

IDENTIFICATION OF THE CRITICAL SUCCESS FACTORS FOR EXPORT-ORIENTED
AGRO-PROCESSING PROJECTS IN ETHIOPIA



A Research Report presented to the
Department of Construction Economics and Management in partial fulfilment of the
requirements for the degree MSc in Project Management

Prepared by: Teferi Abay (ABYTEF001)

Supervisor: Dr Nien-Tsu Tuan

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ABSTRACT

The study aims to identify Critical Success Factors (CSFs) and their relationships in Ethiopian export-oriented agro-processing projects, using an Interactive Qualitative Analysis methodology (IQA). The CSFs identified and discussed in the study include Quality and Continuous Supply of Raw Material, Availability of Transportation Infrastructure and Systems, Sufficient Storage Capacity for Raw Material, State of the Art Capital Goods, Quality Intermediate Goods, Available Skilled Labour, Availability of Credit, Large Processing Capacity, Favourable Foreign Trade Policy, Sufficient Working Capital, Advanced Market Intelligence on Trends, Competition, and Industry. Furthermore, the study identifies the (cause and effect) relationship between the identified Critical Success Factors (CSFs) and creates System Influence Diagram (SID) to demonstrate this relationship. This research paper presents significant recommendations for developing future export-oriented agro-processing projects based on the findings.

Keywords: Interactive Qualitative Analysis (IQA), Critical Success Factors (CSFs), Agro-Processing.

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LIST OF ABBREVIATIONS

ADLI	Agricultural Development Led Industrialisation
ART	Affinity Relationship Table
CSF	Critical Success factors
DAAU	Deloitte Africa Agribusiness Unit
DBI	Doing Business Index
DGC	Dairy Goat Co-operative
EIC	Ethiopian Investment Commission
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan II
IAIPs	Integrated Agro-Industrial Parks (IAIPs)
IQA	Interactive Qualitative Analysis
IRD	Interrelationship Diagram
P(x)	Participant (number)
SID	System Influence Diagram
SMME	Small, Micro and Medium Enterprises
SSAB	Small Scale Agricultural Business
TQM	Total Quality Management
UNIDO	United Nations Industrial Development Organization

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CHAPTER ONE: INTRODUCTION

1. Background to the Study and Problem Statement

1.1. Ethiopian Agricultural Sector

Ethiopia, a country with an estimated population of 115 million and an annual Gross Domestic Product (GDP) per capita of 890 dollars, is considered one of the poorest countries in the world (World Bank, 2020). The Ethiopian economy is predominantly agriculture-based. The agricultural sector directly supports 85% of the population, constitutes 46% of Gross Domestic Product (GDP) and 90% of export value in Ethiopia (Government of Ethiopia, 2013). While the above are reasons to celebrate agriculture's ability to feed multitudes of people, this sector is equally the source of Ethiopia's economic weakness. Ethiopia is lauded for its auspicious topography and arable land, but the country has been a victim of the most ferocious and recurrent droughts for years (Alem,2018). Nevertheless, through all of this, the agricultural sector remains the principal activity in the economy. Apart from being a source of employment and food for millions, its impact on the GDP is unrivalled (Kabeta & Sidhu,2016).

Ethiopia's government has embarked on a far-reaching programme of economic reforms to help the agricultural sector (International Trade Administration, 2021). The government has shown its commitment to the sector by allocating approximately 15% of the national budget to agricultural development and growth (Demeke, Guta, Ferede, & Ababa, 2004, p.1). The government's commitment to agriculture was gradually complemented by efforts to promote manufacturing in sectors where the country has a perceived comparative advantage (Agro-processing) (World Bank Group, 2015).

The government of Ethiopia has been implementing Agricultural Development Led Industrialisation (ADLI), which calls for broader reforms, more foreign direct investment, and greater integration with the global economy through the implementation of an export-oriented agricultural development strategy (Lavers, 2011). According to ADLI, agriculture must be promoted first in order to facilitate demand for industrial commodities by strengthening the relationship between the agricultural and industrial sectors; agricultural growth is meant to stimulate both demand and supply links, resulting in overall growth (Degu, 2019). As a result, the programme aims to boost agricultural productivity in order to boost overall production, especially in rural areas.

1.2. Agro-Processing in Ethiopia

An agro-processing industry comprises of enterprises that process agricultural raw materials which originate from the agricultural sector, forestry, and fisheries sector (Srivastava, 1989). These products undergo transformation, preservation, and preparation for intermediary use or final consumption. Food processing adds value to produce in the form of improved storage and product shelf life (Srivastava,1989). Agro-processing sources its raw materials from the agricultural sector and manufacturing sector (Packaging and labelling). Hence it has great value in connecting the agricultural sector with the manufacturing sector. This relationship between the agricultural industry and the agro-processing industry extends beyond basic trade to more complex operational activities such as transportation and financing (Agro-Processing, 2018). For example, if there is perceived and established trust between the two sectors, agro-industrial enterprises can secure the supply of raw inputs on credit from the agriculture sector (Agro-Processing, 2018). As a result, the success of one agro-processing project has a knock-on effect on other industries.

In its second Growth and Transformation Plan (GTPII), Ethiopia's government has identified the agro-processing industry as one of the vehicles for accelerating economic growth and facilitating employment (Tekleyesus, 2019). The Ethiopian Invest Commission has also recognised it as one of Ethiopia's top ten priority investment industries for 2020 (EIC, 2020). To reach the full potential of agro-processing, a coordinated government effort to guide investments toward the establishment of a competitive agro-processing industry would be necessary. Ethiopia has the potential to become a key player in the international agro-processing trade if investments are directed toward this sector.

One way this is being addressed is through the Ethiopian government's building of Integrated Agro-Industrial Parks (IAIPs) in various parts of the country to boost the industry (Zhang et al., 2018). These agro-industrial parks will serve as the driving factor in transforming the Ethiopian agro-processing industrial system from its fragmented form to a more organised, quality and demand focused system. The government is planning to invest over 1 billion US dollars in the project (International Trade Administration, 2021). IAIP is a geographical cluster of companies that share infrastructure and other resources in order to maximise their full potential when business opportunities become available. These business opportunities include joint purchases, sales, training, among others. When companies work together as in the model of IAIP, the overall productivity and efficiency of the commercial food supply chain improves (UNIDO, 2015).

The government has selected four pilot areas to build these industrial parks, which are Southwestern Amhara, Central Eastern Oromia, Eastern SNNP and Western Tigray region (UNIDO, 2015). These areas were chosen based on their existing agricultural raw material production. According to UNIDO (2015), successful industrial parks will lead to two types of benefits: static economic benefits (e.g., employment generation, export growth, government revenues and foreign exchange earnings) and dynamic economic benefits (e.g., skills upgrading, technology transfer, innovation and economic diversification) (UNIDO, 2015).

Apart from governmental investment, the Ethiopian government recognises that these efforts would require private sector participation; hence it is working to create an investment-friendly environment (World Bank, 2020). Because of political and societal turmoil, Ethiopia is viewed as a high-risk country for foreign investment (World Bank, 2020). Ethiopia is now ranked 159th out of 190 countries on the World Bank's Doing Business Index (DBI) (Cost of Doing Business, 2020: 4).

As Ethiopia's government pursues an agricultural-led growth strategy, agro-processing is expected to be the primary source of export revenues and the backbone of the country's transition from agriculture to light industry (Woldemichael, Salami, Mukasa, Simpasa & Shimeles, 2017). As a result, the success of each agro-processing project is crucial to the country's development (UNIDO, 2015). However, the agro-processing sector is not growing as rapidly as anticipated, with a number of agro-processing projects failing to meet their objectives and, in some cases, declaring bankruptcy (Gabbert, Gebresenbet, Galaty & Schlee, 2021). As a result, it is beneficial to investigate factors that are critical for the success of agro-processing projects in order to increase their success rate.

For all the importance to the economy, there continues to be no general consensus among academics and writers on the factors that are critical to the success of these projects in Ethiopia. Identifying the critical success factors of these projects would help to ensure that those significant variables are given careful and ongoing management attention, which will aid the success of other similar projects or Ethiopia's agro-processing industry in general. As a result, the aim of this research report is to fill in the gaps by identifying the critical success factors of export-oriented agro-processing projects in Ethiopia through an empirical investigation from the perspectives of key stakeholders, management, project teams and consultants.

1.3 Problem Statement

Ethiopia has a number of export-oriented agro-processing projects. However, the agro-processing business is not growing as rapidly as expected, with a number of agro-processing projects failing to meet their objectives and, in some cases, declaring bankruptcy (Gabbert, et al., 2021). As a result, it is worth investigating and acting on factors that are critical to the success of these agro-processing projects in order to increase their success rate.

The critical success factors of these export-oriented agro-processing projects are neither well known nor properly documented, and most projects do not achieve their intended goals (Ethiopian reporter, 2017). It is the purpose of this research to identify critical success factors in the export-oriented agro-processing projects in Ethiopia.

1.4 Research Questions

The research seeks to answer the following questions:

1. What are the critical success factors (CSFs) for export oriented Agro-processing firms in Ethiopia?
2. Identify if there are any noticeable interrelationships between these identified CSFs?

1.5 Research Aim

The goal of this research is to identify critical success factors in the export-oriented agro-processing projects in Ethiopia, as well as to reveal possible interrelationships between the identified CSFs.

1.6 Research Objectives

The objectives of this research study are to identify:

1. The CSFs for export-oriented agro-processing projects in Ethiopia; and
2. Noticeable interplay between the identified success factors.

1.7 Structure of Research Report

The research report comprises five chapters. Chapter one discusses the research study in terms of background to the study, problem statement, research questions, research aim, and research objectives. The second chapter identifies common CSFs of agro-processing projects in previous studies and reviews common methodologies used in identifying CSFs of agro-processing

projects. Chapter three will discuss the methodology and data used in this study. The study employs an Interactive Qualitative Analysis (IQA) methodology. The data used in this study is collected through focus groups carried out in the the study. Chapter four will unpack the findings of data collected through the IQA methodology presented in chapter three and also compares these findings with the findings from the literature review. The final chapter of the paper is chapter five which will address how the research goal and objectives are met. It also presents the conclusions and recommendations of the research study.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of previous research on Critical Success Factors (CSFs) and agro-processing. This analysis of existing Ethiopian reservoirs of knowledge in the subject of CSFs and agro-industries aids in designing and devising a research topic and questions that need to be investigated. The chapter begins with section 2.2, which defines critical success factors, outlines the background of critical success factors, and decodes critical success factors to promote understanding. Section 2.3 articulates common critical success factors in the agro-processing industry as found in the literature, and section 2.4 concludes with a review of common methodological approaches in identifying CSFs.

2.2 Critical Success Factors

All projects aim to be successful. Project success cannot be guaranteed, but the chances of success can be increased by focusing on key success factors of the project. As a result, identifying the critical success factors for projects is crucial. Lessons learned from past projects, in terms of what went well and what did not, and why, can help isolate these factors responsible for success, and therefore can be applied in other projects in the future (De Wit, 1988).

Critical success factors (CSFs) are defined as "characteristics, conditions, or variables that, when properly sustained, maintained, or managed, can have a significant impact on the project's success" (Milosevic, & Patanakul, 2005, p.183). Boynton and Zmud (1984, p.17) define CSFs as "those few things that must go well to ensure success for a manager or an organization." Additionally, Chan, Chan, Chiang, Tang, Chan and Ho (2004, p.93) define CSFs as "a set of factors contributing to project success" (Chan et al., 2004, p.93) and "project elements that, when influenced, increase the likelihood of success" (Müller & Jugdev, 2012). In the literature, success factors allude to both project critical success factors and factors that lead to successful project management.

Cooke-Davies (2002) recognises project management success factors, project success factors, and corporate success factors as three distinct sets of factors. Accomplishing "consistently successful projects" is a measure of corporate success (Cooke-Davies, 2002, p.118). Therefore, this is especially important for large project organisations because it determines their profitability. It is important to note that project success factors are not the same as project success criteria. Project success criteria are similar to objectives applied to assess a project's

success. However, project success criteria and project success factors are important, when considering project success.

In industry projects with many dynamic variables, critical success factors are often the only constants that are required for the success of any project (Cooper, 2008). Management must oversee the administering of critical success factors because of how important they are for the success of projects (Cooper, 2008). CSFs have become a necessity for the achievement of desired results in most business projects. Sahney (2008) indicates that, depending on the business, the CSF model can serve as either a monitoring tool or a building mechanism.

Aleu and Aken (2016) indicated that CSFs could have many benefits for businesses and managers. In this regard, identifying CSFs aids in the development of effective reporting mechanisms for managers, the definition of variables involved in industries, and the development of skills for rich, complex data-driven decision-making (Aleu and Aken, 2016). These factors allow management to be resilient to changes in the business environment (Cooper, 2008). However, when inappropriate CSFs are identified for a particular project, the outcomes can be detrimental to the business's success. CSFs often have an impact on the achievement of broader corporate goals. In cases where organisations tend to confuse CSFs with non-CSFs, the project will be affected adversely. Besides, the benefits of CSF identification projects are not limited to project successes. CSFs can also enlighten and improve the understanding of stakeholders/customers and manage the evaluation of projects (Sahney, 2008).

According to Cöster, Engdahl and Svensson (2014), CSFs are better understood from an organisational and consumer perspective. From an organisational perspective, Cöster et al. (2014) linked CSFs to the strategic elements that could affect organisational performance. In addition, from a customer's perspective, Customers' value is important to consider because customers provide the majority of earnings for businesses. Standard project management practice considers CSFs as inputs that can contribute to the success of a project, directly or indirectly (Aleu and Aken, 2016).

Although the development of CSFs results in the formation of numerous factors that contribute to the successful implementation and completion of projects, the relationships that exist between CSFs must also be considered. Fortune and White (2006) observe that it is not only the success factors themselves that contribute to the project's success, but also, and more importantly, the relationships between the CSFs. According to Andresen, Ekker and Gottschalk (2007), understanding the interrelationships between success factors is beneficial for project

managers because it guides them towards those that they can control. This observation suggests that when formulating and developing success factors, these factors should be viewed not only independently, but also in relation to one another.

2.3 Common Critical Success Factors in Agro-processing Projects

Scholars, experts, and researchers have published studies that investigated and identified success factors in various project types. Some CSFs appear in the studies of multiple researchers (Eleni, 2018) (Tsun & Dac-Buu,2008). However, it is critical not to accept and implement any CSFs without first understanding the underlying contexts in which they were identified or implemented. This can help avoid failure due to the use of inappropriate CSFs on projects that do not fit. CSFs are used in projects to increase efficiency and the likelihood of success; as a result, experts must always oversee the administration and implementation of these CSFs. Common CSFs of agro-processing projects in literatures include finance and funding, management, procurement of raw material, infrastructure, marketing, supply chain management, government policy and technology. Table 2.1 below shows a list of studies that contain the aforementioned CSFs. The subsequent section reviews some of the papers mentioned in table 2.1 and explains other CSFs found in those research papers, in addition to the CSFs mentioned in table 2.1.

Table 2.1 depicts the summary of CSFs in literature as identified by various authors.

Table 2. 1: Summary of CSFs in literature as identified by various authors

Critical Success Factors	Authors	Number of Citation
Finance and Funding	Brethenoux et al. (2012), Bruntrup et al. (2013), Christian (2015), de Almeida and Zylbersztajn (2017), Deloitte (2011), Gandhi (2014), Jordaan (2012), Louw et al. (2013), Macdonald and Rowarth (2013), Meena et al. (2009), Nkwabi et al. (2019), Ouma and Whitfield (2012), Owoo and Lambon-Quayefio (2017), Van Lin et al (2018),	14
Management	Boakye (2013), Brethenoux et al. (2012), Bruntrup et al. (2013), Chrynowicz et al. (2017), de Almeida and	14

	Zylbersztajn (2017), Deloitte (2011), ILO (2017), Lambert (2001), Louw et al. (2013), Ouma and Whitfield (2012), Odoyo (2013), Swai (2017), Van Lin et al. (2018), Wanjau et al. (2015),,	
Procurement of raw material	Asokan and Singh (2003), Bruntrup et al. (2013), Lambert (2001), Suryaningrat (2016), Swai (2017), Van Lin et al. (2018).	6
Infrastructure	Black et al. (2020), Brethenoux et al. (2012), Bruntrup et al. (2013), Chryniewicz et al. (2017), ILO (2017), Kumar (2016), Louw (2013), Nuamah (2014),	8
Marketing	Chryniewicz et al. (2017), Deloitte (2011), Kumar (2016), Lambert (2001), Louw (2013), Louw et al. (2008), Owoo and Lambon-Quayefio (2017), Swai (2017), Van Lin et al. (2018)	9
Supply chain management	Bruntrup et al. (2013), Christian (2015), Koira (2014)	3
Government policy	Ayele et al. (2019), Black et al. (2020), Bruntrup et al. (2013), de Almeida and Zylbersztajn (2017), Jordaan (2012), Swai (2017),	6
Technology	Chryniewicz et al. (2017), de Almeida and Zylbersztajn (2017), Deloitte (2011), Gandhi (2014), Lambert (2001), Meena et al. (2009), Mutua (2014), Ngenoh et al (2019), Nkwabi et al. (2019), Odoyo (2013), Swai (2017), Van Lin et al. (2018) ,	12

The agro-processing industry in Africa is growing, and there are certain countries that seem to be leading in this growth; for example, Black, Edwards, Gorven and Mapulanga (2020) published a study that focused on the agro-processing industry in South Africa. In the study, Black et al. (2020) found that the South African agro-processing industry dominates the regional markets when it comes to exporting of agro-processing products. Black et al. (2020)

also identified areas where the industry still needs to improve; for example, creating a trade balance and policies to promote the development of suppliers outside of South Africa. This includes general measures such as improvements in the regulatory and investment environment, and better infrastructure. Improving the regional market through supplier development is also critical for South African agro-processing firms.

Rambe and Agbotame (2018) published a paper that highlights the influence of foreign alliances on the performance of small-scale agro-processing businesses. The study conducted a survey of 151 Small Scale Agricultural Business (SSAB) owners and/or managers in the study area. One of the findings was that SSABs with foreign alliances outperformed those reliant on domestic links. For example, the establishment of some form of foreign alliances among agri-businesses is statistically significant when it comes to the performances of those businesses. This indicates the importance of foreign alliances in the success of agro-processing firms. Aside from the alliance, researchers such as Louw, Jordaan, Ndanga and Kirsten (2008), in their case study research, suggest that integrating small-scale farmers into the urban retail market can be a success factor for the growth of small-scale farmers and agri-food suppliers.

Macdonald and Rowarth (2013) conducted an academic literature review, examining international growth strategy within the framework of Lewis et al. (1991) to analyse three companies: Ravensdown, Dairy Goat Co-operative (DGC) and Fonterra. The study prepared individual case studies from company reports and interviews with key industry people. Macdonald and Rowarth (2013) identified the following success factors for agribusiness when going global: Control; Adequate access to capital; Value chain analysis; Customer relationships; Long-term competitive advantage and Effective governance and communication. Macdonald and Rowarth (2013) further found that due to its intangible nature, cultural understanding is frequently overlooked by firms during the offshoring process. Therefore, to support the success factors listed above, a broad cultural understanding is required.

A paper by Johnson, Suarez and Lundy (2002) characterises and measures the contribution of social capital to the performance of 50 Colombian agri-businesses. They document, using qualitative analysis, how social capital performs a variety of functions in firms, such as providing access to information through networks of contacts, lowering transaction costs in contracting through trust, and sustaining capacity for collective action. The results suggest that while firms can improve their economic performance by investing in social capital, institutional

and technological innovations that mitigate the effects of market failures and the use of social relationships for business purposes could also improve equity and efficiency.

A research study by Deloitte (2011) on Deloitte Africa Agribusiness Unit (DAAU) identifies four critical factors in African agro-businesses. These factors include contextual considerations (country risk, industry risk, security of tenure, legal system, climatological factors, prevailing agricultural landscape, market access), funding, experience (right management to execute the strategy) and technology. This continues to show that most CSFs are unique to projects. Another study by Van Lin, Van den Bos and Sterras (2018) identifies similar CSFs that are important for success in agro-processing industry. Van Lin et al. (2018) identifies market access (regulatory and commercial requirements, national and international market), processing technology access (food innovation, production, and equipment) and access to finance (public/private), access to skills and information (job creation and market information), access to input (quality and quantity, price, national vs international) as factors influencing (SMME) growth in fruit and vegetable agro-processing.

Every day, new agro-processing companies are founded. Many of them grow into large corporations, even exporting some of their products to foreign markets. However, some of these agro-processing businesses do not last long before going out of business. There are many factors and reasons why there is a high failure rate of businesses in agro-industry. Swai (2017) conducted a case study that sought to understand CSFs that affect the growth of small and medium agro-processing firms in Tanzania. The study focused on a sunflower oil processor in the town of Dodoma. This research identified that management skill, financial resources, raw materials, technology, government policy and regulations, market accessibility and competition and demand as factors affecting growth of small and medium agro-processing firms. Meanwhile, Wanjau, Wambugu and Mung'atu, (2015) and Wambugu, Gichira, Wanjau and Mung'atu (2015) investigated the relationship between risk taking and performance, as well as the relationship between proactiveness and performance of small and medium agro-processing enterprises in Kenya, respectively. The above studies found that these two characteristics, risk taking and proactiveness, are very important tenets for the realisation of a high performance and success in entrepreneurship.

Agro-processing firms that last long do so because of the factors identified by Swai (2017) in the paragraph above. However, those factors identified above do not tell the complete story. Agriculture based firms need a strong and dedicated team to ensure that objectives are met.

