ADDIS ABABA UNIVERSITY

ADDIS ABABA INSTITUTE OF TECHNOLOGY

SCHOOL OF MECHANICAL AND INDUSTRIAL ENGINEERING

OPERATIONAL EXCELLENCE TOWARDS SUSTAINABILITY OF SYNGENTA FLOWERS ETHIOPIA CUTTINGS PLC.

BY

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June. 2020

Addis Ababa, Ethiopia

Operational excellence towards sustainability of Syngenta flowers Ethiopia cuttings PLC.

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A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in partial fulfilment of the requirement for the Degree of Masters of Science in Industrial Engineering Stream

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June. 2020

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SCHOOL OF GRADUATE STUDIES

POSTGRADUATE PROGRAM IN INDUSTRIAL ENGINEERING

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DECLARATION

I, the undersigned declare that this research report entitled "Operational excellence towards sustainability of Syngenta flowers Ethiopia cuttings PLC" represents my original wok which has been done for the Master of Science degree in Industrial Engineering, except where a due reference is made. It has not been previously included in a thesis or dissertation submitted to this or any other institution for a degree, diploma or other qualifications.

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This is to certify that the declaration made by the candidate is correct to the best of my knowledge.

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ACKNOWLEDGEMENT

First of all, I would like to thank God Almighty my creator, my strong pillar, my source of inspiration, wisdom, knowledge and understanding. He has been the source of my strength throughout this program. He took care of everything that would have stopped me in my tracks and strengthened me even through my most difficult times

Special thanks go to my advisor and instructor Dr. Ameha Mulugeta for his efforts in reviewing, discussing, and directing the research, and for excellent encouragement and guidance through this achievement. I also want to thank my co-advisor Dr. Gezahegn Tesfaye.

In addition to the ones already mentioned, I'd like to thank my friends and families who have been asking the progress of my journey and always encouraging & reminding that I should have to finish it successfully. And, my colleagues at Syngenta flowers Ethiopia cuttings Plc., those who are contributed in this study directly and indirectly.

DEDICATION

In memory of my colleague Bekele Aleka. The one who faced too early death, while protecting others.

ABSTRACT

Floriculture business is one of the major sources of foreign currency and creates job opportunity for more than one hundred thousand citizens in Ethiopia. EHPEA report showed, though the development of floriculture industry requires modern production techniques and infrastructure. The benefits derived from the sectors exceeds their costs and this is enough reason for attracting foreign investors in a big ways. however, the industry is accused for environmental and socio-economic problems. like high water consumption, application of inorganic fertilizers, pesticides, pollution and waste disposal are the major ones. Operational excellence management system gives a company the benefits of reduce production costs, increased efficiencies, less injuries, maximum sustainable returns on operating assets, and an improved competitive position. This study aimed to answer the following research questions; What are operational excellence assessment models and their applicability in flower industry? What are operational excellence dimensions and their impact in order to ensure long-term profitability and consistency? And how operational excellence factors influence sustainability of flower business? The study used a case study research design. The target population was Syngenta flowers Ethiopia cuttings Plc. Permanent employees. Stratified sampling technique used to address all level of employees. The primary and secondary data was collected using questionnaire, direct observation and document review. Questionnaire collected from 212 employees out of 283 sample size. Quantitative data was analysed using descriptive statistics using SPSS Version 20.0. The data was presented through percentages, means, standard deviations. From the findings, the study concludes that Syngenta flowers Ethiopia cuttings PLc. has adopted operational excellence initiatives to a great extent to sustain in the business. Operational excellence dimensions recognized in the study were, Health, Safety, Environment, culture, continuous improvement, enterprise alignment and result. Those are reflected in the case company to a great extent., and they are factors influence substantivity of the business. Some of the weakness seen in the company are, not meeting incident free targeted days, not adopting recycling system, operational excellence knowledges are not disseminated to all employees. Unstaining Bright Idea Program. The study recommends that the management team should organize training and workshops for their employees to be trained on the concept and technics of operational excellence and how well to implement it. Finally, the study recommended that similar studies should be done more on other farms with different perspectives and objectives, like implication of operational excellence tools and technics and implementation challenges.

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ABBREVIATIONS

- OpEx/OE: Operational Excellence
- ETCU: Syngenta Flowers Ethiopia cuttings PLC
- EA: East Africa
- CI: Continuous Improvement
- KPIs: Key Performance Indicators
- EHPEA: Ethiopia Horticulture producer Exporters Association
- HSE: Health Safety and Environment
- OSHA Occupational Safety and Health Administration
- URC Unrooted Cuttings (flower product)
- EFQM European Foundation for Quality Management
- MBNQA Malcom Baldrige National Quality Association
- RPA Rapid Plant Assessment
- PPE Personal Protective Equipment
- CSR Corporate Social Responsibility
- EQA Ethiopian Quality Award

CHAPTER ONE

1.1 INTRODUCTION

Operational excellence enables an enterprise and its leadership to continuously improve all areas of performance, including decision-making, on-going investment, profitability, customer and partner services and human resources capabilities. Operationally excellent enterprises possess the processes and structures or the "intangible assets" that give them the visibility, control, tools, and management practices necessary to drive greater operational effectiveness and efficiency. The alignment of people, processes, and technology helps the organization optimize resources, opportunities, and performance [1]. Operational excellence is a way to foster continuous improvement. Achieving this benefit level, however, requires a fact-based understanding of operational performance. Operational excellence helps firms to address their today's challenges and capitalize on tomorrow's opportunities. The key operations executives must be able to define, monitor, and adjust actions aligned with the operational strategy and objectives (through, for example, the use of metrics and key performance indicators, (or KPIs) and, when necessary, change the organization's processes and performance objectives [1]

Customers are ever more demanding, and margins for error are shrinking. With intense public study on product recalls and quality issues, anything less than perfection in any area a single missed shipment, a single product defect can have permanent consequences. Product quality, productivity and customer retention, in short, the pillars of *operational excellence,* are critical to profitable manufacturing concerns. While strategies such as Six Sigma, lean manufacturing, continuous improvement and others will continue to drive management decisions, many manufacturers are placing a renewed focus on the fundamentals of execution. Operational excellence has emerged as the key to sustainable revenue and business growth [2].

Every organization is fighting to gain or keep market share. But today, being a 'good' organization is not enough. To become a 'great' organization, companies need to change the way they deliver value through their business operations. "Change is tough,

but not changing is tougher" [3]. The African manufacturing companies' concept of quality and productivity comparing with the rest of the world especially the American and European countries, it shows a great difference. Since Ethiopia is one of the developing countries in the world, increasing or improving productivity is unquestionable and mandatory issue in every sector. The industrial strategic development plan of Ethiopia gives great emphasis to improve export-led products such as coffee, livestock and livestock products, textiles, garments, pulses, oilseeds, horticulture, and others to join the international market in a large scale. [6]

According to Shingo Model Prise research, Operational Excellence have been widely implementing in manufacturing & service industries for the past 25 years, and several researches done on these sectors, [25]. Whereas in Ethiopia there are no much research done on the impact of operational excellence for horticulture industries, so that this research will give us an insight how operational excellence have a great impact.

1.2 BACKGROUND

On a global scale, the flower industry is booming world consumption of flowers is growing at a rate of 6 to 9% a year with highest growth rates in Japan and the USA [12]. Currently the flower, fruit, vegetable, and herb farms occupy 10,897.21hectars of land. The horticulture sector employs 199,640 citizens and in 2017/18 fiscal year generated US$ 307.04 million. In hard currency generation, the horticulture sector has stood at the fourth largest in export earnings [17]. Some of the EU markets show some saturation, while flower consumption in other EU countries is still growing. Within the EU, Germany is the biggest consumer, followed by the UK, France and Italy in order of importance [12]

Ethiopia is the world's 4^{th} largest supplier of cut flowers [10]. The lowland and highland offer ideal conditions for a wide range of flower plants, long hours of sunshine and ample supply of fresh water enable roses, gypsophilia, hypericum, limonium, carnation and chrysanthemum to flourish. Over 85% of cut flowers are exported to Europe with floriculture accounting for 8% of export earnings. The volume of exports of cut flowers is growing and this is showing great promise as a developing industry sector. A substantial number of investors have started operating in Ethiopia

due to the Government's focus on this sector and the unparalleled advantages that Ethiopia has in floricultural production compared to other producers [14].

