35.

231. Republic of South Africa 'National Policy on Organic Agriculture, 8th draft' available at <http://www.nda.agric.za/doaDev/sideMenu/plantProduction/doc/National%20Policy%20on%20Organic%20%20Production%20%20Draft%208.pdf> accessed 10 January 2013 at 14.

232. Ibid at 8.

use of any synthetic chemical inputs, the consumption of organic foods significantly decreases the public's exposure to harmful chemicals and additives. Thus, the incorporation of organically produced food into more and more South African diets would result in increased health benefits and a reduction on the drain on the national healthcare system.²³³ Thirdly, organic production of food has been linked to a multitude of environmental benefits such as enhanced soil structure, the conservation of fresh water, and increased biodiversity.²³⁴ Fourthly, studies have shown that the adoption of organic farming practices actively mitigates against climate change as these farms emit much lower levels of greenhouse gases into the atmosphere. Organic production also has a role to play in increasing resilience with respect to the effects of climate change. This is due mainly to the sector's water retention efficiency and lower risk of complete crop failure. Organic farming also has the ability to minimize energy consumption by 30-70% per unit of land by eliminating the energy required to manufacture synthetic fertilizers and fossil based fuels.²³⁵ Fifthly, the Constitution of South Africa actively endorses the freedom of choice. What this means is that farmers have the constitutional right to choose to adopt organic agriculture if they so please. Likewise, consumers have the right to choose what they would like to eat and drink. Therefore it is incumbent on the government to ensure that an effective organic farming policy is developed in order to safeguard those constitutional rights.²³⁶ Finally, capital retention on organic farms is enhanced as these farmers are not dependent on costly inputs of synthetic fertilizers, pesticides, herbicides etc.²³⁷

233. Republic of South Africa 'National Policy on Organic Agriculture, 8th draft' available at <http://www.nda.agric.za/doaDev/sideMenu/plantProduction/doc/National%20Policy%20on%20Organic%20%20Production%20%20Draft%208.pdf> accessed 10 January 2013 at 8.

234. Ibid at 9.

235. Ibid at 9–10.

236. Ibid at 10.

237. Ibid at 10.

The NPOA highlights a number of actions which need to take place if the successful cultivation of an organic farming sector is to take root in South Africa. Of paramount importance is the development of an effective and affordable organic certification programme. This initiative would be founded upon the principle of traceability whereby the authenticity of an organic claim would be verified through the use of documentation and inspection processes carried out throughout the entire production process. The certification process would conform to international norms and standards so as to allow for trade in both local and international markets.²³⁸ Information is key to the success of a functioning and effective organic agriculture sector. There are many ways information regarding organic farming practices can be disseminated to the public. These include integrating organic agriculture courses into the curriculums of primary and secondary schools, the creation of specialized institutions that offer organic farming training, the development of an apprenticeship program whereby the organic food producer is recognized as a legitimate craftsman, the creation of higher education courses which deal with organic agriculture project management, and the development and implementation of country-wide information and promotion campaigns designed to distribute information about the merits of organic farming to the general public.²³⁹ For organic farming to be successful, due to its adherence to the integration of food production processes into the localized ecosystem within which it operates, it necessitates the development of research and technology that is site specific. Thus, state funding of organic agricultural research that directly benefits the farming community should be a necessary ingredient of any organic farming policy.²⁴⁰ Finally, the NPOA expressly calls for the development of national legislation and regulations for organic products. These regulations should be formulated in close consultation of the existing organic agricultural sector so as to

238. Republic of South Africa 'National Policy on Organic Agriculture, 8th draft' available at <http://www.nda.agric.za/doaDev/sideMenu/plantProduction/doc/National%20Policy%20on%20Organic%20%20Production%20%20Draft%208.pdf> accessed 10 January 2013 at 18.