Boakye (2013) confirms the importance of good management and leadership when investigating why donor funded agro-processing firms were struggling to deliver, with no sign of improvement. Boakye (2013) identifies appropriate project teams and the use of multiple control modes as critical success factors for agriculture-based international development projects. In a different study, Julie (2019) used a regression model to investigate the impact of internal control practices on the financial performance of agro-processing firms in Kisumu County, Kenya, and found a positive relationship between the internal controls environment, risk assessment, monitoring, information and communication, control activities, and financial performance of agro-processing firms.

The trend of large numbers of new entry firms in the space of agro-processing prompted an investigation of why there is a huge interest in this industry. These studies sought to understand not only the drivers of this industry, but also the factors associated with the likelihood of success or failure for many of these new entry firms. One particular study by Bruntrup, Swetman, Michalscheck and Asante (2013) discovered interesting findings. Bruntrup et al. (2013) investigated the factors of success and failure of large agro-enterprises. In the study, Bruntrup et al. (2013) identified the success factors on five levels: entrepreneur, enterprise, local environment, natural environment and international environment. Under entrepreneurs, factors such as personal characteristics, business exposure, personal access to credit and political connectedness were found to be crucial in the agro-industry. For enterprise, factors such as specialisation versus diversification, enterprise size and growth, energy, water, waste-integrated systems of their management, cultivation on own land, access to land, enterprise's access to credit and staff considerations were found to be important as well. Under the local environment the study identifies the following tenets: electricity and water supply, waste management, staff availability, raw material suppliers – out growers, local private-public-partnerships, local impact of climate change, local infrastructure and local community relations.

Under the natural environment the study found these factors to be more pertinent: land market, infrastructure, public facilities and their institutional set up, national standards and their implications, lack of import protection, exchange rate regime and inflation (competitiveness), government support, agricultural and business innovation system. Lastly under the international environment the study found the following factors: strict regulation in the international market, rapid changes on international markets, foreign government subsidies and (limited) policy space for corrective import measures, and donor support.

According to a survey of fruit processing industries in Indonesia by Suryaningrat (2016), continuity and raw material resources were identified as very strong factors in raw material procurement of fruit processing industries. A paper by Asokan and Singh (2003) suggests that contract farming is becoming an important procurement tool for agro-processing companies. Odoyo (2013) conducted a survey of 400 agro-processing/value-addition groups and individuals, as well as all 22 technical experts providing agro-processing training and advisory services in Bureti District, and discovered that advanced manufacturing equipment, manufacturing skills training, access to automated functions and managerial skills training were factors that led to a positive impact on the growth of smallholder agro-processing.

Lambert's (2001) research found that preventing constraints through sustainability and availability of raw materials, research and technology and technical support for agro-industrial development and management, finance and marketing support mechanisms are critical for the success of agro-processing. Mutua (2014) used a questionnaire approach to identify government policy, educational, socioeconomic, and technological factors influencing the implementation of agricultural projects funded by microfinance institutions in Machakos County, Kenya. The study found a long list of factors that are critical for the success of projects. These factors are: technological advancements (intensive use of agricultural tools and modern management techniques), workforce (use of skilled labour with investment in training and differentiated pay), quality (designation of origin and coordinated communication efforts concerning the regional coffee), management of costs and productivity (increasing number of producers adopting modern tools for cost and productivity management), obtaining funding (access to the governmental rural credit programme and other alternative forms of finance), commercialisation (the use of various sales channels [cooperative, direct trade, and exporting], as well as risk-management tools such as forward contracts and derivatives), sustainability (conformity, as well as bureaucratic processes) and legislation (increasingly important for farm management – need for specialised support).

de Almeida and Zylbersztajn (2017) found that lower-skilled labour and technology such as good transportation systems, storage facilities, and financial systems, as well as access to basic infrastructure (e.g., electricity, road networks from farming communities to urban and peri-urban markets, irrigation facilities) have been identified as factors that make the agricultural and agro-processing sector more conducive to success in Ghana (Owoo and Lambon-Quayefio, 2017). According to Gandhi (2014), reaching large numbers of small farmers and efficiently

procuring quantity, modernising farming through adoption of good technology for quantity and quality, investing in modern processing technology and meeting its high capital requirement, delivering a strong marketing effort, and organising ownership, management and control are success factors for a good agri-business model.

Dlamini, Kirsten, Masuku (2014) used a questionnaire to identify factors such as the production of affordable high-quality products, the availability of water for industrial purposes, and the low cost of unskilled labour to improve the competitiveness of Swaziland's agri-business. Furthermore, Ngenoh, Kurgat, Bett, Kebede and Bokelmann (2019) used multivariable probit regression analysis, and the results show that coping with shocks, along with access to information on market prices and warnings of unexpected events, contract farming, certification and modern irrigation technologies, are the main conditioning factors for smallholder African indigenous vegetable farmers' access to the pillars of competitiveness.

The main drivers of agri-business investment in Ethiopia, according to Ayele, Ayele, Nigussie and Thorpe's (2019) research, are investors' (businesses' or individuals') motivations and experiences, market potential for growth and profit, availability of suitable agricultural land and water for irrigation, infrastructure, and the country's peace and stability. Christian (2015) identifies the perceived critical success factors and their prioritisation for accurate and well-focused performance action of African agri-businesses using a case study from the Democratic Republic of the Congo. In Kinshasa, an investigation was conducted on 259 businesses, and the critical success factor methodology was used to seize and categorise all perceived factors from entrepreneurs. This resulted in 45 identified CSFs emerging throughout the operational channel of SMMEs and being classified into four groups: externalities, strategy, finance, and organisation. The Analytical Hierarchy Process was used to prioritise these CSFs according to the operational channel sections of supply chain, production and distribution. Importantly, the findings show that the supply chain is the most critical path, while finance is the most critical axis, followed by strategy, externalities, and organisational axes.

Nuamah (2014) conducted a case study of Blue Skies Products Ltd. in Nsawam, Ghana. In the study, Nuamah (2014) discovered that stable power supply and the availability of foreign exchange are critical for the success of agro-processing. He also recommends that local governments promote integrated industrialisation by ensuring that agro-industries combine a mix of job creation and occupational diversification, as well as land reforms, credit system reorientation, and massive public investment in rural infrastructure, to ensure the success of

agro-processing firms. Jordaan's (2012) research on the agro-processing industry in South Africa identified infrastructure provision and a favourable trade policy, grades and standards, connecting small farmers to formal markets, business development services, incentives and support programmes as an important enabling environment for competitive businesses to thrive.

Nkwabi, Mboya, Nkwabi and Nkwabi (2019) employed a mixed approach using content analysis as well as descriptive statistics to determine that lending institutions should lower interest rates for processors to make funds available to them, allowing various processors to acquire up-to-date technologies that will speed production, reduce costs and increase profitability. Furthermore, storage facilities should be improved to allow for the preservation of raw materials and processed foods in order to ensure food security in the country, as these are critical factors for the success of agro-processing in Tanzania.

According to Koira (2014), more agribusiness workers are needed to increase the value of products, develop businesses, and build the capacity to adapt to change. Farmers require networks to connect them to new technical ideas and markets. This can be accomplished by improving post-harvest operations, storage, distribution, and logistics, as well as strengthening links with industry through agro-processing and value addition to agricultural products. According to Sjauw-Koen-Fa, Blok and Omta (2016), there are two types of CSFs for smallholder inclusion in high value-adding supply chains and these are: external and internal. Sjauw-Koen-Fa et al.'s (2016) study focused on Food and Agri-business Multinational Enterprises. The study found internal factors such as selection of smallholders suitable for a viable business case to secure (long-term) sustainable supply, building partnerships for upgrading, building a captive governance structure based on cooperative 'buyer-seller' relationship, building effective producers' organisations, and providing access to farm finance are examples of external factors. In all of these, the presence of a proactive Corporate Social Responsibility (CSR) strategy supported by a committed top management and use of cross-functional sourcing teams led by procurement, including CSR, are considered internal organisational CSFs.

The world population is increasing at an exponential rate every day. Demand for food products is increasing. As a result, the agriculture and agro-processing industries have never been more important. Countries produce and export food that they can produce at a more competitive cost compared to other countries. Chryniwicz, Kyryliuk and Wojtaszek (2017) conducted a study to understand factors that determine competitive advantage in agro-processing. Based on

World Bank and State Statistical Service of Ukraine data analysis, Chryniewicz et al. (2017) identified nine key macro factors to increase agricultural competitiveness in Ukraine: technology production processes, productivity, management personnel qualifications, experience in marketing, investment, the intensity of competition in the internal market, the volume, structure and nature of demand, the development of information infrastructure and use of scientific and technological achievements. Chryniewicz et al. (2017) also suggested that to gain a sustainable competitive advantage, firms should shift their focus away from comparative advantages (such as natural resources, fertile land, and cheap labour) toward competitive advantages based on a developed institutional environment, new organisational and institutional forms, unique products, and technologies.

Meena, Prasad and Singh (2009) conducted a personal interview with agro-processors in the Punjab state in India's north-western region and identified constraints perceived by rural agro-processors in adopting modern post-harvest technologies. They proposed that implementing the seven factors listed below would aid in avoiding these constraints and lead the agro-processing industry to success: These success factors include: the formation of social capital at the cluster level, as well as the transfer of technology through them; the provision of needs-based and skills-oriented training; long-term institutional credit support; a market-driven and decentralised extension system and an emphasis on high-value enterprises through the provision of technology-based entrepreneurship development programmes; use of an appropriate media mix at the rural level and creation of awareness about post-harvest technologies and government schemes via mass media.

2.4 Review of Common Methodological Approaches in Identifying CSFs

All research undertakings consist of several phases. These phases include the selection of the topic of interest, collection of data, designing of data processing methodology and presenting of findings. All the above must be done within accepted academic standards and procedures. The process of identifying CSFs requires the application of a set of tools and rigorous methodologies. This process is collectively called research, which is the process of investigating and solving problems by applying scientific techniques to find solutions (Walliman, 2015).

Any research requires discipline and accurate administering of technical procedures. The evidence of the above is reflected on the research results (Walliman, 2015). It is crucial that during any phase of this procedures, the researcher minimises the risk of errors as much possible in order to obtain credible findings (Brink, 1989). Data and methodology aspects

provide a focus for the discussion below. This section reviews several techniques or methodologies that are commonly used when investigating CSFs. There are many techniques that can be used to investigate CSFs. Table 2.2 below lists these types of methodologies and examples of studies in which they were applied. However, this research only aims to provide an in-depth review of the commonly used CSF identification approaches, and also highlights their key advantages and disadvantages (Interviews and group discussions, the questionnaire approach, and the case study).

Table 2.2 below depicts the types of methodologies that are used in the literature to identify CSFs

Table 2. 2: Types of methodologies used in the literature to identify CSFs

Research Methods	Authors
Interviews	Bruntrup et al (2013), de Almeida and Zylbersztajn (2017), Meena et al. (2009),
Case Studies	Black et al. (2020), Bruntrup et al. (2013), Koech (2014), Louw et al. (2008), Macdonald and Rowarth (2013), Van Lin et al. (2018),
Combination of Methods	Ayele et al. (2019) [The study was based on five case studies of agribusinesses and in-depth interviews with business leaders, ten key informant interviews, and a review and synthesis of academic and grey literature on Ethiopia], Gandhi (2014) [Questionnaire, interview and literature review], ILO (2017) [Interview and literature review], Louw (2013) [Interview and structural questionnaire], Nkwabi et al. (2019), Oduyo (2013) [Questionnaire, interview and literature review], Swai (2017) [questionnaire and document review],
Questionnaire	Christian (2015), Dlamini, Kirsten, Masuku (2014) ,Julie (2019), Kaikkonen (2006), Mutua (2014), Nuamah (2014), Rambe and Agbotame (2018), Suryaningrat (2016), Wanjau et al. (2015),

Literature Review	Boakye (2013), Chryniewicz et al. (2017), Kumar (2016), Ouma and Whitfield (2012), Sjauw-Koen-Fa (2016)
Multivariate Analysis	Ngenoh et al. (2019)

2.4.1 Interviews and group discussions

The interviews and group discussions approach are the most popular approach in qualitative, investigative research. It comes with a great reputation as different professionals in academia have employed this type of standardised interview standard for centuries (Gorden, 1975). However, one of the biggest challenges with this method of data collection process is attaining credibility, and this means addressing all issues of validity and reliability (Brink, 1989). This method can take many different forms depending on the objectives the research intends to arrive at. The most common type occurs in the form of a two-person conversation in a controlled and structured manner (Akbayrak, 2000). The purpose of the conversational approach is to collect data; therefore, while it is an open-ended exchange between two parties, researchers must ensure that the conversation must not deviate from the topics of interest (Gubrium and Holstein, 2002). However, the researcher can expand and advance on submissions from the interviewee if those issues are relevant and of interest; hence it is called structured (Gubrium and Holstein, 2002).

One key point that is worth emphasising is consistency in interviewing techniques. It is important that the set of questions asked in the interviews is standardised for all participants. If this is the case, Gorden (1975) posits that the difference in answers is due to different respondents and not influenced by the way the question was constructed and presented to the participant. This is called standardising the stimulus (Smith, 1975). The fundamental assumption in this argument is that all participants have a common vocabulary and understand the meaning of all words in the questions the same (Nay-Brook, 1984). Thus, in order to achieve reliability in this type of method, the researcher must not necessarily repeat the same words for each participant but communicate these words with same equivalence of meaning (Denzin, 1989). Of course, in cases where it is clear that participants may not understand questions the same way, then a different technique must be used to retain and maintain the integrity of the results. In such cases, researchers can use alternate procedures in the form of a binary technique. In the binary interviews, the interviewee answers a series of questions by

giving yes or no answers (Lune and Berg, 2017). Alternatively, the interviewee can give 1 or 0 as answers to questions (Lune and Berg, 2017). This form of questioning is highly structured and restrictive.

While a two-person conversation type of interview is desirable, another more common form that allows the researcher to collect more data about the topic of interest is group discussions. Group discussions or focus groups are a type of interview technique that involves bringing together a group of individuals selected based on a certain criterion, to discuss a topic of interest, provided by the researcher (Powell and Single, 1996). In the group discussion interviews, the researcher obtains rich information such as respondents' feelings, beliefs, experiences, reactions, and triggers, when discussing a particular issue. It allows for probing and seeking for clarification when needed. The minimum number of people involved in a discussion is three participants (Adams and Cox, 2008). Below is a list of advantages and disadvantages of interviews and group discussions, as found from Adams and Cox (2008), Akbayrak (2000), Bowling (2005), Kumar (2011) and Luna-Reyes and Andersen (2003).

Advantages:

1. Semi-structured option allows for researcher to deviate or follow up on issues (Akbayrak, 2000; Kumar, 2011);
2. Interviews produce reliable responses;
3. Interviews have a high response rate because only parties who really want to be part of the study take part in it;
4. The one-to-one interview allows opportunities for the respondent to open up about sensitive or personal issues because of the trust established between them and the researcher; and
5. Focus groups allow for a collaborative spirit to take charge in a group, allowing participants to open up even more if their opinions are shared by others.

Disadvantages:

1. Require time, planning and are expensive;
2. High attrition rate amongst participants;

3. Difficulty of finding appropriate participants who are fitting and willing to take part in the study;
4. Decoding and organising responses are long and tedious, and sometimes difficult; and
5. Group discussion responses are prone to confirmation biases.

2.4.2 The questionnaire approach

An alternative to interviews is the questionnaire approach, which is an information gathering technique that involves answering of a series of related questions of interest from participants. This is the simplest of all approaches because it requires recording and sorting of information from the respondent (Akbayrak, 2000). This method can be administered in different forms, it can be administered via the telephone, or websites or be paper based. There are many things to consider when designing survey questionnaires. These include but are not limited to research objectives, data collection methods, writing style of questionnaire, structure and flow of questionnaire document (Ikart, 2018). The questionnaire must be informed by the research topic, research aims and research objectives. Questions must be clear, specific and easy to understand. It is important to include different types of question options such as multiple choice, ratings, scales, rankings, closed-ended and open-ended questions (Ikart, 2018, p.3).

The researcher must be meticulous when designing these sets of questionnaires. Questions must be short, precise, understandable, and unambiguous (Adams and Cox, 2008; Akbayarak, 2000;). Participants are more likely to not complete questionnaires that are long and non-engaging. The drop-off rate in completing surveys is high for respondents who are not interested in the topic, not paid or if the questions are too difficult to answer (Ikart, 2018:3). If the questionnaire meets the above conditions, then it is likely to produce reliable and valid information. The questionnaire approach is preferable because the respondents answer a set of questions by themselves with minimal invigilation from the researcher. Therefore, results are less influenced by external influences such as in the interview approach. Granted, there could be elements of bias that may be inherent in the design of the questionnaire itself (Adams and Cox, 2008). Therefore, the last decades have been characterised by the move to instilling quality into survey questionnaires through the process of pretesting. This quality building is for operational purposes but has also been informed by work in cognitive psychology and social psychology (Ericsson and Simon, 1984). Below is a list of advantages and disadvantages of the questionnaire approach, as found from Adams and Cox (2008), Akbayrak (2000), Bowling (2005), Kumar (2011) and Luna-Reyes and Andersen (2003).

Advantages:

1. Cost effective;
2. Easy to collect and analyse data;
3. Requires minimal training to conduct;
4. More likely to have a complete representative sample of participants; and
5. Anonymity leads to more accurate and reliable responses.

Disadvantages:

1. Questions can be biased, depending on how they are designed;
2. Lack of researcher involvement guiding the responses may lead to unreliable results;
3. Questions can be misunderstood or misinterpreted;
4. High risk of low responses;
5. Likelihood of incomplete answering of questionnaires, leading to unrelated results; and
6. Difficult to verify responses of participants who might not answer questions honestly.

2.4.3 The case study approach

The distinctive factor in the case study approach is context. This approach involves an investigation of a particular phenomenon within the boundaries of a particular setting (Chih-Pei & Chang, 2017). The case study method is highly scientific and exhaustive compared to the other two approaches reviewed above. This approach is utilised to gather in-depth information about complex, real-life issues, from a multi-faceted perspective (Yin, 1981). Below are the advantages and disadvantages of the case study approach, as found from Bazeley (2004) Dubois and Gadde (2002), Flyvbjerg (2006), Gable (1994), Yin (1981), and Zainal (2007).

Advantages:

1. Allows for a drill-down examination of issues;
2. Can be used in a qualitative or quantitative study;
3. Provides detailed insights from a micro-level perspective; and
4. Can be useful for generating and testing null hypotheses.

Disadvantages:

1. Lacks robustness if only cases study is relied upon in a study;
2. Can be an expensive undertaking;
3. Can lack rigour in data collection and interpretation;
4. Can be time consuming, difficult and tedious; and
5. Requires high level of expertise.

In general, each methodology has its own set of advantages and disadvantages. The ability of each methodology to address the research objective determines which methodology is chosen.

2.5 Chapter Summary

The chapter has discussed CSFs in agro-processing sector. The literature has revealed factors which are necessary for successful agro-processing projects. The most common CSFs include finance and funding, management, procurement of raw material, infrastructure, marketing, supply chain management, government policy and technology. The chapter also discussed commonly adopted approaches used in the identification of CSFs. These methodologies include interviews and group discussions, the questionnaire approach, and the case study. The next chapter will discuss the methodology used for the research.

3.1 Introduction

The previous chapter reviewed the CSFs of agro-processing projects in existing literature, common methods used to identify these CSFs, as well as their benefits and drawbacks. Focus groups, questionnaires, and case studies are some of the most commonly used methods. The majority of previous research papers used qualitative research methods in order to discover critical success factors. For most of the reviewed papers, participants were the only source of data (information), and this information was analysed and interpreted by the researchers. These methodologies assumes that the researcher has an in-depth understanding of the phenomenon in order to interpret the data of the participants. It also makes the research prone to personal bias.

Due to the exploratory nature of this study, which aims to find CSFs that are considered social artefacts, it adopts a qualitative research approach capable of identifying both CSFs and their relationships. However, unlike other qualitative methods, the method used in this research minimises researcher bias while accomplishing the goals of the study.

An Interactive Qualitative Analysis (IQA) research design is used as it fits the above criteria. IQA is a research method developed by Northcutt and McCoy (2004) and combines two central goals which are to investigate the elements that make up a system and their relationships, and to translate this theory into research practice. It is a qualitative research approach that seeks to provide a systemic, rigorous, and reliable framework that is suitable for studies in which researchers wish to examine how phenomena are socially constructed (Northcutt and McCoy, 2004). Unlike other methods, in IQA participants analyse their own data and build structural representations of the influences and outcomes; hence it is less prone to researcher bias.

The chapter begins with section 3.2, which provides a brief overview of IQA. It is then followed by section 3.3, the ideology of IQA (Ontology and Epistemology). Section 3.4 covers a detailed step-by-step description of how the methodology was designed and applied. Section 3.5 discusses strengths and limitations of IQA as a research method and the chapter concludes with sections 3.6, and 3.7, which discuss the rigour of the methodology and ethical considerations in the study, respectively. This chapter uses figures from (Northcutt and McCoy (2004) for discussion.

3.2 Interactive Qualitative Analysis

IQA is a qualitative research design that uses focus groups to collect data on a subject and configures the data into a systematic structured representation to derive insights (Northcutt and McCoy, 2004). It is a useful tool utilised to understand social and organisational phenomena or outcomes, as well as their causal factors (Northcutt and McCoy, 2004). Most researchers use the IQA to build theories of change that can be applied in other similar settings, with the aim of replicating observed phenomena.