Syngenta has one of its biggest flowers farm in Ethiopia and it is a world leading agribusiness operating in the crop protection, seeds and lawn and garden markets. Crop protection chemicals include herbicides, insecticides, fungicides and seed treatments to control weeds, insects and diseases in crops, and are essential inputs enabling growers around the world to improve agricultural productivity and food quality. The company has more than 28,000 employees in over 90 countries dedicated to purpose: *Bringing plant potential to life*. Through world-class science, global reach and commitment to their customers they help to increase crop productivity, protect the environment and improve health and quality of life. Ethiopia Cuttings Plc is a part of the Syngenta Flowers Lawn & Garden business division, having a significant investment in East Africa, including Kenya cutting, Kenya Pollen and Ethiopia Cuttings Plc. (ETCU). ETCU producing two types of crops called Mandevilla and Geranium and more than 700 employees have work opportunity from this business.

Syngenta flowers Ethiopia cutting PLC is a case company for this research because it can be a good model to other Ethiopian floriculture industries, concerning to, health, safety and environment (HSE) aspects.

1.3. PROBLEM STATEMENT

As EHPEA report showed, though the development of floriculture industry requires modern production techniques and infrastructure, the benefits derived from the sectors exceeds their costs and this is enough reason for attracting foreign investors in a big ways.

As Floriculture business is one of the major sources of foreign currency and creates a job opportunity for more than one hundred thousand citizens [15], however, the industry is accused for environmental and socio-economic problems. Environmentally ecological concerns like high water consumption 60,000 litters/ha/day, application of inorganic fertilizers under certain conditions high levels of nitrates (>10 mg/l) are toxic to human beings, pesticides, pollution and waste disposal are the major ones [13].

In addition, socio-economically the industry has a problem with the community like labours are suffering from health problem due to toxic chemicals, where up to 127 different chemicals are used in enclosed spaces increasing risk of exposure through the skin and inhalation [13]. From 612 greenhouse worker in West Shewa, Oromia about three hundred ninety-two (67.70%) had at least one skin problems. Four hundred and sixty-nine (81.10%) had at least one respiratory health symptom [13] and even their right to form a union and bargain on their working condition is also denied. Moreover, the industry has also created land holding problems.

The Operational excellence management system gives a company the benefits of reduce production costs, increased efficiencies, less injuries, maximum sustainable returns on operating assets, and an improved competitive position. Operational excellence approaches enabled alignment of people, processes, and technology that assisted the organization effective use of resources, opportunities, and performance; it enabled the company and its leadership to continuously improve all areas of performance, including decision-making, on-going investment, profitability, customer and partner services and human resources competences; it enable the firm to create leaders who have the skills and capabilities to train and develop their teams. [39]

1.4. RESEARCH QUESTIONS

- What are operational excellence assessment models and their applicability in flower industry?
- What are operational excellence dimensions and their impact in order to ensure long-term profitability and consistency?
- How operational excellence factors influence sustainability of flower business?

1.5 OBJECTIVES

1.6.1 Overall Objective

To study operational excellence application and its significance in floriculture industries and looking forward the way to business sustainability and improvement.

1.6.2 Specific Objectives

- ✓ To learn and understand the application of operational excellence in different sectors, in relation with flower farms.
- ✓ To study the actual situation of the case company according to operational excellence principles.
- ✓ To review different operational excellence assessment models and establish operational excellence model for flower farms.

1.6 SIGNIFICANCE OF THE STUDY

This study identifies significance of operational excellence in the case company to increase organizations' competitiveness while still ensuring fair competition in the sector, and the management team will be in a better position to understand where they stand regarding implementation and use of operational excellence improvement practice, how they can become operationally excellent and how to focus on key processes that can add value to the business. It will enable them to realize that being operationally excellent relies on the full support of the organization and employee empowerment and hence they should create an environment that supports a culture of operational excellent management system. The study findings assist management in planning for any requisite improvements in safety, health, environment, quality and productivity in order to solve the bigger problems that enables them to sustain in the market. Environment, health, and safety is the first and foremost element within the operational excellence charter, this is the license to operate.

The findings also be useful to researchers and scholars since it forms a basis for further research. The outcomes of this study help the regulators and policy makers in the agriculture industry in coming up with regulatory framework that embraces best practices in implementation of Operational excellence.

1.7 SCOPE

The focus of this study is limited on reviewing the operational excellence research done in different sectors, evaluating different operational excellence models and developing new assessment model referring different internationally known assessment models for evaluating flowers farms operational excellence experience.

Since this exploration is case study research the data collection is only limited in the case company Syngenta flowers Ethiopia cuttings PLC.

1.8 LIMITATIONS

Because of the company's confidentiality policy, it was not easy to present and discuss some information concerning HR, finance and process improvement information's. There are literatures scarcity on operational excellence. Most of the reviewed literatures and researches focus on manufacturing, oil and gas and service industries but it is limited on flower or agricultural business.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter has an overview of previous research on operational excellence and its linkage with business sustainability, the review includes different dimensions of operational excellence, discussion about known assessment models of operational excellence, its methodology, and the applicability in different business sectors. Finally, address significance of operational excellence, towards business sustainability.

2.2. Operational excellence (OpEx)

The term Operational Excellence has been defined differently by different organizations and sectors. Each of them has executing their own operational excellence model. Although the definitions may differ among the industries, the fundamental principles are kept on similar. Operational excellence defines as "The design and management to maximize operating profits through continuous operation of an excellent production and delivery system that offering product and services to customers at right value" [4]. Operational excellence described as a management approach that participates people, processes and tools to become more competitive and acquire world-class performance. Such an approach supports organizations to exceed their competition and get greater growth, return on assets and cash flow [4]. When management philosophies such as Six Sigma, lean manufacturing and total quality management are integrated under the umbrella of operational excellence and enforced across the organization, a novel approach of leading business originates one that generates bigger returns, decreases waste, improves quality and customer satisfaction.[10]. Operational excellence is doing things well to provide competitive advantage [18]. And "defined as an integrated management system that drives business productivity by applying proven practices and procedures." [19].

As an idea that requires performing activities right across an organizations operation in a way that helps the organization to attain competitive advantage in any marketplace. Literatures explains operational excellence as both a philosophy and a set of technologies that aim to enhance competitive positioning by doing things better

and faster than anyone else with less waste, reduced cost, better quality and enhanced productivity. It is achieved when each and every employee in the organization from the top to bottom can see the flow of value to the customer, identify if the flow is normal or abnormal and fix that flow before it breaks down without requiring the assistance of management, and also it is a state when all the efforts of the organization are focused on alignment for achieving its strategies and where the organizational culture is dedicated to the continuous and planned improvement of its people and company‘s performance. It must be pursued by design and not by coincidence [7, 10]

In a company Operational Excellence is a journey, not just a set of goals but strive for the future vision. By choosing the right tools and methods that are custom-made to fit company´s vision is the starting point of operational excellence. This theory consists of using lean as a mind-set to eliminate all waste, to improve the flow of information, and using six sigma to remove variation in processes and standardizing a production way to maintain the quality as the customer requested. However, when the company starts to undermine the benefits of employee interaction and stop listening to their suggestions, the way of reaching operational excellence has failed, because it is a balanced management of quality, cost and time and at the same time focusing on the customer requirement, and emphasizes on performance and organizations practices that the way organizations to achieve superior performance and continuous improvement. As a term, Operational Excellence is about continuous improvement that uses the aspects of lean and six sigma to adapt to the changes of the industry, to maintain the vision everyone has in mind to achieve the organizations vision and future goals, and it is improvement in all dimensions of the production plant and measured by the performance efficiency and effectiveness. To achieve operational excellence, top management must play a great role to engage the operational excellence structure and culture to their employees. [4 & 26]

The implementation of operational excellence involves execution of the Six-Sigma concept. The three major components of Six Sigma include; the culture of an organization; improvement tools and support systems for the tools, which enables an organization to generate sustained success demonstrated by sustained profitability and strong market share. Not surprisingly, operational excellence is frequently cited with lean management principles and the six-sigma methodology [1].

