

The market potential for the Ocmis travelling irrigation system in a selected agricultural district

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Mini-dissertation submitted in partial fulfilment of the requirements for the degree *Master of Business Administration* at the North-West University

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Graduation May 2018

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ACKNOWLEDGEMENTS

After a 3-year journey in completing my MBA studies I look back on memories of laughter and appreciation. I thank the Lord for the talent and ability I received to successfully complete my studies. I would also like to acknowledge my parents, colleagues, family, friends, lecturers, PBS administration and fellow MBA students for the never-ending support I received during this time.

To my parents; Elmarie and Christo Serfontein, for words of wisdom and encouragement, support, understanding and unconditional love;

I would like to extend my appreciation to Frik Solms and Tobie van den Heever of Irrigation Unlimited, who allowed me this opportunity as a research project. I trust that the insight gained in this report will create new opportunities in the South African agricultural market and I am looking forward with enthusiasm to the opportunities that will arise in my life as a leader.

I am grateful and extend my appreciation to Prof Jan Visagie, for his sound guidance, that enabled me to reach the end of my MBA journey. Also, Clarina Voster who assisted me with final editing of my final research document.

At the end of my MBA study brings moment of laughter, and appreciation. The successful completion of this course is a true reflection of the never-ending support I received from my parents, colleagues, family, friends, lecturers, PBS administration and fellow MBA students.

I thank the Lord for the talent and ability I received to gain the knowledge, insight and experience from my MBA and I am looking forward with enthusiasm to the opportunities that will arise in my life as a leader.

My fellow MBACers; Rennett, Mynie, José, Derick and Joanna, for your hard work and perseverance.

ABSTRACT

This research study analyses the Ocmis Travelling irrigation system market potential in the South African market. It gives insight into the irrigation market and overlooks the influences on the market and the opposition companies in the agricultural market

The irrigation industry value chain will be looked at to see where there is opportunity for the Ocmis machine in the value chain. The irrigation market is a very competitive market with a broad competition field. In this study the analysis of how the competitive environment gets influenced by the competitive pressures from the irrigation sector

Diagnostic models were used to evaluate the strategic management were used to set some guideline for this study

Acknowledged diagnostic models in the field of strategic management were used to guide the study.

PESTLE analysis will be used the identify the environment of the agricultural sector. The agricultural industry value chain will be identified by using the value chain analysis.

The SWOT analysis will be explored to identify the strengths, weaknesses, opportunities and threats, and the Porter's five forces model.

Primary and secondary sources where collected from the data. Two questionnaires where used to collect the data from the agricultural sector. The Data was analysed to gain insight into the agricultural sector and as well as from the users of the Ocmis Travelling system.

The forces within the agricultural macro environment influence the industry according to the research that have been done. Water scarcity, climate change, population growth and land availability are some of these forces that influences the agricultural sector.

From the value chain analysis, the opportunities exist that the Ocmis Travelling irrigation system must create vertical and horizontal partnerships within the agricultural environment industry.

The Ocmis traveller has competitive pressures in the market from direct competitors, and also been confronted with the bargaining power of buyers.

Opportunities were identified from the data that was collected, which served as recommendations for Irrigation Unlimited who is the sole Importer of Ocmis in developing its strategic plan for the future of the Ocmis travelling irrigator in South Africa.

Key words:

Travelling Irrigation

Precision farming

Water scarcity

Irrigation technologies

Ocmis

Irrigation efficiency

Irrigation distribution

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CHAPTER 1: THE NATURE AND SCOPE OF THE STUDY

1.1 Introduction

Water is life and the most essential resource on the planet earth, without water there no life will be on earth. Infuriating bits of knowledge in the earlier decades demonstrate a decrease in water availability and especially fresh usable water, and is rapidly increasing (Revenga, 2000). Fresh water for agricultural use is laying at about seventy percent (Bruinsma, 2013:138). The agricultural irrigation sector fulfils a crucial part in the overall economy, giving acceptable respect and ensuring overall security support (Riemenschneider, 2003:1).

Everything considered, the overall economy, overall agrarian fragment and moving toward water crisis raise the noteworthiness of upgraded capability in water framework advances to enhance overall supportability. The test remains to find perfect responses to support the world later and reduce the impacts on the trademark resource base amid the time spent extending sustenance creation (Bruinsma, 2013).

The worldwide economy, worldwide agricultural segment and approaching water emergency raise the significance of enhanced ability in water system advances to improve global supportability. The test stays to discover ideal answers for sustaining the world later and reduce the effects on the characteristic asset base during the time spent expanding food emergencies (Bruinsma, 2013)

Shockingly, as Postel (1999) and Seckler *et al.* (1998:25) expressed, most water system frameworks result in significant water waste. The motivation behind the investigation is to build up a procedure for Irrigation Unlimited (Ocmis) to be a significant partner in the South African farming business sector.

1.2 Background to the study

Role-players and competitors in the agricultural environment are confronted with meaningful challenges. Koncept Analytics (2010) stated that the most significant challenge in the world today is to save water and use water sparingly.

The agricultural sector is encountering significant changes caused by large-scale ecological impacts on characteristic assets. These variables incorporate fast total population development, deficiencies in land and water, environmental change, raising costs in production of food.

In 2015 the world population went from 3 billion in 1960 to 6.8 billion and it is foreseen to exceed 9 billion by the year 2050 (Holmes, 2014). This growing population will require a significant change in food production patterns.

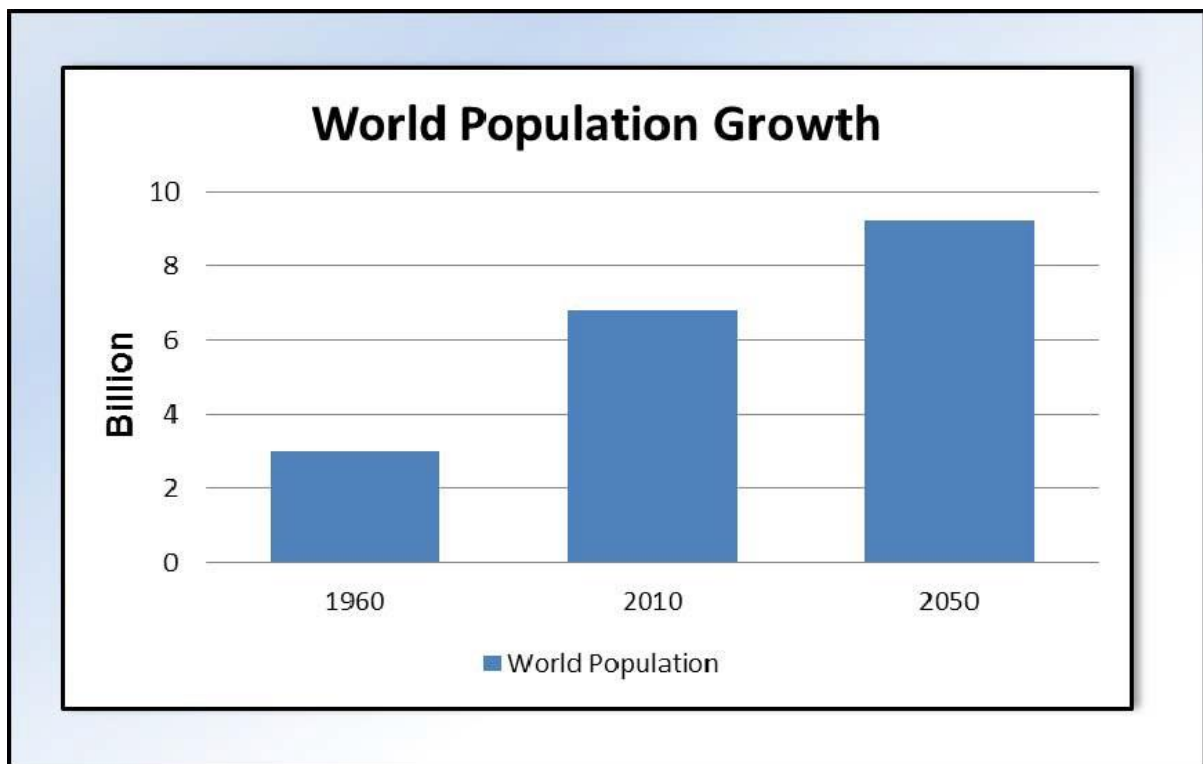


Figure 1. 1: The population growth globally (Source: Holmes, 2014)

Food production increases also brings an increase in the water demand of the world and with the grain yields that are rising significantly the demand for irrigation water also increased by double for the same period (Postel, 1999:165).

Agricultural land and water use are inter-linked, with water scarcity and efficient water use affecting food security (Mann *et al.*, 2013:15). Klop *et al.* (2008:2) stated that seventy percent of the world's freshwater is used by the agricultural sector. The way the water resources are managed in the future will determine the availability of water (Revenga, 2000).

Pimentel (2000) explained that to replace 25 mm of soil lost to erosion, it takes up to about five hundred years, with irrigation soil depth to be at least 150 mm deep. Smith, Gregory *et al.* (2010:2942) states that there must be a shift from extensification farming to intensification farming to make sure that there will be significant food production for the growing population. Bruinsma (2013:125) established that intensification farming over the next thirty years will increase with about eighty percent.

Climate change is the most talked about topic in the agricultural sector in the last century. "The negative effects of climate change are already being felt, especially in food-insecure regions" (World Bank, 2009). Effective and efficient irrigation systems and farming will help to control and help to reduce the impact of these climate changes. The rapid increases in prices of tractors, harvesters and irrigation systems has had a significantly increase in the production costs.

Precision agriculture like, digital moisture sensors and computers to match agricultural practices to confirm the yield conditions within an agricultural field (Holmes, 2014), these practices seem to be the best option to increase production efficiency. According to Pierce, 2000, precision agriculture practices have achieved higher production per Ha and the quality of products is much higher.

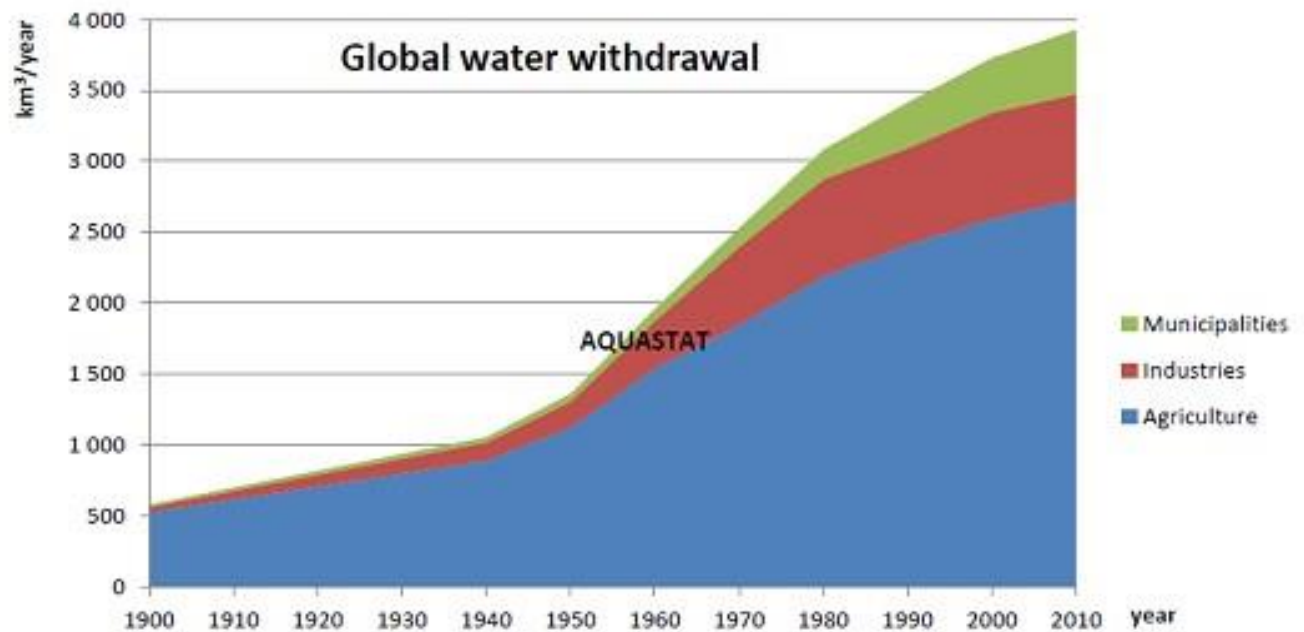


Figure 1. 2: Global irrigated water withdrawal (Source: Aqaustats 2015)

Wood *et al.* (2000:58-59) clarified that an un-efficient irrigation system has negative effects on soil. The expectations of an effective irrigation system must include the following, Effective distribution and uniformity patterns which can contribute to an increase in water usage. (Padgham, 2009:66),

1.3 Problem statement

Competitors in the agricultural sector are confronted daily with challenges within the agricultural economy. Koncept Analytics (2010) said that the greatest challenges in the future would be to conserve the water availability. Macro-environmental influences on natural resources causes major changes in the world. Changes includes shortages in fresh and arable land water, Climate changes, population growth, production costs that's keep's rising. According to Riemenschneider, for global food security the agricultural sector will need to play a significant role in the economy (Riemenschneider, 2003:1)

Worldwide, in 2017, over 324 million hectares are equipped for irrigation, of which about 85% or 275 million ha are actually irrigated. Irrigated agriculture represents 20% of the total cultivated land, but contributes 40% of the total food produced worldwide. The significant potential for expanding irrigated agriculture, considering both land and water resources, is in the South Africa region, where only one fifth of

the irrigation potential has been equipped, or 7.7 million ha out of a potential of 38 million ha, where only one fourth of the potential has been equipped, or 16 million ha out of a potential of 60 million ha. Localised irrigation has grown rapidly since the invention of cheap plastic pipes in the 1970s: from almost 0.5 million ha in 1981 to almost 9 million ha in 2010 worldwide.

Sprinkler irrigation equipped more than 35 million ha in 2010. Although considered less efficient than localised irrigation, both its lower prices and potential mobility explain its wider expansion. As indicated by Aquastat, no less than 33 nations have executed a water system administration move all together for the administration of the water system frameworks to be exchanged from the legislature to the irrigators or water clients. Out of the above, the following problem statement could be derived namely, is there a sustainable market share for the Ocmis Travelling irrigation system in the South African agricultural market.

1.4 Objectives of the study

This research study aims to provide Irrigation Unlimited who imports Ocmis Traveller with an comprehensive insight into the agriculture sector and recommendations to compile an strategic plan to get an bigger market share in the agricultural sector.

1.5 Scope of the study

This research specifically asked questions around the South African irrigation market and how it can influence the market share of Ocmis Travel irrigation system as a entrant in the South African irrigation market, namely:

- The driving forces in the agricultural sector that potential will influence OCMIS as a competitor in the agricultural sector in South Africa.
- OCMIS positioning in a South African irrigation value chain.
- OCMIS current and potential strengths and weaknesses.

1.6 Research methodology

Applied research is used in this study. According to Saunders *et al.* (2015:588) applied research is to us the data collected to understand a business problem and to

provide a solution option for the value of the business. Diagnostic models in strategic management were obtained and used and the relevant data was collected.

The relative power of a supplier like Ocmis was investigated and the PESTLE analysis was used and the driving forces that impact on the industry where identified. Secondary data was collected through secondary data. Journals, reviews and reports where used. Primary data was collected with questionnaires with specialists in the South African agricultural environment.

The Porter's Five Forces model was implemented to see where the South African irrigation sector is and what competitive forces will impact the Ocmis Travelling irrigation as a competitor in the South African market. Substitute products in the market, Competitors in the market, buying power of suppliers and buyers, and new entrants where the main focus of the data the was collected. Secondary data where collected through the internet.

The agricultural value chain was researched through the value chain analysis and was used to determine Ocmis travelling irrigation positioning in the value chain. Secondary data was obtained through articles, sourced from internal Ocmis and Irrigation Unlimited document.

A SWOT analysis was used to evaluate Ocmis Travel Irrigation situation in terms of current and potential strengths and weaknesses. Primary data was obtained through self-administered questionnaires to existing Ocmis and Irrigation Unlimited system users. Secondary data was obtained from internal Ocmis and Irrigation Unlimited reports and documents. Information obtained from the PESTLE analysis was applied in the SWOT analysis to identify existing opportunities and threats in the market.

Chapter	Title	Description
1	The Nature and Scope of the study	Chapter 1 Introduction of the research study. The problem is stated and the research aim and scope of the study defined.
2	Overview of the organisation	Chapter 2 offers an indebt insight into the Ocmis Company from where it opened its door until now.

3	Literature review of study	Chapter 3, Analytical tools for this study is introduced and explained.
4	Findings	A concluding chapter

CHAPTER 2: OVERVIEW OF THE ORGANISATION

2.1 Introduction

In the hose reel irrigators, splash blasts and pumps category, Ocmis is top of the log and considered to be a world pioneer. Top of the chart execution, innovation, a wide selection of items for each need and guaranteed quality of this machinery are the consequence of a remarkable organisation. It was inspiration and duty that drove Ocmis to the highest point in the household and worldwide markets. A total of thirty years in experience, research and product development to meet the requirements of the farming business have given Ocmis an opportunity to make consistent extension. This was anticipated from the slopes of Castelvetro outward towards worldwide markets.

2.1.1 *Mission statement of Ocmis*

To develop and increase the use if hard hose travelling irrigators, distinguishing ourselves from the rest through excellence and professionalism recognised by our customers who work with us throughout the world. Invest in research of new and improved applications to optimise technological improvements with the objective to increase agricultural production while reducing input costs.

2.1.2 *Vision statement of Ocmis*

To contribute to the overall global agricultural production, as we perform our work, in order to support the earth and all its inhabitants.

2.1.3 *Value statement of Ocmis*

Quality policy Ocmis aims at developing and increasing the use of hard hose travelling irrigators through excellence and professionalism recognised by our customers who work with us throughout the world. We invest in research of new and improved applications to optimise technological improvements with the objective to increase agricultural production while reducing input costs. The quality control system according to the UNI EN ISO 9001:2008 standard is the critical instrument to

pursue Ocmis objective to maintain the leadership position it holds in the irrigation industry in the short, mid and long term. The Ocmis Management commits to comply with the Quality System provision in order to maintain its leadership role which is contingent upon research, development, investments seeking to understand the market needs and those who operate our machines while respecting the environment. To this aim, Ocmis set up a procedure for the systematic checking of its processes to support its Management to determine and to review the Company's objectives. The Ocmis Management undertakes to give ample instructions to all the members of its staff to guarantee that these guidelines are fully understood and complied with. The set-up procedures will be continuously monitored to make sure that they satisfy the Quality System provisions.

2.1.4 *Ocmis company structure*

Ocmis, founded in 1970, initially focused on constructing precision mechanical parts and producing irrigation machinery. In the beginning the company concentrated on the production of Hose reel irrigators with lead to its position as world leader in this sector.

There is a variety of models hose reel irrigators, which make up a range of machines to use in any situation. Ocmis also produces pumps for tractors for clean water and sewage. Centrifugal pumps and over gears for thermal and electric motors is also part of the product variety. On company demand, only the highest quality of raw materials is used in the finished products. This constant process of product improvement and development has kept the company in the market leader position in Italy and the World. In September 2009 the company was permitted to obtain the certification for the Quality Management System in agreement with the UNI EN ISO 9001:2008 standard, this result confirms the reliability of the company. With constant investment in production, development and information technology it will ensure that Ocmis enter the new century as a dominant company in its sector.

2.1.5 Ocmis Staff

Employees in this company are kept to a minimum with the advanced system of automation. This system includes automatic welding and semi-automatic paint spraying lines. Ocmis is the employer of 69 production workers and 33 office staff.

2.1.6 Annual turnover in 2016 for Ocmis

With national and international sales combined, the annual turnover for Ocmis was 23 511 000.00 Euro in 2016

2.1.7 Annual production units of Ocmis

Units produced annually are 3350, 600 of these units are micro rain machines

2.2 Production history

One of the biggest reasons Ocmis always stood out was its commitment towards the research and development of its product range and quality. Ocmis made use of several different turbine systems over the years, the current system being the fourth generation. The company was sceptical from the beginning about systems using bellow drive for hose rewinding, considering it an obsolete technology. Some of the evident disadvantages were: slow and uneven intake also problems relating to dirty water. This led to the hose being under continuous strain and frequent overflow of water from the side of the machine.

Pelton turbine

They started using the Pelton turbine, representing the subsequent development stage, but even though this turbine was fitted with outer by-passes it did not limit the power consumption. A turbine with a built-in by-pass reduced power consumption but still was not an outstanding system because of the belt system used to drive the gearbox.

Turbo Speed Ocmis came to a turning point when the fourth generation turbine system was developed. It provided excellent results even at very low pressures, 2 to 3 bars when using the spray boom and 5 to 6 bars when using the rain gun. Another factor making this system unique in terms of reliability and performance is the choke-

flow turbine with built-in by-pass and flanged directly to an oil-bath gearbox. The connection shaft of the turbine is made of stainless steel and the mechanical cover is made of special plastic. The turbine is made with a special aluminium alloy. After seven years of experience, the current Turbo Speed System eliminated the transmission belt and external by-passes. Now the turbine is connected directly to the gearbox and the bypass is internal, keeping the pressure absorption to a minimum allowing the machine to run more smoothly.

Vario Rain

In 2006 Ocmis introduced the Vario Rain System. This system is fitted with a new and innovative gearbox which has 3-4 synchronised speeds and is coupled to a high efficiency turbine with a gearbox/turbine shaft connection through a bevel gear. The Vario Rain is easy to use, gives excellent manoeuvrability and is guaranteed to have the highest safety standards.

CHAPTER 3: LITERATURE REVIEW OF STUDY

3.1 Introduction

In the analytical section, a review of the analytical models is given. The companies require certain strategy and direction but needs to understand the agricultural sector and environment. Hough *et al.* (2015:70) suggest to make use of analytical tool to gain insight into a business strategy.

- Economic factors: Growth rate, supply and demand, technology, industry driving forces; market positioning; competitive forces;

Analytical tools

- Porter's Five Forces Model
- PESTLE Analysis
- Value Chain Analysis
- SWOT Analysis

3.2 Porters five forces model

Porter's Five Forces model is an analytical tool to effectively evaluate the competition pressures in agricultural sector. Hough *et al.* (2013:70) explains the five competitive pressure in a markets as following.

- Rival sellers (competitors);
- Threats of new entrants into the market;
- Companies offering substitute products;
- Supplier bargaining power and supplier-seller collaboration;
- Buyer bargaining power and seller-buyer collaboration.