The Total Quality Management (TQM) methodology, developed to gather knowledge from organisational members to solve issues and improve industrial processes, gave rise to IQA data collection/analysis tools. TQM assumes that people closest to the task have the best understanding of what is wrong and how to correct it. Similarly, the IQA method of data collection allows members of a group close to a phenomenon of interest to describe and label their experiences, as well as indicate perceived linkages among these experiences, to build a theory of perception or a conceptual map (Northcutt and McCoy, 2004). "IQA challenges the traditional assumptions of qualitative research that participants' role is to create data that only the researcher is equipped to analyse" (Bargate, 2014, p.12). This would ensure the rigour of qualitative research by promoting trustworthiness, dependability, and confirmability (Davis, 2019).

3.3 The Ideology of IQA

Section 3.3 explores the ontological and epistemological assumptions of the IQA. The section discusses how these crucial pillars of the IQA inform the research method and design.

3.3.1 The ontological perspective

An IQA research approach is consistent with a socially constructed ontology and acknowledges that many phenomena are social constructs endowed with social meaning (Northcutt & McCoy, 2004). The essential constructs in this work, such as CSFs, are referred to as social artefacts.

Northcutt and McCoy (2004, p.40-41) explain that during IQA research, "the researcher attempts to uncover the workings and relationships of social systems with analytical assistance of the research participants" and this is done as it "facilitates group processes and focus groups to create representations and therefore offers a chance to create a quilt of meaning" (Northcutt & McCoy, 2004, p43).

3.3.2 The epistemological perspective

IQA's epistemological assumptions are socially constructivist in nature. Social constructivism asserts that individuals learn about and comprehend their communities through the process of social creation of meaning (Davis, 2019). Because data collection, analysis, and interpretation take place in focus groups, reality is socially produced by group members.

IQA maintains that both deduction and induction are necessary components of meaning exploration (Northcutt & McCoy, 2004, p.16). In IQA, constituents in focus groups socially form meaning categories or affinities through induction. The constituents then define and refine the affinities (induction and deduction). In the final stage, participants investigate the relationship between constructs deductively. The IQA coding method correlates to the three classic categories of coding analysis – emergent, axial, and theoretical (Northcutt & McCoy, 2004, p.16). Moreover, “IQA contends that *decontextualized* descriptions are useful and possible as long as they are backed up or grounded ... by highly contextualized ones” (Northcutt & McCoy, 2004, p.17). The researcher assists the reader by providing context for the research. Northcutt and McCoy (2004) use Denzin and Lincoln's (1998, p.3) metaphor of the bricoleur as quilt maker to illustrate this point. The group then creates its own interpretive quilt of meaning, or bricolage, using IQA.

3.4 The IQA Processes

The first step in the IQA process would be to select eligible participants and create focus groups that would produce affinities from a collection of thoughts (affinities). Then the researcher would use the affinities to build an Affinity Relationship Table (ART). The ART is then used to create an Interrelationship Diagram (IRD). The next step is to create a cluttered and uncluttered System Influence Diagram (SID). The last step of the IQA process then uses the created SID to interview participants to get further information. Northcutt and McCoy (2004:41) state that “The product of an IQA study is a visual representation of a phenomenon prepared according to rigorous and replicable rules for the purpose of achieving complexity, simplicity, comprehensiveness and interpretability.”

The process is outlined in figure 3.1 below:

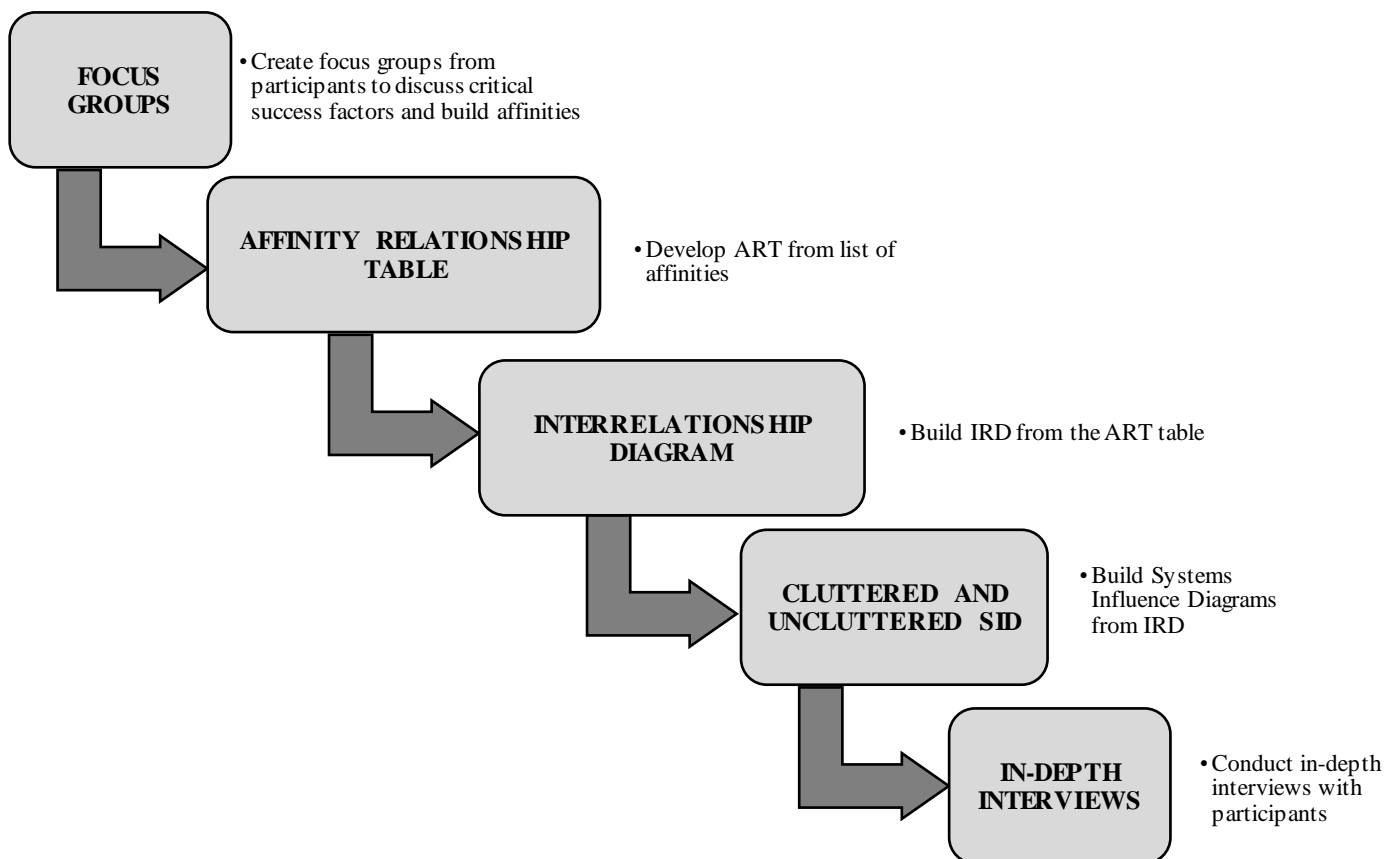


Figure 3. 1: The IQA Process of Creating SID (Northcutt & McCoy 2004)

3.4.1 Eligibility and selection

The constituents of this study were first selected according to the criteria of “distance and power” (Northcutt & McCoy 2004, p.69) to the phenomenon. Only participants with the closest distance and highest power (knowledge) of the phenomenon are selected. Only individuals with at least six years of experience in export oriented agro-processing projects in Ethiopia were invited to participate in the focus group discussion. This ensured that the participants are very close to, and knowledgeable about, export oriented agro-processing projects in Ethiopia. This implies that the selection is first about commonalities rather than differences when designing the composition of the group. Participants were chosen based on the researchers' perceptions of their abilities to answer the study question and achieve the focus group activity's objectives, as advised by Saunders, Lewis, Thornhill and Bristow (2015).

Provided that the above-mentioned criteria (“distance and power”) for the selection of constituencies are met, a non-probability convenience sampling technique was used to invite participants based on their location (near and around Addis Ababa)(Cooper & Schindler, 2003).

3.4.2 Sample size

In total, 13 of the 23 invited focus group participants confirmed their attendance, but only 11 actually attended the focus group, resulting in a 48 percent favourable response to the original invitation. A focus group should consist of between 8 and 12 participants (Babbie & Mouton, 2004; De Vos, Strydom, Fouche, & Delport, 2005; Mangioni & McKerchar, 2013; Welman, Kruger, & Mitchell, 2005): therefore, the number of participants was adequate.

Northcutt and McCoy (2004) do not invalidate studies conducted with smaller groups but recommend that the ideal number of participants should be between 12 and 20 (Behling, Lenzi, and Rossetto, 2022, p.5). The reason for this is that, while a smaller number of participants do not pose an issue during the affinity generating stage, the smaller the number of participants, the more one participant's decision will influence the data during the theoretical coding stage (for example, in a focus group of five participants, one person can influence the data up to 20%).

In this case in a focus group of 11 people, each participant had a 9.1 % influence on the data. This allows an adequate variation when participants have to vote on the relationships between variables (theoretical coding) while being small enough to explore complex topics.

3.4.3 Focus groups

The focus group approach is a method by which small groups of participants organise themselves and discuss the 'what', 'why' and 'how' of the research questions. The focus group method is complex and costly because the facilitator needs to be there in person in order to monitor the efficiency of the groups. The focus group technique manifests itself in the form of group debates, opinions and interaction within group members (Northcutt and McCoy, 2004).

On the preparation to the focus group session, a standard warm-up exercise was conducted. The facilitator led a group discussion on the issue statement, and the participants suggested a structure of identifying the CSF's that is used during the silent nominal phase that follows.

During the focus group session, the facilitator uses a problem statement to deconstruct and operationalise the research question. The facilitator posed the research question: "What are the critical success factors of export-oriented agro-processing projects in Ethiopia?" Participants discussed the issued statement, reflected on their experiences about it, then wrote their thoughts on post-cards discreetly. Silence and privacy reduced undue influence from peers in the focus group or by the facilitator. It is important that the process is conducted discreetly so that discussion does not influence individual responses. This prevents hierarchical influences and domineering tendencies by members of the focus group, and thus ensures authenticity and

individuality of thoughts and reflection about the issue statement. This is the brainstorming part of the data collection (Northcutt and McCoy, 2004, p.69). Members of the focus group are encouraged to use as many cards as they want in addition to the ones they were provided with.

After the silent nominal group process, the focus group members are instructed to tape the post cards on the wall in rows and columns where everyone can view them. Then they begin the process of analysis.

3.4.4. Affinities analysis (clarification)

The facilitator assisted participants in clarifying their understanding of the responses on each card in order to eliminate any ambiguity or vagueness regarding the meanings of the words or phrases on the cards.

The study facilitator continued the data clarification process by reading each response aloud for the entire group to evaluate. If the listed CSF is not clear, the participant who wrote the card (CSF) explains the meaning to other participants. The objective is to reach a socially constructed, common meaning for each card among group members. Each focus group participant reflected on each card in order to establish clarity and unanimity on the meanings of the terms.

Following the clarification, participants may choose to add additional reflections and thoughts to the index card. The facilitator promotes more response generation and, if necessary, a second clarification discussion to verify that the responses accurately reflect the group members' individual and shared experiences with the issue statement.

3.4.5 Inductive coding and axial coding

3.4.5.1 Inductive coding (clustering)

Inductive coding is the process of reviewing and grouping thoughts into categories of similar themes (Northcutt and McCoy, 2004). The process of grouping thoughts occurs purely by trial and error. This means that participants are free to move thought cards in and out of certain categories until they are satisfied. When the majority of the ideas have been clustered, the facilitator assisted the participants in identifying an appropriate label for each cluster or affinity, and further to identify labels for subcategories within each affinity. The intent of this process is to categorise data into thematically organised groupings, referred to as *affinities*. This process too was completed in silence to avoid domination by strong personalities or monopolization by the facilitator.

3.4.5.2 Axial coding (Refining)

The purpose of axial coding is to name, reorganise, clarify, and refine the affinities. Constituents evaluate the post-it notes assigned to each grouping to ensure they were assigned to the appropriate themes. This is accomplished through group discussion and consensus building. The group refines and narrows the descriptions until everyone believes that the definition accurately captures the essence of the affinity. Each themed grouping was labelled with post-it notes. Finally, each affinity was formulated into a description of the themes by using the post-it cards.

Figure 3.2 shows a sample arrangement of affinities after the axial coding.

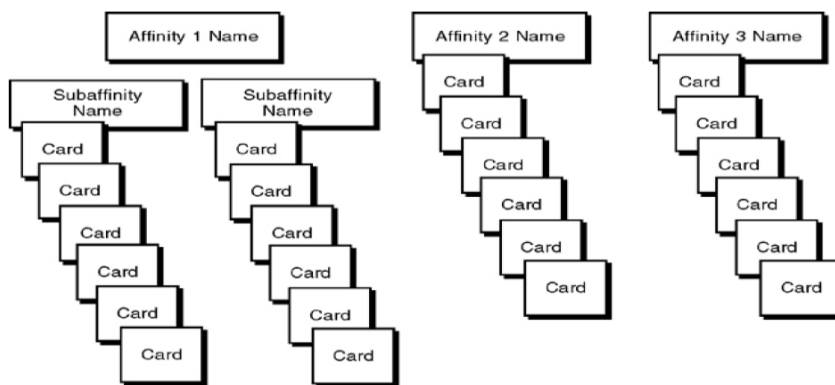


Figure 3. 2: Affinity Analysis (After Inductive and Axial coding) (Northcutt & McCoy, 2004)

After identifying affinities, the next step is to create a thorough affinity relationship table.

3.4.6 Affinity relationship table (ART)

An Affinity Relationships Table (ART) is constructed from the themes or affinities obtained in the focus groups. In the ART, all focus group members are required to tell what they think is the relationship between all the affinities. It is important to note that participants are not accounting for the degree of strength of the relationship between two affinities. They are merely pointing them out as they understand and perceive them to exist. Table 3.1 shows an example of a Simple Affinity Relationship Table to be completed by each participant.

Table 3. 1: Simple Affinity Relationship Table (Northcutt & McCoy, 2004)

<p style="text-align: center;"><i>Affinity Name</i></p> <p>1. 2. 3. 4. 5. 6.</p>	<p style="text-align: center;"><i>Possible Relationships</i></p> <p style="text-align: center;">A → B A ← B A <> B (No relationship)</p>
--	--

<i>Affinity Pair Relationship</i>	
1	2
1	3
1	4
1	5
1	6
2	3
2	4
2	5
2	6
3	4
3	5
3	6
4	5
4	6
5	6

Each focus group member was asked to determine the nature of the relationship between all possible pairs of affinities. There are only three possible relationships between two affinities A and B: Either A has a direct influence on B, or B has a direct influence on A, or A and B have no direct influence on one another. The following summarises these Hypothesising Rules:

For any 2 affinities A and B, either

A → B (A influences B)

A ← B (B influences A)

A <> B (No relationship)

After completing the ‘ART’ filling, the focus group session ended.

3.4.7 Pareto protocol

According to the ART, all affinities are related to one another (except with themselves). However, according to the Pareto protocol, some of these relationships are redundant. To find the optimal number of relationships that should compose the IRD, the Pareto protocol statistical method is utilised. It is predicated on the fundamental principle that "a minority of the

relationships in any system accounts for the majority of the variance within the system." (Northcutt & McCoy, 2004, p.157). This optimal number of relationships will occur at the point of maximum power. Each relationship's frequency is computed using individual ARTs, recorded into a spreadsheet, and the overall number of votes for each relationship is calculated. The number of votes for each relationship will be organised in descending order and used to create a Pareto table as shown in Table 3.2.

Table 3. 2: Pareto Table (Northcutt & McCoy, 2004)

Table 6.6 Affinities in Descending Order of Frequency With Pareto and Power Analysis					
<i>Affinity Pair Relationship</i>	<i>Frequency Sorted (Descending)</i>	<i>Cumulative Frequency</i>	<i>Cumulative Percent (Relation)</i>	<i>Cumulative Percent (Frequency)</i>	<i>Power</i>
1. 2 → 3	20	20	3.3	10.8	7.5
2. 1 ← 2	18	38	6.7	20.5	13.9
3. 3 ← 5	18	56	10.0	30.3	20.3
4. 4 ← 6	17	73	13.3	39.5	26.1
5. 2 ← 4	16	89	16.7	48.1	31.4
6. 1 ← 3	15	104	20.0	56.2	36.2
7. 5 ← 6	15	119	23.3	64.3	41.0
8. 2 → 5	13	132	26.7	71.4	44.7
9. 1 ← 6	12	144	30.0	77.8	47.8
10. 1 ← 5	11	155	33.3	83.8	50.5
11. 1 → 3	3	158	36.7	85.4	48.7
12. 1 → 4	3	161	40.0	87.0	47.0
13. 2 → 4	3	164	43.3	88.6	45.3
14. 2 → 6	3	167	46.7	90.3	43.6
15. 4 → 6	3	170	50.0	91.9	41.9
16. 2 ← 5	3	173	53.3	93.5	40.2
17. 5 → 6	2	175	56.7	94.6	37.9
18. 4 → 5	2	177	60.0	95.7	35.7
19. 1 → 2	1	178	63.3	96.2	32.9
20. 1 ← 4	1	179	66.7	96.8	30.1
21. 1 → 5	1	180	70.0	97.3	27.3
22. 3 ← 4	1	181	73.3	97.8	24.5
23. 3 → 6	1	182	76.7	98.4	21.7
24. 3 ← 6	1	183	80.0	98.9	18.9
25. 4 ← 5	1	184	83.3	99.5	16.1
26. 1 → 6	1	185	86.7	100.0	13.3
27. 2 ← 3	0	185	90.0	100.0	10.0
28. 2 ← 6	0	185	93.3	100.0	6.7
29. 3 ← 4	0	185	96.7	100.0	3.3

The first column describes the possible relationships among the affinities, and the second column describes the frequency in descending order of appearance of each relationship indicated by individual constituencies. The third column, provides the cumulative frequency. The fourth and fifth columns show the percentage that each connection represents on the total

of perceived relationships based on relation and frequency respectively. Finally, the fifth column indicates the degree of influence and power of each relationship. Following the Pareto Principle, when the values are filled, it is possible to ascertain that 20% of the relationships are representative of 80% of the results, which, according to Northcutt and McCoy, (2004), gives the researcher the security to discard the remaining relationships and analyse more deeply only 20% of them. From this spreadsheet and the 80% cut, the degree of consensus of the interviewees on the System Influence Diagram was verified, in order to understand what the 20% of causal relations were that affected the 80% of the results. Figure. 3.3 shows a sample illustration of the variance accounted for of the cumulative frequency related to the quantity of affinity pair relationships.

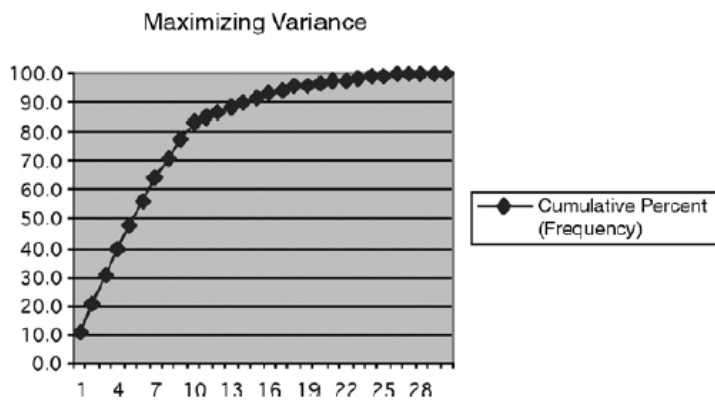


Figure 3. 3: Cumulative percent – Total relationships (Northcutt & McCoy, 2004)

As illustrated in Figure 3.3 in the cumulative percentage versus total relationship graph, only the first few relationships resulted in higher percentages of variation (steeper slope). Following that, the more relationships added, the less variation they represent, resulting in a flat graph.

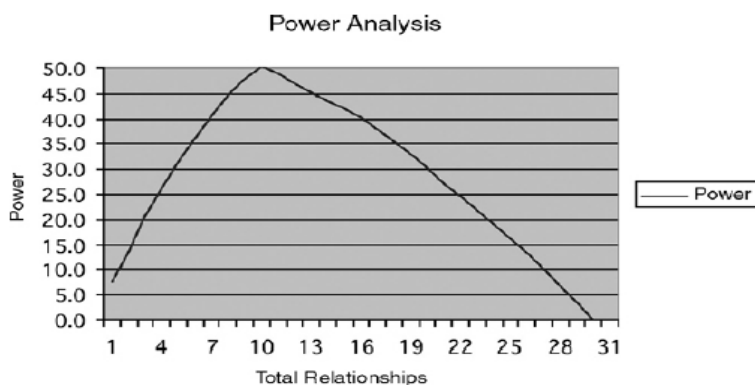


Figure 3. 4: Power – Total relationships (Northcutt & McCoy, 2004)

The power analysis graph is crucial when determining which relationships to include or remove for creating composite group IRDs. The optimal number of relationships is at the point where the power of influence in the system reaches its maximum. As a result, only relationships prior to the graph's maximum point in Figure 3.4 were used to create the IRD. (Only 10 relationships will be included at the point where the power reaches a maximum at 50.5). The remainder of the relationships were eliminated. The beauty of the IQA comes from the trade-off between accounting for "maximum system variation" and "minimising the number of links in the aim of parsimony" (Northcutt & McCoy 2004, p.160).