Prior studies have identified many benefits of Operational Excellence, that management system gives a company the benefits of lower costs, increased efficiencies, fewer injuries, maximum sustainable returns on operating assets, and an enhanced competitive position and helps for sustainability of any industry is highly affected by operational excellence [18,19]. The goal of operational excellence is to "Provide customers with reliable products or services at competitive prices and delivered with minimal difficulty or inconvenience" [22] meaning, it is a way of reaching exceptionally high standards of consistency in performance for the customer. For the customer this means that they know if they order at an organization that they know that they get it, right as ordered the first time, always on time and at a price that suits. [22, 23]

So far, operational excellence has been defined a consequence of an enterprise-wide practice of ideal behaviours based on the correct principles or simply as a state where each employee can see the flow of value to the customer and fix that flow before it breaks down. Although these definitions may seem broad, it is the correct principles categorized under four dimensions; Cultural Enablers, Continuous Process Improvement, Enterprise alignment and Result [25]

2.3 Operational excellence in different sectors

Operations in any firm play a very important role in integration all function of the business and provide capabilities that support the overall business strategy. Operational excellence enables a firm to manage all the business process, and to enjoy low operating costs and risks, quality improvement, competitive advantage, increased revenues and ability to create value for both its shareholders and customers [38]. Industries consider operational excellence as an atmosphere that initiates the achievement of optimal performance in all facets of the business in a continuous manner

2.3.1. Operational Excellence in Manufacturing Sector

Operational excellence has been in the manufacturing industries for decades, known as lean production. Operational excellence in the manufacturing practice meant optimizing business processes, broadly production and manufacturing, it is the act of increasing productivity within the minimal lead time flexible while being cost effective

for improved quality. In the manufacturing industry, operational excellence is a mechanism for a continuous production improvement at the simplest minimum cost for profit maximization. Operational excellence in manufacturing industry is reaching the height of operational efficiency by doing things better, faster, and cheaper [26]. Operational excellence is the unification of firms' entire operations such as procurement, manufacturing, and after-sales service as an end-to-end system. It has been the purpose of operational excellence to boost production efficiency, improve quality and meet up with market demand. Operational excellence approach is like a typical production system combined with customer orientation and the necessity of continuous improvement.

2.3.2. Operational Excellence in Service Sector

Operational excellence is also the current learning not only in the manufacturing industry but also in the other service industry. Operational excellence as a relatively new phenomenon in many service industries and it refers to a significant increase in performance across various aspects including operations [26, 47 & 53]. Operational excellence is an approach designed to achieve outstanding production and delivery systems with excellent technical and social aspects in service industries [26]. Operations in the service industry has no clear production line, as a result, it is influenced by the level variety of offerings and variability of delivery [26 & 55].

Operational excellence is the maximization of value that operations supply to customers over strong leadership and the implementation of value-added technologies by maintaining industry best practices. And enables sustained delivery of high-quality, cost-effective services and capabilities that deliver exceptional customer value [26 & 55], Operational excellence is a strategic competitive advantage that influences on the effectiveness of operations in creating and sustaining customer satisfaction and reliability.

Operational excellence is the processes of enhancing post-sales services [26]. Service operations implicate synchronization of the various processes involved in service delivery. Operational excellence is about firm's position in handling costs and risks associated with its service groups beyond just operational effectiveness but also for achieving outstanding performance, is expressly about customer satisfaction, cycle

time reduction, and waste reduction, improvement in quality, cost reduction, and systems development [26 & 55]. Operational excellence is the destination of leaders who are passionate about delivering excellent customer value and outstanding business results [26]. They further continued that operations excellence is an act of leveraging the power of employees, indorsing effective process management, implementing value added technologies, and installing individual accountability to achieve sustainable success, all on behalf of the customer [55].

2.3.3. Operational Excellence in the Oil and Gas

Oil and gas operations such as exploration, production, and transportation contain basic risks: like slips and trips, fatalities or severe environmental incidents [48]. Operational performance in the oil sector cannot, therefore, separated it from hazard. So, because of these intrinsic risks, and specific recent incidents in the global oil and gas operations, stakeholders stress for firms in the industry to perform becomes intense [46, 51]. Pressure such as the requisite to improve productivity that is faster, safer, more reliable, more resilient and environmentally sound [26, 48] made the need for operational excellence in the area more than ever before [52]. As result of the pressures, companies help to operational excellence to meet up with these stakeholders' demands. So operational excellence conferring to [26] is about process safety, environmental protection, risk mitigation and achieving a consistent world class performance. In the oil and gas sector, mainly health, safety, environment, and quality are the foundation of operational excellence [48] where every employee, contractors, and the environment understood the operational risks involved. Operational excellence is a strategy that ensures sustained pursuit to eliminate injuries to people, the environment and zero-defect approach to product quality [52]. Operational excellence is the process of refining feedback stock flexibility, growing high-value product yield, assuring the availability of product, increasing logistics capabilities and reducing risk [26]. It is saying that product quality, availability, and risk management are among the major fundamentals in managing operational excellence in the oil and gas sector.

Unlike other areas of the economy, oil and gas companies are under wonderful pressure from both regulators and the environment to reduce risk in their operations. So, the developing complexity, costs, and risks combine in the oil sector trigger the

need for operational excellence to achieve efficiency more than ever before [52]. Hence any strategy aimed at improving processes and supply chain efficiency is expressly managing and minimizing operational risk and uncertainty [26] categorically in the oil industry. These uncertainties have potential effects on businesses' assets and operations that cause failure in the internal process, systems, technology, actions of people, or external events leading to trouble in business operations. This confusion might result in production closure and loss of revenue. So effective and efficient services benefit to fulfil organizational goals at the lowest cost, least negative social consequence, and least destructive environmental impact [26], any discussion on oil and gas operations cannot go independent of workers safety, community health and the environment.

As discussed above, the implementation of operational excellence is commonly adopted in some industries like, manufacturing, service and oil & gas. From the above review operational excellence has been implemented in different sectors, whereas it is rarely experienced in flower industries, but those sectors have common process that can be applicable in flower sector. Operational excellence is broader because it sets business growth as a target and runs a step by step approach to achieving it in businesses. So that, it would be difficult to have a commonly accepted definition of operational excellence. The spread of the concept of operational excellence in the current day has gone across several industries [26]. Nonetheless, scientific literature defining operational excellence practice implementations in industries, in general, is still scarce.

2.4 Operational excellence Assessment Models

So far there is no clear difference stated between quality award models and operational excellence models, whereas operational excellence principles are a bit border than quality award principles. There are many tools that are currently available for the internal and external assessments of Quality, Lean and Process Improvements for organizations. These tools tend to cover some principles of OE and consequently weakening to realize how dependent the principles of OE are on each other [25].

The use of assessment tools is one approach that can be adopted by organizations to evaluate the level of operational excellence journey. Performing assessments serve as

a reality check while emphasising the weaknesses and strengths on which organizations can build upon to achieve operational excellence. Currently there are many tools that are available for the internal and external assessments of Quality, Lean and Process Improvements for organizations [25].

From most of known models, Shingo is one of the well-known and globally accepted model used to support the implementation of operational excellence programmes. Other well-known models, such as EFQM Excellence Award or the models behind the MBNQA or the Deming Prize, have a broader perspective over business excellence and consider but are not focused on operational excellence [4, 25, and 37].

2.4.1. Excellence Model of Ethiopian Quality Award

The EQA Model's main criteria used to evaluate industries were calcified as: Leadership, Policy and Strategy, Resource Management, Processes, Customer Focus, Business Performance and Social Impact. The model indicates that any company can achieve excellence in its overall business performance through the application of these seven elements. The model is not new to the business practices, has a new approach to implement. The model enables companies to make all fragmented elements into integrated and purposeful. The seven key components are adopted based on international practices. However, the Excellence Model of EQA has detailed elements under each key element that consider the specific situations in the country. The specific elements under the key elements are revised to enable to consider the changing circumstances in the country. [64, 65]

2.4.2. The Shingo Model

The Shingo model is conceptualized using concepts of Lean Management approach. The founder of the model is Dr. Shigeo. The model consists of four dimensions, Cultural enablers, Continuous process improvement, enterprise alignment, and results. Under this model there are 10 guiding principles. These principles are, respect every individual, lead with humanity, seek with perfection, embrace scientific thinking, focus on process, assure quality at the source, flow & pull value, think systematically, create constancy of purpose and create value for customer. The 10 principles are supported by 19 supporting principles that cover five typical business and management

processes including supply, management, customer relations, product & service [24, 42].

According to the Shingo Institute, the Shingo Model is not an additional improvement programme, but a set of 'guiding principles' that support the organisation's daily initiatives in filling out gaps in a constant evolution in the scope of organisational excellence. As such, the focus of the Shingo Model is not to achieve specific results but to improve the organisational systems and culture in order to better achieve and improve them in the future. [37]

2.4.3. The Chevron OE Management System (OEMS):

Chevron is an international integrated energy company which developed and incorporated an OE model through their OEMS. The main goal of this management system is to effectively direct the process of reaching and sustaining industry and world top standards for safety, health, environment, efficiency and reliability [36 & 57].

Chevron has chosen to embrace a wider range of business responsibilities, beyond environmental aspects, into their management system. The Operational Excellence Management System includes environment, health, safety, efficiency, and reliability. It is widely recognized that these aspects are interrelated and very important to a business. [58]

The thirteen elements taken from the Chevron OEMS guidelines are: Security of Personnel and Assets, Facilities Design and Construction, Safe Operations, Management of Change, Reliability and Efficiency, Third-Party Services, Environmental Stewardship, Product Stewardship, Incident Investigation, Community and Stakeholder Engagement, Emergency Management, Compliance Assurance, Legislative and Regulatory Advocacy.