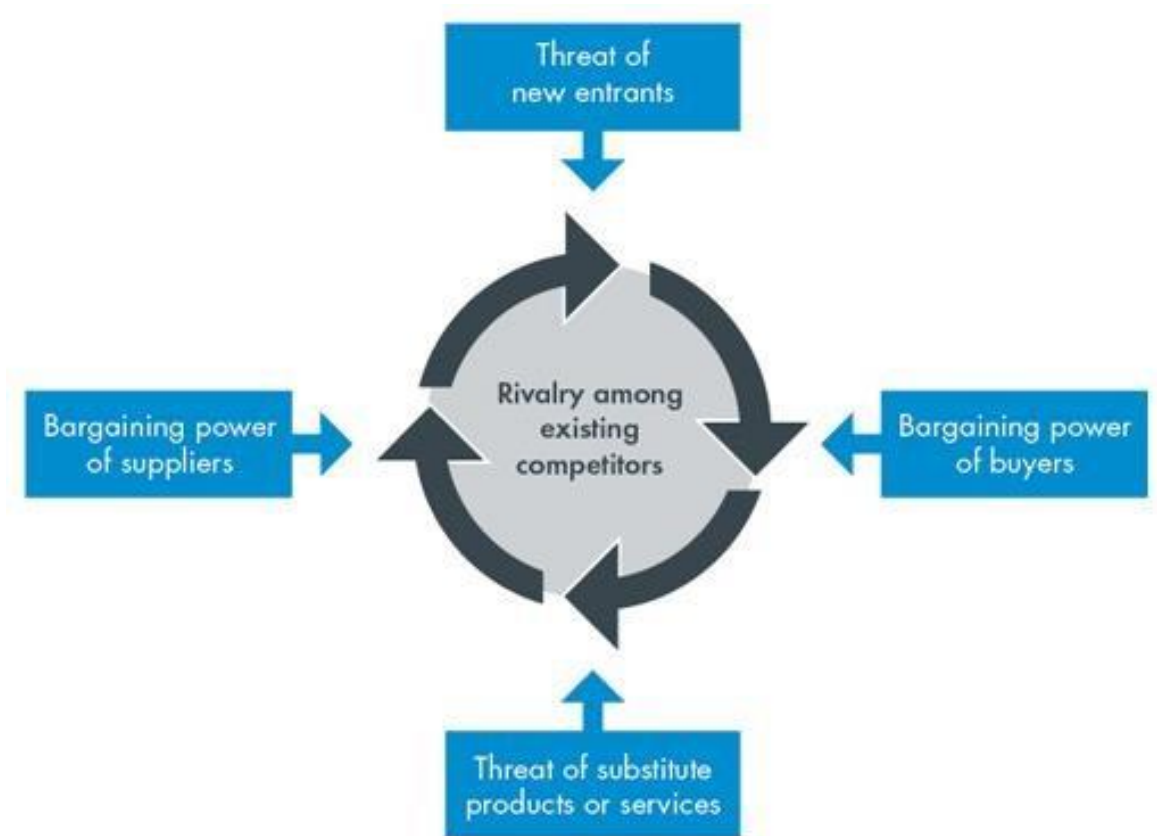


Figure 3. 1: Porter's five forces model (Source: Chartered Global Management Accountant)

The Porters five forces model gives Ocmis a complete analysis of the competitors' products, prices, unique selling proposition, distribution networks, product performances, service to the end buyer. Porters five forces also identifies new entrant into the agricultural irrigation sector. Buying powers are also identified through Porters five forces model.

3.3 SWOT analysis

Kerin *et al.* (2006:49) explain the importance of where the business is in terms of strengths and weaknesses, also how the external factors influence the opportunities and threats of the organization.

Hough *et al.* (2013:118) defines the SWOT analysis as follows:

- To make conclusions where data was collected of the business:
- To form a strategy from the conclusions with multiple actions on how to increase the strengths and opportunities and to adverse the weaknesses of the business and to also know what your competition is doing and to be aware of external threats.



Figure 3. 2: SWOT Analysis (Research Methodology)

The SWOT analysis in this research is looking at the internal strengths and weaknesses of OCMIS as well as the external threats and opportunities of the agricultural sector.

3.4 Conclusion of SWOT analysis

This section reviewed the theoretical models used throughout this research study. The analytical tools are used to provide the organisation with indebt look into the agricultural sector. The use of these models is to create a strategy for IU to penetrate the agricultural market. To create this potential strategy, they will have to get a good understanding of the agricultural sector, the competition business, the company strengths and weaknesses.

3.5 Review of the South African agricultural sector

3.5.1 Introduction

PESTLE analysis, analysis the external environment of the agricultural sector. By applying the PESTLE analysis on the South African agricultural sector, it gets more transparent how PESTLE factors influence the agricultural sector.

3.5.2 The South African agricultural sector

The agricultural land available is 250 0000 hectares, comprising of around 1601000 hectares farming area (Smith *et al.*, 2010:2927). FOA(2016a) expressed that of the 10.3% of arable land territory surface are utilised for a generation (arable land and land under changeless harvests) as outlined in Figure 3.3.

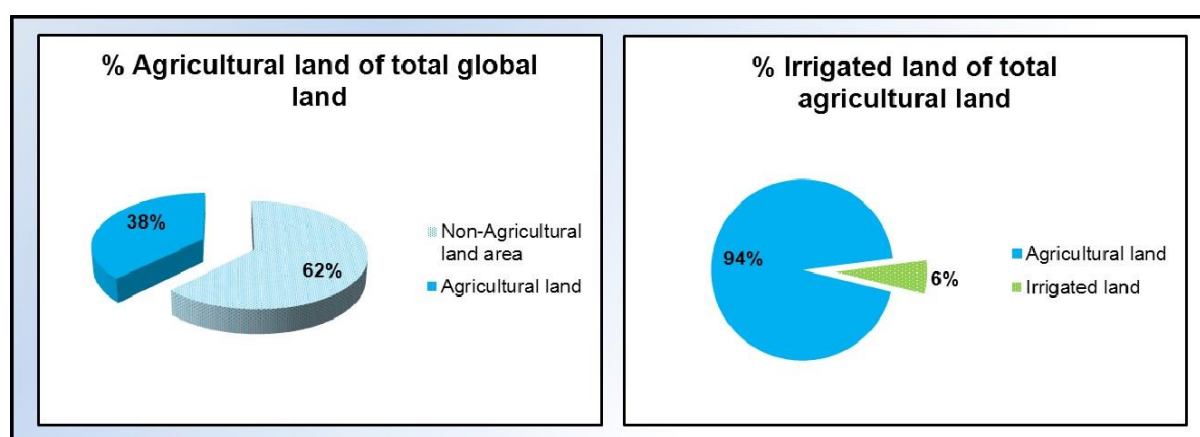


Figure 3. 3: Percentage agricultural land and percentage irrigated land (Source: FAO, 2016a)

Agricultural land are seen as scope of land and in certain areas of in the inland areas water areas are seen as streams, rivers and lakes. Sauer *et al.* (2010:1) clarified that more than seventy percent of anthropogenic water withdrawals are made by the agricultural water users.

Biotechnology element is the expanding. Plants are hereditarily changed by utilising chosen plant qualities with advantageous attributes to enhance the quality and amount of harvests yields. The plant's capacity to enhance interior water use is expanded, photosynthesising forms are enhanced and protection from vermin is improved. The capacity of plants to adjust to rough developing conditions has been

fundamentally made strides. Agriculturists overall receive plant biotechnology at expanding rates. This holistic approach could be considered a positive direction towards agricultural precision farming.

3.5.3 *The role of irrigation in the agricultural sector*

Irrigation watering system is a way to get water from the water source onto the irrigated land or soil. Irrigation plays a critical role in the production of crops for food securities in South Africa. Irrigation companies as well as Agricultural businesses will be hold accountable for sixty seven percent of the food security in South Africa with a growing population. Making ideal progress in trim creation requires an agreeable design between arable land, water, capital, information, work and generation parts. Ignoring any of these parts will bring about average product quality and even total dissatisfaction. The necessities set by heightening require broad capital speculation. The essential for capital venture is de-taking a chance with the speculation to guarantee capital payback. Ability is a key factor in water system. Optimum yield in crop production as subjected to the land available, water source, Water quality, farming knowledge. If any of these components are missing the whole yield and quality of the crop are affected and the crops can also die off. A large capital investment is needed to farm intensification. Risking an investment to ensure that the capital will pay it self-back. The main factor to evaluate an irrigation system is how efficient the irrigation system is. Efficiency is when the water exits the nozzle and it reaches the ground and is there for the plant to be used through its roots. Even water distribution is also a factor to consider to be effective and to get a high application rate.

Up to sixty percent according to (Seckler *et al.*, 1998:25) water connected through some water system frameworks dissipates before achieving the product, while some miniaturised scale frameworks apply the water in a little area yet in a vertical profile and tremendous measures of water is lost underneath the successful root zone of the plant. The cost of water system water lies underneath its financial esteem, and even lower than the cost of supply, Klop *et al.* (2008:37). This beneath value estimating brings about a general refutation of the estimation of water.

As water shortage increments and the opposition for water escalates between various enterprises, the cost of supplying water will increment. Klop *et al.* (2008:47) anticipated this would compel ranchers and water system sheets to put accentuation on putting resources into water-proficient advancements. Water system connected successfully could likewise offer extra advantages, for example, optimum yield, insurance and viable use of manures and pesticides.



Figure 3. 4: OCMIS Traveller (Source: Irrigation Unlimited)

The risk of soil and water degradation can be managed by accurate application of fertilizers and pesticides through the Ocmis travelling irrigation system.

Oster and Wichelns (2003) avowed that the continual population development and restricted capacity to extensivity add a vital duty to move towards viable and proficient water system innovations to meet the common sustenance requests without bounds.

Dry-land cultivating places a high hazard on edit generation due to the reliance on whimsical and eccentric precipitation and the impacts of environmental change. Water system decreases this hazard and along these lines offers chances to farmers

to acquire financing for usage of water system system. A further advantage is that a few governments fund up to seventy percent of cutting edge innovation water system systems like the Ocmis travelling irrigation system. Bruinsma (2013:15) expressed that water system gives a capable administration instrument against the caprices of precipitation and makes it financially alluring to develop large return seed assortments, apply satisfactory plant sustenance and also bug control and different sources of info, guaranteeing greater yields. Providing freshwater in a manageable way requires first adjusting the social uses with its accessibility in nature (Braden & Van Ierland, 1999). Efficient water system, water administration can be viewed as a water system approach that improves food security while saving the earth (Cai *et al.*, 2001:1). Maintainability is turning into a necessary thought in the strategies of numerous administrations. Taking care of harvest requests anticipated for 2025, when the planet's population is relied upon to achieve eight billion, could require an extra 192 cubic miles of water per annum, (Postel, 1999). Expanding harvest yields through photosynthetic procedures through effective irrigation systems and can also help to protect the plant from pests and fungus. By streamlining the plants water absorption proses to use less water end to utilise the available water supplied the required rural water rates are lowered and water is saved. (Conway, 2000:14). Also, the utilisation of exactness farming, similar to dampness measuring tests and computerised control frameworks, in a joint effort with water system could improve execution and increase yields (Holmes, 2014).

Sustainable Agricultural practices are driven by the following factors

- Environmental sustainability
- Energy efficiency and
- Water efficiency,

for sustainable irrigation technology. An effective irrigation system is one that uses optimal water to produce crops at a price that is reasonable. To farm sustainable for the future generations on the same land farmer will have to implement efficient irrigation systems.

3.5.4 Evolution of irrigation

Archaeological proof revealed that water systems had been rehearsed for many years. The improvement of sustainable farming in around 6,500 BC brought answers for traveling individuals who were continually wandering around looking for sustenance.

This advanced in permanent farms, denoting the establishment of human development. The essential of water for agricultural practices prompt the first farming focusses being produced in regions where water supplies where abundance.

This principle focusses of farming improvement were the Nile stream in Egypt, the Tigris and Euphrates waterways in Mesopotamia, the Indus and Ganges streams in India, and the Huang (Yellow) stream in China (Tipler, 1976). These four territories were seen as the supports of human development.

Grain was developed in old-fashioned Persia, now Iran, many years prior utilising surge water system where normal precipitation was lacking to grow a harvest (Hill, 1984). The Qanats, created in old Persia in around 800BCE, is among the most seasoned public water system strategies still being used today. It is yet found in Asia, the Middle East and North Africa.

Mokhtar (1981:309) clarified that the antiquated Nubians built up a type of water system by utilising a water wheel-like gadget called a 'Saskia'. Water system started in Nubia between the third and second thousand years BCE and to a great extent relied on the floodwaters coursing through the Nile-and different streams in exhibit Sudan (Bulliet *et al.*, 2009). The most punctual hints of water system in the New World as portrayed by Hill (1984:19) are found in the Zana valley of the Andes Mountains in Peru. Archaeologists discovered stays of three water system channels, which were radiocarbon-gone back to the fourth thousand years BCE. The water system works of old Sri Lanka, the soonest dating from around 300BCE, were viewed as a standout amongst the most complex water system frameworks of the old world. Notwithstanding underground channels, the Sinhalese were the first to manufacture totally simulated repositories to store water. The vast majority of these water system frameworks have existed undamaged right up until the present time.

From these early aqua-ducts and animal-drawn bucket wheels, four major different irrigation systems evolved; namely flood-, drip-, sprinkler- and mechanised irrigation.

3.5.5 *irrigation methods*

Flood irrigation

Flood irrigation is when water is applied to a field and gravity makes the water flow over the field. Water is channeled called furrows (Brouwer *et al.*, 1988). In irrigation Flood irrigation is the one of the most popular ways of irrigation.

Table 3. 1: Types of Flood irrigation

Flood irrigation methods	
Basin irrigation	Flat areas are created inland with bund walls, the water is fed into these bunds and the water stands for 12 to 24 hours
Furrow irrigation	Small channels created in the fields between the crops. Water gets pumped with gravity into these channels. The crops absorb the water through their roots.
Border irrigation	Long sloping strips with big bunds. Channels on these banks get opened and water is fed into the field. Can also use siphons.

Drip irrigation

Micro irrigation, piped network with low pressure that distributes water over the length of the pipe in small quantities through small holes in the pipe. Drip irrigation is the most used in agricultural in South Africa today. Every drop gets to the root zone and is one of the most effective irrigation systems on the market (Koncept Analytics, 2010:7).

Sprinkler irrigation

Water is applied through a black LDPE pipe into the fields and the water gets distributed through a high impact sprinkler. (Brouwer *et al.*, 1988) or sprinkler guns (Klop *et al.*, 2008:24). Solid set or moveable irrigation systems are very popular with farmers.

Sprinkler systems are more expensive than flood irrigation and costs can easily double. (Klop *et al.*, 2008:24). Sprinkler systems are used worldwide and use more water but efficiency of a sprinkler set can be between thirty and seventy percent over flood irrigation.

Mechanised irrigation

Pivot systems

A pivot system uses one line of steel pipe in the air and is moved by wheeled towers of the field and the water is applied through sprinklers. Centre pivots move in circular pattern. (Koncept Analytics, 2010:7-8).

Ocmis Travel Irrigators

Irrigation system that uses HDPE Pipe get pulled off the machine into the field and when the machine gets set into gear the hose wheel starts to rotate and pulls the Sprinkler and the pipe towards the machine. The irrigation system equipment is fixed at the hydrant valves along the Mainline. This system only uses one Operator.

3.5.6 Conclusion

This section explored the common farming sector and presented factors influencing the sector. Agricultural land is restricted, and arable land is diminishing because of soil corruption and disintegration. Farming uses seventy percent of the land's availability water sources, and water is ending up rare because of changing atmosphere and wasteful utilise. Population development is slanting which represents extra strain onto the earth. To meet the requests of population development, broad increments in food production are required throughout the following 50 years. With a specific end goal to meet the developing requests for expanded harvest generation, expanding developed territories, heightening existing developed zones and advancement in innovations will be basic. The declining accessibility of land combined with expanding interest for sustenance generation move the concentration to strengthening of land, whereby higher yields should be accomplished on a similar land zone, without additionally harm to nature. Propelled innovations contribute in accomplishing the difficulties for manageability. Biotechnology concentrates on horticultural works on decreasing the negative impacts of generation on the earth. Water system is a key idea of agricultural creation. Effectiveness is a key factor in water system, and proficient water system innovations shape a basic piece of accomplishing generation requests in a supportable earth way. Most creating and created nations are detecting the desperation and are embracing the economical farming idea.

3.6 PESTLE analysis of the South African agricultural sector

3.6.1 Introduction

The Marco-environment is used to evaluate the PESTLE analysis to see what the potential market to enter the South African agricultural market. Understanding of the market and the factors that influence the market must be studied to compile a strategy for Irrigation Unlimited to import the Ocmis Machines

The availability of fertile land and freshwater are two crucial factors for crop production.

(Sauer *et al.*, 2010:1). Ocmis target market includes 50 dealers worldwide with IU as Sole distributor in South Africa

As Hough *et al.* (2013:53) explain, business model, direction and decision making get influenced by the macro environment. PESTLE analysis focusses on Political, Economic, Social, Technological, legislative, and environmental external factors.(Oxford University Press, 2014).

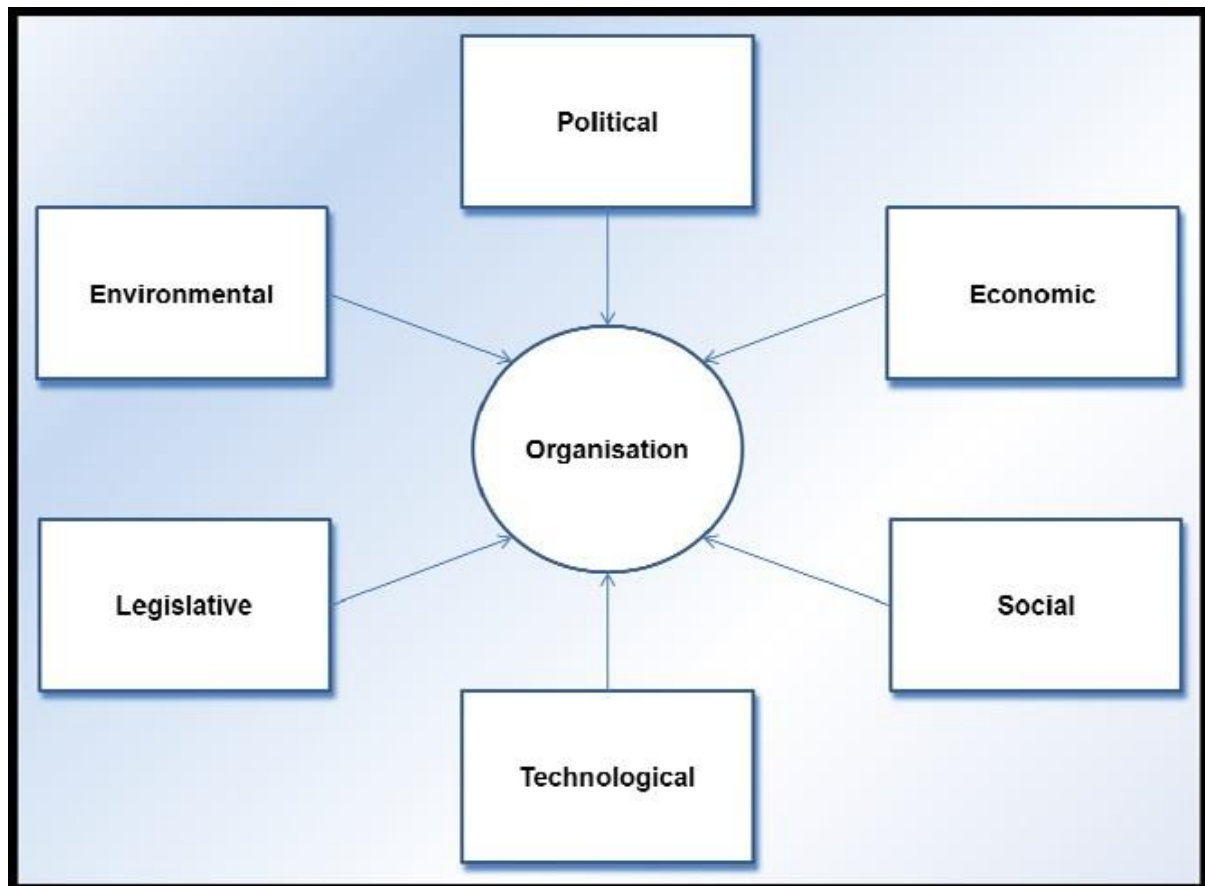


Figure 3. 5: Components of the PESTLE analysis (Source: www.ignitestrategicsolutions.com)

PESTLE was used in this study to analysis the trends and forces that externally influence the South African Agricultural Sector and examines the potential market for Ocmis Travelling Irrigation System. This study analysed the macro-environment and give Ocmis the insight to identify the market opportunities and risks.

This part of the study, the secondary resources was used like reports, reviews and articles. PESTLE factors will be discussed and analysed. The primary data acquired through questionnaires to specialists in the agricultural sector.