239. Ibid at 16-17.

240. Ibid at 20.

ensure that the proposed regulations are enabling and constructive.²⁴¹

6.3. Discussion

The South African agricultural sector is divided into a number of agricultural modes of production which are seemingly incompatible with each other. These modes include the conventional farming industry (by far the most widespread), those farms who have adopted agroecological principles and the organic farming industry. The government, instead of proposing and developing an integrated national approach to agricultural policy in South Africa is actively entrenching this 'box-like' categorisation of agricultural modes of production. In addition, far from affording each agricultural production method equal footing in terms of the law, conventional farming practices have an elevated status in the South African legal landscape. The reason for this active adoption of 'industrial style' agricultural practices may be sourced from the prevailing agricultural policy and existing legislation governing the regulation of the sector.

According to the South African Agricultural policy document published in 1998 a number of strategic aims to achieve sustainable, equitable and efficient agricultural development were proposed. These include increasing the efficiency of the agricultural sector by prioritizing international competitiveness, actively promoting market deregulation, active negotiating on the part of the government to reduce protectionist measures in trade policies, and undertaking measures to encourage export competitiveness.²⁴² To give effect to this policy the Marketing of Agricultural Products Act (MAPA) was assented to and came into effect.²⁴³ The objectives of the

241. Republic of South Africa 'National Policy on Organic Agriculture, 8th draft' available at <http://www.nda.agric.za/doaDev/sideMenu/plantProduction/doc/National%20Policy%20on%20Organic%20%20Production%20%20Draft%208.pdf> accessed 10 January 2013 at 21.

242. Republic of South Africa 'Agricultural Policy in South Africa 1998' available at <http://www.daff.gov.za/docs/Policy/policy98.htm> accessed 09 November 2012 at 16.

243. Marketing of Agricultural Products Act 47 of 1996.

MAPA include:

- “(a) the increasing of market access for all market participants;
- (b) the promotion of the efficiency of the marketing of agricultural products;
- (c) the optimisation of export earnings from agricultural products;
- (d) the enhancement of the viability of the agricultural sector.”²⁴⁴

Two of the objectives are particularly significant, namely the increasing of market access and the optimisation of export earnings from agricultural products. What the MAPA in effect achieved was the radical deregulation of the formally controlled agricultural markets in South Africa.²⁴⁵ The MAPA lawfully abolished all agricultural control boards by early 1998 and, as a consequence, eradicated all government price controls over agricultural products²⁴⁶, thereby ushering in a neo-liberal free market approach to the trading of agricultural products in the domestic as well as the international marketplace. In addition to the effects of the policy and the MAPA, the government actively supported the adoption of GM crops into the agricultural landscape with the inclusion of the GMO Act. One of the selling points of GM crops is their ability to elevate a farm’s productivity per hectare. This advantage of GM crops actively aids in the creation of an export-based agricultural market as proposed by the 1998 policy. The Fertilizer Act also assisted in the entrenchment of a chemical culture in the agricultural sector by legalising the use of chemical additives in the industry. The sum total of the 1998 agricultural policy, the MAPA, the GMO Act and the Fertilizer Act has been the active adoption of a conventional farming industry in South Africa. It is against this overwhelming status quo that the government is now trying to incorporate more sustainable agricultural production modes such as agroecology and organic farming.

244. Marketing of Agricultural Products Act at s 2(2).

245. Republic of South Africa ‘Agricultural Policy in South Africa 1998’ available at <http://www.daff.gov.za/docs/Policy/policy98.htm> accessed 09 November 2012 at 8.

246. Marketing of Agricultural Products Act at s 27.

According to the non-profit organization the African Centre for Biosafety (ACB):

“The proposed strategy seems to posit agroecology as another production technology, an add-on to our current system, rather than a transformation, through policy, of our deeply entrenched industrial agricultural system, which is based on the privatization of agricultural resources and knowledge to deploy an environmentally destructive production system, ever at the mercy of skewed global trade relations”.²⁴⁷