The immediate difference between the Shingo Model and that of Chevron is the lack of focus on a set of "principles to live by" in the latter. Instead, the Chevron approach is to focus on a set of management rules (13 expectations), which if adhered to would lead to the outcomes the organisation desires (as per the Chevron OE vision statement). The reason for adopting an emphasis on principles is given by The Shingo Prize for

OE, by stating the following in reference to their guiding principles: “When taken in their totality, these timeless principles become the basis for building a lasting culture of excellence in the execution of one’s mission statement.” [36 & 58]

The Chevron OE model is focused on the desired outcomes of the process that means become world-class in process safety, personal safety & health, environment, reliability and efficiency, with the OEMS designed as a methodical system engaged to achieve those outcomes. As stated earlier, this contrasts with the principles-based approach of the Shingo Model. Chevron prescribes leadership accountability, whereas a principles-based approach would incorporate such accountability inherently in the culture [36, 42 & 57].

2.4.4. EFQM Assessment Model

The EFQM Excellence Model is a generic model for quality management, which is used in all types of organizations, regardless of sector, size, structure or maturity [24]. The Foundation is in the tradition of the American Malcolm Baldrige Award and was initiated by the European Commission together with 14 European multi-national organizations in 1988. The essence of the approach is the EFQM Model, which can be used as a self-assessment instrument on all levels of an organization and as an auditing instrument for the Quality Award. In 1999 the EFQM Model was revised but its principles remained the same for all levels. [44]

2.4.5. MBQA Assessment Model.

The MBNQA was established by the United States Congress, on August 20th, 1987, named after Secretary of Commerce Malcolm Baldrige, who served from 1981 until his death in 1987, “the intent of the program is to promote US business effectiveness for the development of the national economy by providing an approach system for organizational assessment and improvement” [61] The Baldrige Award was introduced as a part of the Quality Improvement Act, and consists of a very detailed framework of criteria and procedures for assessing the quality of an organization [24, 44]. The Malcolm Baldridge prize recognizes organizations with performance excellence with excellent quality of products and services. This program is managed by the National Institute of Standards and Technology. The program has scoring guidelines and self-assessment tools. It consists of a range of organizational performance indicators which can be used for transformation. It consists of mapping

the key processes. This is followed by answering qualitative questions which are framed to study organizational strategies and practices. [24]

MBNQA's framework is based on seven independent quality criteria which are presented in Figure MBNQA named "Leadership", "Strategic Planning", "Customer/Student Focus", "Process Management", "Human Resource/Staff Focus", "Measurement, Analysis & Knowledge Management" and "Organizational Performance Results [61]

2.4.6. Rapid Plant Assessment (RPA) Model.

Lean RPA was developed by Dr. R. Eugene Woodson in 1998 based on his learnings from the automotive industry in the early 80s. Dr. Woodson traces his experiences back to his time using the Toyota Production System to evaluate automotive suppliers [46]. One fundamental idea behind lean RPA is this: to a trained eye, even a quick plant tour can reveal a lot about a company. Sometimes it is called Murphy's Law of auditing: whatever is going wrong in the plant, an auditor will be there exactly when it happens. The corollary though should also be true: things that are going right in the plant will be going on when an auditor is there.

In lean terminology, lean RPA refer as a "Gemba walk," that is focused by the audit purpose and the limited timeframe available. Key to the Gemba walk is that the lean RPA, must go to the place where things are happening. lean cannot assess based on procedures and records alone.

Lean RPA Rating Categories are , 1) Customer Satisfaction, 2) Safety, Environment, Cleanliness, and Order,3)Visual Management System Deployment 4) Scheduling System, 5) Space, Movement, and Flow, 6) Inventory and WIP, 7) Teamwork, Skills, and Motivation, 8) Tooling and Equipment Condition/Maintenance, 9) Management of Complexity and Variability, 10) Supply Chain Integration, 11) Quality System Deployment/Commitment [46].

2.4.7. Kobayashi 20 Keys Assessment Model.

The 20 Keys to Workplace Improvement was developed over a dozen years ago by Prof. Iwao Kobayashi, in Japan in 1980-ties based on Toyota production system. It enables easier accomplishment of company's strategic goals development of human and organizational potentials and is an excellent start for the reform of the whole

company. 20 keys defined as a company-wide process of focused and continuous incremental innovation leading to a culture of sustained improvement and elimination of waste in all systems and processes. The term originates from 20 tools and different techniques which can be used in different circumstances and areas in the company. The keys are collection of different tools and techniques which are already well known in the world, but they are incorporated into a common system of evaluation, visual reporting, monitoring of results, and work organization. The system cheers synergic effects within different business areas and successful and long-lasting improvements in business operations and can be an excellent introduction to lean [47 & 56].

Kobayashi (1995) developed [56] Practical Program of Revolutions in Factories (PPORF) as a result of his work with businesses in their pursuit of improvement. The basic principles of implementation package of PPORF are presented in his 20 keys relations diagram where all the keys are presented together with their relationship. Every tool (key) of this methodology is contributing to the main long-term goal which is a revenue. The main thought of every key is continuous improvement and accomplishment of the company's goals and due to methods' completeness can be considered as a quality management model. According to [56] the four basic keys which are building a block of the methodology:

- Key 1 - cleaning and organizing - everything starts with order and cleanliness
- Key 2 - rationalizing the system/management of objectives - set goals and ensure that everybody in the company knows what his/her responsibility is to achieve these goals
- Key 3 - improvement team activities - provide a culture within which team activities can be set up to organize the improvements
- Key 20 - leading technology/site technology - everything stands and falls with the speed at which an organization can successfully adopt new technology

There are 4 keys linked to the characteristics that make a production system excellent, i.e. better, faster, and cheaper. Keys 11 (quality assurance system), key 6 (manufacturing value analysis) and key 19 (conserving energy and materials) and key 4 (reducing inventory) are keys.

Table1.1: Categorization of components of existing assessment tools against Shingo Dimension and Principles (in brackets the weight of each category) [25].0:1

Operational excellence Dimensions	Shingo Assessment Areas	EFQM Assessment Areas	MBQA Assessment Areas	Rapid Plant Assessment (RPA) Areas	Kobayashi 20 Keys Assessment Areas
Culture	(25%) Lead with Humanity Respect Every Individual	(22.5%) Leaders People Partnership and Resources	(25%) Leadership Human Resource Management	(20%) Safety Environment, Cleanliness & Order Teamwork and Motivation	(20%) Improvement Team Activities Empowering Workers Cross Training Conserving Energy & Materials
Continuous Improvement	(35%) Flow & Pull Value Assure Quality at Source Focus on Process Embrace Scientific Thinking Seek Perfection	(10%) Products and Services	(14%) Quality Assurance of Products and Services	(42.5%) Scheduling System Use of Space and Product Line Flow Inventory Condition and Maintenance Commitment to Quality	(70%) Cleaning & Organizing Inventory, Quick Changeover Manufacturing Value Analysis Zero Monitor Manufacturing Coupled Manufacturing

					Maintenance Time Control and Commitment Quality Assurance System Eliminating Waste Production Scheduling Efficiency Control Site Technology
Enterprise Alignment	(20%) Create Constancy of Purpose Think Systematically	(17.5%) Policy and Strategy Partnership and Resources	(13%) Information and Analysis Strategic Quality Planning	(30%) Visual Management Management of Complexity and Variability Supply Chain Integration	(10%) Management by Objectives Developing Your Suppliers
Results	(20%) Results Create Value for Customer	(50%) Customer, People, Society & Key Performance Results	(48%) Quality and Customer Results	(7.5%) Customer Satisfaction	(0%) N/A

2.4.8. Operational excellence Methodologies

Operational excellence is linked to some methodologies or frameworks. Methodologies like lean and six sigma are seeing a renaissance in manufacturing to help ensure predictable and waste elimination from production process, will facilitate the journey to excellence. However, all the methodology or framework are used improving business performance. [3, 22, 23]. The most popular and common methodologies are Lean Management, Business Process Management, Balanced Scorecards & Dashboards, ISO, and Six Sigma [22].

If companies truly want to achieve operational excellence, the first step every company in any sector is to get control over manufacturing or service data. Because effective decisions are always based on the collected information and analysed data, not speculation or conjecture. Automated data collection is the basis for creating the actual enterprise and differentiates top performers from their poorer performing peers [23].