The questionnaire – Appendix A–

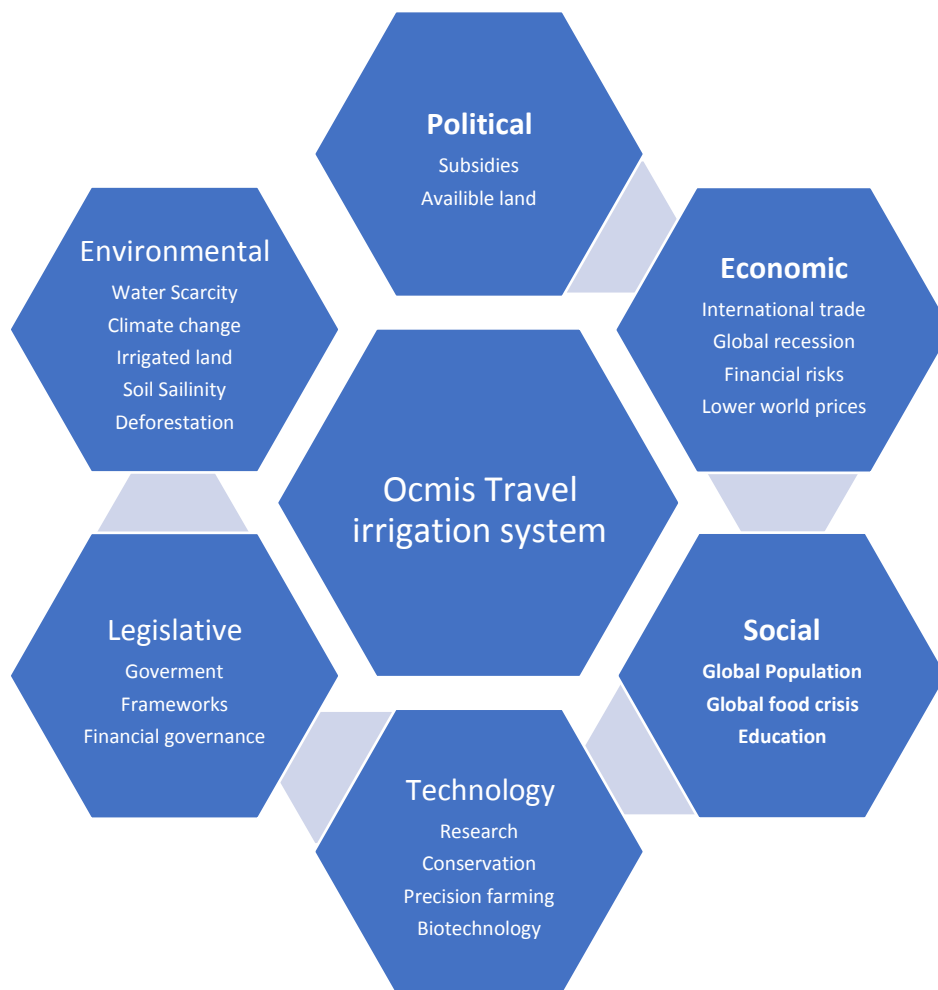


Figure 3. 6: PESTLE framework

3.6.2 PESTLE Analysis

3.6.2.1 Political factors

Political factors, for example, universal arrangements and procedures, exchange assertions and political structures on environmental change are flow worldwide scale drivers that influence farming around the world (Hazell & Wood, 2007:501). The idea of political impacts is either immediate or indirect. Coordinate political impacts are forced onto ranchers through strategies and controls that point of confinement or improve cultivate administration rehearses and characterise property rights (Archer *et al.*, 2008:278).

According to Archer *et al.* (2008:278) political impacts are seen as government interest in agribusiness, Agricultural grants and sponsorships. The world trade organisation as well as the Organisation for economic Co-operation and

Development are boosting the agricultural sector. Organisation like these mentioned gives platforms where government can meet and discuss monetary and ecological agricultural issues.

Farming approaches and guidelines restrain the contorting impacts on creation and exchange and protect nature (OECD, 2012).

3.6.2.1.1 Subsidies

Political impedance isn't generally experienced as positive and can diminish monetary efficiencies, discourage the development of creating nations and add to natural harms (OECD, 2012). Generation appropriations and exchange boundaries are considered to have the most noteworthy effect. Sponsorships influence choices with respect to land and water utilisation by impacting the kind of land, or water utilise methodologies used at cultivating level. Nations that don't get endowments from governments are frequently adversely influenced in the worldwide economy because of higher generation costs than their partner nations getting appropriations.

The WTO has set weight on governments to move far from generation bolster sponsorships and instead plan to execute approaches adding to insurance of agricultural land in aggressively burdened territories.

3.6.2.1.2 Competition and availability for land

The growing population impacts the available land capacity to grow enough food to feed the population. With just 10 600 000 hectares of the South African agricultural land staying reasonable for edit creation, arrive has turned into a financial ware, exchanged between nations as a venture for agricultural generation. Agricultural and food generation strategies should meet the immediate and backhanded drivers of rivalry for arrive (Smith *et al.*, 2010:2942).

Coordinate drivers incorporate common causes; arrive change (crops, pastures, urbanisation) and land corruption. Circuitous drivers incorporate financial and innovative variables; societal patterns and institutional elements (Smith *et al.*, 2010:2942). Yield change has turned out to be more extraordinary because of diminishment in quality and reduction of agricultural land in the process to increase agricultural generation (Smith *et al.*, 2010:2944). Another thought that Smith *et al.*

(2010:2951) watched is the infringement of farming areas into officially imperilled and ensured ecological zones. AgCapita had officially brought €1.35 billion up in private value cash for worldwide farmland ventures. China, with 20 for each penny of the total populace and just 9 for every penny arable land, has allotted €3.4 billion to put resources into creating land in Africa.

Even though these extended ventures make full scale level advantages, for example, GDP development and government income streams, it immediately affects neighbourhood individuals losing the accessibility of their assets on which they pivoted their food security and vocation

3.6.2.2 Economic factors

The agricultural exchange gives a connection between farming creation and the global economy. Difficulties looked in agriculture that influence overall revenues incorporate a reduction underway, increment in costs, decrease as far as exchange, increment in dangers and subsequently a decrease in the level of GDP. Globalisation, a combination of economies and social orders the world over, is an unpredictable procedure that impacts agribusiness. Components that prompt the achievement of globalisation are the receptiveness to exchange and the stream of capital and in addition the capacity to embrace and adjust to mechanical developments (Bruinsma, 2013:294). Globalisation through arrangements and local input plans offers various open doors for farmers and food sector in developing countries (Bruinsma, 2013:296).

3.6.2.3 Social factors

Societal conduct, for example, changes in riches and weight control plans impacts Agricultural frameworks straightforwardly (Archer *et al.*, 2015:272). A comprehension of the worldwide social impact is basic for an agricultural framework to be manageable. The most prevalent social impact is statistic patterns. Interior social elements impact administration choices at cultivate level with more seasoned agriculturists more set in conventional ways and less versatile to change. More youthful agriculturists are all the more eager to chance grasping innovative advances and enhanced approaches that expansion yields and upgrade generation.

3.6.2.3.1 Global population growth and poverty

Population increase leads to the increase of food production. The total population keeps growing by a big percentage every year and has multiplied over the last 40 years (Brown, 2011:2). This Expanding population has an expansion effect in grain fed poultry and animals (Brown, 2011:2).

3.6.2.3.2 Global food crisis

The much-faced off regarding global food emergency represents a test throughout the following 50 years. The increment in farming generation is evaluated to reach 71% for grains and 131% for meat by 2050 (FAO, 2016c:3).

Mechanical advances, developments of developed territories and heightening of developed land are components to increment farming generation. An expanded interest in relationship building abilities' and improvement will be necessary to expand food security. Other contributing variables to the decrease in the worldwide sustenance emergency will incorporate dealing with the impacts of environmental change through biotechnology joined with viable water system advances. As per the FAO (2016c:5), strategies going for expanding agricultural generation and also diminishing neediness and enhancing the general prosperity of the worldwide population will have the most noteworthy effect. Tidy tempests are apparent from satellite pictures diverting a massive number of huge amounts of profitable best soil. The consequences of seriously disintegrated soils and debased cropland is an immediate abatement in the accessibility of sustenance, an expansion in hunger, and more reliance on imports and worldwide help. Water shortage and declining water tables have an immediate consequence on the rising cost of sustenance.

3.6.2.3.4 Dietary changes and lifestyles

Population Ways of life have changed and alongside expanded earnings is the interest for better food quality, more assortment and comfort. The wage prompted increase in water utilisation is specifically credited to the way that higher salary crowds (Klop *et al.*, 2008:12) incline toward meat concentrated eating regimens.

3.6.2.3.5 Education

Personal development gets affected by education, from the higher productivity to more sustainable environment (FAO, 2016c:3). Rural areas are affected the most in South Africa where the access to education is very limited. The high unemployment rate leads to no education and the reduction in this unemployment will make an increase in the economy. Well trained farmers, researchers and service providers will lead to a more efficient agricultural industry (Thomas, 2005). Agricultural management education is crucial part in the success of the agricultural sector. To limit the risks and financial implications it is necessary to require new technologies into farming principles. According to Thomas (2005) there is a big gap in the agricultural education sector

3.6.2.4 Technological factors

Innovation broadly empowers an expansion in the profitability of water utilisation (Gurria, 2008). 'Green Revolution' and rising new innovations that add to higher product yields prompted an expansion of the world harvest arrive by 12% in the neighbourhood of 1961 and 2016 (FAO, 2016a). New advances will have a critical conduct on ecological effect and additionally agricultural development. In spite of the fact that farmers can build generation with poor advances, it is to the detriment of nature. Mechanical advancements are basic for on-request water dissemination, soil dampness checking and enhanced yield resilience, and will be raising harvest efficiency and agricultural monetary suitability (Klop *et al.*, 2008:24).

Enhanced water system advancements, for example, Ocmis Travel Irrigator alongside present day biotechnologies and accuracy cultivating.

3.6.2.4.1 Agricultural research

The majority of the development in farming over late years can be ascribed to a massive speculation into science based innovative work (Bruinsma, 2013:327).

Bruinsma (2013:327) additionally expressed that in the previous 50 years, agricultural research concentrated overwhelmingly on expanding efficiency through

an arrangement of advances, which has created as the green transformation. As indicated by Bruinsma (2013:17), inquire about later on will require an incorporated comprehension of advances in atomic sciences, biotechnologies, ecologies of plants and vermin with regard to streamlining soil, water and supplement collaborations and efficiencies. Keeping in mind the end goal to encourage connections of the logical teaches and after that archive and disperse the examination comes about, compelling advances in data and correspondence innovation will be fundamental.

3.6.2.4.2 Conservation Agriculture

‘Conservation agriculture’ (CA) is saving the resources that you have and the reinvest in resources like soil and processes to improve crops and to minimize labour and to make more profits

Principles of CA are as followed, zero-tillage approach, Permanent soil cover, and Crop rotation, will improve the growing conditions of the crop planted and will help to improve the soil fertility. Soil erosion and leaching will be better managed which will lead to better absorption of rainwater in the soils (FAO, 2011). Plant nutrients will also be better managed when zero-tillage principles are implemented.

3.6.2.4.3 Organic agriculture

Organic agricultural can be depicted as a creation administration framework that advances and improves the strength of the environment and organic cycles by enhancing the use of joint assets using insignificant outer information. Organic farming denies the utilisation of synthetic composts and pesticides. The expansion in agricultural innovation has prompted a move to mechanical preparing, biotechnology and genetic change of plant and creature atoms. Organic agriculture is under-stuck by the rule that sustenance generation stays aware of the earth (Bruinsma, 2013:308).

3.6.2.4.4 Precision farming

Technology and information based farming management practices that are implemented to better manage and analyses the fields to produce better quality products and to achieve optimum profits and to farm sustainable.

A plants physiology limitation is due to the stress on the environment (Bruinsma, 2013:315). Managing the farming process as a whole and understanding the soil and environment forms part of precision farming practises. Technological devices helps to provide the farmer with information to help the farmer to make good agricultural practises derisions.

The precision management processes involve (Singh, 2006):

- Global Positioning System (GPS), Global Information Systems (GIS) and Remote Sensing

GPS and GIS systems gets used for precision farming. They send out satellite signals that broadcasts real time information about the crops, infield soils and accurate water measurements. GIS software and hardware that makes uses of location maps data for a specific area. Crop and field information gets analysed and the farmer knows what dissections to make accordingly. Health evaluating of crops gets done by a remote sensing data tool. Farmers can see whether a crop is stressed because of diseases, the soil content, of water shortages.

- Information Management and Costs

Precision farming approach the farmer must understand the information given to him through the tool and must be able to analysis data provided to him, as well as the associated costs of purchasing equipment and learning new skills

Ocmis Travelling Irrigation approach towards precision farming is well aligned with the new technology practises, but the challenge that IU is faced with is to convince the farmers to make use of the Ocmis irrigation systems despite the high costs but to see the value in the long term on sustainability.

3.6.2.4.5 Biotechnology

Biotechnology is characterised as an 'innovative application that utilisations natural frameworks, living beings, or subsidiaries thereof, to make or change items or procedures for particular utilise' (Biology Online, 2008). Biotechnology is turning into a fundamental part of agribusiness, in light of the fact that of its capacity to build harvest and domesticated animals yields, its capacity to give more, less expensive

and better nourishment and the possibility to spare and enhance arrive assets (Bruinsma, 2013:322). There are various biotechnological propels especially in the agrarian business that have an effect on trim yields and water system philosophies. These incorporate plant (tissue societies and hereditary alterations) and creature biotechnology, bio-manures and bio-pesticides and also sustenance preparing (AusBiotech, 2012).

3.6.2.4.6 Computerisation and telecommunication

The production cycle from part of the crop, from planting to harvesting and selling of the product and information and how it is transferred plays a big role in the decisionmaking process. These information helps the farmer to a large degree on the availability of crops and information. The farmer needs access to weather stations to monitor the weather to make decisions on when to irrigate and how much to irrigate. Mobile phones provide the farmer with great technology and form of communication to a majority of people in developing countries at an affordable cost (World Bank, 2014).

3.6.2.5 Legal factors

The business-empowering condition incorporates worldwide exchange assertions, enactment, strategies, controls and market norms that improves the potential for Ocmis travel irrigation system in the business' value chain.

3.6.2.5.1 Legislative frameworks

'Framework convention on climate change' where international environmental law includes this policy where countries takes actions on environmental issues (WRI, 2012).

3.6.2.5.2 Financial governance structures

The global environmental facility (GEF) is responsible for funding some of the global environmental programs which includes South Africa. The World Conservation Union

(IUCN) has a network of non-governmental organisations (NGO's) responsible for financing and implementing projects within the 140 representative countries (WRI, 2012)

3.6.2.6 Environmental factors

Available arable land is one of the agricultural sectors biggest challenges and if it is not managed well, it will increase the water scarcity, corrosion of soils.

3.6.2.6.1 *Water scarcity*

The monetary reasonability of cultivating is debilitated by the way that water utilisation in a few districts is over allotted surpassing the ecologically supportable level of recharge capable supply (Gurria, 2008). This is, as per Gurria (2008), one of the components going about as a hindrance to accomplish progress in the objective of practical water administration.

The freshwater issue is a nearby issue, as water all-inclusive isn't equitably disseminated. For instance, fifty percent of the world water is given by the Amazon bowl however just one percent of the worldwide populace lives there (Klop *et al.*, 2008:8). Interestingly, China has twenty percent of the worldwide populace yet just approaches seven percent of the worldwide new water supply. The general discernment is additionally that water is a typical asset and inadequate control over its assignment brings about an absence of responsibility for its utilisation. Strategy producers need to guarantee that water utilised by agriculture is proficiently distributed – if underestimated, supply will be considered in wealth (Gurria, 2008).

Keeping in mind the end goal to meet the worldwide requests by 2050 compelling water system frameworks will be basic. The potential for expanding the ability of water use in agricultural creation is gigantic as just twenty five percent to forty percent of water at last achieves the yield (Klop *et al.*, 2008:2). Openings emerge for successful water system advancements and water administration techniques that expansion water protection and worldwide farming creation prerequisites.

All inclusive, agribusiness is in charge of 40% of water contamination from substance and compost from ground water (Klop *et al.*, 2008:14). Intemperate pumping of water

prompts salt water implanting into water tables diminishing the accessibility of new water further (Klop *et al.*, 2008:14).

3.6.2.6.2 Climate change

Proof demonstrates that worldwide agribusiness has both added to and been influenced by environmental change (Hazell and Wood, 2007:500). Ozone harming substance emanations through deforestation, culturing, arrive consuming practices and in addition methane outflows from domesticated animals have contributed fundamentally to an Earth-wide temperature boost. The impacts of environmental change will bring about an expansion in extreme precipitation took after by serious dry periods that will represent surges and dry spells in a few areas. The flighty precipitation designs increment bugs and infections influencing harvests and domesticated animals. Environmental change affects animal's creation. Warmth stretch specifically influences domesticated animals' physiological procedures and in addition expands illness weight on domesticated animals. The significance of compelling water system, accordingly, will increment as precipitation designs keep on fluctuating. The duty set onto feasible water system frameworks to balance negative impacts of environmental change is colossal. Padgham (2009:75) recommended that these duties would include: the reformulation of water system strategies; dynamic engagement of water clients; upgrade of water profitability; change of water administration in flooded rice projects; development of the financial and ecological practicality of minor water sources; and the extension of zone under sustainable water system.

3.6.2.6.3 Degradation of irrigated land

Soil disintegration, biodiversity misfortunes and water debasement have added to twenty five percent of the world's property being profoundly corrupted, eight percent tolerably corrupted and 30% somewhat corrupted. Just 10% of these figures are thought to enhance (FAO, 2011). The significant reasons for arriving debasement incorporate poor land utilise, unseemly land and water system administration rehearses, deficiency of land as populaces increment, deforestation and neediness (FAO, 2013a). Land corruption in sloping zones with an absence of tree scope prompts poor water maintenance, occasional flooding and soil disintegration.

3.6.2.6.4 Soil salinity

Dissolved salts are brought up through water that soaks into the water table and lets the water table rises.

3.6.2.6.5 Deforestation

The expansion of farming practices are the most common causes of deforestation and also where the soils are not fertile anymore where the forest needs to be deforested for agricultural purpose.

3.6.2.7 Agricultural industry specialists' questionnaire feedback

PESTLE analysis involved a questionnaire distributed to eight industry specialists in the South Africa. Four respondents replied, with LNR involvement in the Irrigation Technology.

Industry trends and driving forces

- i. Burning issues that are at the forefront presently include climate change, global warming, looming food shortages due to South African population growth, land scarcity, soil degradation, water scarcity and rapidly increasing costs. What is your view on the effects of these aspects on the current global agricultural sector?

Respondent 1:	The South African agricultural division has survived every one of the hardest times throughout the hundreds of years. They have anticipated the finish of the earth because of population development, coming up short on assets, worldwide solidifying, an unnatural weather change, saltiness.
Respondent 2:	Center pivots and drip micro system are moved in the sector more towards low flow systems
Respondent 3:	Water plays a big role in irrigations and the water quantity and quality are the two overriding issues in my opinion.
Respondent 4:	The sector is becoming more aware of these trends and south Africa will have to adapt

- ii. With the issues mentioned above, sketch the role of irrigation in meeting the demands of food security, economic productivity and environmental sustainability.

Respondent 1:	Reap yield benefit is identical to the expansion of all data factors, (for instance, light, water, compost, weeds, ice et cetera.) not the extension of the segments. In case with or without are at 100% from one that is at a large portion of the yield will be at half. The measure of every data varies with changes in territory. As a result of data necessities changing from field to deal with, neighborhood, to state, country to country et cetera there is no genuine approach to give specific answers without portraying all the data factors for a specific field. Generally speaking, the costliest single factor is water framework when growing a collect in a range with a water setback air.
Respondent 2:	Irrigation is important to gain good yields
Respondent 3:	Irrigation provides for a stable growing environment for crop production.
Respondent 4:	Food security and economic in agriculture is irrigation a crucial part of

iii. Land for cultivation is clearly a scarce resource, what is your opinion regarding a proposed solution?

Respondent 1:	There is no insufficiency of land for sustenance creation. The issue is zone of land versus region of people and creation resources. The basic thing is to pick or make water framework structures and diverse commitments for the specific land package or region. While considering another region to make don't wrongly search for the likeness, look for the refinements, as the qualification causes the issues ought to be
Respondent 2:	Enough satisfactory land is accessible; the force of editing on the land falls behind the accessible innovation. Nourishment costs have an extraordinary arrangement to state in the matter of how quick the change to escalated techniques happen
Respondent 3:	In any event in bone-dry locales, water is unmistakably the constraining variable, as is valid in Freestate – I can't address this issue, but to take note of that clearing more forestland negatively affects staying regular habitats a negative impact on remaining natural Environment.
Respondent 4:	Education program is essential to provide training the farmers of South Africa.

iv. Do you foresee water shortages looming in the near future for irrigation purposes?

Respondent 1	Climate change will dislocate distribution over the earth, but the largest threat to specific locations is the ecologist who has no concern for the human population.
Respondent 2:	Water shortages are already a huge problem for South African farmers
Respondent 3:	World-wide problem
Respondent 4:	Use of the right recycle processes to increase water efficiency.

v. Where do you foresee will the biggest growth in agricultural land and irrigation take place?

Gauteng, Mpumalanga, North West, Limpopo, Freestate and Cape? Please substantiate your answer.

Respondent 1:	They all could turn out to be the largest
Respondent 2:	The activity of irrigation practices will determine this. This may be modified by any significant climate change.
Respondent 3:	Mpumalanga
Respondent 4:	Limpopo, most unused land and population growth is the lowest with large land areas available to create agricultural areas.

vi. Provide your views on land degradation due to bad farming methods and practices?

Respondent 1:	It occurs because of absence of learning and advantages for cultivate accurately. Want to demolish is the special case not the run the show. The best boost to secure farmlands is the capacity to gain salary and have the capacity to keep or spare cash. In the event that they have this then training and changes in techniques will be acknowledged. For whatever length of time that a high level of the total populace stays in neediness because of debasement in national and neighborhood governments, change in expectations for everyday comforts will be spotty and moderate. Too high a level of the world's philanthropy has been usurped before it gets to the penniless
Respondent 2:	Terrible practices have corrupted the land as far back as cultivating started. It will proceed until the point when the incentive from cultivating extraordinarily surpasses the hazard and speculation.

Respondent 3:	What's more, the cost of keeping up a solid domain passed on to the customer. Land and water debasement must be put to stop
Respondent 4:	Come back to a harvest pivot approach an absolute necessity.

vii. What is your view on the fresh water situation in agriculture?

Respondent 1:	Fresh water is accessible wherever that financial aspects exist to give it.
Respondent 2:	Agriculture must look for sources of multiple use water The days of single agriculture use are ending and make use of rain water and the way rainwater is harvested
Respondent 3:	There is not enough fresh water to continue on the current course.
Respondent 4:	Recycle grey water in agricultural areas close to urban developments.

Irrigation industry and technologies viii. What is your opinion on the importance of irrigation in the agricultural sector?

Respondent 1:	It is key in many provinces for the production of food be consumed by the total population.
Respondent 2:	In these day water is everything and must be up there .
Respondent 3:	Irrigation remains one of the most important things for agriculture.
Respondent 4:	Vital for better yields

ix. What in your opinion are the key elements for effective irrigation practices?

Respondent 1:	scale water framework has been to a great degree viable in the expert portions of the world and has created from item to alter as budgetary viewpoints have gained ground. Yields were high regard and creation extended with better quality making the systems greatly valuable. In the midst of World War II polyethylene pitch was created, which mulled over a vital diminishing system costs
Respondent 2:	water sources and availability go hand in hand with crop selection
Respondent 3:	high efficient application.

Respondent 4:	Reduce overwatering
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- x. The irrigation industry is currently dominated by pivot- and drip irrigation systems although flood irrigation remains the highest irrigation method in the world. What is your view of the different technologies in terms of water use efficiency, management ability, labour and cost?