It is important to note that some of these relationships might be ambiguous relationships such as ($A \rightarrow B$ and $A \leftarrow B$). There are two possible resolutions for ambiguity, according to Northcutt and McCoy (2004, p.171). The first possibility is that both affinity A and affinity B are influenced by an 'undetected shared influence' (affinity) C. As a result, it would create "an undetected feedback loop," which may be discovered while building the Systems Interrelationship Diagram (see Figure 3.5).

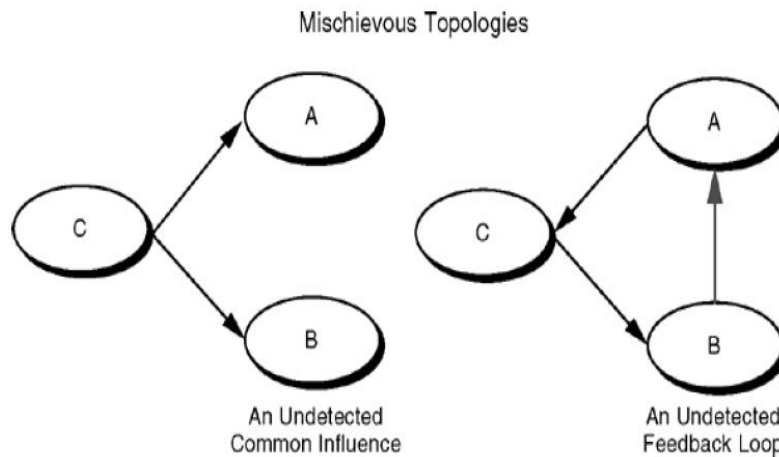


Figure 3. 5: Undetected shared influence (Northcutt & McCoy, 2004)

The second possibility of avoiding ambiguous relationships is to list all the conflicting affinities (ambiguous relationships). Only the conflicting relationships with the higher frequencies are included in the next step, while the relationships with the lower frequencies are eliminated. For example, the $1 \rightarrow 5$ affinity pair has a frequency of two and $1 \leftarrow 5$ affinity pair has a frequency of six; thus, in this case, the $1 \rightarrow 5$ relationship will be eliminated, and the $1 \leftarrow 5$ relationship maintained in the construction of an interrelationship diagram (IRD).

3.4.8 Creating a group composite: Interrelationship Diagram (IRD)

The next step is creating the Interrelationship Diagram (IRD). The IRD is a process of rationalising the system that has been developed. The IRD matrix contains all the listed relationships in the system. It is a more simple and elegant way of representing affinity relationships. The delta category represents values calculated from subtracting the number of arrows facing left (called ‘Ins’), from arrows facing up (called ‘Outs’). The greyed blocks in the grid indicate there is no relationship between the two affinities. This is because an affinity cannot influence itself. The IRD table is presented below in table 3.3.

Table 3. 3: Interrelationship Diagram (Northcutt & McCoy, 2004)

<i>Tabular IRD</i>									
	1	2	3	4	5	6	<i>Out</i>	<i>In</i>	Δ
1		←	←	↑	←	←	1	4	-3
2	↑		↑	←	↑		3	1	3
3	↑	←			←		1	2	-1
4	←	↑				←	1	2	-1
5	↑	←	↑			←	2	2	0
6	↑			↑	↑		3	0	3

The Interrelationship Diagram in Table 3.3 was then ordered by delta (Δ), starting with the largest number, and going down to the smallest. The sorted Interrelationship Diagram is illustrated in Table 3.4.

Table 3. 4: Sorted Interrelationship Diagram (Northcutt & McCoy, 2004)

<i>Tabular IRD: Sorted in Descending Order of Δ</i>									
	1	2	3	4	5	6	<i>Out</i>	<i>In</i>	Δ
6	↑			↑	↑		3	0	3
2	↑		↑	←	↑		3	1	2
5	↑	←	↑			←	2	2	0
3	↑	←			←		1	2	-1
4	←	↑				←	1	2	-1
1		←	←	↑	←	←	1	4	-3

The delta (Δ) value is used to categorise affinities as outcomes, pivots, and drivers (Northcutt and McCoy, 2004). Drivers are affinities with positive deltas, outcomes are affinities with negative deltas and affinities with zero delta values are called pivots. Identifications of

outcomes and drivers is represented by the Tentative Systems Influence Diagram assignments (see Table 3.5). These diagrams help in the creation of the Cluttered Systems Influence Diagram (see Figure 3.6).

Table 3. 5: Tentative Systems Influence Diagram Assignments (Northcutt & McCoy, 2004)

<i>Tentative SID Assignments</i>	
6	Primary Driver
2	Secondary Driver
5	Circulator / Pivot
3	Secondary Outcome
4	Secondary Outcome
1	Secondary Outcome

3.4.9 Focus group Systems Influence Diagrams (SID)

The next and final stage is to draw the System Influence Diagram (SID) in the form of a visual representation. The SID is created from focus groups outcomes. In layman’s terms, the SID is a visual representation of the affinity system built from the IRD (Northcutt and McCoy, 2004, p.175).

The primary drivers were plotted on the far left of the diagram, while the secondary drivers were shown to the right of the primary drivers. The primary outcomes were plotted on the far-right side of the picture, with secondary outcomes plotted to the left of the primary outcomes. The pivot element was in the centre. The Systems Influence Diagram was created using the sorted Interrelationship Diagram (Table 3.4). All of the arrows in the Interrelationship Diagram were also displayed as arrows on the SID. The arrows were pointing in the same way as the sorted Interrelationship Diagram. Thus, if the sorted Interrelationship Diagram showed 6→ 1(6 influences 1), the base of the arrow on the SID would be at 6, with its tip ending at 1. This step was carried out for each relationship in the sorted Interrelationship Diagram. A Cluttered Systems Influence Diagram was the end result (see Figure 3.6).

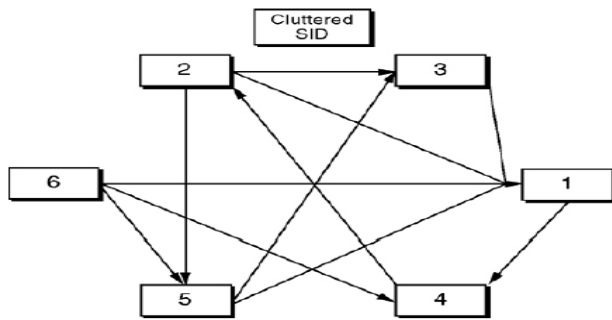


Figure 3. 6: Complex cluttered SID representation (Northcutt & McCoy, 2004)

As can be seen above, the SID was complex and cluttered. Almost all affinities were related to one another. It requires rationalisation, in order for reasonable interpretation to take place. Rationalisation is defined as a process “undertaken to describe the comprehensive, complexity, parsimony or simplicity and visual interpretability” (Northcutt and McCoy, 2004, p.79). Rationalisation is performed to eliminate redundant and weak linkages between affinities in retaining only relationships with strong relationships and meaning. The removal of linkages was carried out in a fairly systematic and transparent manner, resulting in the possibility of only one representation of the system. Generally, the affinity with the highest delta is examined first by examining its direct link to the affinity with the lowest delta, progressing right until all direct linkages are eliminated that could be explained by an indirect link.

After the rationalisation process, the preceding uncluttered SID is produced. Relationships are clearly visible and rational in the uncluttered SID (see Figure 3.7).

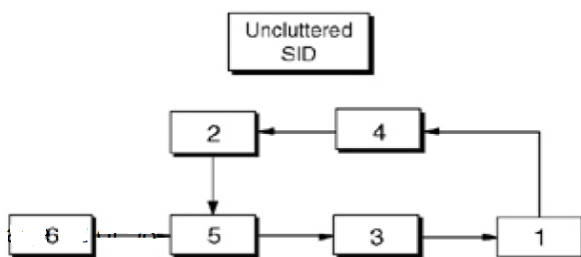


Figure 3. 7: Simple uncluttered SID representation (Northcutt & McCoy, 2004)

3.4.10 Interviews

The research was “Focus group only” IQA research. It was conducted with only focus group and there was no interview conducted for this research. All the quotations of participants are

collected during focus group discussion section. According to Northcutt and McCoy (2004, p.168) “Even though the IQA process is designed to incorporate interviews, limits on resources such as time may prevent interviewing”. The researcher decided to use this approach because it was difficult to gain the participants' time and commitment for an interview. This would compromise the research's rigor because it limits the chance to triangulate data from the focus group. However, according to Northcutt and McCoy (2004) extra care taken with the focus group can produce a good study, albeit not as rigorous and descriptive as a full IQA study.

3.5 Advantages and Limitations of IQA as a Research Approach

One advantage of the IQA is that the participants in focus group activities generate their own themes and then proceed to coding their own data (Bargate, 2014; Human-Vogel & Van Petegem, 2008; Northcutt & McCoy, 2004). The researchers have no influence over the procedure or the results because they are not involved in the data generation or coding process. The researcher acts as an independent facilitator in the focus group activity. One of the potential limitations of qualitative research is the researcher's bias towards the data and its generation (Lasserre-Cortez, 2006). On the other hand, the IQA procedure addresses the possibility of the researcher's bias (Northcutt & McCoy, 2004). As a result, the original expressions of focus group participants are maintained.

Another advantage of IQA is, after identifying and coding the themes, the IQA process examines all the relationship between the themes. In this IQA process, every relationship is examined without ignoring any link. This approach ensures that all of the numerous relationships are completely examined and depicted in the resultant Systems Influence Diagram in a systematic manner (Human-Vogel & Van Petegem, 2008). The fact that an audit trail exists for the entire process followed during the research (Northcutt & McCoy, 2004) is another strength.

In the IQA technique, individual voices cannot be differentiated following the focus group activity (Human-Vogel & Van Petegem, 2008), because the focus group activity produces a unified voice. This is a potential flaw in the approach. However, since this study aims at acquiring the combined voices of the members of the focus group, this limitation was not an issue for this paper.

Even though each participant completed their own Affinity Relationship Table (ART), the ARTs were combined to generate a unified Systems Influence Diagram by applying the Pareto principle.

The final potential limitation of IQA is ensuring the time and commitment of participants. The participants' time commitment for the full research period was estimated to be three to four hours (Bargate, 2014). Participants were informed about this limitation before time so that they were aware of the meeting's length before accepting the invitation. In addition, several IQA techniques (Simple IRD, "Focus group only research") were implemented to reduce the time required for data collection and ensure participant commitment.

3.6 Rigour

Rigour is characterised by operating within predefined conditions or constraints, defined by certain parameters, with the aim of achieving consistency. Human-Vogel and Van Petegem (2008), define rigour as the criteria adhered to in qualitative research. These criteria include aspects such as consistency, dependability, and transferability (Denzin and Lincoln, 2003). Academic rigour is devoid of all self-contradictions, and considers all data, information, and knowledge available on a subject. However, that knowledge must be approached with scepticism so that there is no room for inconsistencies. In addition, the facilitator plays a minimum role of observer in the study, and therefore, has little influence on how participants analyse data.

According to Northcutt and McCoy (2004, p.38), in the IQA methodology, rigour is achieved during the process of collecting and analysing data. When these two phases are being carried out, they must be done in a public and non-idiosyncratic manner (Northcutt and McCoy, 2004 p.38). Furthermore, the process must be replicable within reasonable means, and must be non-dependent on the natural characteristics of the elements themselves (Northcutt and McCoy, 2004, p.38).

The protocols that must be followed when using the IQA definition can be summarised as follows:

1. The analysis must be public and must not be highly peculiar or distinctive to an individual.

2. The analysis must be replicable within reasonable means.
3. The analysis must not be predicated on the nature of the factors themselves, meaning that the process and systems built into this study are independent of the content and the nature of the factors in the study.

In other words, every step of collecting and processing data must be documented. An audit trail must be created so that the same process can be replicable if need be. This means that if in the future, another researcher was to carry out the same investigation, he/she should arrive at the same conclusion, if the steps are followed to the letter. This serves as testimony and proof against any biases that the original researcher may have been presumed to have. It rids the study of all subjectivity, biases, and external influences.

3.7 Ethical Considerations

The researcher was involved in the process of compiling and gathering data for the study, working with the approved group of participants. During this stage, the researcher vowed to respect the rights of the participants and not to use the data for malicious purposes. The researcher ensured that industry standards were observed in all phases of data collection and analysis in order not to bring the whole study into disrepute. These standards come highly recommended by reputable researchers, and they include respecting of individuals' privacy, values, opinions, and feelings. No participants were discriminated against on the basis of their sex, race, gender, ethnicity, religion, illness or other.

The principal ethical categories relevant and applied in this study are anonymity, no harm to participants, consent and transparency. The above ethical considerations are important to guarantee protection from harming the participants, whether psychologically or physically (Bell and Bryman, 2007).

3.7.1 Anonymity

The study committed to the fact that the identities of the participants would not be revealed for any reason whatsoever. This was to protect them from any potential victimisation that may arise as a result of them being part of this study, or suspicion that they may have shared some knowledge they ought not to have. Only certain information would be published; for example, a role or position they occupy in an agro-processing company. However, personal information such as name, surname and age to name a few, is omitted from the study.

3.7.2 Harm to participants

At the end of the study, some participants learned more about agro-processing than they already knew, while some developed life-long relationships. The research was conducted in 2020 and all COVID-19 regulations were observed during all processes.

3.7.3 Consent

All participants submitted written forms of consent that indicated that they agreed to avail themselves for the study to share their wealth of knowledge on the subject of this study. All firms which the participants come from also gave permission to proceed with this undertaking.

3.7.4 Transparency

The researcher communicated the intention and purposes of the study and data collection to the participants. All participants were instrumental in all phases of the research and were provided with explanations of the purpose of each activity during the process of data collection and analysis.

3.8. Conclusion

This chapter provided an overview of the research design, and the process of data collection and analysis of the study, which was conducted from an IQA approach. The data collected by participants was used to form affinities which were then used to develop the SID, which is a visual representation of the system. In the next section, chapter 4, the study discusses in detail the findings of the research.

CHAPTER 4: RESULTS AND DISCUSSION OF FINDINGS

4.1 Introduction

The objective of this study is to identify critical success factors (CSFs) of export-oriented agro-processing projects in Ethiopia and to identify if there is a relationship (cause and effect) between the identified CSFs. This chapter is organised into five sections. Section 4.2 discusses the background of the research participants. Section 4.3 presents and discusses the CSFs found in this study. This is followed by section 4.4 which explores relationships between the identified critical success factors. Section 4.5 compares the findings with the CSFs identified in the literature review and section 4.6 gives an overall conclusion of the chapter.

4.2 Research Participants

The focus group was conducted with 11 participants. Only individuals with at least six years of experience in agro-processing projects in Ethiopia were invited to participate in the focus group discussion. This ensured that the participants are very close to, and knowledgeable about, export oriented agro-processing projects in Ethiopia.

A convenience sampling method was used once the above-mentioned requirements were met. Only participants who live in Addis Ababa were invited to the focus group discussion due to budget and scheduling constraints. Details of all the participants are as follow:

Table 4. 1: Details of research participants

Participant Number	Current position /Level	Project management Experience (Yrs.)	Type of Agro-Processing	Project Management Qualification(s)
P1	Project Head	7 years	Juice processing project/ worked in brewery manufacturing Company before as well	Online course certificate
P2	Production Manager	9 Years	Avocado Oil Processing Project	No
P3	Public and Private Partnership Head	7 Years	Indoor flooring and outdoor decking from bamboo processing project	-
P4	Senior Project Manager	13 Years	Flour processing project	No

P5	Owner (GM)	14 Years	Coffee processing project	MBA
P6	Project Manager	15 Years	Coffee processing Project	PMP certified, PRINCE 2 certified
P7	D/Project Coordinator	8 Years	USAID (Smallholder Horticulture project)	MSc. Project Planning and Management
P8	Deputy General Manager	13 Years	Coffee processing project	No
P9	Lecturer	13 Years	Addis Ababa University lecturer with research on Agro-processing. (Brewery)	MBA
P10	Supply Chain Manager	13 Years	Sugar manufacturing project	PMP
P11	Programme Manager	9 years	Peanut butter manufacturing project	No

Due to time constraint, the participants were emailed the questionnaire a week before the focus group discussion to identify and list CSFs of export-oriented agro-processing projects in Ethiopia (which is not a part of the IQA processes). They were supposed to have researched and identified each of these critical success factors in their company. Within the framework, the participants have as much freedom as possible to list elements that they consider relevant. This was done to provide the participants enough time to prepare for the focus group discussion and to avoid the focus group section from taking longer than necessary. This questionnaire was very pivotal to the research study because it not only provides the name of each CSF listed by the participant, but also a brief description of each listed CSF. This provides an opportunity for the researcher to understand each CSF's listed by each participant in detail. Hence, the questionnaire does not affect the rigour of the research. In fact, it makes a positive contribution to the research's data richness. Appendix A contains a sample questionnaire form, whereas Appendix B contains completed questionnaire forms.

Before the focus group started, during standard warm-up exercise, the participants agreed that dividing the agro-processing project into value-chain activities based on how materials flow through the production chain would make the identification of CSFs at each step as well as the structuring of the discussion easier. The participants divided agro-processing into three value

chains. These are pre-processing (procurement), processing, and post-processing (marketing and distribution) (see Figure 4.1).

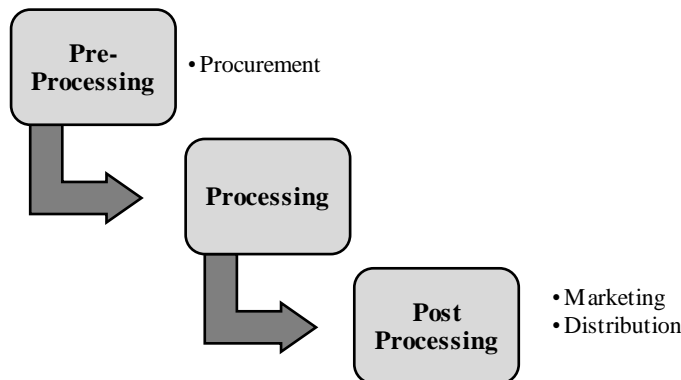


Figure 4. 1: Agro-processing value chain steps

1. Focus Group Discussion

The focus group started with an issue statement provided by the facilitator to initiate reflection. The issue statement is “There is a number of export-oriented agro-processing projects in Ethiopia. Critical successes factors of these export-oriented agro-processing projects are neither well known nor properly documented, and most projects do not achieve their intended goals. It is the purpose of this research to identify critical success factors in the export-oriented agro-processing projects in Ethiopia.” This was followed by the question, “What are the critical success factors of export-oriented agro-processing projects in Ethiopia?”

Constituents spent about 10 minutes silently thinking on their experiences after a brief discussion of the issue statement, and then they wrote/copied their reflections on post-it notes. After the participants had written their suggestions on post-it notes, the researcher assisted them in sticking the post-it notes to the white board.

The eleven participants identified a total of 43 CSFs. Table 4.2 below shows CSFs as identified by each participant.

Table 4. 2: Original, unedited list of generated ideas

Participant	Ref No	CSF	Description
P1	1	Supply of agricultural raw material	Continuous supply of raw material is important (Reliability).
	2	Quality machinery	Quality machines that have high efficiency and produce quality products.
	3	Packaging	Quality packaging is necessary and rarely available in the local market.
	4	Finance	Raw material and salaries need a large amount of working capital.
	5	Land	It is vital to find a convenient location for processing and storage.
	6	Transportation facility	Fruit must be transported in cold storage to maintain their freshness.
	7	Government support	Government support in tax exemptions and available hard cash for the imports.
P2	8	Advanced machinery	Advanced oil extraction machinery is important in oil manufacturing. (Germen machinery).
	9	High volume production	Oil production is a mass production process (profit only comes out of volume).
	10	Finance (working capital)	Large production has high operational cost so it needs large finance resources to cover operational cost.
	11	Large storage	Seasonal production; hence storage is important.
	12	Reliable raw material supply	Finding and organising farmer cooperatives to source raw material from is the core of the business.
P3	13	Advanced machinery	Advanced machinery is essential for export production (including off grid power supply).
	14	Skilled labour	We hire foreigners with high salaries in dollars as there is a shortage of skilled labourers in industry and forestry.
	15	Finance	Having good investors and available credit is important.
	16	Experience and knowledge of export market	This might include networking and market research.
	17	Storage	Sufficient storage including storage depots around the forests.

	18	Transportation	Partnering with local transportation associations benefits the business and also creates local job which is part of our CSR.
	19	Quality control	Sourcing quality bamboo with less variability would reduce the burden of quality control and increase raw material for production.
P4	20	Transportation infrastructure	Road infrastructure is necessary for collection of wheat.
	21	Technical and material skill	Technical and managerial skill are important.
	22	Credit from bank	Credit from bank is important as processing needs expensive machinery.
	23	Market research	Information on customer trends and market is essential.
	24	Hard currency	Hard currency to import intermediate goods and services.
P5	25	Quality packaging	Quality packaging is one of the *USPs of the coffee manufacturing industry. (* Unique selling proposition)
	26	Advanced machinery	Advanced machinery is essential to maintain product and process quality, especially for the export market.
P6	27	Quality of packaging	Quality of packaging makes a contribution.
	28	Project Finance	Credit support 70% from African development bank
P7	29	Continuous raw material supply	A continuous supply of high-quality raw materials is required to keep the business running.
	30	Experienced management skill	Finding skilled and experienced management is also critical, especially in emerging industries such as agro-processing.
	31	Transportation infrastructure and system	Because agro-processing raw materials are perishable, having a modern transportation system and infrastructure would provide a competitive edge.
P8	32	Large storage capacity	As the harvesting season is once a year, large storage is critical for year-round processing.
P9	33	High quality and continuous raw material supply	
	34	Credit from banks or financial institutes	
	35	Market research and networking	
	36	Stable exchange rate for financial planning	

P10	37	Credit	Credit system is essential for most processing plant because of the need for large initial investment and operation cost.
	38	Transportation system	The availability of a transportation system is critical.
	39	Large processing capacity	Because agro processing is a volume-based business, having a huge processing capacity is critical to keeping the business afloat.
P11	40	Raw material supply	There is seasonal shortage in raw material supply ; hence securing raw material is an advantage.
	41	Credit	Credit is essential for capital investment and covering operational costs.
	42	Processing capacity	Large production is essential for economies of scale.
	43	Advanced market intelligence	It is critical to have advanced research on the export market trends and consumers behaviour.