To successfully implement good improvement tools and technics, it is the underlying principles of these tools that must be focused on results rather than the application of the tools. The concept of Operational Excellence goes beyond using individual tools and techniques. It incorporates Lean principles with organizational culture and management at a strategic level. [25]

As the below graph showed the two leading methodologies are lean methodology and six sigma methodology, Both Lean methodology: enhancing customer value by systematically eliminating waste in the form of excess expenses, and Six Sigma: a methodology for improving processes in order to reduce defects, will facilitate the journey to excellence[3]. Lean methodology looks at the rate at which organizations convey products to market, and how to impact the speed and time required to develop new products. Lean methodology attaches the producer and the consumer of the product, looking at the process from concept to delivery. As product complexity increases, the time to produce it is usually longer. Lean methods examine ways to reduce the time to market. Six Sigma looks at the product strength in the long term. Six Sigma methodology bargains a way to cut costs, maximize results and dramatically improve performance. It examines the organization’s capabilities, and how they impact quality and stability. And, it helps organizations translate customer needs into smart KPI’s.

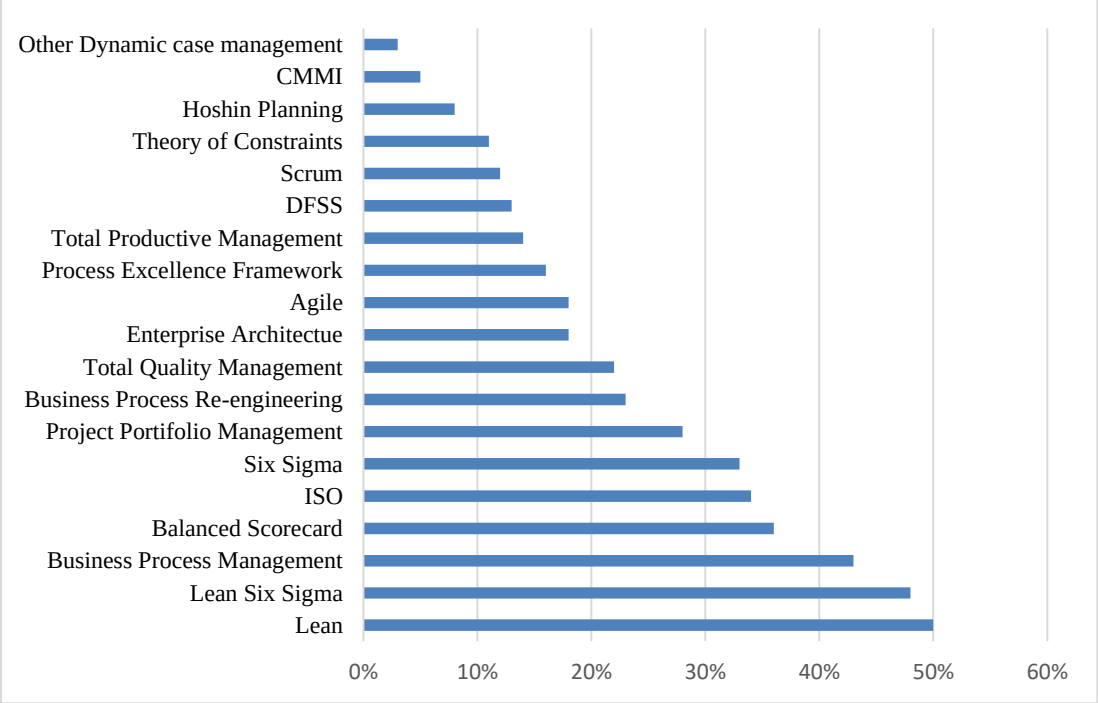

Figure 2.1: Operational Excellence frame [22]

2.5. Dimensions of Operational excellence

The pursuit of improvement is natural. To be successful in the long term, businesses and indeed any organization must be engaged in a persistent mission to make things better. Improvement is hard work, it requires great leaders, smart managers and empowered people [25]. When leaders anchor the business mission, vision and values to principles of operational excellence and help links to connect and anchor their own values to the same principles, they enable a shift in the way people think and behave. Shifting the collective behaviour of the group changes the culture. This is a leadership responsibility that cannot be substituted.

Commonly used assessment model uses the four common operational excellence dimensions, those are, culture, continuous improvement, enterprise alignment, and result. These all dimensions have their own guiding principles, are discussed in below.

2.5.1. Culture

Operational excellence cannot be achieved through top-down directives or piecemeal implementation of tools and technics. When the leaders/Cultural enablers engage employees and contractors to build and sustain the operational excellence culture and deliver operational excellence performance. This make it possible for people within the organization to engage in the transformation journey, progress in their

understanding and, ultimately, build a culture of operational excellence [25, 36]. The two main principles in this dimension are: lead with Humanity and respect every individual. Lead with Humanity: “One common trait among leading practitioners of operational excellence is a sense of humanity. Humanity is an enabling principle that precedes learning and improvement” [42].

A culture is not something that can be developed in a six-month project, developing a culture of mutual respect and humanity takes a consistent commitment over a sustained period. It is an issue that must be continuously worked, and the work will never be finished. Changing organization culture is thus neither an easy nor a straight process, and it can easily meet resistance from the workforce [37, 42]

2.5.2.Continuous Process Improvement

“Continuous improvement implies a focus on solving a series of quality problems, reducing inventories, eliminating waste and increasing productivity” [45]. Continuous improvement means development of the business itself; it affects to the entire company strategy. As a matter of a fact, it is a change management discipline including methodologies and principles. It can be called as a philosophy. The change arises, when organization realize the business should be more profitable or there is forced demand for cost cutting, these establish a way for change. Actual business case determinates how deep this philosophical aspect would be [41]. “Continuous improvement begins by clearly defining value through the eyes of customers.” [42]. Expectations must be clearly communicated throughout the company so systems can be designed to meet customer needs. To continuously improve the system, Dr. Shingo advised: “Improvement means the elimination of waste, and the most essential precondition for improvement is the proper pursuit of goals. We must not be mistaken, first, about what improvement means. The four goals of improvement must be to make things easier, better, faster and cheaper.” [42].

Continuous process improvement has guiding principles with the support of focus areas: the principles are Focus on Process, Embrace Scientific Thinking, Flow & Pull Value, Assure Quality at the Source and Seek Perfection [25 &42].

2.5.3.Enterprise Alignment

To succeed, organizations must develop management systems that align work and behaviours with principles, direction and work commitment, in ways that are simple, comprehensible, actionable and standardized. The significant reason why most of the modern management failed is not focusing on execution, instead they focus on strategy and planning. Focusing on aligned execution called “Principle-based Strategy Deployment.” [42]

Strategy deployment requires a management system built around scientific thinking, from the second operational excellence dimension, and with more emphasis on cycles of learning than on perfect plans. It is important to establish effective communication, a process for gaining agreement, clear responsibility and systems where implementation and countermeasures are planned and tracked, whether through operational excellence methodologies. In principle, operational excellence is the definition of successful strategy deployment [42].

Similarly, with the two dimensions enterprise alignment has also guiding principle with its focus areas: Create Constancy of Purpose and Think Systemically.

2.5.4. Result

All leaders of organizations share one common goal, they are responsible for great results. These results are the outcome of following the principles that govern the results. According to The Shingo Model, the main principles is Create Value for the Customer. “Ideal results require ideal behaviour” [42]. This is what they call operational excellence.

Customer satisfaction assured when the customer information and understanding is mutually shared by marketing and operations. Workers needs to know clearly who their customers are both internal and external and should make customer satisfaction their primary goal through their day to day activity. Customers are served individually and rapidly, and experiences that their need for personalisation, high quality, and efficient deliveries are satisfied [31, 43]

Organization that embrace customer focus benefit from increased customer loyalty, market share, repeat sales, customers contention, organization corporate image and

income. Research on enrichment of customer satisfaction through TQM [38], noted compared to the previous years, customer have become more aware and knowledgeable about quality and other needs. These has forced organization to be more responsive and they are offering better service and products and keep improving through continuous improvement. The researchers concluded that where organization risk falling behind their competitors, if they don't take the initiative to improve the value offered to their customers and the customer's satisfaction.

2.6. Organization sustainability

The definition of sustainability is being to "keep the business going", whilst another commonly used term in this framework refers to the "future proofing" of organizations, "achieving success today without compromising the needs of the future" [32]. To the success in the direction of sustainability, organizations pursue justice before markets, increasing their scope and securing greater financial returns. In the context of organizational sustainability, the Triple Bottom Line [33] comes to light, which advocates that the traditional business model, that considers only economic factors in the appraisal of a company, should be expanded to a new model by also contemplating the organization's environmental and social performance, as well as the financial. The principle of organizational sustainability is enhancing, social, environmental and economic systems within which a business operates. "Organizational sustainability is most commonly understood as the state of organizational capability to meet customers need. Management of successful organizations is proactive regarding sustainability development [18]. For sustainability organizations outfaces many of its issues related to identification, developing short-term plans in congruent with long-term plans, a consistent and reliable funding system, employee development and empowerment, and internal processes of decision-making."