Questionnaire feedback: Drip and Pivot

Element	Respondent 1	Respondent 2	Respondent 3	Respondent 4
Pivot				
Water use efficiency	Same as drip	No response	Good	Medium
Area Versatility	Depends on the topography	No response	Fair	Large
Management and Maintainability	Very different problems from drip	No response	Good	Medium
Labour	Lower for both	No response	Excellent	Highly skilled needed
Capital- and Running Costs	Depends on design and running life	No response	Excellent in proper circumstances	Medium
Drip				
Water use efficiency	Same as pivot	No response	Excellent	Highest
Area Versatility	Depends on the Topography	No response	Excellent except for cost	Small - Row crops and trees
Management and Maintainability	Very different than pivot problem	No response	Good after training and practice	Highest
Labour	Lowest for drip	No response	Good	Highly skilled needed

Capital- and Running Costs	Depends on design and running life	No response	Excellent except for field crops	High
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xi. Are you or the opinion that dragline systems still have a role in the agricultural environment? Please substantiate your view.

Respondent 1:	Dragline was a very good development in the irrigation sector but technology has developed better alternatives to allow for higher yields.
Respondent 2:	Best fit for local needs
Respondent 3:	High labour costs.
Respondent 4:	No, too labour intensive and bad uniformity

xii. Do you think it is possible to improve on existing irrigation technologies in respect of water, energy sustainability and if so how?

Respondent 1:	There are changes each year or the water system industry would not remain in business. A few upgrades are particular and some are general however in the event that they are to be created there must be a need.
Respondent 2:	Technology provides for better information in a timely manner to make better decisions.
Respondent 3:	It is improving all the time. Major trend is low flow sprinklers and drip irrigation.
Respondent 4:	Improvement, yes especially in the automation side of systems

xiii. Are there in your opinion irrigation system/s that fulfils the needs completely sustainable agriculture practices? What are their most significant strengths?

Respondent 1:	Yes, they exist but are different in different places. They are crop specific.
Respondent 2:	The grower must believe in the irrigation system.
Respondent 3:	Each system has its weak and strong points.
Respondent 4:	No

xiv. What are your views on the ability of modern technology to increase yields?

Respondent 1:	On-going process.
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Respondent 2:	Technology with increased water use efficiency management.
Respondent 3:	Technology increases yield
Respondent 4:	Used wisely because it can disturb the environment and organic way of growing

xv. In your view how relevant is the use of high technology systems in agriculture?

Respondent 1:	Without technology farmer would still be collecting grapes and gathering grain by hand. Much more effective
Respondent 2:	The user must believe in technology
Respondent 3:	No comment
Respondent 4:	Very relevant but must be carefull

xvi. What are the restraints in the market for farmers to switch to modern high technological systems?

Respondent 1:	See answer above 2.
Respondent 2:	Capital vs Investment options
Respondent 3:	High Initial cost will be the considering factor
Respondent 4:	The lack of educated personnel.

xvii. Do the yield increases achieved through modern irrigation and precision farming technologies justify the increases in costs?

Respondent 1:	Everything backpedals to financial aspects. On the off chance that the cost isn't defended the progressions won't be made by generally agriculturists. The individuals who do will likely go bankrupt. On the off chance that a communist society continues with uneconomic choices the general public will end up plainly bankrupt.
Respondent 2:	Not always
Respondent 3:	They will definitely help.
Respondent 4:	Yes, all depends on the prices of the produce.

xviii. Why are farmers reluctant to change? What are the constraints? With this in mind, what is your view on traditions, knowledge, capital constraints?

Respondent 1	Tradition Must be considered when managing the instructing the utilization of a system. A few societies make dread of being out of a cabin amid the dull. We won't have the capacity to change that, so we should outline around the limitation; Knowledge – provide the opportunity to learn by seeing and doing
Respondent 2:	Tradition ,If you are currently profitable, why change?
Respondent 3:	Tradition – Major problem although farmers all over the world look over the fence line to see what their neighbour has done. Conversion to any new irrigation technology takes twice as long as expected based on my experience; Knowledge
Respondent 4:	if it works do not fix it, farmers work hard with little financial reward.

xix. Please comment on the importance of (1) Precision farming; (2) Improvements in irrigation systems and inst allation methods; (3) Emitter efficiencies?

Respondent 1:	(1) farmers can improve they improve yields; (2) Install maintenance; (3) Improve emitter efficiencies.
Respondent 2:	(1) long-term installation investment (2) System performance will determine water efficiency; (3) buy the best and you will save .
Respondent 3:	(1) Installing a drip system but there is no technology part to a drip system (2) must happen seasonally in my opinion (3) the efficiency of the emitters depends on how they deliver the water.
Respondent 4:	Mangemnet skills are high on drip sytems and spacing of emitters destroys the efficiency percentages.

Financial xx. Is the financial world ready to invest in agriculture?

Respondent 1:	Project orientated.
Respondent 2:	Investment risks
Respondent 3:	Geographic locations differ.

Respondent 4:	No comment
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xxi. Do you believe that the dramatic rise in food prices will make agriculture a profitable and attractive sector for investment like the mining- and industrial sectors?

Respondent 1:	Not directly in my field
Respondent 2:	Input costs are high
Respondent 3:	runaway food prices in the near future
Respondent 4:	Wholesaler determines the prices to end users.

3.6.2.8 Findings

The agricultural sector is managed by lawful and political bodies. Global strategies, procedures and agreements are all incorporated into these laws and political views. The World trade organization and the OECD bodies are some the most significant overseeing entities in the agricultural sector. They have concern over environmental changes and water shortages. The growing population is also a big concern for these bodies and not all these measures and admin fundamentals has a positive impact on the agricultural sector. IU and Ocmis must be aware of these overseeing organizations and position themselves accordingly.

The faced off point is this competition and Ocmis must inquire for themselves if this is a negative or positive factor for them. The buying or renting of land for agriculture by financial organization is an ongoing rivalry between them.

Irrigation improvements for farming is still a speculation topic in the agricultural sector, but with the focusses on cutting edge water suppling technology, this gives Ocmis Travelling irrigators a feasible opportunity to enter the South African market with great successes. Building up connections and recognising where the

opportunity lies will be the deciding factor for the success of Ocmis Travelling Irrigation.

Cutting edge irrigation water systems and zero-tillage are all examples of the way forward for agriculture and the alteration of cultivating techniques will go into organic lifestyles. Production processes will also change and the way the agribusiness works will change in the future.

The co-ops and partnerships must be targeted by agriculturist to ensure that best outcomes with cultivating strategy and the farming needs gets overseen by an agricultural specialist in partnership with Ocmis.

The expanding food cost crisis and the economic impact of this is an financial problem for all but especially for the framers of South Africa and also the rural areas. The cost of an irrigation systems get influenced by the sustainability costs and yield efficiency (Simpson & Reinders, 1999).

Environmental changes and the climate change factors are all high risks for the markets variances and agriculture gets seen as a high-risk sector because of these factors. Efficient irrigation systems can help these risks the advances and accuracy can be planned more efficient.

The biggest challenge stays to answer the economic question on where to are the markets going and how will the agricultural sector be affected. New technology will be part of the procedure in the future. Water conservation will become more adequate and applying the water to the arable land will become part of these changes and will become part of the agricultural and rural contributions to build the population. Mann *et al.* (2009.) These notable upgrades must also guarantee that population will be build and looked after but without the negative impacts on the earth. The key driver for progress is compelling administration Thomas (2005.)

Precision farming is a fundamental part of agriculture and the need for irrigation on a specific time and with the correct amount of water and in the right area of the farms. Ocmis Travelling Irrigation makes use of this precision irrigation system and can also apply fertilizer through the irrigation system to ensure good yields

The Ocmis Travelling irrigation system meets the demand of the fundamentals of precision farming and irrigation management.

The key points for an successful irrigations system by the respondent is to incorporate how the water gets from the water source into the irrigation system and how the water is applied as uniform as possible, with the least water evaporation and lowest pumping costs. The management of the irrigation systems also plays a crucial role in the choice of an irrigation system Padgham (2009:66), and in addition Hightower and Pierce (2008) outlined the desires of viable water system as modernised water system frameworks, which can add to an expansion in water effectiveness by enhancing water profitability, decreasing vitality utilisation and improving natural maintainability.

Ocmis travelling irrigation systems innovative way of water big areas without any labour and can easily be managed and also fertilize while irrigating.

3.6.2.9 Conclusion

The political, economic, social, technological, legislative and environmental factors were all evaluated in the South African macro environment

The South African agricultural sector makes uses of political and legislative systems to implement regulations and policies. The effects of soil erosion and water scarcity needs to be controlled in South Africa, and this is where the OECD and WTO plays their role in overseeing these systems. The Subsidies and measurement that is placed in to the agricultural sector are not always seen as a positive measure and it can cause some challenges rather than giving solutions. The Competition for arable land is a big trend for South Africa economy, where it is seen as an investment opportunity to own land.

The population changing lifestyles are increasing the production required and sustainable agriculture needs to meet these demands and improve on farming techniques, especially on the irrigation side.

Biotechnology, conservation agriculture, organic farming and precision farming are all practises supporting the development of agriculture in South Africa.

3.7 Value chain analysis

3.7.1 Introduction

Doyle and Stern (2006:82) explains how the value chain is a great and effective tool to use to see where the competitors and where the organization lies within the chain.

The external and internal environment of the organisation gets examined. As indicated by Hough *et al.* (2013:123), an organisation's value chain is a piece of a greater chain of exercises that includes the value chains of its providers and of other related collusion systems.

The value chain procedure is the administrations and physical change the organisation goes through to transport to end product to the user. The value chain analysis gives the organisation a broad view of the whole chain and all the deferent quantitative and subjective instruments.

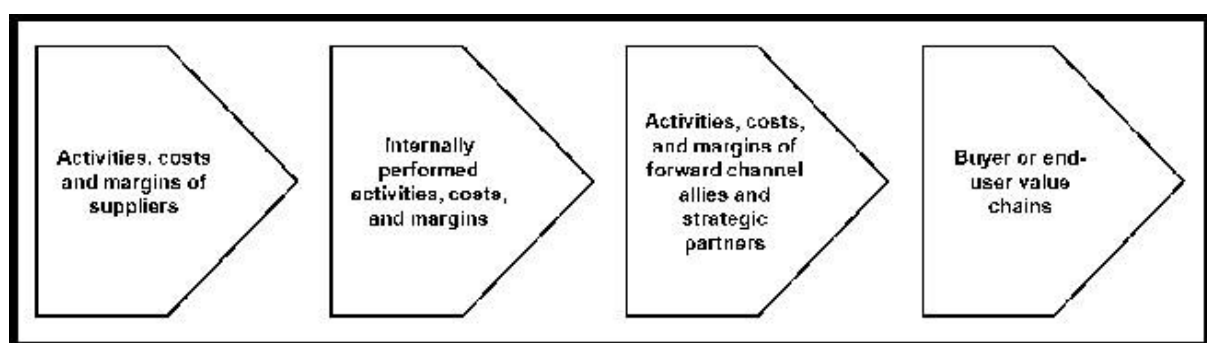


Figure 3. 7: Industry value chain analysis (Source: Hough, Thompson, Strickland and Gamble (2016)

Customer value gets created by the primary and secondary activities and this forms the companies value chain (Hough *et al.*, 2013:120). Creating value for the customer is the primary activities, the functioning of the primary activities is the support activities.

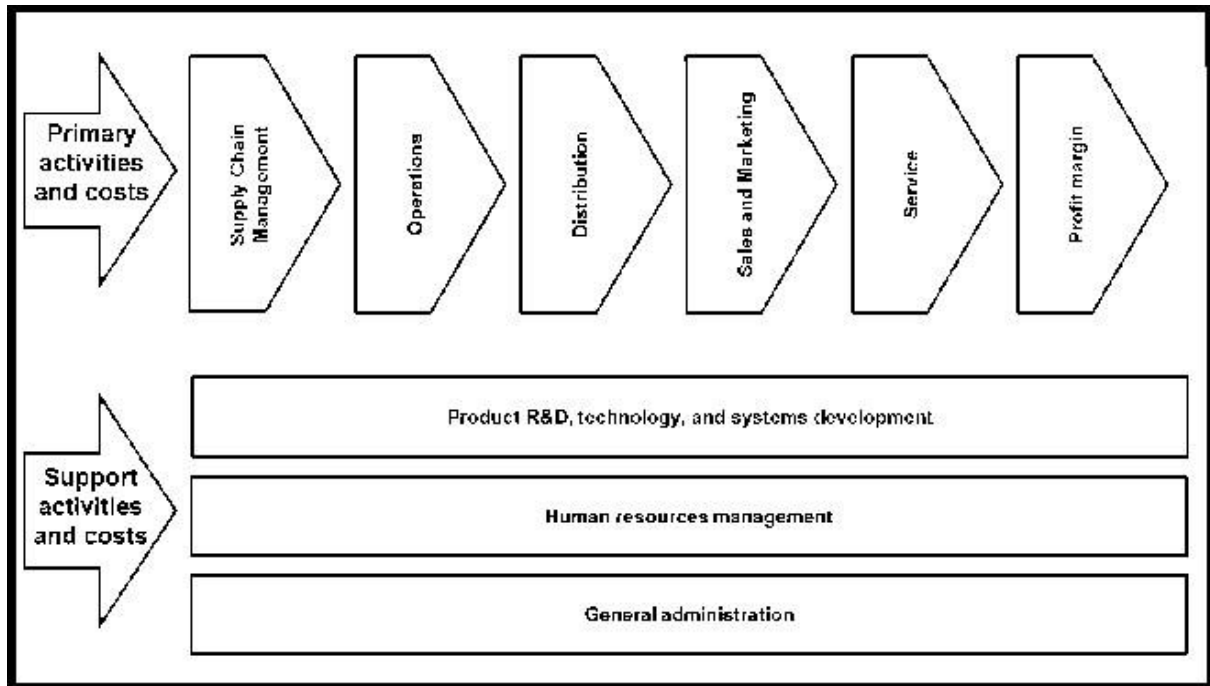


Figure 3. 8: Company value chain (Source: Hough, Thompson, Strickland and Gamble (2016))

For Ocmis the crucial aspects of the agricultural sector value chain were analysed to help the organisation to understand how they can implement the value chain and to create a strategy for IU within the irrigation sector.

Ocmis internal company value chain was examined and the primary activities were noted and were IU focus should be in their strategic planning

The incorporated value chain forms part of the industry value chain. Administration like transportation, change, advertising and the products attributes, all forms part of the value chain to the end user (Höffler, 2011:26). All the providers, decision makers, purchasers are all incorporated.

Hoeffler (2011:18) mentioned that the linkage of the value chain includes the makers, processors, dealers and merchants of a specific item. The structure and other elements forms part of the value chain

Structure incorporates all the value including elements that shape some portion of the esteem chain, while progression incorporate the determinants of conduct of

people and associations and the effect thereof on the value chain (Campbell, 2013:1).

The value chain includes strategy, authoritative components that effect the costs and time prerequisites Hough *et al.* (2008:122) portrayed the cost structure must be understood and the value chain analysis will assist to enhance intensity. Benchmarking can also be done with value chain analysis against competitors in the agricultural market. Hough *et al.* (2008:122) likewise said that the value chain examination of a business additionally mirrors the development of the business' procedure and helps the organisation in ideally executing its technique.

Ocmis value chain and the Agricultural sector value chain was used to form where the Ocmis lies in the value chain. Reports form Ocmis as well as form irrigation Unlimited was used. The inner Value chain of the organisation information was obtained by narrative information.

3.7.2 *The agricultural industry value chain*

The agricultural sector as a very diverse value chain from the start to the end users. The value chain expanding and the value chain must be able to adjust by working together with other agricultural companies and connecting the agricultural sectors to streamline make the production network more effective and to lower costs (Keyser, 2006:4).

The end users demand is to produce food for the population The rural area are face with much difficult demands to meet the demand of the growing population and they should be encouraged to streamline their agricultural value chain to ensure they meet the populations demand.

3.7.3 *Stages of the agricultural value chain*

Keyser (2006:4) explains the quantitative methodology practices of the stage of the agricultural value chain. The requirements and also the cost implications.

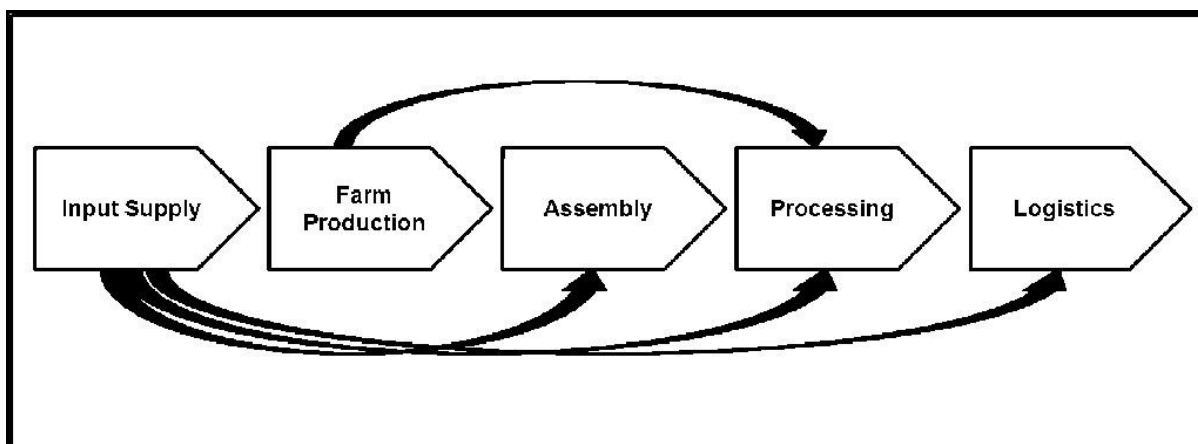


Figure 3. 9: Stages of the Agricultural Value Chain (Source: Keyser)

3.7.4 The key activities occurring at each stage of the value chain include:

3.7.4.1 Input supply

The raw materials for the production of the agricultural produce, and the processing and selling of the products. Manufacturing cost, Transport costs, taxes and duties are all cost activities that needs to be performed (Keyser, 2006:5). The complete value chain consists of all the input supplies that is applied to all stages.

3.7.4.2 Farm production

The agriculture production consists of all the primary farm production stages, this includes all raw products that is been used for production or send to the market. There are many variable costs in this stage like fertilizers, seeds, feeds, irrigation, machinery maintenance costs, labour costs, marketing cost (Keyser, 2006:11). Ocmis Travel irrigation system fits into the farm production stage of the value chain.

3.7.4.3 Assembly

In this stage all the raw material is been collected and transported to a factory to be processed and packaged (Keyser 2006:5). Costs includes storage, packaging, depot costs, transport costs, licence fees, management, interest payable, vehicle costs.

3.7.4.4 Processing

The production of the raw materials get dine in this stage and a finished product is the finale process (Keyser, 2006:5). Costs include, energy and machine operating

costs, repairs and maintenance, packing and consumables, storage, vehicle overheads and maintenance, management, labour, licenses, interests and overheads

3.7.4.5 Logistics

The fiscal transportation of the finished good to the end user or the market. The markets can be situated anywhere in the world (Keyser, 2006: 11). Variable costs include, loading and reloading, storage, transportation to point of delivery, duties and taxes, purchases from processors, clearing fees, licenses and permits, interest, management and overheads (Keyser, 2006:11).

The input and output costs are spread over the whole value chain at all the different stages. The cost must be accounted for at every stage in the value chain to determine a competitive price and where the costs can be reduced at the market (Keyser, 2006:5).

3.7.5 *Key elements within the value chain analysis*

The agricultural environment demands are seen in the value from all the shareholders, activities and client behaviours to meet the demand.

Key elements to take into consideration include:

3.7.5.1 End markets

This is where end users get their products to meet their demands. The market is where the end products are sold and the agricultural sector has quite a few markets where producers can sell their produce. The World Bank (2014:1) remarked that huge organisations overwhelm the universal rural exchange. Example where couple of big partnerships organisation are making it difficult for new entrants to enter the market.

3.7.5.2 Business enabling environment

This format where a business can move a product up and down along a value chain. The movement is moulded by universal laws, strategies and exchange understandings. The worldwide economy gets boosted with this arrangement and

structures with the reason to empower small scale farmers (Kleinberg and Campbell, 2012). Kleinberg and Campbell (2008:1) clarified that measuring the accomplishment of arrangement change depends on dissecting how the strategies are executed; regardless of whether they put extra weights on organisations and in addition connections; and the motivations that drive business choices.

White (2008:22-35) identified the following guidelines for organisations to promote a business enabling environment:

1. Restructuring practices;
2. Gaps in the policies and agreements must be identified to see the opportunities;
3. Strategy of communication must be formulated:
4. Key Stakeholder must be identified;

3.7.5.3 Horizontal- and Vertical linkages

Industry value chain gets shaped by Horizontal and vertical linkages. Vertical linkages are made with between organisations to enhance their market share. These linkages are seen as very powerful linkage where connections help to shape the value chain. These vertical linkages are build up through common trust and joint vision

The main idea with the linkages is to that the organisation has the capacity to make financial connections decisions (McCarthy, 2008:1). Economies of scale is a big deal with horizontal linkages, and it gives the organization more power to bargain with, the costs get divided, and the administration gets shared (McCarthy, 2008:1).

McCarthy (2008:2) condensed that learning while sharing trust and social capital are all attributes of successful level linkages. Ocmis together with IU must look for collaboration partners in South Africa to build economies of scale.

3.7.5.4 Supporting markets

Supporting services are functions in the business to help the business to grow and to function optimally. Financial services, legal advice, information gathering, technology advice. The services strengthen the company's ability to have a competitive product on the market

Competitiveness and growth of business gets supported by the supporting markets and plays a significant role in success of the business.

3.7.6 Value chain constraints and opportunities

Value chain has limitations and must be adaptive to change. Lusby (2007:13) built up the agricultural system to order limitation in the value chain.

Table 3. 2 : Category of value chain constraints/opportunities in Agricultural Sector

Category Examples

Technology and product development	• Technical skills lacking • Production skills lacking • product demand information lacking • Unreasonable buyer demands
Market Access	• Large buyers can't be reached • Marketing strategy is lacking
	• Product demand information lacking • Bad marketing techniques • No Market • Transports costs are too high
Input supply	• Raw materials quality is lacking • Bad suppliers
Management and Organisation	• Economies of scale • Financial training is lacking
Policy	• Taxes deductions • Governmental price subsidies • No regulations
Finance	• Bad supplier credit

	• No access of funding • Bank loans are the only option
Infrastructure	• Lack of Infrastructure.

Lusby (2007:13) remarked that the above-mentioned requirement can happen ongoingly.

3.7.7 The internal company value chain analysis

Primary activities

Ocmis Travelling irrigation value chain analysis is as follows and consist of the company's primary activities.