The ACB specifically points out that agroecology is seen as an add-on and not an integrative approach to incorporating more sustainable agricultural practices in South Africa. There are a number of issues with this ad hoc approach to developing agroecology and organic farming practices in isolation of the prevailing agricultural landscape in South Africa. Firstly, nowhere in the agroecology strategy or the organic farming policy is there any mention of how these two modes of agricultural production will interact with surrounding industrial style farms that actively incorporate GM crops and artificial chemicals on their land. Each individual farm in South Africa cannot be an island unto themselves. A very real possibility of chemical contamination or biological contamination (from GM crops) of agricultural products is an ever present danger to farmers who explicitly reject the use of synthetic chemical additives and the use of GMOs on their lands. This lack of integration is a serious shortfall of both the proposed agroecological strategy and the organic farming policy. Secondly, as has been highlighted in Chapter 5, there are serious deficiencies inherent in the current suit of agricultural legislation. The development of new policies and strategies designed to promote sustainable agriculture will be doomed to failure unless these current deficiencies are dealt with. Adding new legislation on an already shaky base will not bode well for the attainment of a sustainable agricultural sector. Thirdly, both the proposed agroecology strategy and the organic farming policy highlight information dissemination as key to the development of these

247. 'African Centre for Biosafety Comments on: National Strategy on Agroecology 30 November 2012' available at:

http://www.acbio.org.za/images/stories/dmdocuments/ACB_agroecology_comments_NOV2012.pdf
accessed 19 February 2013 at 4.

types of agriculture production systems. However, if the enabling legal environment and support systems are not in place, raising awareness amongst the general public would be useless.²⁴⁸ Lastly, both the agroecological strategy and the organic farming policy do not put into place realistic time frames for the attainment of key targets. Without an action agenda, characterized by quantifiable goals, both the proposed agroecological strategy and the organic farming policy will be doomed to fail. It is precisely this lack of political commitment to creating quantifiable goals able to achieve a more sustainable agricultural sector that both the proposed agroecological strategy and the organic farming policy are still very much in the draft stage of development.

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248. 'African Centre for Biosafety Comments on: National Strategy on Agroecology 30 November 2012' available at:

http://www.acbio.org.za/images/stories/dmdocuments/ACB_agroecology_comments_NOV2012.pdf
accessed 19 February 2013 at 12.

Chapter 7: Conclusion

“A nation that destroys its soils, destroys itself.”

Franklin D. Roosevelt

Sustainable agricultural production methods offer a holistic approach to farming which takes into account environmental, social and economic considerations. This method of agricultural production emphasises the need to incorporate agricultural practices which safeguard the environment whilst simultaneously enhancing vital ecosystem services.

The attainment of a sustainable agricultural sector is a complex undertaking. It requires, amongst other factors, the agricultural community to seriously rethink the role of agriculture in society. Agricultural practices need to become more than simply a means to produce food for economic gains. In order for the successful incorporation of sustainability practices into the South African agricultural sector to occur, the potential barriers to its implementation, as well as the specific characteristics of the South African agricultural sector, need to be acknowledged and incorporated.

The agricultural sector in South Africa is the single biggest land user in the country and is heavily dominated by commercial style farms. This sector contributes 1.9% to the total GDP of the country and employs a significant proportion of the workforce in South Africa. The sector is characterized by a free market economic policy designed to boost international trade in agricultural goods. However, issues such as food insecurity continue to be a persistent societal issue in South Africa as the volatility of the international agricultural marketplace often causes the domestic prices of agricultural goods to fluctuate extensively. Commercial farming in South Africa is associated with much environmental harm. Due to the semi-arid to arid conditions prevalent throughout much of the country the risk of land degradation is high. Environmental harms associated with land degradation specific to South Africa manifest themselves in the fragmentation of natural habitats, the persistent problem

of overgrazing, and soil degradation in the form of chemical contamination. Eutrophication of South Africa's fresh water bodies also continues to be a persistent and acute environmental issue partially perpetuated by the inappropriate fertilizer application of farmers on cultivated land. The prevalence of these environmental harms in the South African environment as a result of commercial farming enterprises necessitates the incorporation of more sustainable agricultural practices into the sector.