Environmental changes have been a challenge for a large amount of organizations [33] and suffered pressure from legislations and society, forcing them to seek alignment with sustainability. So, it may be inferred that organizational sustainability "balances the economic, environmental and social development, for both in the internal and external customers of the organization. Enables the organization the capacity to survive and pay the invested capital; seeks the reduction of environmental impacts and

promotes the rational use of natural resources; guarantees the individuals sufficient resources to access equal opportunities and development in face of organizational objectives, as well as assures that individuals receive balanced and contextual social and environmental benefits and detriments that arise from organizational activities.

Business sustainability seeks to create long-term shareholder value by embracing the opportunities and managing the risks that result from an organization's economic, environmental, and social responsibilities. Business sustainability must meet the needs of the organization and its stakeholders today while also protecting, sustaining, and enhancing the environmental, social, and economic resources needed for the future [35].

The major business sustainability principles are: Leadership, stakeholders, system thinking, people, continuous improvement, information and knowledge, Business responsibility and sustainable results. Leadership-Lead by example, provide clear direction, build organizational alignment, and focus on sustainable achievement of goals. Stakeholders-Understand what your stakeholders' value, now and into the future, and use this knowledge to drive organizational design, strategy, products, and services [35]. Systems Thinking-Continuously improve business and operational systems. People-Develop and value people's capability. Release their skills, resourcefulness, and creativity to change and improve the organization. Continuous Improvement Develop agility, adaptability, and responsiveness based on a culture of continual improvement, innovation, and learning. Information and Knowledge-Improve performance by using data, information, and knowledge to understand variability and improve strategic and operational decision-making. Business Responsibility-Behave in an ethically, socially, financially, and environmentally responsible manner. Sustainable Results-Focus on sustainable results, value, and outcomes.

Sustainability is a state in which an organization or a society exhibits a relation to economical environmental and social aspects [33]. Therefore, usually when it is said that an organization or a society is sustainable it is meant that it holds a certain state of sustainability. As such, sustainable is what can be maintained, in other words, nothing is stagnant, that is why sustainability must be viewed in levels. This way, the

correct would be to say that a given organization or society holds a certain level of sustainability, rather than what is and is no longer sustainable.

2.7 Operational Excellence and Sustainability

Furthermore, today's competitive market conditions have forced the organization to seek long term success by achieving excellence in the business. However, how to achieve the operational excellence and sustain competitive advantages are the fundamental questions among the organizations [4]. Many organizations are seeking the excellence performance in order to be competitive in the business. One of the ways to achieve the excellence result is by using the improvement initiatives and tools such as excellence model.

An organization can be effective and efficient when, the organization's operating excellence is linked with organizational efficiency and effectiveness. In the competitive environment, every organizations are under the intense pressure reducing cost without decreasing volume of output and quality, often termed as efficiency. When organizations become efficient in reducing waste of time, raw materials, unnecessary processing, and energy used in transportation, storing, and operating plant then the state of organization efficiency is generated [18]. And when organization achieves its long-term goals through increased customer satisfactions and proves its reason of being then this state is called effectiveness.

Operational excellence is the formation of sustainable competitive advantage by consistently accomplishing business strategy than the competitors. Operational excellence [17, 18] can be attained by linking operational activities of the organizations with strategic goals. For example, increase productivity is the strategic goal of the industry, and then financial objectives can be reduced cost and increase use of assets. The customer objective to support this financial aim could be "Low total cost," "Perfect quality," and "Speedy, timely purchase". Further strategic objectives can be developed to support customer objectives, such strategic objectives can be "develop supplier relations," "produce products and services," "distribute to customers," and "manage risk." All these can be achieved three important resources: human capital, informational capital, Technology that facilitates process improvement, and organizational capital, Culture of continuous improvement.

Operational excellence is “A philosophy of the workplace where teamwork, problem solving, and leadership leads to the ongoing improvement in an organization and achieving results. The process involves focusing on the customers’ needs, results, leadership and constancy of purpose, employee empowerment and ownership, continuous learning, innovation and improving the current activities in the workplace” [17]. Operational excellence is considered a philosophy of leadership, teamwork and problem solving resulting in continuous improvement throughout the organisation by focusing on customer needs, employee empowerment and process optimisations [37]. The viewpoint of operational excellence is organizational leadership that stresses the application of a variety of principles, systems, and tools toward the sustainable improvement of key performance metrics. Much of this philosophy is based on earlier continuous improvement methodologies, such as Lean Manufacturing, Six Sigma, and Scientific Management. The focus of Operational Excellence, however, goes beyond the traditional event-based model of improvement towards a long-term change in organizational culture [6]

In the manufacturing industry, operational excellence is a mechanism for a continuous production improvement at the simplest minimum cost for profit maximization. Operational excellence enables sustained delivery of high-quality, cost-effective services & capabilities that provide special client value operational excellence is about process safety, environmental protection, risk mitigation and achieving a consistent world class performance. Most of the articles reviewed showed how valuable employee education and engagement is to achieve operational excellence in all the industries. From the few studies conducted in the manufacturing and service industries, human resource variables such as change management, leadership, culture and six sigma factors used as predictors of operational excellence [26].

2.8 Summary of literature review

The most well-known and globally accepted model used to support the implementation of operational excellence programmes is the Shingo Model which mainly focuses of manufacturing sector. Most of other well-known models, such as the previously mentioned EFQM Excellence Award or the models behind the MBNQA, have a broader perspective over business excellence and consider but are not focused on operational excellence.

Unlike in the manufacturing or service sectors, oil and gas operational excellence definitions emphasize on health, safety, and the environment (HSE) and reliability [26]. While in the service sector, the emphasis of operational excellence is customer satisfaction and delivery time. Whereas in the manufacturing sector, operational excellence was viewed from the angle of waste elimination (lean), continuous improvement and flexibility [26]. To this end, all the industries focused on (manufacturing, service, and oil & gas) their unique concepts of what operational excellence is all about. So, as the focus of this paper is flower industry it will combine some of the concepts based on the case company purpose and values the company bring plant potential to life by working to its values: Innovation, Intensity, Health and Performance. These values are at the core of everything that every level of employees does at Syngenta".

The literature on operational excellence is still limited around manufacturing areas, where there is a lack of research that investigate the operational excellence in flower business and most of the studies are giving more attention on other performances. By understanding the characteristic challenges associated with operational excellence and more importantly, the critical success factors and skills needed to overcome the inherent challenges, organizations will be better positioned to create a culture of continuous improvement, one that is never satisfied with the status quo [19]. Since the major concept areas of operational excellence are improving safety, health, environment most of the researches done on customer satisfaction through quality and productivity, continues improvement in manufacturing and service sectors, whereas this research will be focusing on the significance of operational excellence towards sustainability of flower farms as it is a critical business area for Ethiopia Agro business industries.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section intends various stages and phases that will be followed in completing the study. The study will adopt both primary and secondary data. Secondary sources of information in this study are broad review of literatures related to the major issues in floriculture business, and operational excellence application in manufacturing, service and oil and gas business. The primary data sources are employees of Syngenta flowers, Ethiopia cuttings. Mainly the following subsections are included; research design, data collection and data analysis.

3.2 Research Design

The case company is selected considering the strategic importance of flower business for the country because of its significant contribution to generate foreign currency and as well as the ease of data access and intimate knowledge of the company. The study used a descriptive design, descriptive is preferred to review significance of operational excellence in flower farm aiming fact finding as it produces a great deal of information.

In order for the researcher to gain different perspectives and draw attention to operational excellence towards sustainability of Syngenta flowers: Ethiopia cutting Plc (ETCU), case study research methods were employed, this method was chosen as it helps in this thesis to study operational excellence dimensions and application of its assessment tools and model in the case company in depth. As the case study is used in this research the data collection has been done only in Syngenta flowers, Ethiopia cuttings PLc. (ETCU). Both qualitative and quantitative data was collected in the case company, it also helps to study places more emphasis on the full analysis of the events of operational excellence factors or conditions and their interrelations with the specified problems in the flower industries. Thus, case study is essentially used as an intensive investigation of operational excellence dimensions and implementation under consideration of operational excellence towards sustainability. This approach is

appropriate for the study as it help to describe the state of businesses as they exist without manipulation of variables which is the aim of the study.

Expect validation method is used to validate the model. The model developed to analyse operational excellence and may therefore represent different parts of the system at different levels of concept. From the three approaches to model validation expert intuition adopted in this study. Guiding question used to validate the modal.