3.7.7.1 Research and development

The company is presently in the process of developing new Ocmis Reel and boom sprinkler systems with an increased radius of water distribution, with the purpose to entrench it in the replacement market of existing irrigation systems used in the irrigation industry. Vast potential exists in this market, especially in the SA. Research and development work in the future will focus on completing products currently in the pipeline, which include a bigger hose reels and also maximising the length of their boom systems for grass fields and orchards and expanding the product range to meet various demands of the agricultural sector.

3.7.7.2 Supply chain activities

Ocmis satisfies the part of providing the irrigation system and additionally all segments identified with the irrigation sector to the market. Collusions should be made with existing providers (Irrigation Unlimited) of Ocmis system to incorporate these items in stock.

3.7.7.3 Design and manufacturing

Ocmis Hose reel system does field layout designs for irrigation systems internally, which include a bill of quantities to the customer through Irrigation Unlimited in South Africa.

3.7.7.4 Distribution

The distribution of the product is directly from Ocmis premises in Italy. The product is distributed within South Africa as well as to international countries including Botswana, Mosambiek, Namibia, Kenya etc.

3.7.7.5 Installation

Installation of the system is done directly by Irrigation Unlimited themselves. The firsttime start-up commissioning is also done by Irrigation Unlimited in South Africa.

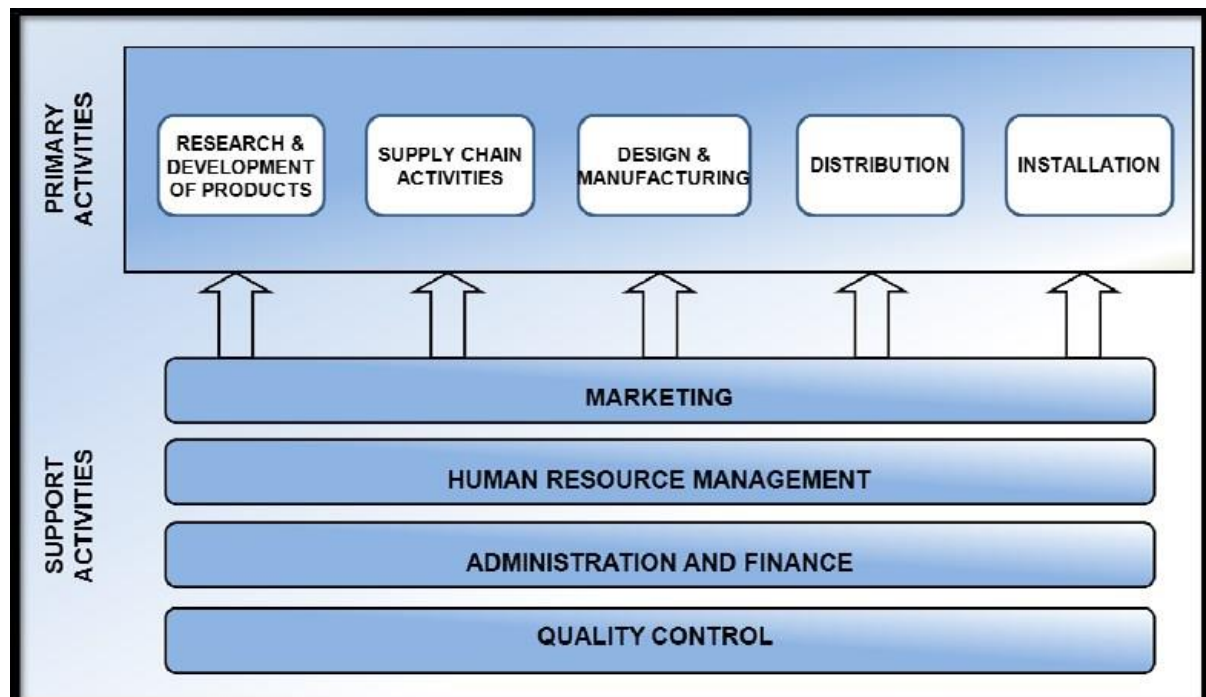


Figure 3. 10: Ocmis value chain

3.7.8 Findings

To support the value chain, it is clear that the data generated in this area part is of the value chain and it is an incorporated structure with essential basics that will add to higher accomplishment rate in the support in the value chain. Trends and dynamic forces in the complete condition of the International agricultural division creates new opportunities for cutting edge water system advances. The Ocmis travel system is in an immense position to gather aggressiveness from these new opportunities that includes item improvement and exceptional quality that meets these requirements. The Ocmis is working through an individual seller (Irrigation Unlimited) inside the Valve chain.

The South African agricultural sector was impacted by International strategies and controls for adjusting unconstructive impacts that is forced onto a native environment by the following examples, abnormal weather changes, ecological changes and land corruption. These International strategies and instructions will add to concrete business-empowering state and to differentiate between openings in the hole emerging from these managerial structures the Ocmis and the UI needs to work together to form these structures. The business needs to reconstruct their method and they need to change the business state to national and International advancement designs in order to reach their target. To have a vision to reach the desired outcome it is important for the business to reconstruct its procedure and this needs an investigation of existing boundaries experienced in the value chain. As an International company, the intensity of cost causes losing intensity and the supplier and purchaser exchanging control is high so the result is that if you bring out an item with a high starting capital interest in the market you will lose intensity. To strengthen to company's position the vertical organisations should be set up. Inside the agricultural sector these corporations should be shaped to take hold off exactness cultivating, decreased water-and energy uses and to increase price competitiveness to reach economies of scale.

If the company is using distribution networks it could only be a benefit to the company if they created horizontal linkages. To move forward in exchanging information, abilities and innovation the horizontal linkages can upgrade the supporting markets. To provide agriculturist with finances, Ocmis could earn money by shaping companies together with supporting money connected to administrations. A universal approach with decent interpersonal relationships from all stakeholders can improve the power of their value chain within the marketplace.

3.7.9 Conclusion

In this sector we focussed on the agricultural value chain and recognised some stages that is needed to create a product from the foundation through the production- transformation –and distribution phases up to the stage where they sell the product. Key elements can support all the important stakeholders, activities and behaviours that is necessary to meet the market's demand in the whole agricultural environment. These elements consist of inter-firm relationships, vertical and

horizontal linkages, support services, end markets and business-enabling environment. The final point of the value chain is called the end market and forms part of a strategic part of the value chain that is developed. To encourage a healthy business environment a business-enabling environment is developed by a governance structure which is formed by international laws, policies, trade agreements regulation.

To achieve a higher market share in the industry it is very important that vertical and horizontal alliances and synergies among companies strengthen a business's competitive position. A service by an enterprise will support the business to grow even more and this is called a support service. The complete value chain procedure is completed through regulatory institutions, sellers, service providers and buyers and these are part of the value chain governance. To identify any problems in the market within the value chain, the process will enable the business to investigate the problems and either reduce it or turn the problems into opportunities. The total Ocmis Internal value chain was evaluated and analysed.

3.8 Porters five forces model

3.8.1 *Introduction*

Porters five forces model is used to focus on the competitive pressures in the agricultural market. The FOA(2016) noted that “drives down rates of profit for contributed capital” is a significant process of business that helps deciding to exit rivalry and to clarify the opposition. Empowering ventures comes from aggressive rate.

These forces incorporate the danger of new competitors; the risk of substitute items; the quality of competition and the power applied by providers and purchasers. Ehmke *et al.* (2004:1) expressed that porters model is a successful instrument to break down the structure of an existing industry. Desktop research where used to gather secondary data from related book and brochures

3.8.2 Competitors analysis

3.8.2.1 Flood irrigation systems

3.8.2.1.1 Introduction

Flood irrigation is one of the oldest methods of irrigation used by farmer (FAO, 1989). Broad classifications are basin, furrow and border irrigation as well as uncontrolled flooding.

3.8.2.1.2 Performance enhancing attributes

Gravity or animal powered bucket wheels, as still used in some countries can provide sufficient energy for a flood system. The low skill requirements are well suited to successful crop production by uneducated farmers. Gently sloping fields of any shape or size can be irrigated

3.8.2.1.3 Performance inhibiting attributes

Water usage is fairly high and it is difficult to do fertigation. Water and fertilizers are wasted due that fact of run off and the cost of drainage ditches are high

3.8.2.1.4 Conclusion

Rice paddies in Asia are one of the oldest examples of flood irrigation.

3.8.2.2 Drip irrigation systems

3.8.2.2.1 Introduction to drip irrigation

Subsurface irrigation like drip and micro sprinklers was patented by Blass for Netafim in 1960. Australia and North America embraced this new technology in the late 1960s (Irrigation Direct, 2012). Drip is black polyethylene pipe with small and frequent emitters that emits water at very slow discharge (Shock, 2006). High capital

cost and ongoing maintenance and the high level of labour, the drip and micro sector have made substantial market growth in South Africa (Reinders, 2006).

3.8.2.2.2 Conclusion of drip irrigation

One of most successful irrigation systems in South Africa is the drip and micro irrigation sector. Agriculturist should utilise the negative factors. Some of the most popular drip and micro companies are Euro drip, John deer, Netafim, Agriplast, these companies specialize in training and has hands on supports structure.

3.8.2.3 Pivot systems

3.8.2.3.1 Introduction of Pivot systems

Towers that are on wheels with suspending pipes that rotates around a certain point is called pivot system. The droughts lead to the exitance of the pivot irrigation system which leads the water from underground water source to the centre hole. Pivots machines have the ability to irrigate over hills and is one of the most important benefits. Valley was the first brand to obtain the patent that was made out to Frank Zybach in the 1950s. Valmont how is owner of Valley brand has grown to be one of the biggest agricultural companies in the world and focuses mainly on irrigation.

The pivot system is long galvanized steel pipes in a long span rotating around a centre point where the source of the water is pumped to. Emitters are installed on top of the pipe and as the pivot moves the wetted areas move to different point. Electric motors turns the. This implies that the water application rate must increase with distance from the pivot to deliver an even water application.

○ Linear move systems

Solomon (1988) explained the systems moves in linear movement and consist of side roller system.

These systems are made of square fields that are free from any obstacles and has a very high- water usage. High capital investments are needed but can be financed.

3.8.2.3.2 Performance enhancing attributes of Pivot systems

According to the manufactures brochures, there is very little labour involved and that bring labour costs down. A swing arm can also be installed on the pivot to compensate for the fall out areas of the pivot. Pivots can be installed with pressure compensating emitters to compensate for the different slopes. Drop Tubes can also be installed on pivots to apply the water closer to the ground and crops.

3.8.2.3.3 Performance inhibiting attributes of Pivot systems

Twenty seven percent of the square block cannot be irrigated with a pivot. Lower yield can occur on the edge of the circle. There can also be 2 pivots installed at an increase cost but then the yields will be better. Not suited for certain clay soils.

On regular intervals sprinkler packages needs to repaired or replaced as well as maintenance must be done on gearboxes, motors and switching gear

3.8.2.3.4 Conclusion of Pivot systems

Pivots are in South Africa currently dominating the irrigating market. The higher yields and water and labour efficiency are some of the strengths of the Pivot Irrigation system

3.8.2.4 Sprinkler irrigation

3.8.2.4.1 Introduction of Sprinkler irrigation

Solomon (1988) explained that solid set sprinkler system works with a network of pipes and sprinklers with different size of nozzles. The water is pressured through the nozzle and it travels through the air and falls on the crops and soil. Sprinklers must be space correctly to get uniformity in the fields.

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- Hand move or portable systems

Dragline systems falls into these categories where. Lateral pipes of 6-12m gets connected through quick coupling system. Aluminium and black PVC pipe are the most common types of materials used. The lateral with the

emitter on is left for a couple of hours at on position and then it is moved to the next point.

- Semi solid set systems

This system is used where the crop needs to be harvested and on irrigation equipment must be in the fields. The systems gets removed and replaced after harvesting

- Solid set- or permanent system

This system is the most popular and is where they install the infrastructure in the field permanently. Laterals and emitters are installed and is permanently in the field. Labour requirements are very low.

- Travelling Irrigators

The Ocmis Travelling Irrigation system is the recent innovation in sprinkler irrigation technology. Water Propelled Canon Sprinklers. The pipe gets rolled up automatically with the force of the water the retracts the pipe on different speeds depends on the water the client needs per hour. The system has very low labour requirements and the most significant advantage is that it creates irrigation without any equipment in the field with free movement of heavy equipment in the field.

3.8.2.4.2 Conclusion of Sprinkler irrigation

Sprinkler irrigation has strong advantages far better than flood and micro sytems where the water is displaced uniformity and can also use fertilizers like manures and pesticides through the systems. Leaves also get washed of like rain will do making the plants healthier

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3.8.3 Threat of new entrants

Hough *et al.* (2008:63) expressed that risk of potential section is the bigger the level of entrants into the market. The risk

The degree of risk that the contestants posture on existing contenders increments with the quality in limit and assets of the potential new participants. This is particularly important where existing part players in the water system industry have the assets and skills to develop a current item extend through innovative work, to build their piece of the overall industry.

Hough *et al.* (2008:64) clarified facilitate that obstructions representing a high danger to contenders entering another market incorporate the capacity to increment on generation to accomplish economies of scale or expanding the geological region canvassed in advertising the item. A key perspective to accomplish economies of scale is a business' capacity to eliminate expenses and pick up a cost advantage over its rivals. This is in all likelihood accomplished through linkages with providers to chop down generation costs. Responsibility for and protected innovation offers an extra advantage over contenders.

Other real boundaries to defeat when endeavouring to enter a market commanded by existing contenders incorporate existing client faithfulness, mark inclination and in addition infiltrating a system of merchants which requires high capital venture to address the worldwide market. These are real interferences that Ocmis needs to address in its methodology. Administrative strategies impact the worldwide rural division particularly tending to environmental change and water shortage. These administrative approaches act preferably as a positive impact to Ocmis travelling irrigation than an obstruction. Ehmke *et al.* (2004:8) prompted that a business could viably build the obstruction to the danger of new participants by upgrading brand picture, creating licenses and making organisations together which could emphatically add to an item's quality. Ehmke *et al.* (2004:8) additionally featured the significance of not over-benefitting the item to stay focussed.

3.8.4 *Substitute products*

Hough *et al.* (2008:69) identified three prominent factors affecting the competitive pressures on substitution products in the market.

These three factors are:

- The availability and price of substitute products, readily available and attractively priced substitutes increase competitive pressure through placing a limit on the price of products. Ehmke *et al.* (2004:10) stated that product differentiation is a distinguishing factor in overcoming the pressure of substitute products. Through product differentiation a product can justify an increased price over competitors, however only if the product differentiates itself substantially by adding value and benefits.

- High or low switching costs associated with substitute products

High switching costs discourage customers from obtaining substitute products. Hough *et al.* (2008:69) stated that switching costs include not only price, but also time and inconvenience to change to a substitute product. Ehmke *et al.* (2004:11) concluded that customers are often reluctant to switch to another product even if it offers advantages. Customers may perceive changing over to an alternative product as increasing their risk or being discouraged by the inconvenience or added effort to becoming fully accustomed with the new product. Floppy Sprinkler is experiencing this especially in the market where customers have to decision to change an irrigation method.

- Outperforming products through quality, features and performance

Hough *et al.* (2008:69) explained that the availability of substitute products places emphasis on the products' performance, features and quality. Competition from successful substitutes allows consumers a wider selection with a higher likelihood of replacing existing products with substitutes. Ehmke *et al.* (2004:10) explained as an example of substituting products, pork meat being replaced by chicken when pork prices escalated at a high rate.

3.8.5 Supplier and buyer bargaining power

Ehmke *et al.* (2004:2) represented competitiveness gets affected by the cost of an item. The cost of an items can get influenced by the dealing for better price with the providers. Hough *et al.* (2008:71) expressed that little retailers regularly have an

impediment when managing substantial producers with entrenched brand names. Organisations providing separated items and working on low level of economies of scale, similar to Ocmis, frequently encounter next to zero bargaining power with providers because of the way that a constrained number of providers have what it takes and capacity to produce their segments and changing to elective providers is troublesome and expensive. Because of low piece of the overall industry, amounts created by providers are not a noteworthy segment of their business operations and further decreases arrangement quality on costs. Hough *et al.* (2008:73) proposed merchant coordinated effort or organisations together with providers could give appealing win-win openings. In reverse coordination – purchasing out key providers or going into generation in-house offers a chance to wipe out provider control, yet this is a high-cost practice and normally just advocated through expanding amounts. An expansion in piece of the overall industry is expected to build fabricating amounts.

As indicated by Ehmke *et al.* (2004:4), purchasers have an abnormal state of transaction control over dealers on the off chance that they are expansive and buy huge amounts of a provider's item. Purchasers additionally pick up control if the item is accessible from numerous providers or where purchasers can make the item themselves or where there is a low changing expense to change brands. Hough *et al.* (2008:77) clarified that associations amongst dealers and purchasers are an essential factor in the aggressive condition and that as a rule it is of common enthusiasm to work nearly on in the nick of time conveyances, timeous instalments and information sharing.

Hough *et al.* (2008:77) presumed that the aggregate effect of the five powers decides the allure or productivity in the business for members and prompted that an organisation should coordinate its organisation procedure to the aggressive conditions broke down in Porter's Five Forces Model to guarantee ideal monetary and piece of the overall industry development.

3.8.6 Findings of Porters five forces

Porters five forces, the competitors, threat of new entrants, substitute products and bargain power of buyers and suppliers, all determine the profitability of the irrigation

industry. A high rate of competition results in a low rate of return since a high competitive rate inspire more people to invest. Social and technological trends, political, legal and economic factors also environmental forces all influence the competitive densities on an international level. Ocmis South Africa needs to strategist on some counter strategy's

The biggest market share belongs to flood irrigation since it is a low-cost and low skill method. Due to water scarcity and the need for refining and better technology some of the flood irrigation land needed to transform to other irrigation systems. Higher technology systems are Pivot- and drip irrigation, market share of these irrigation methods is growing since technological advanced irrigation methods become higher in demand. This higher demand result in high sale volumes, large-scale operations, and well-established brands. Since Pivot make use of sprinklers it gives Ocmis the prospect to replace the pivots outlying areas.

The biggest competitors for Ocmis are RM and Bauer travelling machines also Rainbird, Vyrsa, Senninger and Nelson. These competitors al have a large market share which result to be a great disadvantage for Ocmis. These competitors have established distribution networks and brand names. They are more cost competitive with strengths in financial and human resources because they have large market share and the advantage of economies of scale

The threat of new entrants seems to be low for Ocmis. They will need high financial investment to increase their strength and capacity. A way to cut cost is to form alliances with agricultural stakeholders, this relationships could also be beneficial to increase volumes and gain access to a distribution network.

Due to the current demand in the market, supplier- and buying bargaining power are strong competitive burdens for Ocmis. As a supplier of a differentiated product on low levels of economies of scale, Ocmis have minute bargaining power as their product is not an important part of suppliers' business. When negotiating with suppliers for reduced prices, it could have a substantial influence on the cost of the product. Therefor it is important for Ocmis to form relationships with these suppliers with the vision to achieve economies of scale. Ocmis can form partnerships with

buyers who buy on a large scale. Growing the customer base will increase the market share for Ocmis.

3.8.7 Conclusion of Porters five forces

After weighing all the competitors, threat of new entries, substitute products and supplier- and buyer bargaining powers the Porter's five focussed powers' model, decides the attraction of benefit of the water system industry and the outcome of this study presented manner for Ocmis in building up its strategy for the South African Agricultural mark

3.9 SWOT Analysis

3.9.1 Introduction SWOT Analysis

Hough *et al.* (2008:9) described the SWOT analysis as a powerful tool to evaluate a company's resource capabilities and deficiencies as well as its market opportunities and external threats that could affect its future health. Information obtained from the SWOT analysis should include attractive resource strengths, core- and distinctive competencies and whether these matches the requirements of the competitive environment.

The SWOT analysis was performed to determine the company's internal strengths and weaknesses, as well as the external market's opportunities and threats. For the purpose of internal- and external analysis, non-standardised focus group interviews were held involving five individuals within the company. The focus group interviews included discussions amongst the group members on the specific topic of strengths and weaknesses within the company and opportunities and threats from the competitive environment. The researcher acted as facilitator to ensure that the discussions remained within the scope of the topic and to ensure that all aspects were addressed.

A rating questionnaire of the product – included in this document as

Appendix a – was sent out to forty Ocmis system users, responses were received from 24 respondents. The response rate was only 60%. Upon enquiry it was found that some of the customers have sold their farms and contact has not been

established with the new owners. A few farmers were in the process of harvesting and did not have the time available to attend to the questionnaire.

Ocmis Travelling irrigation SWOT Analysis

Table 3. 3: SWOT analysis of Ocmis travelling irrigation

Strengths	Weaknesses
Advance technology Specialized expertise Easy operations. No Labour Finance options	Financial resources Weak distribution network. Limited ability to train farmers into precision farming for optimal performance, due to insufficient resources.
Opportunities	Threats
Opening of market. Entering into alliances with partners Legislative and political frameworks. Favourable industry driving forces such as higher efficiencies in energy and water consumption.	Conservative market. Agriculture sector with big competition. Strong competitiveness among rivals

3.9.2 Findings of the SWOT Analysis

3.9.2.1 Strengths and weaknesses

In the agricultural sector there must be certain requirements of the product and the strengths of the company revolve around the individuality of the product and the appropriateness. The strengths for the business were the physical product and the technological knowledge from certain specialist in the business. The intellectual belongings and the relevant patents were registered. The most important weakness that has an impact on the business's capability to offer substantial customer support is the lack of financial strength. Another weakness is that training on management and the use of all the systems was not up to standard. The systems do not achieve their full potential due to lack of responses in the outcomes.

Due to the weak distribution network where most customers complained about the accessibility and availability of the product it is seen as a weakness. Although the product is at all times available, you still need to order it straight from the factory in Italy to UI in South Africa. Most customers saw this as a negative issue as they want to buy it directly from the company's shelves. After all the research the outcome of the weaknesses and the strengths from the Ocmis Travelling irrigation system users are discussed:

3.9.2.1.1 Age and size of Ocmis travelling irrigation systems

For over five years eighty five percent of the respondents recorded had existed. For more than ten years in business only ten percent of these had been running. Over twenty hectares were twenty six percent of the respondent's own systems, with an additional twenty seven percent between 10 and 20 hectares. The International distributor does not possess a Ocmis Travelling irrigation system, but responded to the survey that is based on facts and knowledge of the system in the market. These figures prove stability of the system and the fit of the system for a variety shapes of land.