The focus group then used an inductive coding system followed by axial coding in grouping similar elements under the same theme (Affinities). Affinities produced by the focus group were aggregated and eleven common affinities emerged (see Table 4.3).

Table 4. 3: Clarified, edited and categorised list of ideas

Affinities	Ref No	CSF	Description
1. Quality and Continuous Supply of Raw Material	1	Supply of agricultural raw material	Continues supply of raw material is important (Reliability)
	12	Reliable raw material supply	Finding and organising farmer cooperatives to source raw material from is the core of the business
	19	Quality control	Sourcing quality bamboo with less variability would reduce the burden of quality control and increase raw material for production
	29	Continuous raw material supply	A continuous supply of high-quality raw materials is required to keep the business running
	33	High quality and continuous raw material supply	

	40	Raw material supply	There is a seasonal shortage in raw material supply; hence securing raw material is an advantage
2. Availability of Transportation Infrastructure and Systems	6	Transportation facility	Fruits must be transported in cold storage to maintain their freshness
	18	Transportation	Partnering with local transportation associations benefits the business and also creates local jobs which is part of our CSR
	20	Transportation infrastructure	Road infrastructure is necessary for collection wheat
	31	Transportation infrastructure and system	Because agro-processing raw materials are perishable, having a modern transportation system and infrastructure would provide a competitive edge
	38	Transportation system	The availability of a transportation system is critical
3. Sufficient Storage Capacity for Raw Material	5	Land	It is vital to find a convenient location for processing and storage
	11	Large storage	Seasonal production; hence storage is important
	17	Storage	Sufficient storage including storage depots around the forests
	32	Large storage capacity	As the harvesting season is once a year, large storage is critical for year-round processing
4. State of the Art Capital Goods	2	Quality machinery	Quality machines that have high efficiency and produce quality product
	8	Advanced machinery	Advanced oil extraction machines are important in oil manufacturing (German machinery)
	13	Advanced machinery	Advanced machinery is essential for export production (including off grid power supply)
	26	Advanced machinery	Advanced machinery is essential to maintain product and process quality, especially for the export market
5. Quality Intermediate Goods	3	Packaging	Quality packaging is necessary and rarely available in the local market
	25	Quality packaging	Quality packaging is one of the *USPs of the coffee manufacturing industry (* Unique selling proposition)
	27	Quality of packaging	Quality of packaging makes a contribution
	14	Skilled labour	We hire foreigners with high salaries in dollars as there is a

6. Available Skilled Labour			shortage of skilled labourers in industry and forestry
	16	Experience and knowledge of export market	This might include networking and market research
	21	Technical and managerial skill	Technical and managerial skill is important.
	30	Experienced management skill	Finding skilled and experienced management is also critical, especially in emerging industries such as agro-processing
7. Availability of Credit	15	Finance	Having good investors and available credit is important
	22	Credit from bank	Credit from bank is important as agro-processing needs expensive machinery
	28	Project Finance	Credit support 70% from African Development Bank
	34	Credit from banks or financial institutes	
	37	Credit	Credit system is essential for most processing plants because of the need for large initial investment and operation cost
	41	Credit	Credit is essential for capital investment and to cover operational costs
8. Large Processing Capacity	9	High volume production	Oil production is a mass production process (profit only comes out of volume)
	39	Large processing capacity	Because agro-processing is a volume-based business, having a huge processing capacity is critical to keep the business afloat
	42	Processing capacity	Large production is essential for economies of scale
9. Favourable Foreign Trade Policy	7	Government support	Government support in tax exemptions and available hard cash for the imports
	24	Hard currency	Hard currency to import intermediate goods and services
	36	Stable exchange rate for financial planning	
10. Sufficient Working Capital	4	Finance	Raw materials and salaries need large amounts of working capital
	10	Finance (working capital)	Large production has high operational costs so it needs large finance resources to cover operational costs

11. Advanced Market Intelligence on Trends, Competition and Customer	23	Market research	Information on customer trends and market is essential
	35	Market research and networking	
	43	Advanced Market Intelligence	It is critical to have advanced research on the export market trends and consumers behaviour

The eleven affinities identified were:

Affinity names and their codes	
1.	Quality And Continuous Supply of Raw Material (SUP)
2.	State of the Art Capital Goods (CAP)
3.	Availability Of Transportation Infrastructure and Systems (TRA)
4.	Quality Intermediate Goods (INT)
5.	Available Skilled Labour (LAB)
6.	Availability Of Credit (CRE)
7.	Advanced Market Intelligence (MAR)
8.	Large Processing Capacity (PRO)
9.	Favourable Foreign Trade Policy (FOR)
10.	Sufficient Working Capital (WOR)
11.	Sufficient Storage Capacity for Raw Material (STO)

As discussed during standard warm-up exercise, all of the above listed CFSs belong to one of the three value chain activities shown in figure 4.1 above. These three value chain activities and the CSFs under each value chains are discussed in detail below.

4.3.1 Pre-processing

Pre-processing takes place in the beginning phase of agro-processing. It is a method of managing critical flows of raw material from the farm fields to the manufacturing plant. Raw materials make up the biggest portion of total costs in agro-processing, and the procurement operations fundamentally shape the economies of the enterprise. The main raw materials for the ago-processing industry are agricultural products. Agro-processing raw materials have three distinct characteristics that make them different from the other types of raw material. These characteristics are perishability, seasonality and variability (Austin, 1992). Most of the CSFs

are derived from these characteristics of the raw materials. Particularly at the pre-processing (procurement) stage of agro-processing project, these characteristics play a vital role in determining the CSFs.

Sources of raw materials also play an important role when considering CSFs. The three common sources of agricultural raw materials identified during focus group discussions include smallholder farmers (contract farming), owning a farm (vertical integration) and sourcing from the market. Depending on the project's choice of sourcing, it has different levels of control over the factors that are important to the success of this stage of processing (pre-processing) and for the agro-processing project as a whole.

The focus group identified three CSFs at this stage of agro-processing. These CSFs are **quality and continuous supply of raw material, availability of transportation infrastructure and systems, and sufficient storage capacity for raw material.**

4.3.1.1 Quality and continuous supply of raw material

Continuity and quality of raw material supply was identified as a very strong factor in raw material procurement. This is because of the strong functional interlinkage between the agro-processing and agriculture. Agro-processors rely heavily on agriculture as a raw material supplier. According to the focus group discussion, securing a quality and continuous supply of raw material is a strategic advantage for the agro-processing project because most of the inputs are perishable, seasonal and variable.

The seasonal nature of the raw material makes some of the raw materials only available at certain times of the year while there is a continuous demand for the product. This is a threat to the productivity of agro-processing projects as they operate throughout the year. As such, some agro-processing projects have contracted with multiple suppliers of raw material from different regions so that operating and turning profits are not intermittent and dictated by seasons.

Perishability of the raw material makes the quality and continuity of the material challenging as some of the raw materials are either over-ripe or too raw for processing.

As Participant P1 stated:

“The fruits should be just ripe for processing, not raw or overripe and as identification is based on appearance (colour change) and touch, it is not always reliable.”

This is also supported by Participant P2 who stated that:

“For avocado a "dry weight" test is also necessary while picking the fruit, which determines the oil content of the fruit and tells when to harvest. If the oil content is low, the fruit is unripe and will shrivel or remain rubbery instead of softening.”

When this is the case, quality control ensures that inputs that are not suitable for processing are removed from the processing line. This can lead to insufficient amounts of raw inputs. Hence it is essential for the processing plants to consider the perishability nature of the raw material in its processes design.

The variability of raw material also affects most of the processing projects. As participant P3 from a bamboo floor manufacturing factory stated:

“Bamboo flooring manufacturing requires a standard size (radius and length) for the bamboo stick to fit into the splitting machinery. Because bamboo trees come in a variety of sizes, not all bamboo trees can be used for manufacturing. As a result of the variability, raw materials are in short supply. As a result, the production schedule and, in some cases, quality control at the plant are put under strain.”

As discussed, because the three characteristics of agricultural raw materials mentioned above affect the supply of raw material to agro-processing projects, having a quality and consistent supply of raw material is considered a strategic advantage for any agro-processing project.

4.3.1.2 Availability of transportation infrastructure and systems

Another CSF in agro-processing is the availability of transportation infrastructure and systems. Raw materials are fragile and can get easily spoiled; as such they must be handled and stored carefully to keep and maintain their characteristics, especially when it comes to edible foods. The fact that raw materials can be spoiled necessitates the use of specialised, and sometimes more expensive, transportation methods.

During the forum discussion, two transportation factors were raised. The first is infrastructure for transportation. This included roads, railroad sidings, and storage terminals, all of which are necessary for raw material transportation. This is particularly so when raw materials are sourced from smallholder farmers located in the rural areas, raw material suppliers are dispersed, and transportation costs are high. The logistics of gathering raw materials from rural regions with limited road networks make it complicated and costly for agro- processing projects to conduct business. It is even more difficult during the rainy season when some roads are flooded and

muddy. In some cases, alternative transportation, such as donkeys, may be required to transport raw goods to the nearest accessible road infrastructure.

According to one Participant P3:

“Bamboo is transported from the small holder farmers to the nearest collection depot using a donkey cart.”

The lack of infrastructure in the transportation of raw materials greatly increases the cost of production, and particularly in the agro-processing industry, which requires extremely high efficiency and cost reduction production techniques, its impact would be significant.

When infrastructure is inadequate, the project must weigh the cost invested in building its infrastructure against the benefits of the locale where it is built. Some processing plants may choose to locate near the raw materials based on the physical traits of the inputs and the transformation operation, in addition to the total cost and availability of transportation infrastructure.

The second factor mentioned is the transportation system. Ethiopia has a limited number of agricultural transport companies. Some of the goods are transported by vehicles not fit to transport agricultural products. Moreover, due to the need for quality and standardisation in the western market, export-oriented agro-processing projects must transport their raw materials and final product using a refrigerated truck to prevent temperature fluctuations on the raw material.

As one Participant P7 stated, this is particularly important for flower exporters:

“Because flowers are very sensitive to the environment, they are grown in a closed and monitored environment; therefore, it is critical to transport them in a similar controlled environment; however, there is a shortage of refrigerated transportation providers in the country, as the demand for the service is also very limited.”

There are only a few cold chain transportation providers, and their service is expensive. When this happens, most agro-processers consider starting their own transportation service. Decisions like this tend to necessitate an examination of small constant streams of capital investment increments, together with the savings from improved reliability.

Small-scale agro-processors, as mentioned in the discussion, primarily source from the nearest market to avoid supply chain and transportation issues. As Participant P1 stated:

“The only Juice processing company in Ethiopia that owns and source from its farm is AfricanJUICE. AfricanJUICE has built a gravel road from the farm to the nearest main road as part of its investment, giving them a competitive advantage in transporting raw materials in any season.”

As a result, having an adequate raw material transportation infrastructure and system in place is critical to the success of agro-processing projects.

4.3.1.3 Sufficient storage capacity for raw material

Due to the perishability and seasonality of agricultural raw materials, it is critical to have a good inventory management system in place, as well as a large cold chain storage facility. The primary reason for measuring and monitoring the quantity and quality of input inventory is to reduce the possibility of shortages. Because agricultural products are seasonal, storage capacity is required. Therefore, any agro-processing plant must have a larger storage capacity to ensure that raw materials are available for processing at all times. Furthermore, it is necessary to stock a certain amount of backup raw material in order to continue operating efficiently in case there is a problem with raw material availability or the raw material supply chain is disrupted.

Participant P6 noted that:

“Because of the current political turmoil and road blockades in Ethiopia, where protesters frequently interrupt and block the transport route to the source, businesses will likely use their backup raw materials stored in the warehouse.”

Participant P2 stated:

“Because avocados (Hass) are only available for 6 months from late November to April, the processing plant would have to rely on stored avocados for the remaining 6 months.”

This would make plant production more seamless, increasing productivity because it would not be halted due to a lack of raw materials. If there is a short harvest period in one year and the project does not stock enough inputs due to limited storage space, the project may face high prices when attempting to purchase later, or they may not even find them. Hence having sufficient storage capacity for raw material is critical for the success of agro-processing projects.

4.3.2 Processing

The primary activity of an agro-industrial enterprise is processing. This is the second stage, and the goals are to make the inputs more portable, palatable, and valuable. The focus group suggested seven CSFs for agro-processing projects at this stage: **state-of-the-art capital goods, quality intermediate goods, available skilled labour, availability of credit, large processing capacity, favourable foreign trade policy and sufficient working capital.**

4.3.2.1 State-of-the-art capital goods

Agro-processing is a capital-intensive project. It needs large amounts of capital goods such as buildings, machinery and equipment. At the centre of the processing operation, is technology. Enterprises that use state-of-the-art technology produce the finest products, and their products are often in high demand. Quality of product cannot be stressed enough, particularly when it comes to international markets.

According to Participant P5:

“The domestic market might settle for a less than satisfactory product, however, if an enterprise is serious about increasing their market share on the international market, they need to invest in technological equipment that will allow them to produce high quality products for their potential customers.”

Having the right technology might even reduce the overall cost of production for companies because some technologies allow for alternative raw inputs. This means potentially not having to worry about the cost of scarce or seasonal inputs.

The focus group agreed that using cutting-edge capital goods is critical for agro-processing in two ways. Firstly, it automates the production process, thereby reducing the amount of manpower required and secondly, it produces high- quality output.

4.2.2.2 Quality intermediate goods

Intermediate goods are products that are required for the manufacture of the finished product after the processing of agricultural raw materials. Packaging and labelling are the most common intermediate products in agro-processing mentioned by the participants.

The second most important input in processing, besides having adequate amounts of quality raw inputs, is the packaging of the final product. Packaging increases the shelf-life of the product, maintains quality and improves the taste of the product. Packaging makes goods easy to transport and store. In addition to maintaining the product quality, it also enhances the appeal

of the product, through labelling and style of packaging, thus increasing the overall value of the product. This confirms that product appearance is an important variable in the consumer's purchasing decision. Quality intermediate goods thus have a direct effect on the bottom line of the business; hence they are considered as one factor for the success of the project.

In particular for the projects which are exporting to European markets, there are particular regulations on the use of intermediate goods. As the consumers are becoming environmentally conscious, and more demanding, projects are inclined to use recyclable packaging goods. Hence the use of intermediate goods that take into consideration market requirements, the nature of the product, and most importantly the quality standards of the target market, is one success factor for the project.

4.3.2.3 Available skilled labour

Agro-processing necessitates a large workforce and provides a good source of employment in the country. In the Ethiopian context, the country has an excess of unskilled labour. Therefore, agro-processing projects are usually unconcerned about the availability of unskilled labour. However, skilled, technical, and managerial personnel are in short supply. According to Participant P7:

“Because there is a scarcity of local experts in that field, most processing projects hire foreign experts.”

Participant P3 also supports Participant P7, stating that:

"The majority of the experts in our organisation are foreigners because the country has very little knowledge and experience with bamboo processing."

This problem would be exacerbated if the plant is located in a rural area. If this is the case, the company may need to provide additional financial incentives or social benefits in order to attract and retain qualified employees because recruiting and training skilled new hires would significantly increase operational costs. Having skilled labour is, therefore, regarded as one of the critical factors for the project's success.

4.3.2.4 Availability of credit

As most participants have mentioned, the initial capital investment of industrial agro-processing projects is more than 150 million Birr (\$2.7 million). In addition, it requires a large inventory

of raw materials as well as intermediate goods as backup, which can only be achieved by working with local and international credit providers.

Participant P10 stated that:

“Owning and operating a sugar factory requires a large amount of capital, so only a few private investors are involved, and even for those who are, having access to credit is essential.”

Credit is therefore one of the key factors to support the initial investment and working capital of agro-processing. Most local banks limit the amount they will lend to agro-processing companies and also charge a higher interest rate (13% per year). One positive factor that should be raised here is that the Development Bank of Ethiopia would provide credit for up to 70% of the total investment in agricultural and agro-processing projects in Ethiopia. This will help investors in supporting their initial cost of investment and also encourage investors. Available credit would therefore contribute as a success factor by supporting the financial capacity of agro-processing projects.

4.3.2.5 Large processing capacity

Agro-processing projects need to have a cost – effective production system in order to be profitable. As most of the processing activities take place mainly in the industrial plant, projects are investing a large amount of money to acquire state-of-the-art machinery with higher processing capacity to achieve economies of scale. As there is very dense competition in the export market, efficiency is needed and keeping prices low is a strategic advantage, especially in industries such as breweries, oilseed crushing plants and fruit juices.

In addition, due to the seasonal nature of raw material some projects might choose batch processing rather than continuous processing; hence they need to have large capacity to process the raw material seasonally in batches to prevent raw material perishability and wastage.

4.3.2.6 Favourable foreign trade policy

Favourable foreign trade policy is primarily based on alignment between the government's macro-policy at the macro level and agro-processing operations at the micro level (the "public policy impact chain"). National development goals and strategies are expressed through national policies, which are implemented through various policy instruments (taxes, credit, subsidies, and so on) that affect the production chain and the specific agro-industry in a variety of ways. Tax policy and exchange rate policy are two examples.

Participant P1 stated that:

“Imposing a tax on raw material exports would discourage raw material exporters and increase the availability of high-quality raw materials at reasonable prices.”

The project's annual financial plan would also be jeopardised if the exchange rate fluctuated. Exchange rate fluctuations may not always be in the project's favour, especially if the project engages in both import and export activity.

In addition to these broad policies, governments develop macro-economic policies for specific industries, such as agriculture processing, to encourage investment. This can have a significant impact on the agro-industry's strategy, operations, and viability, both directly and indirectly. A tax break is one policy that is specific to the agro-processing sector. Projects engaged in export-oriented agro-processing are eligible for an export sales tax exemption for up to ten years. This would give the project more time to strengthen its financial capacity and even break even without incurring significant financial costs.

Therefore, favourable foreign trade policy has a positive effect on agro-processing and could be considered one of the CSFs for an export-oriented agro-processing project. As a result, a stable exchange rate, higher taxes on the export of unprocessed raw materials, and readily available hard cash for imports are factors that contribute to the success of export-oriented agro-processing projects.

4.3.2.7 Sufficient working capital

Agro-industries have a greater need for seasonal raw material procurement. This means that during certain seasons, businesses in this industry may have to use stored raw materials and during harvest seasons, they may require a large amount of working capital to purchase this agricultural raw material. Because agro-processing procurement is seasonally driven, projects must be proactive in their procurement budgeting and have sufficient working capital for raw material procurement during the harvest season.

In addition, agro- processing has extremely high operational (variable and fixed) costs. The payment of the labour force takes up large amounts of the fixed cost. Variable costs include transporting and storing of raw or semi-processed material. This requires a significant amount of working capital, as most of these are usually paid for in cash upon receipt; thus having sufficient working capital is a vital for the successes of the project.

4.3.3 Post-processing

Post-processing is often referred to as the post-production process. This stage refers to the activities that occur after the product has been fully processed; that is, preparing the goods for customer consumption. The two main tasks in this stage are marketing and distribution. In this information age, marketing and distribution are supported by different activities in order to be effective. One of these activities is Market Intelligence. Hence the focus group participants identified **Advanced Market Intelligence** as a critical factor in the post-processing operations.

4.3.3.1 Advanced marketing intelligence

When the product has been properly marketed and distributed to customers, projects need to continue conducting market research so that they can better understand their customers. Market research seeks to keep up with trends, competitors and evolving consumer needs. This is mainly to serve customers better and expand on their market size to reach more potential customers. This process is data intensive and costly.

As most participants pointed out, this is one of the most important distinctions between export and domestic production. Local market production is supply driven due to the high level of demand in the market. However, because the export market is flooded with similar competitor goods, it is driven by demand, and conducting market research is critical to the project's success.

As Participant P11 stated:

“Advanced Market intelligence is a specific factor that makes foreign-owned agro-processing projects more competitive than domestic-owned ones. Local-owned projects must conduct extensive market research and establish distribution networks to understand and better serve the export market. However, foreign-owned projects have a well-established understanding of the export market distribution systems, and also have a larger customer base. As a result, locally owned exporting projects are better suited as exporters of semi-processed inputs or raw materials rather than finished goods.”

Hence advanced marketing intelligence would aid in a better understanding of customers, trends, and competitors, which is critical in any decision-making process. This is why advanced market intelligence is a critical success factor for export-oriented agro-processing projects.

4.4 Relationship between the Identified Critical Success Factors

The three main stages of agro-processing; namely pre-processing, processing and post-processing, are interdependent. The nature of their interdependence means that a change in one of them affects others and in this way, affects the overall operation of the system. In a similar way the CSFs identified in every stage of the agro-processing would affect one another. In this section, the study aims to understand the relationship between the CSFs identified in the focus group.

Participants were asked to complete a simple Affinity Relationship Table (ART) (Northcutt & McCoy, 2004, p.152). Once the ART is complete, the frequency of each of the relationship is counted and recorded in an Excel spreadsheet to conduct a Pareto analysis.