3.3 Population and Sample

The respondents are Syngenta flowers, Ethiopia cuttings employees and they are the specific population about which information is desired, the sample taken according to the stratify sampling norm. The population of interest in this study are all permanent employees of the case company, Syngenta Flowers-Ethiopia Cuttings PLC, it is because they have a respectable understanding of all processes in the company and provided the required/helpful response for the intended question, and also they are the one to be responsible for day to day activities in the site and if there are areas which needs improvement after the research has been finalized. A stratified random sample is obtained by separating the population into strata, and then drawing simple random samples from each stratum. Currently, the total number of top managements are 18, middle level management 25, lower level management 20 and 550 front line employees, which touch all area of the company. So that the sample size for the case company was 17 from top management, 40 from both lower and middle level managers and 226 from front line employees. The total sample size representative of the respondent in this study is 283. It is determined based on the sample size calculation [62] which same as using the Krejcie and Morgan's sample size determination table [annex 1]. The sample size determination is derivative from the sample size calculation which expressed as below equation. The Krejcie and Morgan's sample size calculation was based on p = 0.05 where the probability of committing type I error is less than 5 % or p <0.05.

$$S = X^2 NP (1-P) \pm d2 (N—1) +X2 P (1—P)$$

Where,

S = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (0.05 = 3.841).

N = the population size.

P = the population proportion (assumed to be 0.50 since this would provide the maximum sample size.

D = the degree of accuracy expressed as proportion (0.05)

3.4 Data Collection

In this study, the primary data collected using questionnaire, direct observation and documents from the case company. Moreover, the primary data sources are employees of Syngenta flowers, Ethiopia cuttings, observation done around waste treatment area and all green houses where employees are doing their day to day activities, and documents from production and HSE department has been reviewed to get information about productivity and product quality status and to asses employees HS and environment status. The questionnaire is developed based on different assessment models which are reviewed in the literature, mainly by considering this study problem statement, quality, productivity and employees H&S problem and the environment.

The questionnaire has two sections: 1. Respondents general information, and 2. the dimensions of operational excellence general insight in the company and aiming to assess the application of operational excellence and its implication on the specified problems. The first draft questionnaire was tested in the site before distributed to the respondents to get feedback and amended according to the comments.

Direct observation has been done in the farm to have a good awareness on the current situation and how much the specified problems are available or not available. This provide the useful information to cross check the questionnaire answers are and what have been seen in actual situation, and their validity and reliability, which helps to made conclusion and recommendation for farther improvement.

The Documentation have been checked from several production reports and slide shows that documents the management process concerning quality, productivity, and employee safety, health and the environment can be accessed from different HSE files.

In addition, HR reports, financial reports, labour union documents, etc. has been accessed.

3.5 Data Analysis

The study involved collection of quantitative and qualitative data using questionnaire, direct observation and company documentation. The quantitative data collected was analysed by means of descriptive statistics method using SPSS and EXCEL. Grounded theory method was used to analyse qualitative data. Based on the analysed quantitative data, framework was developed for qualitative data analyse. The information generated was then be interpreted and explained. Final discussion made with the support of reviewed literatures and the actual data analysed from the case company. Factorial analysis used to select significant operational excellence variables to the case company. Using principal component analysis selected higher commonalities value. “A value closer to 1 indicate that patterns of the correlations are relatively compact and so factors analysis should yield distinct and reliable factors.” [63]. Based on the selected variables formulate assessment model. The proposed model was validated by means of expert validation and develop new model.

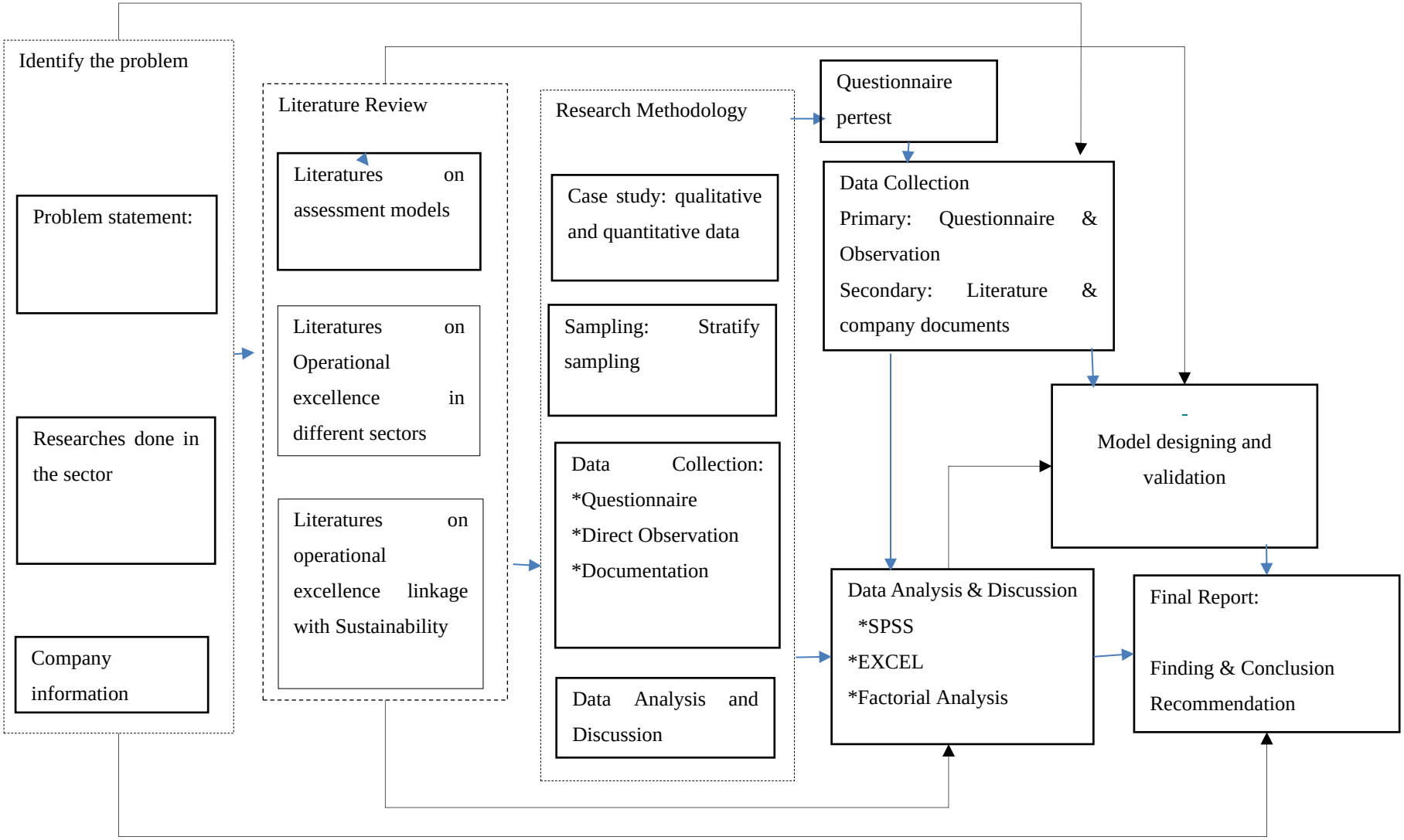

Figure 3.1. Research methodology framework

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1. Introduction

This chapter present data analysis, findings, and interpretation of primary and secondary data collected from the case company, as set out in the research methodology. The study aimed to learn operational excellence application and its significance in floriculture industries and looking forward the way to business sustainability and improvement. The sections cover the graphic information, and the findings based on the objectives. The findings were then presented in tables, graphs and charts as appropriate with explanations being given in style afterward. Operational excellence dimension and their applicability in the case company is presented in detail. The focus of dimensions in this research are, health, safety, environment, culture, continuous improvement, enterprise alignment and result.

4.2. Organization background

The respondents of this research are employees of Ethiopia Cuttings Plc. Syngenta is one of leading agriculture companies in the world. The company ambition is to safely feed the world while taking care of the planet, aiming to improve the sustainability, quality and safety of agriculture with innovative crop solutions. With 28,000 people in more than 90 countries working to transform how crops are grown. Through partnerships, collaboration and “The Good Growth Plan”. Syngenta Global, produce seeds, cuttings and young plants that fulfil grower’s and retailer’s needs. Whereas for cutting flowers, Syngenta flower, Kenya cutting and Ethiopia cutting are the only cutting flower exporter.

Syngenta Flower Ethiopia Cuttings Plc (ETCU) based at Koka, Oromia, East Shewa. The farm is geographically located 73 Km South-East of Addis Ababa, capital city of the country. The farm was established in 2005 by Fisher & acquired by Syngenta in 2008 focusing in plant cuttings production since its establishment, ETCU has been achieving a steady growth in sales and quality. ETCU’s farm covers 18 Hectares for net production, with total gross area of 90 Hectares. Operated by, about 700 employees,

300 of whom are seasonal workers employed on a contract basis for three to four months at a time.