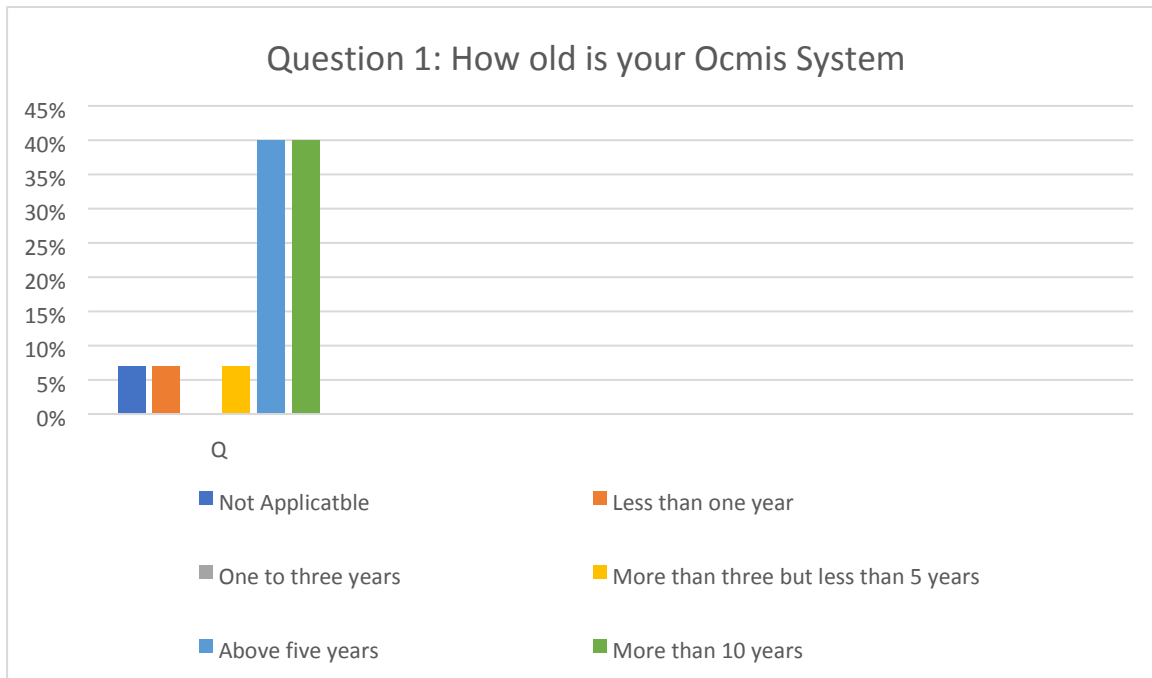


Figure 3. 11: Age and size of respondents' Ocmis traveling irrigation system

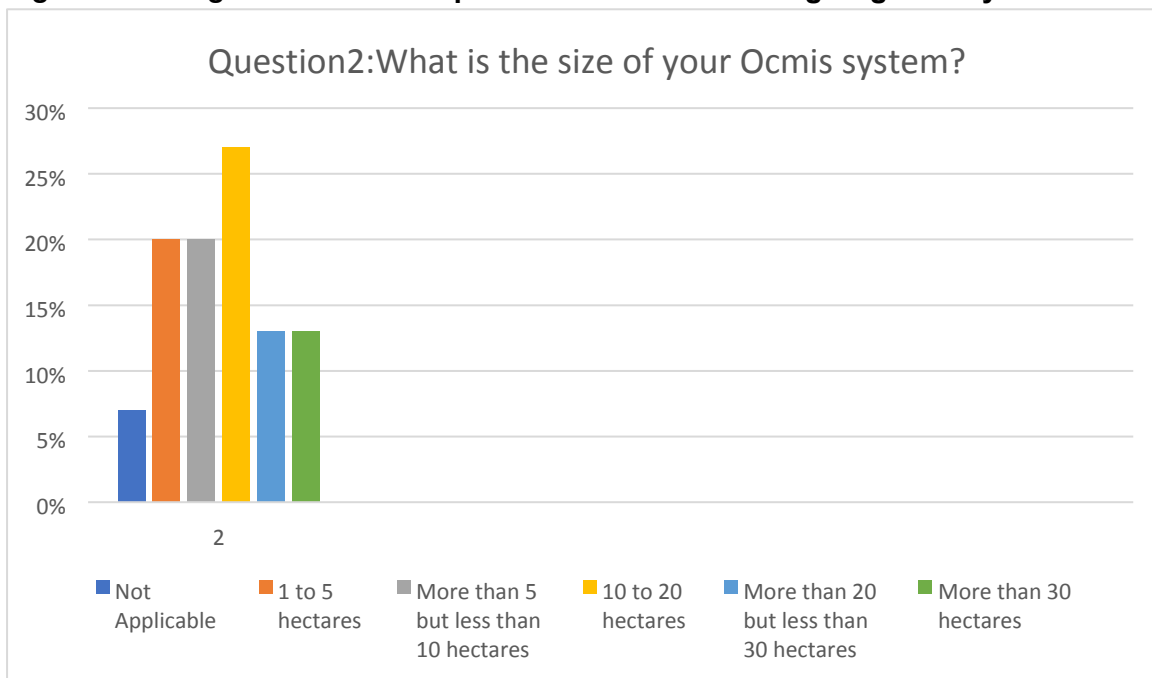


Figure 3. 12: Size of respondents' Ocmis traveling irrigation system

3.9.2.1.2 Ease of installation and versatility on irregular shaped fields or inclines of land

The question was asked to see if how easy the Ocmis machine operates and if the end users experience any installation problems or with the infrastructure.

Respondents' feedback shown that the installation process went smoothly and Fifty four percent acknowledge the fact. On the other hand, twenty seven percent said its was neither easy nor complicated. Ocmis travelling irrigation thus got Eighty percent of the responses thus concluded positively. Versatility of the system on irregular shaped fields responses where very positive and versatility by eighty sevens percent of respondents. Thirteen present of the respondents said that the question was not relevant.

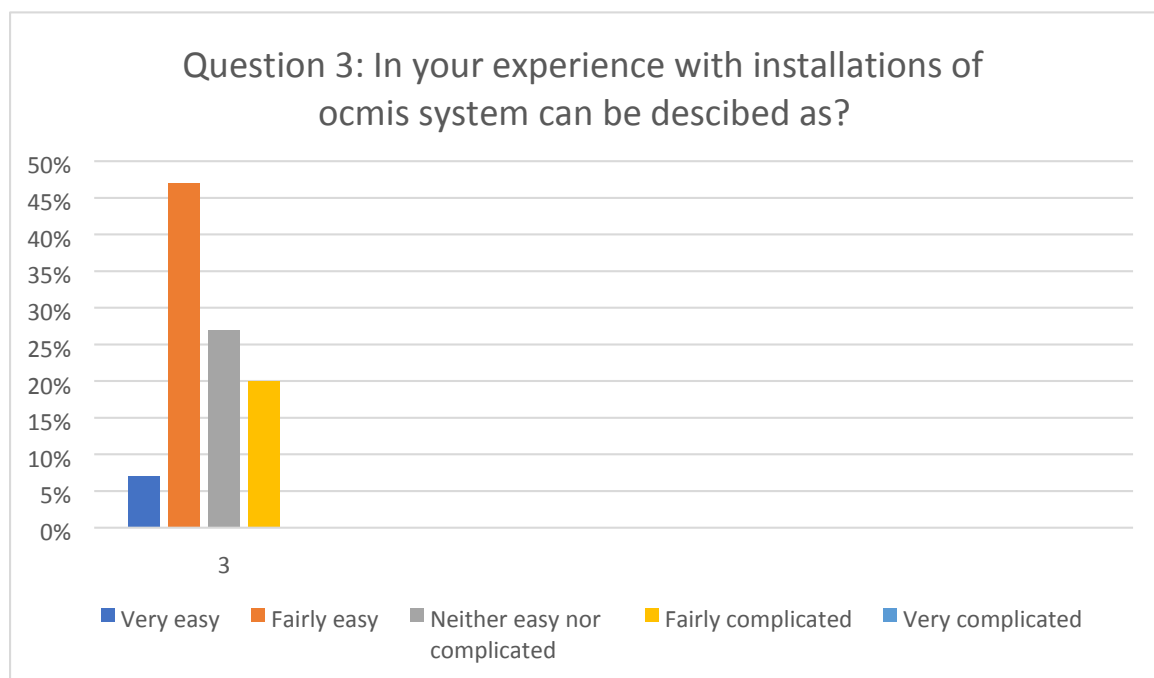


Figure 3. 13: Installation ease of the Ocmis traveling irrigation system

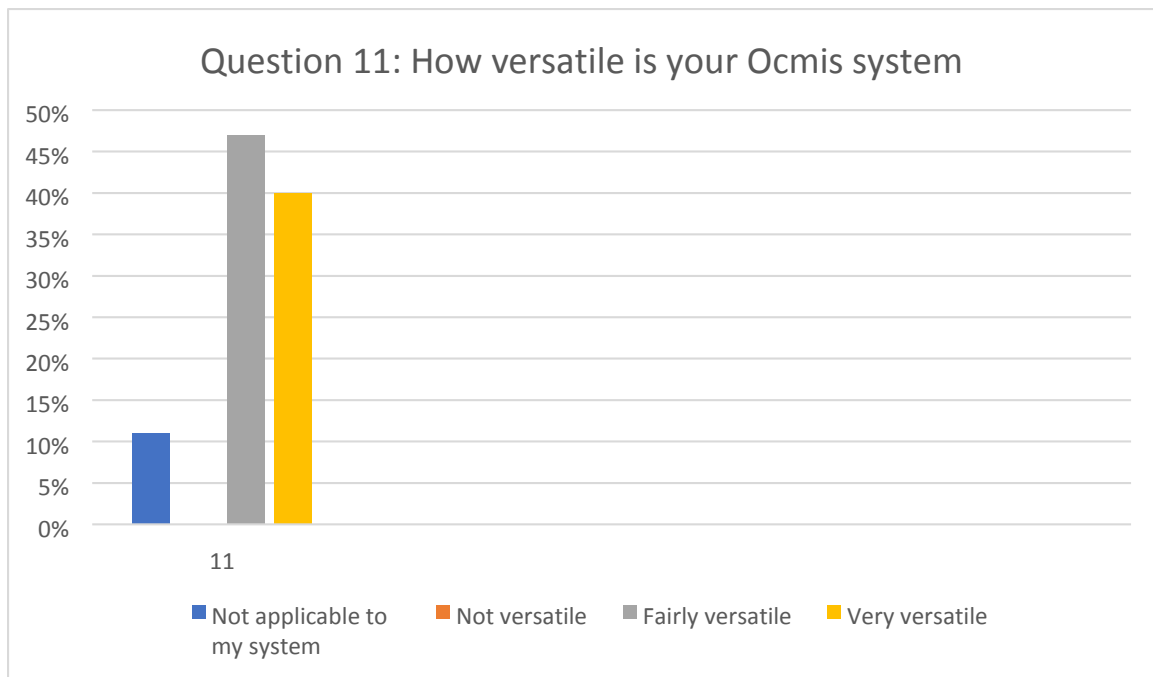


Figure 3. 14: Adaptiveness to versatility of the Ocmis traveling irrigation system

3.9.2.1.3 Availability of the Ocmis traveling irrigation product and infrastructure components

The long-term success of the Ocmis brand lies in the factor of availability of the product. The importing of the Ocmis machines distribution network is weak and with this question the end users gives valuable information regarding this problem. The Ocmis spare parts availability component is also checked. The respondents gave Ocmis a forty seven percent that strongly agreed that Ocmis products are readily available. And the other thirteen percent only mildly agrees. Only twenty percent noted that Ocmis products are not readily available.

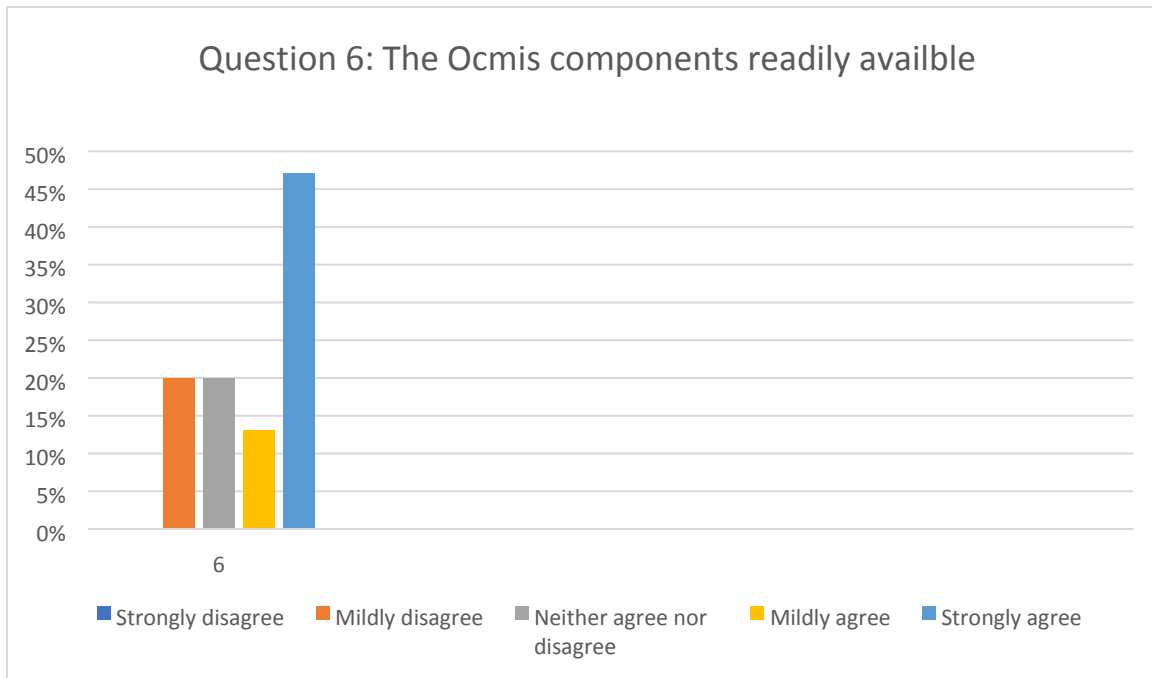


Figure 3. 15: Availability of Ocmis traveling irrigation product

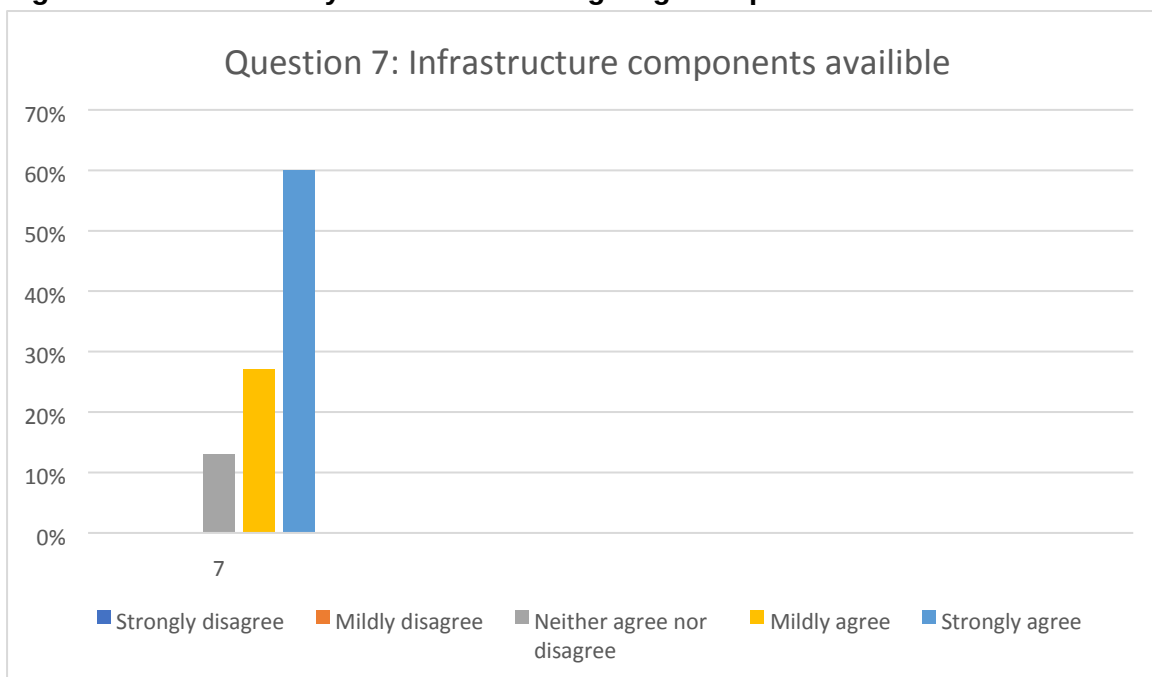


Figure 3. 16: Availability of Ocmis traveling irrigation infrastructure components

3.9.2.1.4 Durability of the Ocmis travelling irrigation system and frequency of parts replacement

The life span of irrigation system is a very important deciding factor, the question was asked to see whether the opinions of the respondents on the lifespan of the product. Low frequent replacement on some parts was record by thirty three percent while twenty percent said there was no replacements needed. Twenty-seven percent said there was no difference to other systems, but the big concern was the twenty seven percent that indicated the system needed very high replacements.

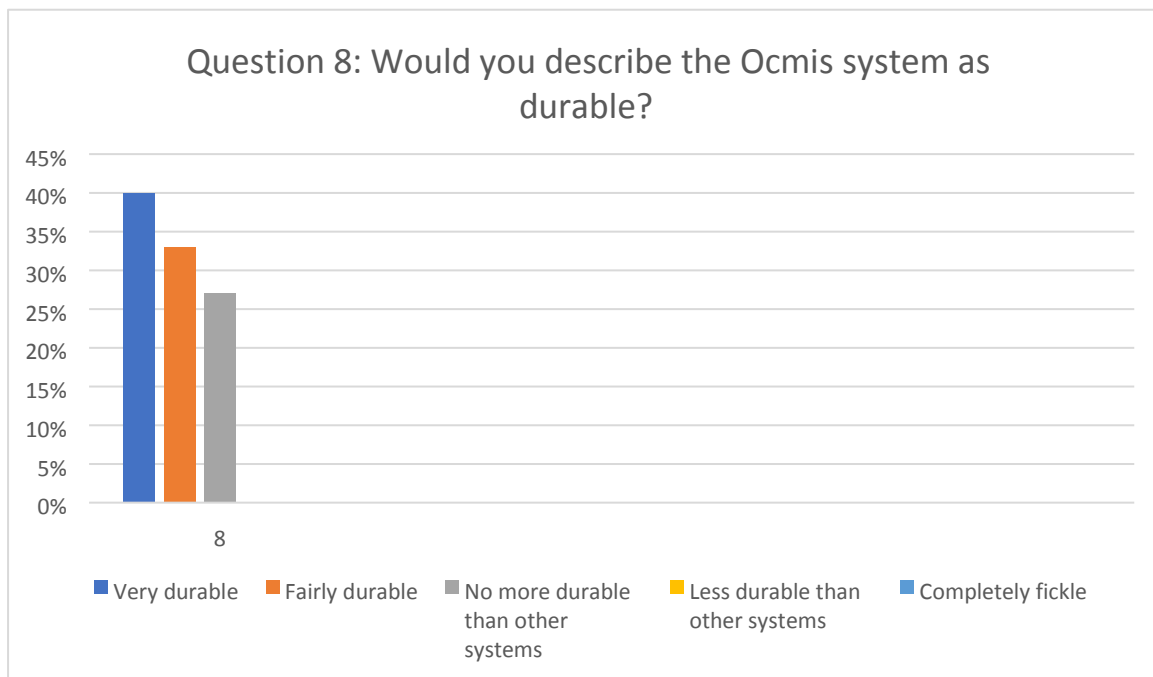


Figure 3. 17: Durability of system and frequency of replacements of Ocmis traveling irrigation

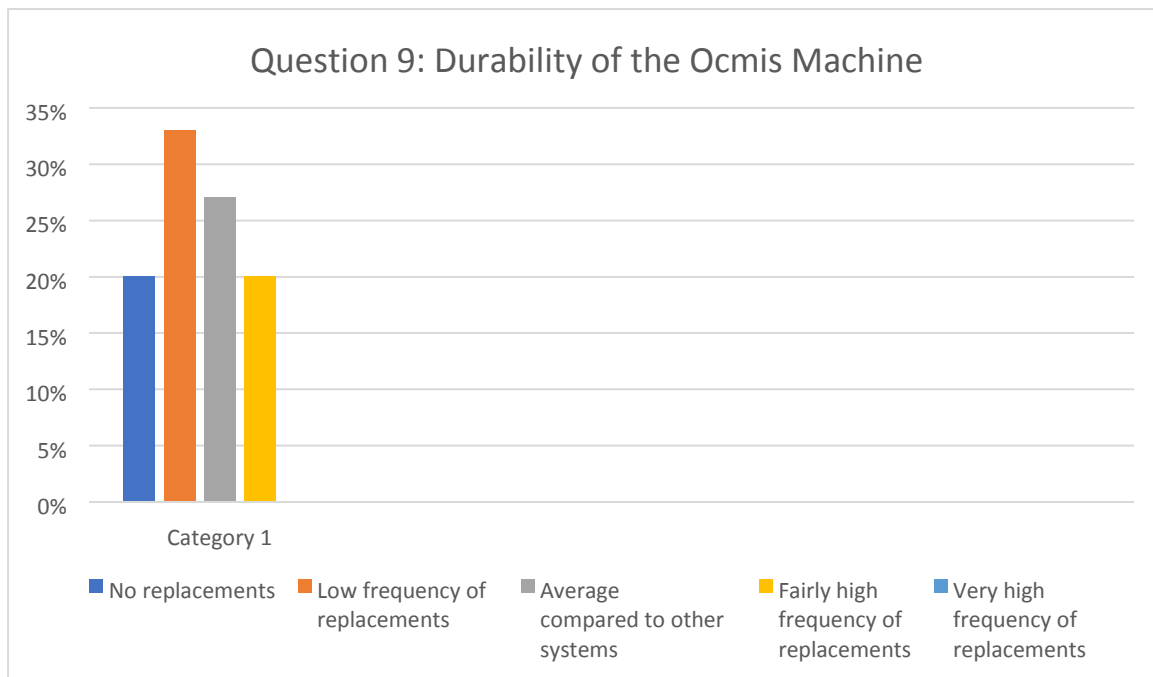


Figure 3. 18: Durability of system and frequency of replacements of Ocmis traveling irrigation

3.9.2.1.5 Theft of Ocmis Travelling irrigation components and level of maintenance

If the high crime rate in South Africa the question was asked how many machines or parts gets stolen as well as the maintenance of the machine. Only seven percent of the respondents recalled a few incidents of theft. While eighty seven percent said there was no theft recorded. There was a very positive response for the respondents on the maintenance of the Ocmis Machines. Twenty percent recorded no maintenance while only forty seven percent indicated low maintenance problems.