4.4.1 Pareto protocol

There are 11 affinities and each of them has relationships with other affinities (except with themselves), so a total of 110 relationships exists. However, some of these relationships are redundant. To find the optimal number of relationships that should compose the IRD, the Pareto protocol statistical method is utilised. It is predicated on the fundamental principle that "a minority of the relationships in any system account for the majority of the variance within the system" (Northcutt & McCoy, 2004, p.157). This optimal number of relationships will occur at the point of maximum power. Each relationship's frequency is computed using individual ARTs, recorded into a spreadsheet, and the overall number of votes for each relationship is calculated. A total of 336 votes were cast for all affinity pair combinations. The procedure produces the frequency of each relationship in the order of affinity pairs — see table 4.4 below.

Table 4. 4: Pareto Analysis

	Column1	Column2	Column3	Column4	Column5	Column6
No	Affinity pair relationship	Frequency Sorted (Descending)	Cumulative frequency	Cumulative percentage (Relation)	Cumulative percentage (frequency)	Power
1	5→8	10	10	0,91	2,976190476	2,0661905
2	2→3	10	20	1,82	5,952380952	4,133291
3	3→8	9	29	2,73	8,630952381	5,9027724
4	5←7	9	38	3,64	11,30952381	7,6722538
5	1→8	9	47	4,55	13,98809524	9,4417352
6	2←9	8	55	5,46	16,36904762	10,913598

7	3←9	8	63	6,36	18,75	12,38546
8	5←9	8	71	7,27	21,13095238	13,857322
9	6→10	8	79	8,18	23,51190476	15,329185
10	1→2	8	87	9,09	25,89285714	16,801047
11	1→11	8	95	10,00	28,27380952	18,27291
12	2→8	7	102	10,91	30,35714286	19,447153
13	2←7	7	109	11,82	32,44047619	20,621396
14	3→11	7	116	12,73	34,52380952	21,79564
15	3←7	7	123	13,64	36,60714286	22,969883
16	4→11	7	130	14,55	38,69047619	24,144126
17	5←10	7	137	15,46	40,77380952	25,31837
18	9→11	7	144	16,36	42,85714286	26,492613
19	1→3	7	151	17,27	44,94047619	27,666856
20	1←7	7	158	18,18	47,02380952	28,8411
21	2→4	6	164	19,09	48,80952381	29,717724
22	2→5	6	170	20,00	50,5952381	30,594348
23	2→11	6	176	20,91	52,38095238	31,470972
24	3←6	6	182	21,82	54,16666667	32,347597
25	3←10	6	188	22,73	55,95238095	33,224221
26	4→8	6	194	23,64	57,73809524	34,100845
27	5→11	6	200	24,55	59,52380952	34,97747
28	6←7	6	206	25,46	61,30952381	35,854094
29	7→9	6	212	26,36	63,0952381	36,730718
30	8←11	6	218	27,27	64,88095238	37,607342
31	10→11	6	224	28,18	66,66666667	38,483967
32	1→4	6	230	29,09	68,45238095	39,360591
33	8←9	6	236	30,00	70,23809524	40,237215
34	1→10	5	241	30,91	71,72619048	40,81622
35	2←6	5	246	31,82	73,21428571	41,395226
36	4←9	5	251	32,73	74,70238095	41,974231
37	4←10	5	256	33,64	76,19047619	42,553236
38	6→8	5	261	34,55	77,67857143	43,132241
39	6→9	5	266	35,46	79,16666667	43,711247
40	7→8	5	271	36,36	80,6547619	44,290252
41	7→10	5	276	37,27	82,14285714	44,869257
42	7→11	5	281	38,18	83,63095238	45,448262
43	8←10	5	286	39,09	85,11904762	46,027268
44	9→10	5	291	40,00	86,60714286	46,606273
45	1→5	5	296	40,91	88,0952381	47,185278

46	4←6	5	301	41,82	89,58333333	47,764283
47	4←7	4	305	42,73	90,77380952	48,04567
48	5←6	4	309	43,64	91,96428571	48,327056
49	6→11	4	313	44,55	93,1547619	48,608442
50	4←8	3	316	45,46	94,04761905	48,592209
51	4←11	2	318	46,36	94,64285714	48,278357
52	9←10	2	320	47,27	95,23809524	47,964505
53	1←6	2	322	48,18	95,83333333	47,650653
54	4←5	2	324	49,09	96,42857143	47,336801
55	2→10	2	326	50,00	97,02380952	47,02295
56	3←5	1	327	50,91	97,32142857	46,411479
57	3←4	1	328	51,82	97,61904762	45,800008
58	10←11	1	329	52,73	97,91666667	45,188537
59	1→6	1	330	53,64	98,21428571	44,577066
60	1←2	1	331	54,55	98,51190476	43,965595
61	1←4	1	332	55,46	98,80952381	43,354124
62	1←8	1	333	56,36	99,10714286	42,742653
63	1←10	1	334	57,27	99,4047619	42,131182
64	2→6	1	335	58,18	99,70238095	41,519711
65	2←4	1	336	59,09	100	40,90824
66	1→9	0	336	60,00	100	39,99915
67	1→7	0	336	60,91	100	39,09006
68	1←3	0	336	61,82	100	38,18097
69	1←5	0	336	62,73	100	37,27188
70	1←9	0	336	63,64	100	36,36279
71	1←11	0	336	64,55	100	35,4537
72	2→7	0	336	65,46	100	34,54461
73	2→9	0	336	66,36	100	33,63552
74	2←3	0	336	67,27	100	32,72643
75	2←5	0	336	68,18	100	31,81734
76	2←8	0	336	69,09	100	30,90825
77	2←10	0	336	70,00	100	29,99916
78	2←11	0	336	70,91	100	29,09007
79	3→4	0	336	71,82	100	28,18098
80	3→5	0	336	72,73	100	27,27189
81	3→6	0	336	73,64	100	26,3628
82	3→7	0	336	74,55	100	25,45371
83	3→9	0	336	75,46	100	24,54462
84	3→10	0	336	76,36	100	23,63553

85	3←8	0	336	77,27	100	22,72644
86	3←11	0	336	78,18	100	21,81735
87	4→5	0	336	79,09	100	20,90826
88	4→6	0	336	80,00	100	19,99917
89	4→7	0	336	80,91	100	19,09008
90	4→9	0	336	81,82	100	18,18099
91	4→10	0	336	82,73	100	17,2719
92	5→6	0	336	83,64	100	16,36281
93	5→7	0	336	84,55	100	15,45372
94	5→9	0	336	85,46	100	14,54463
95	5→10	0	336	86,36	100	13,63554
96	5←8	0	336	87,27	100	12,72645
97	5←11	0	336	88,18	100	11,81736
98	6→7	0	336	89,09	100	10,90827
99	6←8	0	336	90,00	100	9,99918
100	6←9	0	336	90,91	100	9,09009
101	6←10	0	336	91,82	100	8,181
102	6←11	0	336	92,73	100	7,27191
103	7←8	0	336	93,64	100	6,36282
104	7←9	0	336	94,55	100	5,45373
105	7←10	0	336	95,46	100	4,54464
106	7←11	0	336	96,36	100	3,63555
107	8→9	0	336	97,27	100	2,72646
108	8→10	0	336	98,18	100	1,81737
109	8→11	0	336	99,09	100	0,90828
110	9←11	0	336	100,00	100	-0,00081
	Total Frequency	336				

Following the Pareto Principle, when the values are filled, it is possible to ascertain that 20% of the relationships are representative of 80% of the results, which, according to the authors, gives the researcher the security to discard the remaining relationships and analyse more deeply only 20% of them. From this spreadsheet and the 20%/80% cut, the degree of consensus of the interviewees on the System Influence Diagram was verified, in order to understand what the 20% of causal relations that affected the 80% of the results were a total

of 271 frequencies was obtained from the 40 relationships made by the constituencies (Green line- in Table 4.4). The optimal number of relationships is at the point where the power of influence in the system reaches its maximum. At relationship 40, the 80/20 principle is reached, but the power is only maximized at relationship 49. Therefore, the cut-off you selected will be at relationship 49 (Yellow line in-Table 4.4).

Figure 4.2 is an illustration of the variance accounting for of the cumulative frequency related to the quantity of affinity pair relationships in the research illustrating this paper.

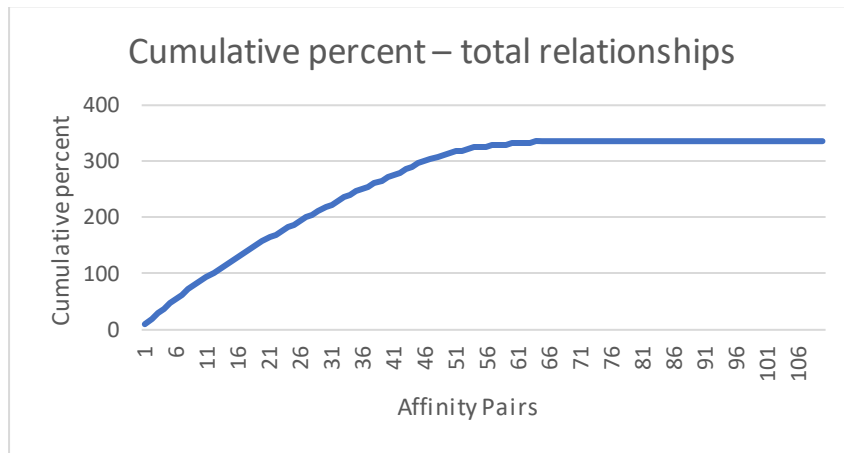


Figure 4. 2: Cumulative percent – total relationships

As illustrated in Figure 4.3, At relationship 40, the 80/20 principle is reached (Green line- in Table 4.4), but the power is only maximized (48.60) at relationship 49, accounting for 93.15% of the variation in this system (Table 4.4). Hence, only the first 49 relationships out of the total of 110 relationships identified in the research, was used to construct the IRD, as the remainder of the relationships were below the cut-off point indicated by the power score- (yellow line - in Table 4.4).

Table 4. 5: Interrelationship Diagram

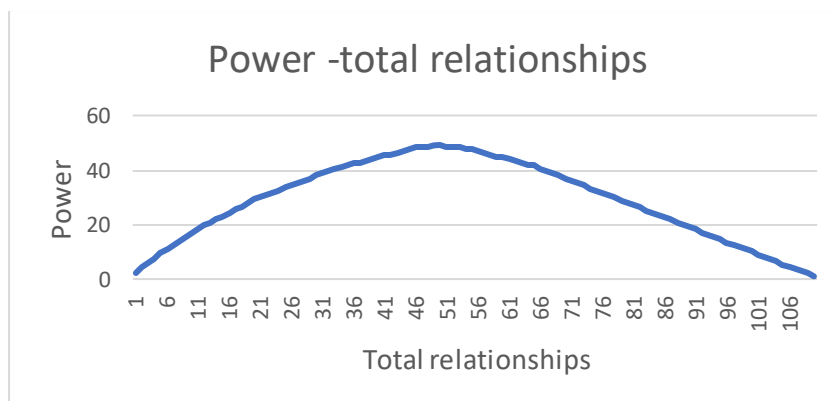


Figure 4. 3: Power – total relationships

As all the relationships below relationship no 49 (6→11) in Table 4.4 (Pareto Analysis) are removed (cut off) using the Pareto Principle, all the potentially ambiguous relationships are removed and there are no further ambiguous relationships found in the construction of the IRD. Hence, there is no need to use an ambiguity relationship removing framework that was stipulated in Chapter 3, Section 3.4.7.

Table 4.5 below represents mechanical relationships in what is called the Inter-Relationship Diagram (IRD).

Table 4. 5: Interrelationship Diagram

	SUP	CAP	TRA	INT	LAB	CRE	MAR	PRO	FOR	WOR	STO	OUT	IN	Δ
SUP	<>	↑	↑	↑	↑		←	↑		↑	↑	7	1	6
CAP	←	<>	↑	↑	↑	←	←	↑	←		↑	5	4	1
TRA	←	←	<>			←	←	↑	←	←	↑	2	6	-4
INT	←	←		<>		←	←	↑	←	←	↑	2	6	-4
LAB	←	←			<>	←	←	↑	←	←	↑	2	6	-4
CRE		↑	↑	↑	↑	<>	←	↑	↑	↑	↑	8	1	7
MAR	↑	↑	↑	↑	↑	↑	<>	↑	↑	↑	↑	10	0	10
PRO	←	←	←	←	←	←	←	<>	←	←	←	0	10	-10
FOR		↑	↑	↑	↑	←	←	↑	<>	↑	↑	7	2	5
WOR	←		↑	↑	↑	←	←	↑	←	<>	↑	5	4	1
STO	←	←	←	←	←	←	←	↑	←	←	<>	1	9	-8

The Interrelationship Diagram in Table 4.5 was then ordered by delta (Δ), starting with the largest number, and going down to the smallest. The sorted Interrelationship Diagram is illustrated in Table 4.6.

Table 4. 6: Sorted Interrelationship Diagram

	SUP	CAP	TRA	INT	LAB	CRE	MAR	PRO	FOR	WOR	STO	OUT	IN	Δ
MAR	↑	↑	↑	↑	↑	↑	<>	↑	↑	↑	↑	10	0	10
CRE		↑	↑	↑	↑	<>	←	↑	↑	↑	↑	8	1	7
SUP	<>	↑	↑	↑	↑		←	↑		↑	↑	7	1	6
FOR		↑	↑	↑	↑	←	←	↑	<>	↑	↑	7	2	5
CAP	←	<>	↑	↑	↑	←	←	↑	←		↑	5	4	1
WOR	←		↑	↑	↑	←	←	↑	←	<>	↑	5	4	1
LAB	←	←			<>	←	←	↑	←	←	↑	2	6	-4
INT	←	←		<>		←	←	↑	←	←	↑	2	6	-4
TRA	←	←	<>			←	←	↑	←	←	↑	2	6	-4
STO	←	←	←	←	←	←	←	↑	←	←	<>	1	9	-8
PRO	←	←	←	←	←	←	←	<>	←	←	←	0	10	-10

The delta (Δ) values in the last column determine the level of influence one factor have on another factor. Factors are categorised as driver, pivot or outcome, based on their delta values. The delta value is obtained by subtracting the total number of inward arrows from the total number of outward arrows. The formula below depicts how the delta value is computed.

$$\text{Delta } (\Delta) = \text{Number of Outward arrows} - \text{Number of inward arrows}$$

Factors that have a delta (Δ) value of 10 are considered as primary drivers as they have all outward arrows (influence) with no inward ones (influenced). Factors that have a delta (Δ) value between 10 and 0 are considered secondary drivers; they have more outward arrows (influence) than inward ones (influenced).

Factors that have a delta (Δ) value of 0 are considered as pivots; they have an equal number of outward (influence) and inward arrows (influenced) arrows. Factors that have delta (Δ) value of between 0 and -10 are considered as secondary outcomes as they have fewer outward arrows (influence) than inward ones (influenced). Factors that have a delta (Δ) value of -10 are primary outcomes as they have no outward (influence) and all arrows are inward (influenced). Table 4.7 below indicates the number of inwards versus outward arrows per CSF.

Table 4. 7: Interrelationship delta and model placement

Driver	Critical Success Factor	OUT	IN	Δ
Primary Driver	Advanced Market Intelligence (MAR)	10	0	10
Secondary Driver	Availability Of Credit (CRE)	8	1	7
Secondary Driver	Quality And Continuous Supply of Raw Material (SUP)	7	1	6
Secondary Driver	Favourable Foreign Trade Policy (FOR)	7	2	5
Secondary Driver	State of the Art Capital Goods (CAP)	5	4	1
Secondary Driver	Sufficient Working Capital (WOR)	5	4	1
Pivot	-	-	-	0
Secondary Outcome	Available Skilled Labour (LAB)	2	6	-4
Secondary Outcome	Quality Intermediate Goods (INT)	2	6	-4
Secondary Outcome	Availability Of Transportation Infrastructure and Systems (TRA)	2	6	-4
Secondary Outcome	Sufficient Storage Capacity for Raw Material (STO)	1	9	-8
Primary Outcome	Large Processing Capacity (PRO)	0	10	-10

Table 4.7 above is used to draw the SID. The arrangement of the CSFs on the SID is based on this SID table. Secondary outcomes and drivers are positioned between the main drivers and outcomes, drivers being on the left, meanwhile outcomes being on the right. The pivot element is located in the centre. For each connection in the IRD (Table 4.6), the arrow connects two affinities, with the direction of the arrow pointing toward the direction of the cause-and-effect relationship, where the product is a cluttered SID.

1. Cluttered SID

Refer to Figure 4.4 below. The cluttered SID has little explanatory utility because it is too complex to analysis. In order for the SID to have meaning, it is a requirement for it to be uncluttered by eliminating redundant connections.

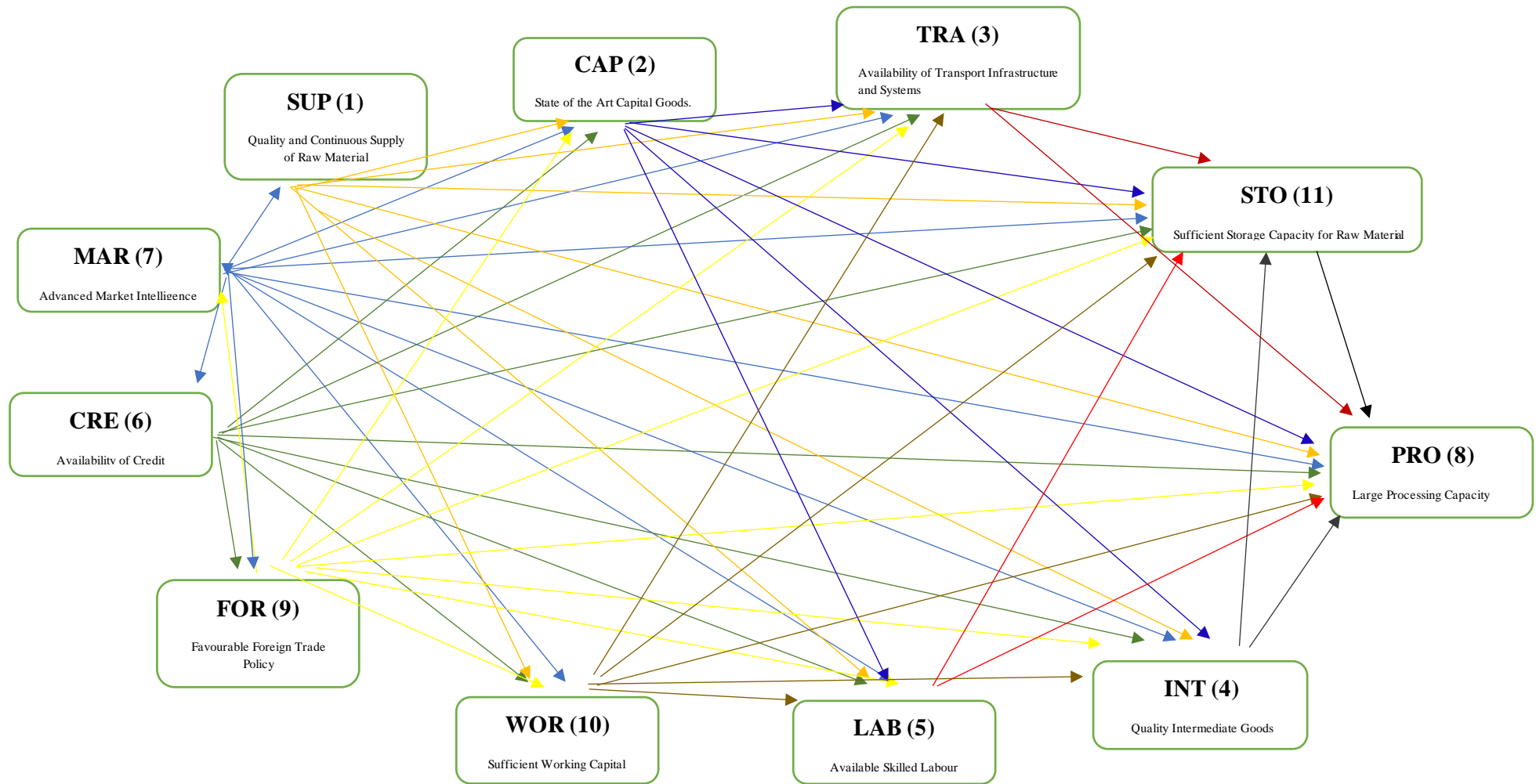


Figure 4. 4: Complex cluttered SID representation

Source: Own representation using focus group data collected (2020)

As indicated below, nearly all CSFs are directly or indirectly linked to each other. However, all unnecessary connections should be omitted in order to simplify the diagram, resulting in an uncluttered SID. In the cluttered SID as shown in Figure 4.4, $1 \rightarrow 3$ can be called a redundant link because $1 \rightarrow 2$ and $2 \rightarrow 3$, therefore making the structure clearer and providing maximal explanatory capacity (Northcutt & McCoy, 2004:177). The method of deleting obsolete ties continues until all of them have been eliminated and the resulting uncluttered SID reflects the agro-processing industry in Ethiopia. To demonstrate this procedure, Table 4.8 below show the elimination of redundant links:

Table 4. 8: Rationalisation process

Step 1 Rationalization			
Analytical Steps	Action Taken	TO	Rationale
1	MAR-PRO	→	MAR-STO-PRO
2	MAR-STO	→	MAR-INT-STO (Alternative path 1A)
3		→	MAR-TRA-STO (Alternative path 2A)
4		→	MAR-LAB-STO (Alternative path 3A)
5	MAR-INT (Alternative path 1A)	→	MAR-CAP-INT (Alternative path 1B)
6		→	MAR-WOR-INT (Alternative path 2B)
7	MAR-CAP (Alternative path 1B)	→	MAR-FOR-CAP (Alternative path 1C)
8		→	MAR-SUP-CAP (Alternative path 2C)
9	MAR-FOR (Alternative path 1C)	→	MAR-CRE-FOR
10	MAR-CRE - Retained		
11	MAR-SUP – Retained (No Alternative path 2C)		
12	MAR-WOR (Alternative path 2B)	→	MAR -SUP-WOR (Alternative path 1D)
13		→	MAR-FOR-WOR (Alternative path 2D)
14	MAR-SUP -Retained (No Alternative path 1D)		
15	MAR-FOR (Alternative path 2D)	→	MAR-CRE-FOR
16	MAR-CRE - Retained		
17	MAR-TRA-STO (Alternative path 2A)	→	MAR-CAP-TRA (Alternative path 1E)
18		→	MAR-WOR-TRA (Alternative path 2E)
19	MAR-CAP	→	RATIONALIZED IN LINE 7 (MAR-CRE -Retained)
20	MAR-WOR	→	RATIONALIZED IN LINE 12(MAR-SUP -Retained)
21	MAR-LAB (Alternative path 3A)	→	MAR-CAP -LAB (Alternative path 1F)
22		→	MAR-WOR-LAB (Alternative path 2F)
23	MAR-CAP	→	RATIONALIZED IN LINE 7 (MAR-CRE -Retained)
24	MAR-WOR	→	RATIONALIZED IN LINE 12(MAR-SUP -Retained)
25	CRE-PRO	→	CRE-STO-PRO
26	CRE-STO	→	CRE-INT-STO (Alternative path 1H)

27		→	CRE-TRA-STO (Alternative path 2H)
28		→	CRE-LAB-STO (Alternative path 3H)
29	CRE-INT (Alternative path 1H)	→	CRE-CAP-INT (Alternative path 1P)
30		→	CRE-WOR-INT (Alternative path 2P)
31	CRE-CAP (Alternative path 1P)	→	CRE-FOR-CAP
32	CRE-FOR -RETAINED		
33	CRE-WOR (Alternative path 2P)	→	CRE-FOR-WOR
34	CRE-FOR -RETAINED		
35	CRE-TRA (Alternative path 2H)	→	CRE-CAP-TRA (Alternative path 1HD)
36		→	CRE-WOR-TRA (Alternative path 2HD)
37	CRE-CAP (Alternative path 1HD)	→	CRE-FOR-CAP
38	CRE-FOR -RETAINED		
39	CRE-WOR (Alternative path 2HD)	→	CRE-FOR-WOR
40	CRE-FOR -RETAINED		
41	CRE-LAB (Alternative path 3H)	→	CRE-CAP-LAB (Alternative path 1HK)
42		→	CRE-WOR-LAB (Alternative path 2HK)
43	CRE-CAP (Alternative path 1HK)	→	CRE-FOR-CAP
44	CRE-FOR -RETAINED		
45	CRE-WOR (Alternative path 2HK)	→	CRE-FOR-WOR
46	CRE-FOR -RETAINED		
47	SUP-PRO	→	SUP-STO-PRO
48	SUP-STO	→	SUP-INT-STO (Alternative path 1M)
49		→	SUP-TRA-STO (Alternative path 2M)
50		→	SUP-LAB-STO (Alternative path 3M)
51	SUP -INT (Alternative path 1M)	→	SUP -CAP-INT (Alternative path 1N)
52		→	SUP-WOR-INT (Alternative path 2N)
53	SUP-CAP – RETAINED (No alternative path 1N)		
54	SUP-WOR- RETANED (No alternative path 2N)		
55	SUP -TRA (Alternative path 2M)	→	SUP-CAP-TRA (Alternative path 1Q)
56		→	SUP-WOR-TRA (Alternative path 2Q)

57	SUP-CAP – RETAINED (No alternative path 1Q)		
58	SUP-WOR- RETANED (No alternative path 2Q)		
59	SUP-LAB (Alternative path 3M)	→	SUP -CAP-LAB (Alternative path 1X)
60		→	SUP-WOR-LAB (Alternative path 2X)
61	SUP-CAP – RETAINED (No alternative path 1X)		
62	SUP-WOR- RETANED (No alternative path 2X)		
63	FOR-PRO	→	FOR-STO-PRO
64	FOR-STO	→	FOR-INT-STO (Alternative path 1J)
65		→	FOR-TRA-STO (Alternative path 2J)
66		→	FOR-LAB-STO (Alternative path 3J)
67	FOR -INT (Alternative path 1J)	→	FOR -CAP-INT (Alternative path 1G)
68		→	FOR-WOR-INT (Alternative path 2G)
69	FOR-CAP – RETAINED (No alternative path 1G)		
70	FOR-WOR- RETANED (No alternative path 2G)		
71	FOR -TRA (Alternative path 2J)	→	FOR -CAP-TRA (Alternative path 1Z)
72		→	FOR-WOR-TRA (Alternative path 2Z)
73	FOR-CAP – RETAINED (No alternative path 1Z)		
74	FOR-WOR- RETANED (No alternative path 2Z)		
75	FOR -LAB (Alternative path 3J)	→	FOR -CAP-LAB (Alternative path 1Y)
76		→	FOR-WOR-LAB (Alternative path 2Y)
77	FOR-CAP – RETAINED (No alternative path 1Y)		
78	FOR-WOR- RETANED (No alternative path 2Y)		
79	CAP-PRO	→	CAP-STO-PRO
80	CAP-STO	→	CAP-INT-STO (Alternative path 1K)
81		→	CAP-TRA-STO (Alternative path 2K)
82		→	CAP-LAB-STO (Alternative path 3K)
83	CAP-INT -RETAINED (No alternative path 1K)		
84	CAP-TRA -RETAINED (No alternative path 2K)		
85	CAP-LAB - RETAINED (No alternative path 3K)		

86	WOR-PRO	→	WOR-STO-PRO
87	WOR-STO	→	WOR-INT-STO (Alternative path 1L)
88		→	WOR-TRA-STO (Alternative path 2L)
89		→	WOR-LAB-STO (Alternative path 3L)
90	WOR-INT - RETAINED (No alternative path 1L)		
91	WOR-TRA - RETAINED (No alternative path 2L)		
92	WOR-LAB - RETAINED (No alternative path 3L)		
93	INT-PRO	→	INT-STO-PRO
94	INT-STO - Retained		
95	TRA-PRO	→	TRA-STO-PRO
96	TRA-STO - Retained		
97	LAB-PRO	→	LAB-STO-PRO
98	LAB-STO - Retained		
99	STO-PRO - Retained		

After the uncluttering process, the proceeding uncluttered SID is produced. Relationships are clearly visible and rational (see Fig 4.5)

4.4.3 Uncluttered SID

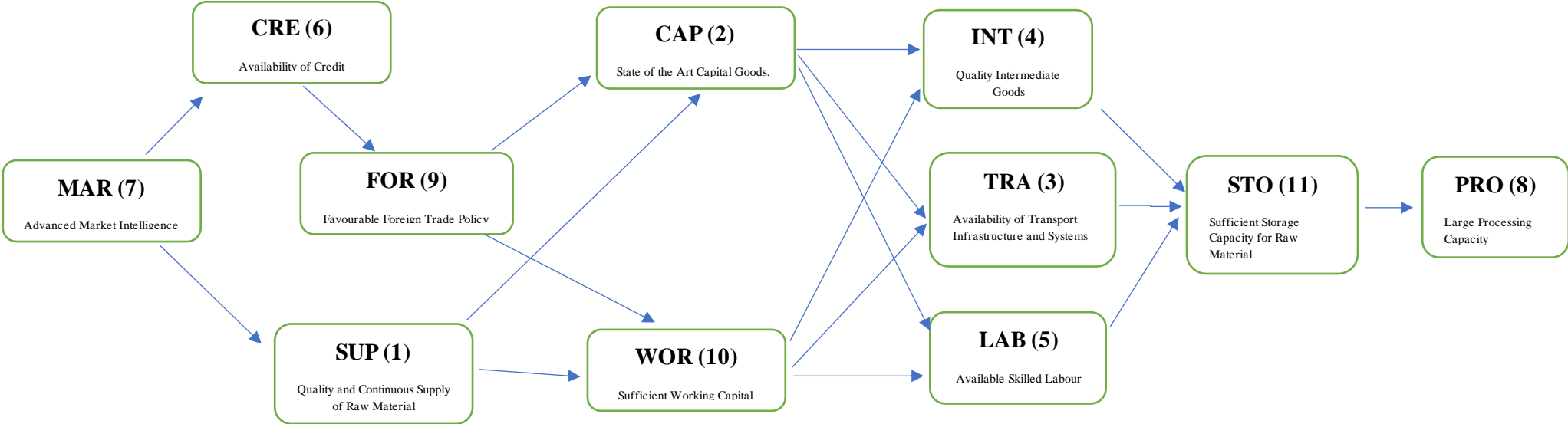


Figure 4. 5: Simple uncluttered SID representation

Below is a description of the above diagram (Figure 4.5), the uncluttered SID:

1. Advanced Market Intelligence influences Availability of Credit and Quality and Continuous Supply of Raw Material.
2. Availability of Credit influences Favourable Foreign Trade Policy.
3. Favourable Foreign Trade Policy and Quality and Continuous Supply of Raw Material influences Sufficient Working Capital and State of the Art Capital Goods.
4. State of the Art Capital Goods and Sufficient Working Capital influences Available Skilled Labour, Availability of Transport Infrastructure and Systems and Quality Intermediate Goods.
5. Available Skilled Labour, Availability of Transport Infrastructure and Systems and Quality Intermediate Goods influences Sufficient Storage Capacity for Raw Material.
6. Sufficient Storage Capacity for Raw Material influences Large Processing Capacity

All of the relationships are direct and there is no intertwined relationship that resulted in a loop.

4.5 Discussion of Relationship between the Critical Success Factors

4.5.1 Primary drivers

Primary drivers are factors that influence other factors without being influenced.

Advanced Marketing Intelligence (MAR (7))

Advanced market intelligence is located on the diagram's (figure 4.5) left edge. It has a delta (Δ) value of 10. As a result, it is the primary driver of the preceding structure. It has a strong influence on other elements while not being influenced by others.

Advanced market intelligence has the most influence over other CSFs. This is because without a market for the output, the project will have no economic value. As the agro-processing industry is a customer-centric industry, most of the project's decisions are made to satisfy the customers. Every export oriented agro-processing project first needs to understand the market. This will aid in determining market viability as well as product-market fit. Understanding the market would be useful in determining the quality and quantity of raw materials to be used in

production, as well as the amount of investment and credit required to be involved in an agro-processing project.

4.5.2 Secondary drivers

Secondary drivers are elements that influence more than being influenced. These factors have a delta (Δ) value between 0 and 10 (excluding 0 and 10). There are five secondary drivers in the SID. These are availability of credit, quality and continuous supply of raw material, favourable foreign trade policy, state-of-the-art capital goods and availability of working capital are elements under this category.

Availability of Credit (CRE (6))

Availability of credit is the second strong driving factor in agro-processing projects. Once an agro-processing project has completed market research and determined the viability of the project and product market fit, the most common next step is to seek credit to support each activity of the project, which is critical to the project's success. To support almost all of the project's operations, funding, particularly credit, is required. The information obtained from advanced market intelligence influences the availability of credit for the project. As credit is the primary source of funding in the majority of projects, it influences the amount of hard currency (FOR) that will be used to import capital goods and intermediate goods (using working capital).

Quality and Continuous Supply of Raw Material (SUP (1))

Advanced market intelligence is also a determinant factor quality and continuous supply of raw material. The quality and continuity of raw materials would be determined for procurement based on market demand and standardisation requirements. All of the requirements must be met by the raw material. As continuous and quality supply is not always available, processors can only procure what is available for them in the required quality; hence supply of quality raw material influences the amount of working capital needed for procurement and processing. Supply of raw material would also influence the projects choice for state-of the art capital goods.

Favourable Foreign Trade Policy (FOR (9))

Favourable Foreign Trade Policy is influenced by credit availability because projects require finance to import capital and intermediate goods. Projects require foreign currency to import capital and intermediate goods for production; As a result, favourable foreign trade policy (availability of hard currency) would influence projects' State-of-the-art Capital Goods selection. It also influences the availability of working capital because some of the processing goods (intermediate goods) are imported.

State-of-the-art Capital Goods (CAP (2))

The type and size of the capital goods are determined by what the market demands (market intelligence), and the technology used in processing should be modified or designed to meet the market's expectations for production quality. Because such machinery is not produced locally, it must be imported from abroad. The availability of credit as a form of hard currency influences the state-of-the-art capital good that a company would procure. It is also influenced by the quality and quantity of raw material supply as the capital goods such as processing machinery need to be able to process the procured raw material to desired quality and quantity. If the machine is not able to process all the provided raw material, there will be wastage of raw material due to perishability, on the opposite side if the machine has more capacity of production than the raw materials available, it would result in production inefficiency hence, it is vital to have a machinery that is able to process the available raw material at the desired quality.

State of the art capital goods influence the quality of intermediate goods, availability of transportation infrastructure and systems and the amount and available skilled labour required for processing.

Sufficient Working Capital (WOR (10))

Sufficient working capital is influenced by the amount of available credit as working capital is mostly obtained through credit. Credit needs to be available in order for the agro-processing

firm to buy agricultural raw material from the farmers. In cases where projects need to import goods and services, the availability of hard currency (favourable foreign trade policy) would also influence the availability of working capital. It is also influenced by the supply of raw material because some raw materials are seasonal. There needs to be enough working capital to procure and store raw materials for future continuous processing. Working capital influences services rendered such as choice and availability of transportation infrastructure and systems and availability of skilled labour. It also influences the quality of intermediate good procured.

4.5.3 Secondary outcomes

Secondary outcomes are factors that influence less factors than being influenced. These factors have a delta (Δ) value between 0 and -10 (excluding 0 and -10). Available skilled labour, quality intermediate goods, availability of transportation infrastructure and systems and sufficient storage capacity for raw materials are secondary outcomes in the structure.

Available Skilled Labour (LAB (5))

Sufficient Working Capital Availability and State-of-the-art Capital Goods influences skilled labour availability. Agro-processing projects must budget for a higher salary to attract skilled labour. As salary is part of working capital, available skilled labour is influenced by available working capital. State-of-the-art Capital Goods also influence skilled labour required. If the processing is fully automated, there would less labour required for operation. If most of the processing is manual, it needs large amount of both skilled and unskilled labour for processing.

Availability of skilled labour affects the storage capacity as there need to be enough labour for storage (inventory management) and processing the raw material.

Quality Intermediate Goods (INT (4))

Sufficient working capital influences quality intermediate goods. Because these goods are part of the operational costs, it is necessary to have a sufficient working capital budget allocation in order to procure quality intermediate goods. Besides the quality of intermediate goods used

for processing is also influenced by the choice of the State-of-the-art Capital Goods (machinery), as some machineries would only use particular types of intermediate goods.

As Intermediate goods are part of the ago-processing inputs, that need to be stored and used for processing (with the raw material), it influences Sufficient Storage Capacity for Raw Material.

Availability of Transportation Infrastructure and Systems (TRA (3))

Availability of Transportation Infrastructure and Systems is influenced by sufficient working capital because cost and choice of transportation is determined by the amount of money required to transport it. It is also influenced by the project's state-of-the-art capital goods, as some of the projects own their own transportations (refrigerated trucks – capital good) hence, there would not have a challenge related to transporting their raw materials. Availability of Transportation Infrastructure and Systems influences Sufficient Storage Capacity for Raw Material because all the raw materials have to be transported to be kept in a storage facility.

Sufficient Storage Capacity for Raw Material (STO (11))

The amount of raw materials the project is able to transport, the labor force available to store and process the raw materials, and the availability of quality intermediate good have an influence on storage capacity for raw material. There will be a need for large amount of storage, if the project is able to transport large quantities of raw materials, have adequate labor for processing activities, and have enough quality intermediate good for processing. Storage capacity of raw material influences the processing capacity of the project as the project mostly relies on the stored raw material for processing.

4.5.4 Primary Outcomes

Primary outcomes are factors that are influenced by other factors however, they have no influence on the other factors. The only factor under this section is large processing capacity. Large processing capacity is located on the diagram's (figure 4.5) right edge. It has a delta (Δ) value of (- 10).

Large Processing Capacity (PRO (8))

Large processing capacity is influenced by Sufficient Storage Capacity for Raw Material. Most ago-processing projects store their raw materials before processing. As there might be inconsistency or disruption in the supply chain, the stored raw material would make the processes flowless. Hence processing capacity is influenced by the amount of raw material stored.

Processing capacity of the project would directly impact the bottom line of the business which will increase the amount of output of the venture. As the output of the venture increases, the revenue would increase and determine the financial success of the project.

4.6 Comparison of Identified CSFs and CSFs in Literature Review

This section compares the CSFs identified in the research to the CSFs found in the literature review. The results of the study's comparison between the 11 identified CSFs and those discussed and discovered in the literature review are presented in Table 4.9. The research-identified CSFs are listed at the top of Table 4.9. Along the row of corresponding authors, a letter X is placed beneath the specific critical success factor. The total number of citations for the CSFs identified by the various authors is shown at the bottom of Table 4.9.

Table 4.9: Research CSFs vs Reviewed Literature CSFs

<i>Research Findings Critical Success Factors</i>	QUALITY AND CONTINUOUS SUPPLY OF RAW MATERIAL	STATE OF THE ART CAPITAL GOODS	AVAILABILITY OF TRANSPORTATION INFRASTRUCTURE AND SYSTEMS	QUALITY INTERMEDIATE GOODS	AVAILABLE SKILLED LABOUR	AVAILABILITY OF CREDIT	ADVANCED MARKET INTELLIGENCE	LARGE PROCESSING CAPACITY	FAVOURABLE FOREIGN TRADE POLICY	SUFFICIENT WORKING CAPITAL	SUFFICIENT STORAGE CAPACITY FOR RAW MATERIAL
Author											
Deloitte (2011)		X			X	X	X				
Van Lin et al. (2018)	X	X			X	X	X				
Louw et al. (2013)			X		X	X	X				
Bruntrup et al. (2013),	X		X		X	X			X		X
Ouma and Whitfield (2012)						X					
de Almeida and Zylbersztajn (2017)		X			X	X			X		
Macdonald and Rowarth (2013)						X					
Owoo and Lambon-Quayefio (2017)						X	X				
Gandhi (2014)		X				X					
Christian (2015)			X			X					X
Jordaan (2012)						X			X		
Nkwabi et al. (2019)		X				X					

Brethenoux et al. (2012)			X		X	X					
Meena et al. (2009)		X				X					
ILO (2017)			X		X						
Swai (2017)	X	X			X		X		X		
Wanjau et al (2015)					X						
Odoyo (2013)		X			X						
Lambert (2001)	X	X			X		X				
Boakye (2013)					X						
Chryniewicz et al. (2017)		X	X		X		X				
Asokan and Singh (2003)	X										
Suryaningrat (2016)	X										
Black et al. (2020)			X						X		
Koira (2014)			X								X
Nuamah (2014)			X								
Kumar (2016)			X				X				
Louw et al. (2008)							X				
Ayele et al. (2019)									X		
Mutua (2014),		X									
Ngenoh et al. (2019)		X									
Total Appearance	6	12	10	0	13	14	9	0	6	0	3

An important finding from Table 4.9 is that eight of the 11 CSFs identified by participants were prominently mentioned by the various researchers. According to the researcher, the appearance of these CSFs indicated that they are regarded as critical in agro- processing projects not only in Ethiopia, but also in other settings. While some of these CSFs are similar to those discussed in the literature review, their impact on individual organisations will differ.

According to Table 4.9, among the CSFs identified in the literature review, state-of-the-art capital goods, transportation infrastructure and systems availability, available skilled labour, credit availability and advanced market intelligence appeared more frequently. This is due to

the fact that they are regarded as critical for the success of agro-processing projects not only in Ethiopia's agro-processing sector, but also in other settings, as shown in Table 4.9.

According to the research study, sufficient storage capacity for raw materials received only few citations by authors, as shown in Table 4.9. This could be attributed to the fact that the context in which the studies were conducted has a well-developed storage facility or they have a well-planned supply chain so that they do not need to store much of their raw material.

Quality intermediate goods, large processing capacity, and sufficient working capital are not mentioned in the literature reviews, which could be because they are considered to be unique success factors, particularly for Ethiopian agro-processors.

4.7 Conclusion

The chapter has discussed the CSFs as proffered by the participants in the study. This chapter identified 11 CSFs and identified the relationships between the identified CSFs. Depending on their influence on each other. Advanced Market Intelligence is identified as primary driver CSF. Quality and Continuous Supply of Raw Material, Availability of Credit, State-of-the-Art Capital Goods, Favourable Foreign Trade Policy and Sufficient Working Capital are identified as secondary driver CSFs. There is no pivot CSF. Availability of Transportation Infrastructure and Systems, Quality Intermediate Goods, Available Skilled Labour and Sufficient Storage Capacity for Raw Material are secondary outcome CSFs and lastly Large Processing Capacity is classified as primary outcome CSFs. Using this information an SID was made and the relationships between the CSFs were identified. The following chapter will present the summary, findings and recommendations deriving from the study.