One strategy to create a more sustainable agricultural sector is through the incorporation of sustainable agriculture principles and practices into law. Unfortunately, the concept of sustainable agriculture is currently absent in South Africa law. However, the suite of progressive environmental law currently in force in South Africa is imminently suited to promote the incorporation of the concept of sustainable agriculture into the South African legal landscape. The inclusion of the environmental right in the Constitution of South Africa obligates the State to enact reasonable legislation and other measures designed to protect the environment by preventing ecological degradation, promoting conservation and securing sustainable development. Sustainable development is the overarching principle which governs environmental management in South Africa. As such, sustainable development envisages a blending of environmental, social and economic considerations in a holistic and integrated fashion in the pursuit of environmental management. There are thus considerable similarities between sustainable agriculture and sustainable development. It is the contention of this research paper that the principle of sustainable development together with other relevant principles listed in the NEMA does not pose a barrier to the implementation of a sustainable agriculture regime.

The enactment of environmental legislation alone is not enough to achieve the ideal of sustainable development. As such, the development of an incentive based approach to environmental regulation is being implemented. Most of the land in South Africa is privately and communally owned. Conceivably, a large proportion of this land would be owned by farmers. Thus, to encourage conservation efforts designed to safeguard and promote biodiversity on these privately owned lands, a series of tax deductions and exemptions have been put in place. These tax schemes have the ability of economically rewarding farmers wishing to promote conservation efforts on their lands. Thus, the continuing development of these types of incentive

schemes is a step in the right direction in the pursuit of achieving a more sustainable agricultural sector in South Africa.

Currently agricultural specific legislation is in place which regulates the agricultural sector in South Africa. It is the contention of this research paper that this legislation is in need of significant revision. Concepts such as sustainable development and an ecological, holistic and integrated approach to environmental management are decidedly absent. The continued reliance of the Department of Agriculture, Forestry and Fisheries on these two Acts for the effective protection of the agricultural environment poses a significant barrier to the effective implementation of an agricultural sector premised on sustainable agriculture principles.

The promotion of the use of GM crops, as advocated by the GMO Act, likewise poses a significant barrier to the development and implementation of a sustainable agriculture regime characterised by agroecology and organic farming principles. The use of GMOs in agriculture does not necessarily imply a lack of sustainability as one of the goals of sustainable agriculture is the achievement of increased productivity. However, proponents of agroecology and organic farming, who expressly reject the incorporation of GMOs into the agricultural landscape, point out the potential environmental harm which may come about, either directly or indirectly, as a result of GMO usage. From an economic perspective, organic farmers whose crops are contaminated by GM material stand to lose not only their organic certification status, but also revenue as they would not be able to sell their products at a premium price necessary to cover the extensive costs of producing genuine organic products.

Agricultural land is a complex mosaic of different farming practices. Proponents of conventional farming practices (undoubtedly the dominant form of agricultural production in the country) will unquestionably find themselves alongside farmers incorporating agroecology and organic farming principles. This is a recipe for conflict. The goal of achieving sustainable agriculture in South Africa necessitates the development of agricultural policy which is able to accommodate these differing modes of agricultural production. The government, instead of proposing and developing an integrated national approach to agricultural policy in South Africa, is actively entrenching a 'box-like' categorisation of agricultural modes of production. In addition, far from affording each agricultural production method equal footing in

terms of the law, conventional farming practices have an elevated status in the South African legal landscape. The reason for this active adoption of 'industrial style' agricultural practices may be traced from the prevailing agricultural policy and existing legislation governing the regulation of the sector.

If the agricultural sector in South Africa is to meaningfully move towards achieving a more sustainable way of producing food, one which is capable of actively mitigating against environmental harm, the existing agricultural legislation and policy in place must be revised and redrafted.

A new agricultural policy, which incorporates the extensive and progressive suite of environmental legislation as underpinned by the environmental right as housed in the Constitution of South Africa, is necessary for the attainment of a more sustainable agricultural sector capable of incorporating the myriad different agricultural production systems currently in existence.

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