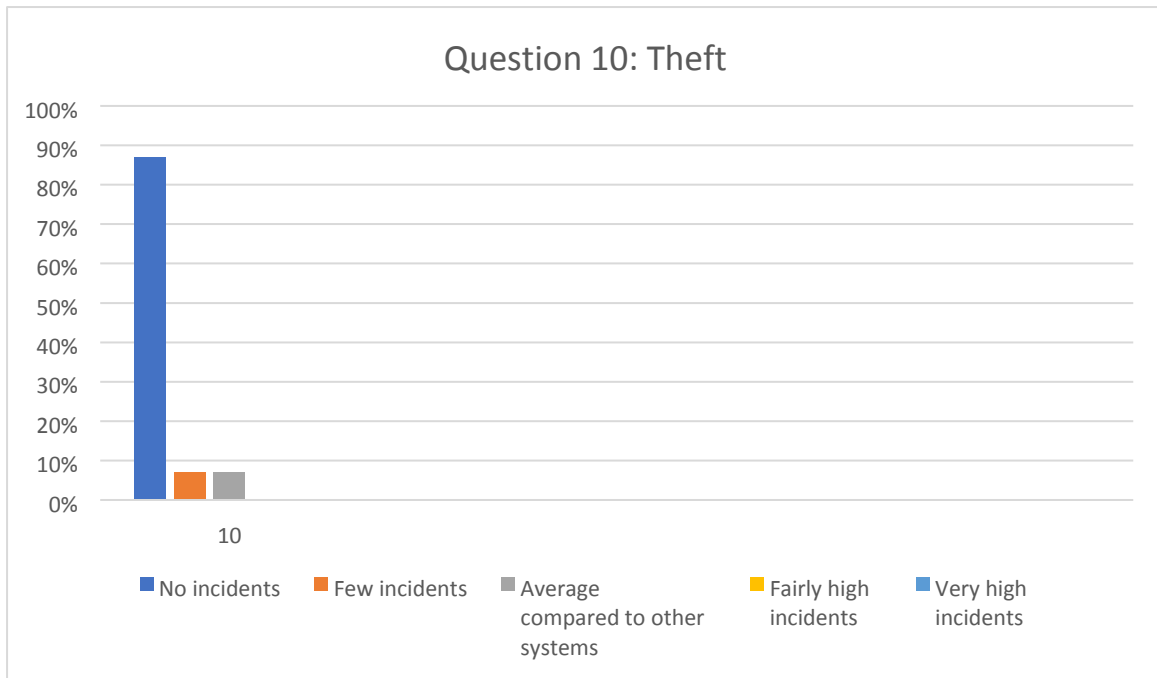


Figure 3. 19: Theft of the Ocmis traveling irrigation system

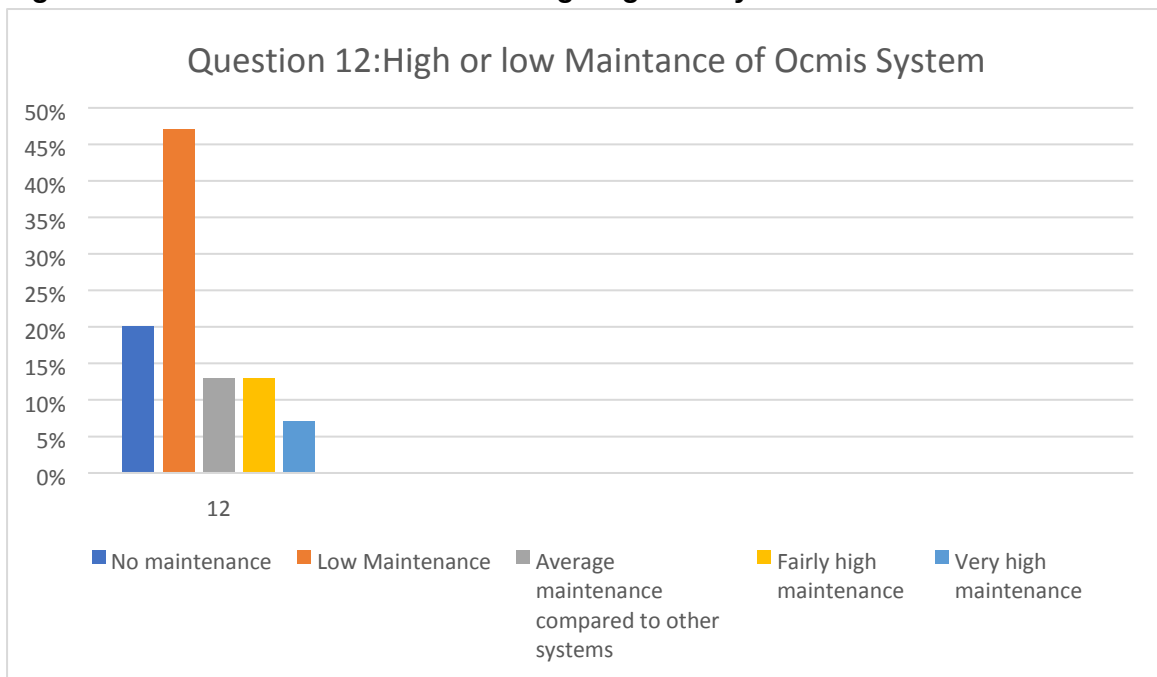


Figure 3. 20: Level of maintenance of the Ocmis traveling irrigation system

3.9.2.1.6 Automation and the effect of automation on the Ocmis system

The positive future of the Ocmis travelling irrigator is that automatic irrigation systems which increases the efficiency and also better water management practices. There was only one respondent to use the fully automated machine with accounts for seven percent. Ninety three percent of respondents only had the mechanically models.

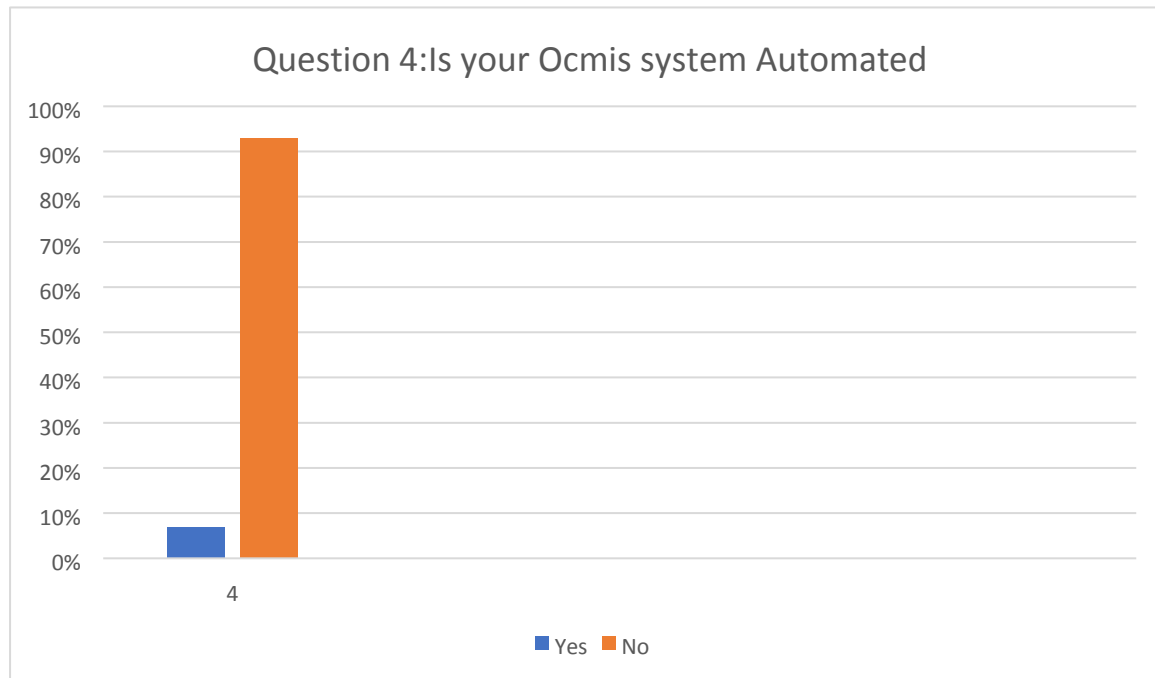


Figure 3. 21: Automation of the Ocmis traveling irrigation system and efficiency

3.9.2.1.7 Ease of management and impact thereof on yields achieved

Scheduling and time management is very new topic in irrigation and that is way the question was asked. Do the yields justify the management of the system? Forty seven percent of respondents said that the management of the Ocmis irrigation system is easy, while forty percent recorded fairly easy to manage the system. Sixty seven percent of respondents said that the time and effort put into managing the irrigation systems, they got better yields, while twenty-seven said there is no difference between yields and how the systems are managed.

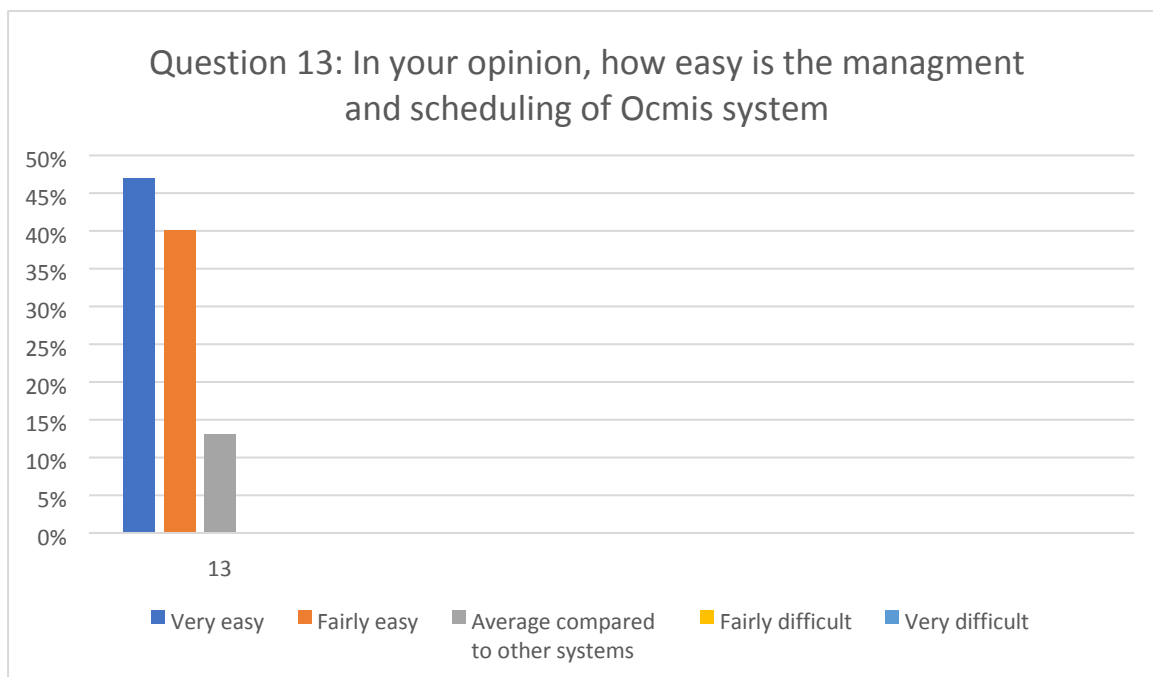


Figure 3. 22: Ease of management and scheduling of a Ocmis traveling irrigation system related to yields achieve

3.9.2.1.8 Application of fertilisers and pesticides through the Ocmis system

Respondents were asked if they fertigate through the Ocmis machine and is it an effective way of doing irrigation with fertigation. The Ocmis machine is very capable to do manure fertigation on fields. Seven percent of respondents finds the efficiency high when fertilizing through the Ocmis system. Twenty seven percent said it is fairly high average. Twenty percent of respondents mentioned that fertigation through the system is average compared to other irrigation fertigation systems. The fact that forty seven percent said they do use the system to fertilized must be a concern for Irrigation Unlimited

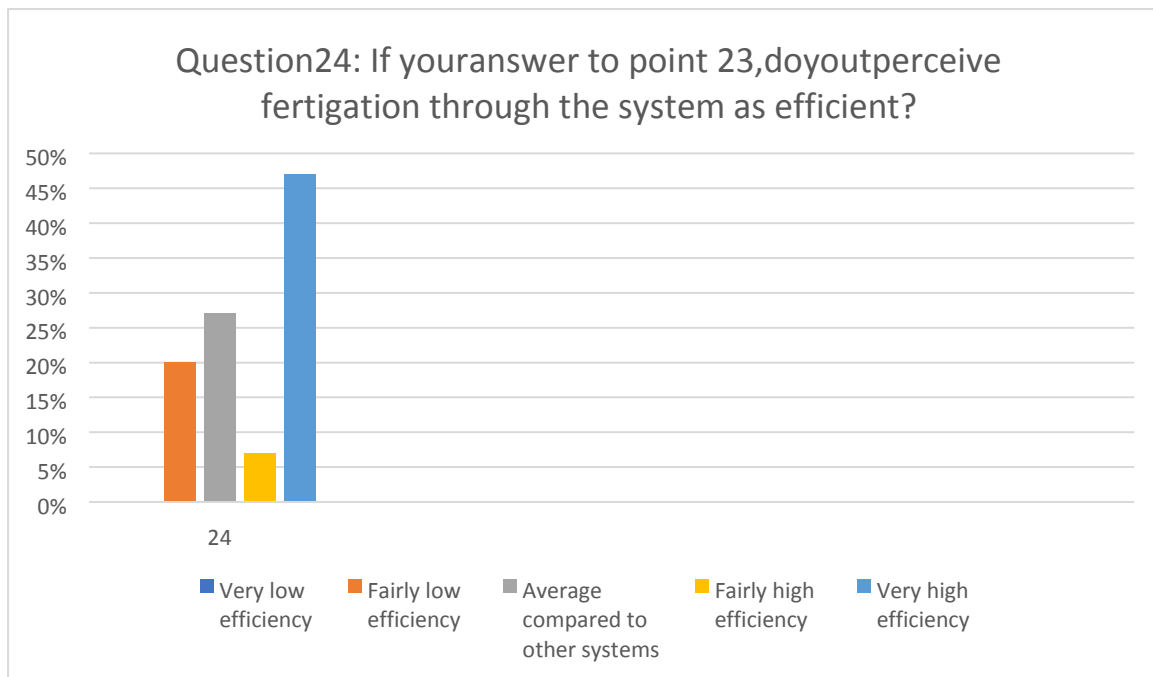


Figure 3. 23: Efficient application of fertilisers through the Ocmis traveling irrigation system

3.9.2.1.9 Water efficiency of the Ocmis Travelling irrigation system

Water efficiency was tested as average by the Ocmis travelling irrigation system. Water efficiency is very dependent on how the irrigation system is managed. The use of probes for scheduling is highly important. Sixty percent of users do not use probes for scheduling, only twenty seven percent uses some sort of measuring tool and thirteen percent indicated that they always use the probes. With this in mind only sixty seven percent recorded fairly water efficiency and only one respondent said that the water efficiency is very low.

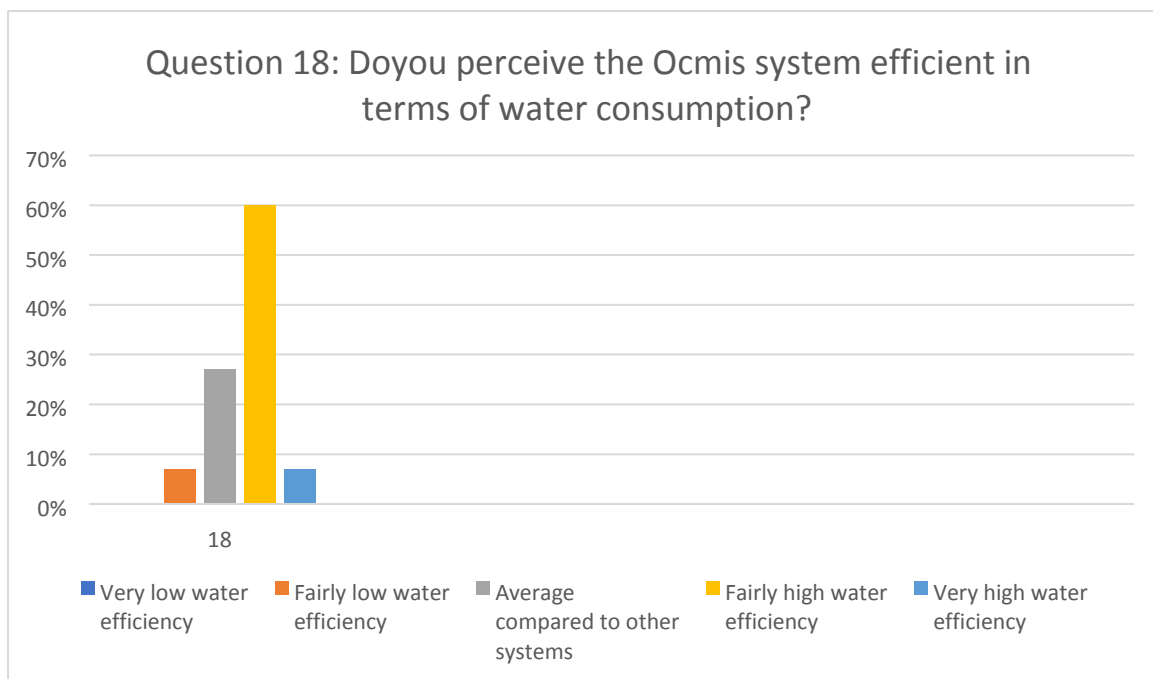


Figure 3. 24: Water efficiency with the Ocmis traveling irrigation system

3.9.2.1.10 Use and efficiency of cooling and frost protection with the Ocmis system

The Ocmis Machine can also do cooling of crops but not with much success this is way the question was asked. Ninety percent of respondents said they never use the Ocmis system for cooling proposes. The other ten percent uses the machine to cool of their cattle in a feedlot

3.9.2.1.11 Labour intensity with the Ocmis Travelling Irrigation system

Operational cost is already very high and must be managed and labour cost must be kept very low. The main benefit of the Ocmis travelling irrigation systems is that it only needs one operator and one tractor. Twenty percent of respondents indicated the machine is equally labour intensive then other systems and only one respondent said that the Ocmis system is very labour intensive. This respondent has multiple machines and big areas to irrigate that is the reason for his answer.

3.9.2.1.12 Energy savings with the Ocmis system

With the high electricity bills for Eskom the Energy consumption in agricultural practises the costs must be kept as low as possible. Reducing pumping and electricity cost are one of the farmers greatest challenges. Management and scheduling of the system plays an important role in saving energy and water. Seven percent of users recorded very high usage of energy, while thirty three percent said fairly high and forty percent recorded very efficient systems because of the water propelled systems and only pumping costs are applicable.

3.9.2.1.13 Ease of movement with tractors, harvesters and implements infield of the system

Ocmis travelling system lets free moving tractors and implements in the field. Seventy five percent is sure that system is very high ability to move freely around. While only thirteen percent noted that the question was not applicable. Twelve percent said there is limitations because of hydrants infield.

3.9.2.1.14 No need to apply chemicals through the Ocmis system

In a questionnaire, respondents were asked to what extent the Ocmis system needs to be flushed with chemicals to clean the system. Ninety three percent of the respondents confirmed they never use chemicals to flush the system. Seven percent of the respondents noted that they used chemicals. It was then recorded that the respondents who used chemicals to flush the system had a high lime content in the water. This lime content caused a sedimentary layer on some of the components which needed to be removed with chemicals. Thus if chemicals is applied through the irrigation system it could be harmful to the soil.

3.9.2.1.15 The cost of the Ocmis system

The high-priced cost of the Ocmis is a concern for the company. The product itself cover only eighty percent of the total system cost. Ocmis does not have control over infrastructure component costs, since these costs are determent by independent suppliers. A question on a questionnaire tried to determine what Ocmis users' view was on how the Ocmis system cost compared to other systems. Forty seven percent of respondents noted the system cost average compared to other systems, thirteen

percent noted a 10% higher cost. Fourteen percent noted a 10% to 30% higher cost and thirteen percent of the respondents noted the cost to exceed 30% more than the cost of other systems. Operational costs should decrease with effective management accounted to labour, energy and water savings. Thirteen percent of the users noted the operational cost of the system more than 20% lower than other systems, twenty percent of the respondents noted a 10% to 20% lower operation cost than other systems. Capital cost of the system does not seem to be a negative factor when considering the Ocmis system. Irrigation Unlimited should form closer relationships with infrastructure suppliers and negotiate lower prices to achieve higher competitiveness in the market.

3.9.2.1.16 Value of system based on cost vs yields

In the questionnaire respondents had to compare the yields they received with the Ocmis compared to other systems and whether they think the yields achieved justified the cost of the Ocmis. Thirty-three percent of the respondents noted about the same than other systems, forty percent noted a ten percent increase in yields compared to other systems. Seven percent of the respondents noted between ten percent and twenty percent increase in yields while seven percent noted above twenty percent higher yields than other systems. Forty seven percent of respondents felt the yields achieved justified the initial higher capital cost, while twenty seven percent of the respondents did not agree that the yields justified the initial higher capital costs. Twenty percent of the respondents did not respond to the question and seven percent of the respondents noted both yes and no.

3.9.2.1.17 Customer satisfaction

The questionnaire asked the respondents if they would consider expanding their Ocmis systems and were requested to give a reason for their decision. Sixty percent of the respondents responded that they will definitely expand their Ocmis and twenty seven percent responded that they definitely won't expand. Seven percent noted that they will possibly expand the system. Twenty percent of the respondents said the reason they will expand was due to maintenance, three percent of the respondents noted it will be due to capital costs while the other three percent answers specified it

as due to management of the system. Seven percent of the respondents did not provide any reason.

3.9.2.1.18 Recommendation for Ocmis

Ocmis irrigation system asked the respondents if they would recommend the Ocmis travelling system to potential clients. Eighty percent said yes and thirteen percent said no. Irrigation Unlimited can see that the overall feeling about the system is great and that the client is satisfied with the product

Ocmis system got excellent results from some of the respondent, the most significant weak point of the company has been identified as weak distribution channels and the financial shortages.