CHAPTER 5: CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter summarises the research findings presented and discussed in Chapter Four. Furthermore, the chapter evaluates whether the study's objectives, as discussed in Chapter One, are met and satisfied. Section 5.2 reviews the objectives of the study and the methodology used. Section 5.3 discusses the findings and sections 5.4 and 5.5 highlight the research limitations and suggest areas of further research.

5.2 Review of Research Aims and Objectives

The objective of this study was to identify critical success factors in the export-orientated agro-processing projects in Ethiopia, as well as to investigate possible interrelationships between the identified critical success factors (CSFs). The study devised the following research questions in order to achieve the above objective:

1. What are the CSFs for export-oriented agro-processing firms in Ethiopia?
2. Identify if there are any noticeable interrelationships between these identified CSFs?

The study adopted the Interactive Qualitative Analysis (IQA) approach to address the main objective of the study. The IQA is a qualitative research method that uses focus group to collect data about a subject and configure the data into a structural representation in order to obtain insights from it (Northcutt and McCoy, 2004). This methodology uses a two-pronged approach, with multiple stages targeted at addressing the two key objectives that were set in congruence with the research aim.

1. Identify CSFs of export oriented agro-processing in Ethiopia
2. Discern any existing relationships between the CSFs

In accordance with the first objective, the study identified the most pertinent CSFs and analysed them based on the empirical data provided by focus group. Eleven expert participants were sourced from Addis Ababa agro-processing firms, based on industry experience criteria. They discussed the critical factors that are necessary for the export-orientated agro-processing project to be successful. This process manifested itself in the form of debates and sharing of

opinions based on experience. The data produced by focus groups was then synthesised into affinities through inductive and axial coding. The CSFs identified by the study are as follows:

1. Quality and continuous supply of raw material (SUP)
2. State-of-the-art capital goods (CAP)
3. Availability of transportation infrastructure and systems (TRA)
4. Quality intermediate goods (INT)
5. Available skilled labour (LAB)
6. Availability of credit (CRE)
7. Advanced market intelligence (MAR)
8. Large processing capacity (PRO)
9. Favourable foreign trade policy (FOR)
10. Sufficient working capital (WOR)
11. Sufficient storage capacity for raw material (STO)

The second objective was to identify prevalent interconnections between the CSFs. Participants in this process established potential links between these overarching themes of critical success factors if, based on their expertise, they believed there were any. Using a cause-and-effect relationship, either the CSFs influence each other or the CFSs do not influence each other. The study used the Interrelationship Diagram and the System Influence Diagram to model the relationship between the CSFs. The study identified the following influences between the CSFs:

- 1 Advanced Market Intelligence influences Availability of Credit and Quality and Continuous Supply of Raw Material.
- 2 Availability of Credit influences Favourable Foreign Trade Policy.
- 3 Favourable Foreign Trade Policy and Quality and Continuous Supply of Raw Material influences Sufficient Working Capital and State of the Art Capital Goods.
- 4 State of the Art Capital Goods and Sufficient Working Capital influences Available Skilled Labour, Availability of Transport Infrastructure and Systems and Quality Intermediate Goods.
- 5 Available Skilled Labour, Availability of Transport Infrastructure and Systems and Quality Intermediate Goods influences Sufficient Storage Capacity for Raw Material.

6 Sufficient Storage Capacity for Raw Material influences Large Processing Capacity

Based on their level of influence (Delta (Δ) values), the identified CSFs are categorised as Drivers and Pivots and Outcomes. Advanced marketing intelligence is considered as primary driver as it has all outward arrows (influence) with no inward arrows (influenced) (Delta (Δ) value of 10). Availability of credit, quality and continuous supply of raw material, favourable foreign trade policy, state-of-the-art capital goods and sufficient working capital are considered secondary drivers as they have more outward arrows (influence) than inward arrows (influenced) (Delta (Δ) value between 0 and 10). There is no pivot element (Delta (Δ) value of zero). Available skilled labour, availability of transportation infrastructure and systems, quality intermediate goods and sufficient storage capacity for raw materials are considered as secondary outcomes as they have fewer outward arrows (influence) than inward arrows (influenced) (delta (Δ) value of between 0 and -10). Finally, large processing capacity is considered primary outcome as it has no outward arrow (influence) and all arrows are inward (influenced) (Delta (Δ) values of -10).

5.3 Implications of Findings

Projects are unique undertakings. In view of this, most CSFs in each project are unique to each specific project. In the future, whenever a project is initiated, managers should consider holding IQA focus groups to identify the relevant CSFs and the relationship between them. The CSF relationship model could help them to identify primary driving factors as priority areas requiring special attention from senior management. This would provide a justification for the investment of limited project resources on main driver CSFs with less focus on primary outcome CSFs, thus increasing chances of project success.

Organisations would consider starting to embed the IQA approach in their project initiation processes to identify the critical factors for the successful completion of projects. Doing so would require that all project managers in such organisations be trained as IQA facilitators in order to ensure that the focus groups are conducted efficiently and effectively.

5.4 Research Limitations

Several constraints hampered this study. There were five notable limitations. Firstly, securing the commitment and active participation of the IQA workshop participants was a challenge because of their limited availability due to their conflicting priorities with the IQA schedule.

Therefore, the study's results are based on the opinions and experiences of no more than eleven participants from Addis Ababa only. While this number is within acceptable limits, more participation from stakeholders from different regions would have improved the focus group discussion and results.

Secondly, the discussions held amongst focus group members were, at times, from a high-level perspective, and they seldom went into detail with each CSF. This has had an impact on the amount and depth of content discussed in the findings.

The researcher used simple ART that is completed by the participants rather than a detailed ART as preferred by Northcutt and McCoy (2004). As total of 11 CSFs were found in the focus group discussion, getting commitment from each participant for an "if/then" question response and explanation for 110 relationships was challenging. Although the simple ART produces all the coding needed for a mind map, volume and detail of data are sacrificed in the interest of time

The research study only included data from the focus group due to time constraints. Only the findings of the focus group activity are reported in this study.

Finally, there was a challenge in finding relevant recent literature and also relevant literature in general. Some study findings were difficult to verify due to a lack of available relevant literature for Ethiopia context.

5.5 Areas for Further Research

The study's findings are especially relevant to Ethiopian export-oriented agro-processing projects. However, because most developing countries are agriculture-oriented, and agro-processing is one of the first steps in transitioning from agriculture to manufacturing, other researchers in different developing countries could conduct the same research for their respective countries. Kenya, Uganda and Sudan are just a few examples.

Some of the CSFs discovered in this study are not found in the reviewed literature. These are quality intermediate goods, a large processing capacity, and sufficient working capital. According to the study, these could be CSFs particular to Ethiopian agro-processing projects. Future researchers could conduct more research to investigate these CSFs and what makes them unique to Ethiopian agro-processing projects.

This study focuses on export-oriented production and does not consider producers for the domestic market. It will therefore be useful to conduct a similar study for domestic production and compare the results.

5.6 Conclusion

This research aimed to identify the factors thought to be critical factors shaping the successful completion of export-oriented agro-processing projects in Ethiopia. It used the IQA methodology to investigate CSFs and relationships. The study identified 11 critical success factors that accounted for success in Ethiopia's agro-processing projects, and the relationship between these critical success factors.

It is important to note that the study's findings are not conclusive. However, the findings show that participants' opinions and the literature are indeed related, but the perceived relative importance may differ between those identified and those found in literature. The identification of CSFs only adds to the ongoing effort of determining which CSFs have an influence on the successful completion of export-oriented agro-processing projects in Ethiopia.

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7 ANNEXURES

ANNEXURE A: Sample Questionnaire Form

ANNEXURE B: Completed Questionnaire Form

ANNEXURE C: Ethics in Research Approval

ANNEXURE D: Plagiarism Declaration

ANNEXURE A: Sample Questionnaire Form



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

Researcher:

Mr. Teferi M. Abay

Important Notes:

- Research Study is conducted to assist the researcher to complete his studies towards the MSc in Project Management through the University of Cape Town (UCT)
- Participants personal details will be kept confidential by the researcher and UCT and will not be made available for public use
- The results of the study might be published in a research journal or book
- The research document will be available to readers in a university library in printed form, and possibly in electronic form as well

Sections 1: Personal Information

Name(optional):	
Current Position / Level	
PM Experience (Yrs.)	
Type of Agro- Processing	
Project Management Qualification (s)	
PM Association Membership(s)	



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

CSF		Description	Control Factor	
			Organi zation	External
Example	*Vertical integration	Vertically integrating and owning from Farm to Market Approach	X	
	*Partnership	Strategic partnership with foreign investors		X
	*Executive Management support	The Management was very supportive and open for engagement	X	
1				
2				
3				
4				
5				

ANNEXURE B: Completed Questionnaire Form



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

Researcher:

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Sections 1: Personal Information

Name(optional):	<input type="text"/>
Current Position / Level	Project Head.
PM Experience (Yrs.)	7 Years.
Type of Agro- Processing	Mango juice processing.
Project Management Qualification (s)	Online Course certificate.
PM Association Membership(s)	No.



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

CSF	Description	Control Factor		
		Organi zation	External	
Example	*Vertical integration	Vertically integrating and owning from Farm to Market Approach	X	
	*Partnership	Strategic partnership with foreign investors		X
	*Executive Management support	The Management was very supportive and open for engagement	X	
1	Supply of agricul tural raw material	Continuous supply of raw material is important (Reliability)		
2	Quality Machinery	Quality machines that have high efficiency and produce quality product.		
3	Packaging	Quality packaging is necessary and readily available in the local market.		
4	Finance	Raw material and salary need large amount of working capital.		
5	Land	It is vital to find convenient location for processing & storage.		
6.	Transport facility	Fruits must be transported in the cold storage to maintain their freshness.		
7.	Government support	Government support in tax exemption (10 year tax break) and available hard cash for imports.		



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Sections 1: Personal Information

Name(optional):	[Redacted]
Current Position / Level	production manger
PM Experience (Yrs.)	9
Type of Agro- Processing	Avocado oil production
Project Management Qualification (s)	NO
PM Association Membership(s)	No



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

CSF		Description	Control Factor	
			Organi- zation	External
Example	*Vertical integration	Vertically integrating and owning from Farm to Market Approach	X	
	*Partnership	Strategic partnership with foreign investors		X
	*Executive Management support	The Management was very supportive and open for engagement	X	
1	Advanced Machinery	Advanced oil extraction machineries are important in oil manufacturing. (German machinery)	X	
2	High Volume production	oil production is a mass production (profit only comes out of volume)	X	
3	Finance (working capital)	large production has high operational cost so it needs large of finance to cover operational cost	X	
4	large storage	seasonal production hence storage is important	X	
5	Reliable raw material supply	Finding and organizing former cooperates to source raw material from is the core of the business	X	



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

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Sections 1: Personal Information

Name(optional):	[Redacted]
Current Position / Level	Public and Private Partnership head
PM Experience (Yrs.)	7
Type of Agro- Processing	Bamboo flooring and Deck manufacturing
Project Management Qualification (s)	
PM Association Membership(s)	



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

	CSF	Description	Control Factor	
			Organi- zation	External
Example	*Vertical integration	Vertically integrating and owning from Farm to Market Approach	X	
	*Partnership	Strategic partnership with foreign investors		X
	*Executive Management support	The Management was very supportive and open for engagement	X	
1	Advanced machinery	Advanced machinery is essential to export production (cost grid power supply)	X	
2	Skilled labour	we have foreign invest with high salaries in dollars as there is shortage of having good investors		X
3	Finance	and available credit is important	X	
4	Experience and knowledge of export market	This might include networking and market research	X	
5	Storage	sufficient storage including storage despots around the forest.	X	
6	Transportation	partnering with local transportation associations benefited the business and create local job which is part of BUS CSR.		X
7	Quality control	Sourcing quality bamboo with less variability would reduce the burden of quality control and increase raw material for production	X	

is skilled labourers in and infra-structure and to factory

production



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

Researcher:

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Sections 1: Personal Information

Name(optional):	[REDACTED]
Current Position / Level	Senior Project Manager
PM Experience (Yrs.)	13
Type of Agro- Processing	Flour Processing
Project Management Qualification (s)	No
PM Association Membership(s)	No



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

CSF		Description	Control Factor	
			Organi- zation	External
Example	*Vertical integration	Vertically integrating and owning from Farm to Market Approach	X	
	*Partnership	Strategic partnership with foreign investors		X
	*Executive Management support	The Management was very supportive and open for engagement	X	
1	Transportation infrastructure	Road Infrastructure is necessary for collection wheat		X
2	Technical and manual skills	Technical and managerial skill is important	X	
3	Credit from Bank	Credit from bank is important as it needs expensive machinery		X
4	Market Research	Information on Customer brand and market is essential	X	
5	Hard currency	Hard currency to import intermediate goods and services		X



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

Researcher:

Mr. Teferi M. Abay

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Sections 1: Personal Information

Name(optional):	
Current Position / Level	Owner
PM Experience (Yrs.)	14
Type of Agro- Processing	Coffee Processing
Project Management Qualification (s)	MBA
PM Association Membership(s)	No



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

CSF		Description	Control Factor	
			Organi- zation	External
Example	*Vertical integration	Vertically integrating and owning from Farm to Market Approach	X	
	*Partnership	Strategic partnership with foreign investors		X
	*Executive Management support	The Management was very supportive and open for engagement	X	
1	Quality Packaging	Quality packaging is one of the USP for coffee manufacturing in industry. Unique selling proposition	X	
2	Advanced Machinery	Advanced machinery is essential to maintain product and process quality. Especially for the export market	X	
3				
4				
5				



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

Researcher:

Mr. Teferi M. Abay

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Sections 1: Personal Information

Name(optional):	[Redacted]
Current Position / Level	Project Manager.
PM Experience (Yrs.)	15 years.
Type of Agro- Processing	Coffee processing.
Project Management Qualification (s)	PMP certified, PRINCE 2 certified.
PM Association Membership(s)	No.



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

	CSF	Description	Control Factor	
			Organi- zation	External
Example	*Vertical integration	Vertically integrating and owning from Farm to Market Approach	X	
	*Partnership	Strategic partnership with foreign investors		X
	*Executive Management support	The Management was very supportive and open for engagement	X	
1	Quality of Packaging	Quality of Packaging Contribution	X	
2	Project Finance	Credit Support for farm African development bank		X
3				
4				
5				



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

Researcher:

Mr. Teferi M. Abay

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Sections 1: Personal Information

Name(optional):	[Redacted]
Current Position / Level	D/project coordinator
PM Experience (Yrs.)	8
Type of Agro- Processing	DIVERSE
Project Management Qualification (s)	MSc project planning and Management
PM Association Membership(s)	No



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

CSF	Description	Control Factor	
		Organi- zation	External
Example	*Vertical integration	X	
	*Partnership		X
	*Executive Management support	X	
1	Continuous raw material supply		X
2	Experienced management skill	X	
3	Transportation infrastructure and system		X
4			
5			

A continuous supply of high quality raw materials is required to keep the business running

Finding skilled and experienced management is also critical, especially in emerging industries such as agro-processing

Because agro-processing raw material are perishable, having a modern transportation system and infrastructure would provide a competitive edge.



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

Researcher:

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Sections 1: Personal Information

Name(optional):	[REDACTED]
Current Position / Level	Deputy General manager
PM Experience (Yrs.)	13
Type of Agro- Processing	Coffee Processing
Project Management Qualification (s)	No
PM Association Membership(s)	No



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

	CSF	Description	Control Factor	
			Organi- zation	External
Example	*Vertical integration	Vertically integrating and owning from Farm to Market Approach	X	
	*Partnership	Strategic partnership with foreign investors		X
	*Executive Management support	The Management was very supportive and open for engagement	X	
1	large storage capacity	As the harvesting season is once a year, large storage is critical for low-rain processing		
2				
3				
4				
5				



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

Researcher:

Mr. Teferi M. Abay

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Sections 1: Personal Information

Name(optional):	[Redacted]
Current Position / Level	Lecturer
PM Experience (Yrs.)	13
Type of Agro- Processing	Brewery
Project Management Qualification (s)	MBA
PM Association Membership(s)	No



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

	CSF	Description	Control Factor	
			Organi- zation	External
Example	*Vertical integration	Vertically integrating and owning from Farm to Market Approach	X	
	*Partnership	Strategic partnership with foreign investors		X
	*Executive Management support	The Management was very supportive and open for engagement	X	
1	High Quality and Continuous Raw Material Supply.			
2	Credit from Banks or financial Institution.			
3	Market Research and Network.			
4	Stable exchange Rate for financial planning.			
5				



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

Researcher:

Mr. Teferi M. Abay

Important Notes:

- Research Study is conducted to assist the researcher to complete his studies towards the MSC in Project Management through the University of Cape Town (UCT)
- Participants personal details will be kept confidential by the researcher and UCT and will not be made available for public use
- The results of the study might be published in a research journal or book
- The research document will be available to readers in a university library in printed form, and possibly in electronic form as well

Sections 1: Personal Information

Name(optional):	[REDACTED]
Current Position / Level	Supply chain manager
PM Experience (Yrs.)	13
Type of Agro- Processing	Sugar manufacturing
Project Management Qualification (s)	PMP
PM Association Membership(s)	No



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

CSF	Description	Control Factor	
		Organi- zation	External
Example	*Vertical integration	X	
	*Partnership		X
	*Executive Management support	X	
1	Credit		
2	Transportation System		
3	Large capacity processing capacity		
4			
5			

Credit system is essential for most processing plants because of the need for large critical investment and operation costs

The availability of a transportation system is critical

Because agro processing is a volume-based business, having a large processing capacity is critical to keeping the business afloat



Research Title:

Identification of the Critical Success Factors for Export oriented Agro-processing projects in Ethiopia.

Researcher:

Mr. Teferi M. Abay

Important Notes:

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- The results of the study might be published in a research journal or book
- The research document will be available to readers in a university library in printed form, and possibly in electronic form as well

Sections 1: Personal Information

Name(optional):	[Redacted]
Current Position / Level	Program Manager
PM Experience (Yrs.)	9
Type of Agro- Processing	Peanut Butter Manufacturing
Project Management Qualification (s)	No
PM Association Membership(s)	No



Section 2: Identification of Critical Success factors (CSF)

In your opinion, what do you perceive to be *Critical Success Factors* that can lead to successful completion of *Export oriented Agro-processing projects in Ethiopia*?

1. Please identify the Critical Success Factor and provide an appropriate description
2. Please mark an X next to those CSFs, which in your opinion are internal to the organisation or external to the organisation

CSF		Description	Control Factor	
			Organi- zation	External
Example	*Vertical integration	Vertically integrating and owning from Farm to Market Approach	X	
	*Partnership	Strategic partnership with foreign investors		X
	*Executive Management support	The Management was very supportive and open for engagement	X	
1	Raw Material Supply	There is seasonal shortage in raw material suppl hence securing raw material is an advantage		X
2	Credit	credit essential for Capital invest ment and cover Operational costs		X
3	Processing Capacity	Large production is essential for economies of scale	X	
4	Advanced Market Intelligence	It is critical to have advanced research on the export market trends and consumers behavior	X	
5				

ANNEXURE C: Ethics in Research Approval

Application for Approval of Ethics in Research (EIR) Projects
Faculty of Engineering and the Built Environment, University of Cape Town

ETHICS APPLICATION FORM

Please Note:

Any person planning to undertake research in the Faculty of Engineering and the Built Environment (EBE) at the University of Cape Town is required to complete this form **before** collecting or analysing data. The objective of submitting this application *prior* to embarking on research is to ensure that the highest ethical standards in research, conducted under the auspices of the EBE Faculty, are met. Please ensure that you have read, and understood the **EBE Ethics in Research Handbook** (available from the UCT EBE, Research Ethics website) prior to completing this application form: <http://www.ebe.uct.ac.za/ebe/research/ethics1>

APPLICANT'S DETAILS	
Name of principal researcher, student or external applicant	
Department	
Preferred email address of applicant:	
If Student	Your Degree: e.g., MSc, PhD, etc.
	Credit Value of Research: e.g., 60/120/180/360 etc.
	Name of Supervisor (if supervised):
If this is a research contract, indicate the source of funding/sponsorship	
Project Title	

I hereby undertake to carry out my research in such a way that:

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

APPLICATION BY	Full name	Signature	Date
Principal Researcher/ Student/External applicant	Teferi Abay		05/02/2020
SUPPORTED BY	I asked Mr. Abay to follow the video 'Reviewer's Feedback on Ethics Clearance Applications' to ensure that all documents required for ethics clearance met the reviewer's expectation. Mr. Abay responded 'Done'. Furthermore, Mr. Abay didn't complete his research proposal until 28 July 2020. It is unknown why his signature date is February.		Date
Supervisor (where applicable)	NIEN-TSU TUAN		30 July 2020
APPROVED BY	Full name	Signature	Date
HOD (or delegated nominee) Final authority for all applicants who have answered NO to all questions in Section 1; and for all Undergraduate research (Including Honours).	Louie van Schalkwyk		27 August 2020
Chair: Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the questions in Section 1.	Louie van Schalkwyk		27 August 2020

ANNEXURE D: Plagiarism Declaration

UNIVERSITY OF CAPE TOWN CONSTRUCTION ECONOMICS & MANAGEMENT



PLAGIARISM DECLARATION

Declaration

1. I know the meaning of plagiarism and declare that all of the work in the dissertation, save for that which is properly acknowledged is my own.
2. This thesis/ dissertation has been submitted to Turnitin module (or equivalent similarity and originality checking software) and I confirm that my supervisor has seen my report and any concerns revealed by such have been resolved with my supervisor."
3. I have not allowed, and will not allow, any one to copy my work with the intention of passing it off as his or her work.

Signed by candidate

Signature: _____

Student No: ABYTEF001