3.9.2.2 Opportunities and threats

Environmental sustainability has made important open doors for Ocmis. Substances, for example, an unnatural weather change, environmental change, populace development, soil corruption and water shortage put accentuation on water system innovations with higher efficiencies in water and vitality utilisation. Up to 60% (Seckler *et al.*, 1998:25) of water connected through some water system frameworks dissipates before achieving the product, while some miniaturised scale frameworks apply the water in a little zone however in a vertical profile and tremendous measures of water is lost underneath the viable root zone of the plant. Authoritative and political systems are representing the rural business in the test against a falling apart earth and expanded requests for nourishment, and offer motivators for the utilisation of cutting edge water system advances. Ocmis flying out water system needs to acclimate itself with all open doors emerging from these structures and acquaint the framework with experts in basic leadership parts. Openings emerge to shape cooperative energies with settled partners and providers in the rural area. Perfect linkages incorporate organisations and innovations that grasp comparative cultivating methodologies and product standards, for example, exactness cultivating and biotechnology. Globalising the item will offer chances to venture into new geological ranges and also new market segments.

The variables that represent a risk to the organisation, incorporates the test to go into a moderate market. It has been discovered that ranchers are set in their courses as far as items utilised and entrenched associations with existing providers and water system operators. A mind-move is required towards attention to rationing the nature and expanding execution in less hurtful ways. Another danger is solid contenders with set up mark names and their capacity to create higher innovation items. Extreme rivalry additionally hinders higher edges in the evaluating structures, decreasing the impact of productivity and thus Ocmis capacity to contend.

3.9.2.3 Conclusion SWOT Analysis

The strengths and weaknesses of a company determine its competitiveness. Applying the SWOT analytical model is imperative to provide the company with direction in developing its strategy. In this chapter, Ocmis travelling Irrigation system strengths and weaknesses were analysed and opportunities and threats were identified. The strengths of the company were identified to be ownership of the intellectual property with a patented product and technological know-how of the economic design of the system. Weaknesses identified revealed limited financial resources as the weakest aspect of the company, influencing customer support services and training as well as finalising research and development work to expand the product range.

A weak distribution network is another weakness, obstructing adequate exposure and distribution to the market. Financing seems to be another limited factor, evidently farmers struggle to obtain financing for the irrigation system, mainly due to the limited exposure of the system in the market and the fact that it consists of an infrastructure permanently installed in the land.

Opportunities arise due to the increased demand for advanced irrigation technologies to address the environmental constraints in the agricultural sector. These factors create opportunities to form synergies with well-established stakeholders and suppliers in the agricultural sector with similar objectives to promote environmental sustainability. Globalising the product will offer opportunities to expand into new geographical areas as well as new market segments.

The factors that pose threats to the company start with the challenge to enter into a conservative market. Farmers are set in their ways and well-established relationships with existing suppliers and irrigation agents. A mind-shift is required towards awareness of conserving the nature and increasing performance in less harmful ways.

Intense competition in the market places limits on the cost competitiveness with reduces profitability, and is especially a threat to Ocmis due to its inability at present to achieve economies of scale.

CHAPTER 4: FINDINGS

4.1 Introduction

The suitability for Ocmis travelling irrigation as a competitor in the South African irrigation market has been dissected by picking up a comprehension of the potential impacts in nature and focussed weights on Irrigation Unlimited as a provider of the Ocmis brand. To decide if the Ocmis traveller especially in the agriculture subdivision would fit, the manufacturing worth was explored. Further on the business was looking into their strength, weaknesses, opportunities and threats. The findings made in this study supply in general the integrated vision.

4.2 Finding on the study

The findings found in the South Africa agricultural environment are land accessibility, global warming, water shortage and the population increase. There are some factors that have a non-stop impact on agricultural production. These factors contain tremendous temperatures, lacking soil quality due to salinization and erosion, deforestation, neglect of water use and natural disasters. To achieve ecological sustainability there is a powerful global focus.

To direct the agricultural subdivision in the direction of sustainable production, legal and political systems have been implemented. The systems are a set of laws, market principles and trade agreements. The WTO has been overriding power to offer governance over trade and ecological agreements with a powerful enforcement and a disagreement instrument. There is a set of technologies that has evolved in the green revolution which focuses redundantly on growing and increasing the

productivity. The agricultural approach is to improve the agricultural environment which include precision farming, unprocessed agriculture, conservation agriculture, and biotechnologies.

For on-demand water distribution, soil moisture monitoring, and improved crop tolerance there is a demand for technological innovations. This will have an incremental result on raising crop productivity and agricultural economic capability. To decrease active harmful irrigation practises such as soil degradation, unproductive water application, evaporation, leaching, water run-off and high energy usage therefore it is important to develop advanced irrigation technologies. Global food production strongly moves in the direction of intensification of existing developed arable land. Intensification requires strong farming practises such as precision farming.

The purpose of precision farming is to increase efficiencies by overseeing the farming system as one piece and to accept the natural variabilities in a certain field. Precision farming has essential basics which cover the environmental, economic, technological and management aspects of farming practises. A powerful synergy has been recognized between essence of precision farming and Ocmis Traveller technology. To achieve the objectives of precision farming the Ocmis Travelling irrigation system could act as the driver. To protect the microbes in the soil and also to repair the condition and health of the soil a zero-tillage approach would contribute considerable benefits. The holistic explanation to agricultural production is that there is a synergy between precision farming, zero-tillage and the Ocmis Travelling irrigation system. In Figure 4.1 the illustrative presentation of the Ocmis Travelling irrigation in the South African agriculture sector.

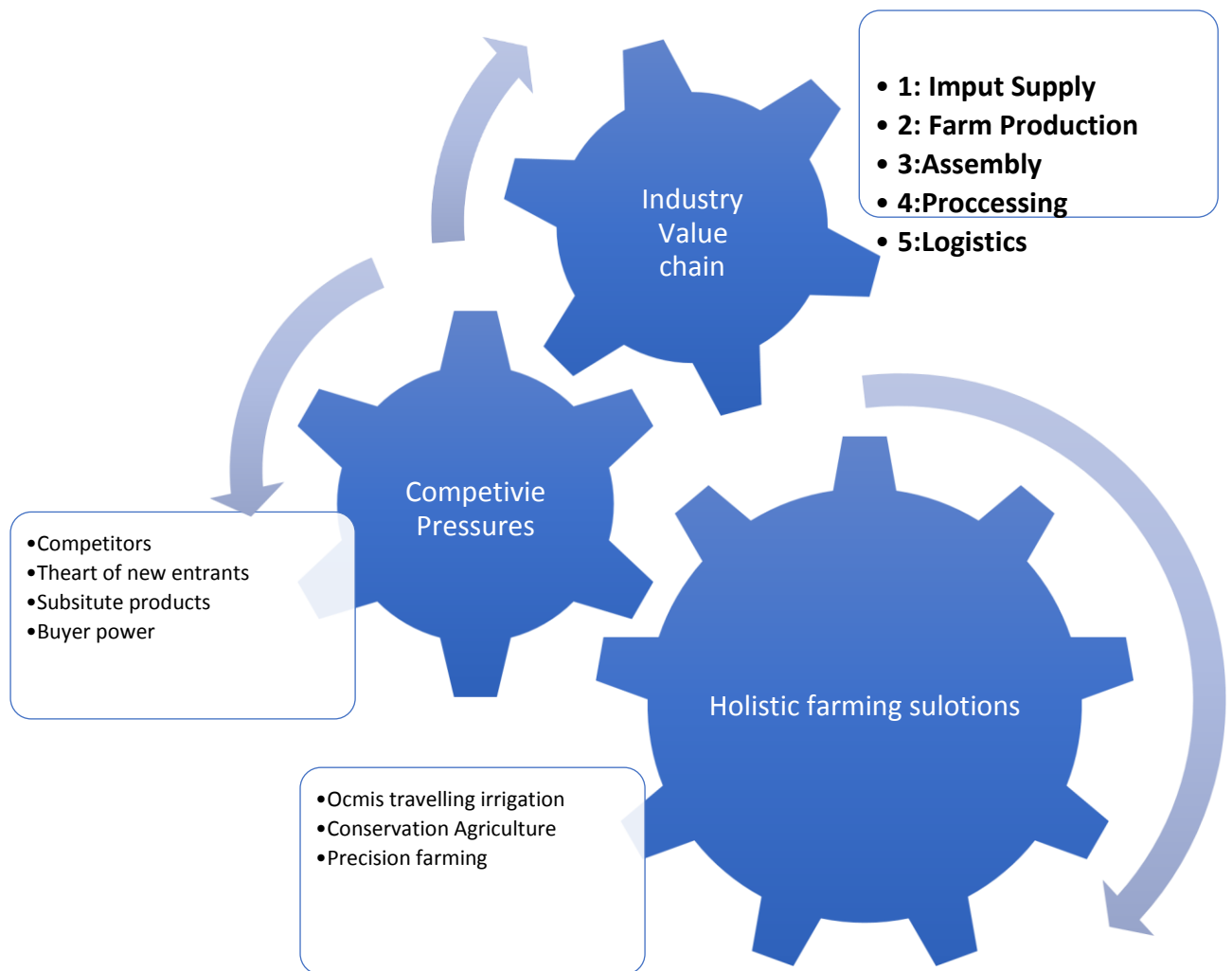


Figure 4. 1: Ocmis travelling irrigation system position in the South Africa agriculture sector

To sustain a sustainable way of water-and energy savings the irrigation system offers the Ocmis that fits into the farm production stage of the value chain. The chain consists of farm production, input energy, assembly and processing and logistics.

Existing irrigation technologies such as pivot and drip irrigation systems is a direct result of formidable competitive pressures. The pivot system has been recognised as a possible synergy. Furthermore, the Ocmis low bargaining power with suppliers and buyers is also recognised as a competitive pressure. The result of this is that the business's low economies of size. To improve the product and to boost the sale volumes there need to be supporting services and Horizontal and vertical linkages

need to be shaped with all the suppliers. The business's strongest attributes have been identified and the result was that they have good business intellectual belongings and product and technological knowledge. The study shows that the financial wealth and weak distribution is a weakness for the business. There is an immense opportunity for Ocmis Travelling irrigation which is mainly determined by the industry trends. If we look at the pretence threats of the company there is conservative market views as well as competitors in the irrigation market.

4.3 Conclusions

In this research study the findings obtained is provided as an overview. A final conclusion and the recommendations for the IU strategy are provided.

In this study the main aim was to gather a detailed insight of the agricultural environment and furthermore offer relevant recommendations for a comprehensive strategic plan for Irrigation Unlimited (Ocmis) to be lead irrigation system in South Africa. Agricultural systems functions in an energetic environment. They are easily influenced by economic, political, environmental, social, legal and technological environments. These factors have a distinct impact on the sector and the result is that these factors will either increase or restrict the possible opportunities for Ocmis Travelling irrigation as a contender in the irrigation market. After analysing the sector, there were discovered that all the factors mentioned before will contribute in a positive manner for the Osmis Traveller, this means that the Ocmis Traveller can create bigger opportunities in the South African irrigation market. The shortage of financial capital has affected the imports of the Ocmis Travelling Irrigation systems from Italy and all the loyal buyers, this was a direct result of challenges the company faces. Another challenge has risen and showed that a slow distribution network will affect the exposure, marketing and the supply of all the products. Competition in the irrigation market and well-known businesses can benefit from economies of scale. To reach advanced cost competitiveness Irrigation Unlimited must develop a horizontal and vertical linkage.

Possible synergies with active competitors have been recognised which can lead to an opportunity for the Ocmis Travelling Irrigation system. These opportunities need to be investigated further. Ocmis Travelling irrigation system most distinguished

competitive benefit is its easy operation technology, the farmer can irrigate any size of land without any fall out areas, and its competitive price per Hectar

4.3.1 Recommendations for Irrigation Unlimited strategy

Market segments identified include:

- The Ocmis Travelling irrigation system for big agriculture projects was implemented by the government and big private institutions must be formed.
- Synergy with more irrigation dealers in South Africa to use the Ocmis Travelling systems as preferred method of irrigating a field.
- For all active pivot systems for commercial farmers must be a out falling area package.
- For commercial farmers there must be a substitute of force sprinklers on permanent and semi-permanent force sprinkler irrigation system.

In setting up a national strategy, the following recommendations are made:

- Each target country should be analysed on each of the PESTLE factors to identify opportunities and threats within each country.
- Institutions such as FAO, WRI, WTO and irrigation relatives of the agriculture sectors all need to be recognised. The Ocmis Travelling irrigation product must be promoted with all the necessary entities with the confirmed result of the product. To find trustworthiness and to have the product established the business must make an effort and allow for an advanced technology irrigation system that is more than competent to improve yields in a sustainable way.
- When the Ocmis Travelling irrigation, system is complete the horizontal linkages need to be established. 20 % of the system cost forms part of the system's infrastructure. To give admission to the Osmis Traveller more alliances must be formed to establish a good distribution network. To reinforce the Ocmis position in the current market these alliances are very essential.

- Precision farming requires vertical syneries formed with supporting service providers, this type of farming will offer the perfect environment to reach the best possible performance from the Ocmis Travelling irrigation system.
- A customer supports and training program must be implemented to guarantee that all the buyers will apply these systems to its full potential.

4.3.2 *Conclusions of the findings for Ocmis*

The market potential for the Ocmis Travelling irrigation system technology is exceptional. To deal with concerns such as water control, soil health and harmful agricultural practises there is most definitely a desire to use advanced irrigation technology. The sustainable irrigation system must meet all criteria and the Ocmis Travelling irrigation system technology meets those criteria. Ecological sustainability is a precondition to meet the demands for production in food. The Ocmis Travelling irrigation product is well known for the use of the three macro-drivers for the new developed irrigation system. Irrigation Unlimited can take 5 % of the International market over the next twenty years if they have strong financing, research, a good South African partner and newly developments such as to improve the competence of the sprinkler head and lastly a very secure relationship with big African clients

4.4 Recommendations for future research

Questionable sentiments exist relating to a portion of the main thrusts recognized in this examination, particularly, water shortage, environmental change and accessibility of land. The data accumulated and utilized as a part of this investigation depended on factual proof acquired from trustworthy writing and world sources including the World Bank, FAO and WRI. Also, research could be grasped to find demonstrate substantiating uncertain and renouncing evaluations to the finding of this investigation.

Further research can be done to find supporting evidence that irrigation Technology products are the way of the future.

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ANNEXURE A

AGRICULTURAL INDUSTRY OPEN-ENDED QUESTIONNAIRE

INDUSTRY TRENDS AND DRIVING FORCES

- i) Burning issues that are on the forefront presently includes climate change, global warming, looming food shortages due to global population growth, land scarcity, soil degradation, water scarcity and rapidly increasing costs.

What is your view on the effects of these specific aspects on the current global agricultural sector?

- ii) With the issues mentioned above, sketch the role of irrigation in meeting the demands of food security, economic productivity and environmental sustainability?

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- iii) Land for cultivation is clearly a scarce resource, what is your opinion regarding a proposed solution?

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- iv) Do you foresee water shortages looming in the near future for irrigation purposes?

v) Where do you foresee will the biggest growth in agricultural land and irrigation take place? In Europe, USA, South America, Asia or Africa? Please substantiate your view.

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vi) Provide your views on land degradation due to bad farming methods and practices?

vii) What is your view on the fresh water situation in agriculture?

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IRRIGATION INDUSTRY AND TECHNOLOGIES

viii) What is your opinion on the importance of irrigation in the agricultural sector?

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ix) What in your opinion are the key elements for effective irrigation practices?

x) The irrigation industry is currently dominated by pivot- and drip irrigation systems although flood irrigation remains the highest irrigation method in the world. What is your view of the various technologies in terms of water use efficiency, management ability, labour and cost?

Element	Pivot System	Drip System
Water use		
Efficiency		
Area		
Versatility		
Management and Maintainability Labour		
Capital- and Running costs		

xi) Are you of the opinion that dragline systems still have a role in the current agricultural environment? Please substantiate.

xii) Do you think it is possible to improve on existing irrigation technologies in respect of water, energy and sustainability and if so how?

xiii) Are there, in your opinion, irrigation system/s that fulfils the needs completely for sustainable agriculture practices? If so, what are their most significant strengths?

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xiv) What are your views on the ability of modern technology to increase yields?

xv) In your view, how relevant is the use of high technology systems in agriculture?

xvi) What are the restraints in the market for farmers to switch to modern high technological systems?

xvii) Do the yield increases achieved through modern irrigation and precision farming technologies justify the increases in costs?

xviii) Why are farmers reluctant to change? What are the constraints? With this in mind, what is your view on:

Traditions:

Knowledge:

Capital constraints:

xix) Please comment on the importance of the following issues: Farming practices:

Precision farming:

Improvements in irrigation systems and installation methods:

Emitter efficiencies:

FINANCIAL

xx) According to you, is the financial world ready to invest in agriculture?

xxi) Do you believe that the dramatic rise in food prices will make agriculture a profitable and attractive sector for investment, like the Mining- and Industrial Sectors?

xxii) For the first time, large equity firms are buying up land for agricultural land investment – 30 million ha in Africa alone by firms such as Goldman Sachs of New York, Blackrock from Canada and George Soros, while Middle East oil money is flowing into the Sudan, Egypt and Asia. This indicates a rise in competition for land. Please provide your comments?

OCMUS TRAVEL IRRIGATION SYSTEM ACQUAINTED QUESTIONNAIRE

SECTION A: SYSTEM INFRASTRUCTURE

1. How old is your Travel sprinkler irrigation system?

Not Applicable	Less than one year	One to three years	More than three but less than five years	Above five years but less than ten years	More than ten years

2. What is the size of your Travel sprinkler irrigation system?

Not Applicable	1 to 5 hectares	More than 5 but less than 10 hectares	10 to 20 hectares	More than 20 but less than 30 hectares	More than 30 hectares

3. In your experience with the installation of the Travel sprinkler irrigation system, it can be described as:

Very easy	Fairly easy	Neither easy nor complicated	Fairly complicated	Very complicated

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4. Is your Travel sprinkler irrigation system automated?

Yes	No

5. If yes, are you of the opinion that the automation of the Travel sprinkler irrigation system increases the efficiency and ease of management of the system?

Very high	Fairly high	Average compared to other systems	Fairly low	Very low

6. The Travel sprinkler irrigation system components are readily available:

Strongly disagree	Mildly disagree	Neither agree nor disagree	Mildly agree	Strongly agree

7. Infrastructure components readily available:

Strongly disagree	Mildly disagree	Neither agree nor disagree	Mildly agree	Strongly agree

8. Durability – would you describe the Travel sprinkler irrigation system as durable?

Very durable	Fairly durable	No more durable than other systems	Less durable than other systems	Completely fickle

9. Durability – frequency of replacement of Travel sprinkler system components / sprinklers?

No replacements	Low frequency of replacements	Average compared to other systems	Fairly high frequency of replacements	Very high frequency of replacements

10. Theft – how do you perceive theft of any parts of the Travel sprinkler irrigation system?

No incidents	Few incidents	Average compared to other systems	Fairly high incidents	Very high incidents

11. How versatile is the Travel sprinkler irrigation system to install on irregular shaped fields and inclines?

Not applicable to my system	Not versatile	Fairly versatile	Very versatile

12. Is your Travel sprinkler irrigation system high or low on maintenance?

No maintenance	Low Maintenance	Average maintenance compared to other systems	Fairly high maintenance	Very high maintenance

SECTION B: SYSTEM MANAGEMENT

13. In your experience, how easy is the management and scheduling of the Travel sprinkler irrigation system?

Very easy	Fairly easy	Average compared to other systems	Fairly difficult	Very difficult

14. Does the level of intensity in management justify the yields achieved?

No, not at all	Yes, to a limited extend	Average compared to other systems	Yes, more than other systems	Yes, absolutely

15. Can you accurately apply fertilizers and pesticides through the Travel sprinkler irrigation system?

Very easy	Fairly easy	Average compared to other systems	Fairly difficult	Very difficult

16. Are you using any metering systems, i.e. water measure probes or tensiometers to determine “when” and “when not” to irrigate?

Never	Sometimes	Always

17. Do you perceive the Travel sprinkler irrigation system as high or low in labour intensity?

Very low labour intensity	Fairly low labour intensity	Average compared to other systems	Fairly high labour intensity	Very high labour intensity

18. Do you perceive the Travel sprinkler irrigation system efficient in terms of water consumption?

Very low water efficiency	Fairly low water efficiency	Average compared to other systems	Fairly high water efficiency	Very high water efficiency

19. Do you realise savings in pumping costs due to saving in water consumption?

Very low energy efficiency	Fairly low energy efficiency	Average compared to other systems	Fairly high energy efficiency	Very high energy efficiency

20. Does the Travel irrigation system enhance the movement of tractors, implements and harvesters in the fields?

Not relevant	To a limited extend	Average compared to other systems	Fairly high ability to freely move implements	Very high ability to freely move implements

21. Do you apply cooling and/or frost protection through the Travel sprinkler irrigation system?

No, never	Yes, sometimes	Yes, always when necessary

22. If yes to point 21, do you perceive cooling/frost protection beneficial to your crop?

No impact	Some impact	Significant impact

23. Do you apply fertilizers through the Travel sprinkler irrigation system?

No, never	Yes, sometimes	Yes, always when necessary

24. If yes to point 23, do you perceive Fertigation through the system as efficient?

Very low efficiency	Fairly low efficiency	Average compared to other systems	Fairly high efficiency	Very high efficiency

25. Do you have to apply chemicals through the Travel sprinkler irrigation system to clean the system?

No, never	Yes, sometimes	Yes, always when necessary

SECTION C: OCMUS TRAVEL IRRIGATION SYSTEM COST

26. How does the Capital Cost compare to other systems?

Average compared to other systems	Up to 10% higher than other systems	Above 10% but less than 20% higher than other systems	Above 20% but less than 30% higher than other systems	Higher than 30% compared to other systems
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27. How does the Running Cost (labour, maintenance, energy, water) compare to other systems?

Higher than 20% less than other systems	Between 10% and 20% less than other systems	Average compared to other systems	Up to 10% more than other systems	Up to 20% higher than other systems

SECTION D: SYSTEM PERFORMANCE

28. Did you realise any increases in yields with your Travel sprinkler irrigation system compared to other irrigation systems?

Lower yields achieved than with other systems	Average yields achieved compared to other systems	Up to 10% higher yields than other systems	Between 10% and 20% higher yields than other systems	More than 20% higher yields than other systems

29. When you consider yield increases, does it justify the higher initial Capital Cost?

Yes	No

30. Will you expand your Travel sprinkler irrigation system?

Yes	No

31. If no to point 30, would it be due to?

Capital costs	Running costs	Management Yield results	Maintenance

32. Will you recommend the Travel sprinkler irrigation system to other irrigation users?

Yes	No