The main crops grown are, Mandevilla and Pelargonium. Throughout these years, the production or growing is managed by agriculturalists with specialization in plant production systems. The company has offered a large and diversified cutting to North America and the Europe countries. Cold truck used to transport products to the airport cargo terminal, owned by the farm. For air shipment, ETCU uses Ethiopian airlines, Qatar air ways, Lufthansa Airways. The cuttings are destined to the export market, mainly to the United States, Japan, UK, France, Italy and Germany, Canada, Switzerland, Netherlands, Sweden.

4.2.1 Organizational Structure

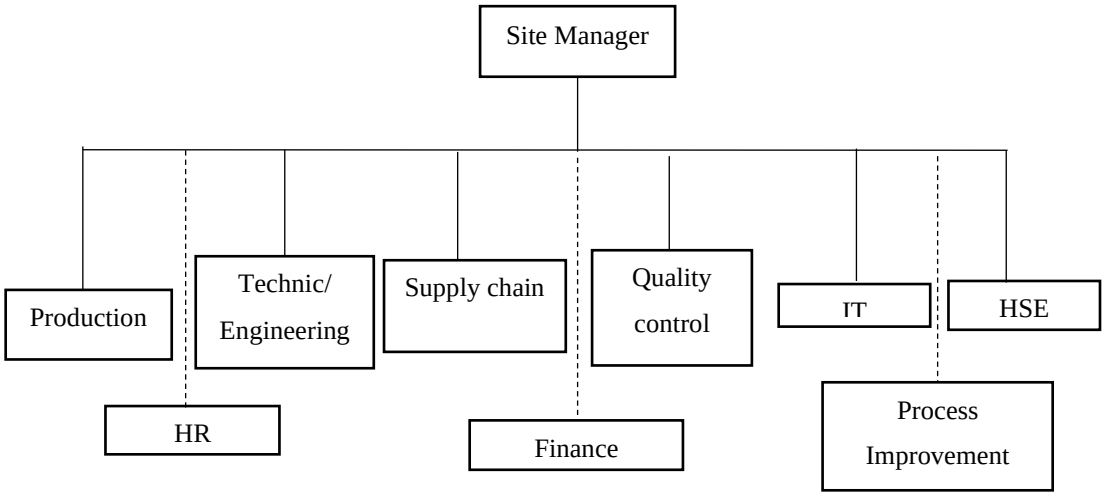

Figure 4.1 Organization structure

A. Production

The production management of ETCU consists of decisions in five areas that are production process (specifically, planting & harvesting), export planning, inventory (chemicals, fertilizers, etc.), postharvest management and quality control. Production strategies relating to decisions on cutting quality, growing & cutting production cost, productivity of labour, production efficiency (labour efficiency in harvesting, crop maintenance, etc.), and harvest capacity management.

B. Research and Development

The researches activities mainly concerned on searching for new growing inputs, new growing method, improvement of yield, processes or equipment. The development activities involve putting research on commercial basis. The research and development strategies cover the areas like evaluation of new varieties, improve productivity of the existing varieties, finding new production methods, improving existing technologies and increase customer satisfaction.

C. Human resource

Human resources management functions relate to the centralized management of personnel, their activities, development and control for the whole organization. Human resource management consists of five important strategic decision areas that are employment, human resource development and training, compensation, human relations and industrial relations

D. Finance

In the company, key resources are allocated and comparison with their real profit contribution is analysed. This involve a study of the company's liquid resources and probable future cash flow position are analysed. Like financial policies, financial position and capital structure are important internal factors affecting business performance, strategies and decisions. Allocate budget collaboration with departments & control resource utilization.

E. Management information system (MIS)

The MIS are being used mainly to monitor production processes as well as transportation of cutting flowers to the end consumers. Different MIS technologies are being used by the company, the main technology that facilitate the productions and logistic working processes are computerized water treatment, computerized fertilizer recipe preparation, farm management system and payroll system.

4.3. General information

The first part of the questioner was determining the general information of the respondents involved in the study with regards to education level, working experience in the company and individual's general operational excellence principles

understanding level. The demographic information points at the respondents' suitability in answering the questions on operational excellence towards sustainability of the business.

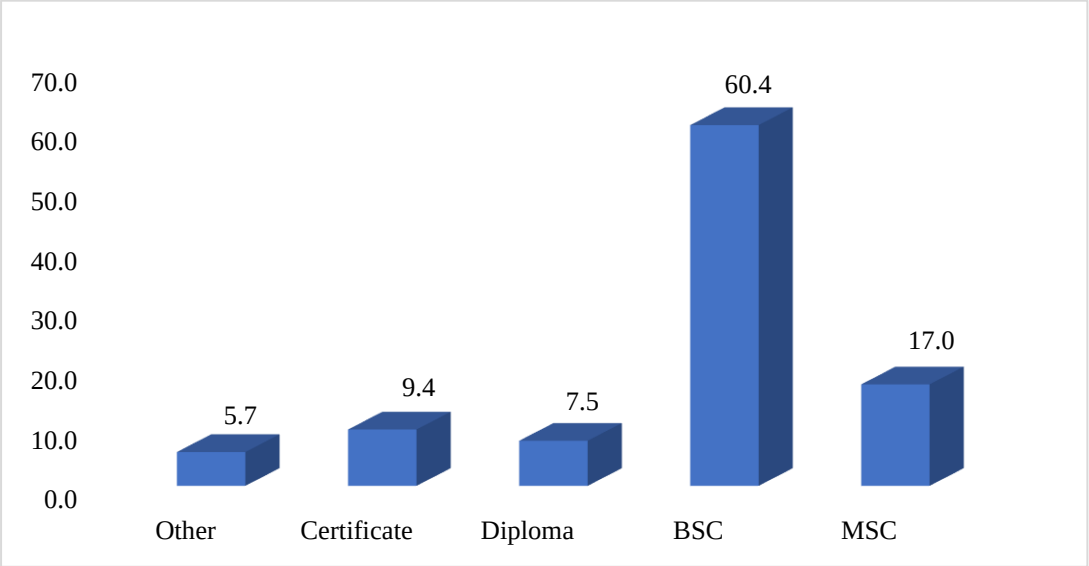

Figure 4.2: Education level of the respondent

From the findings 77.4% of the respondents had BSC and master's degree, and 22.6% are below, diploma and certificate education level. From this information it can be realized that majority of the respondents are capable to answer the questions and it will not be difficult for them to understand the concepts and terminologies mentioned in the questionnaires concerning principles of operational excellence.

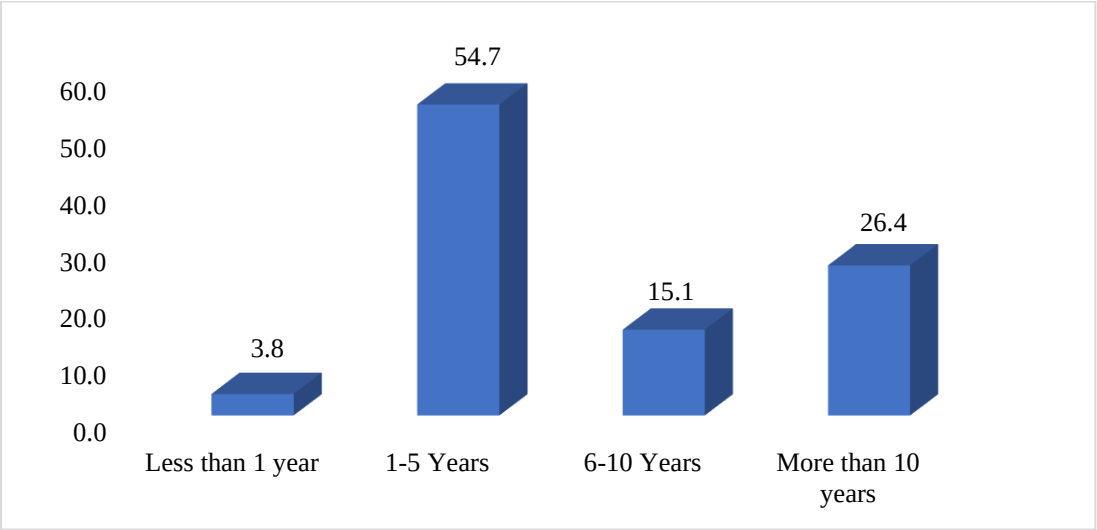

Figure 4.3: Years of Service in the company

The study established that 96.4% of the respondents has been working in the organization for more than one year, while 3.8% of the respondents has been working in the organization for less than one year, besides all of the respondents were permanent employees. This implies that majority of the respondents had good experience in Syngenta flowers Ethiopia Cuttings Plc. And they knew companies' rules, regulations and code of conduct to replay the questions very well, because they have detail information regarding the intended study.

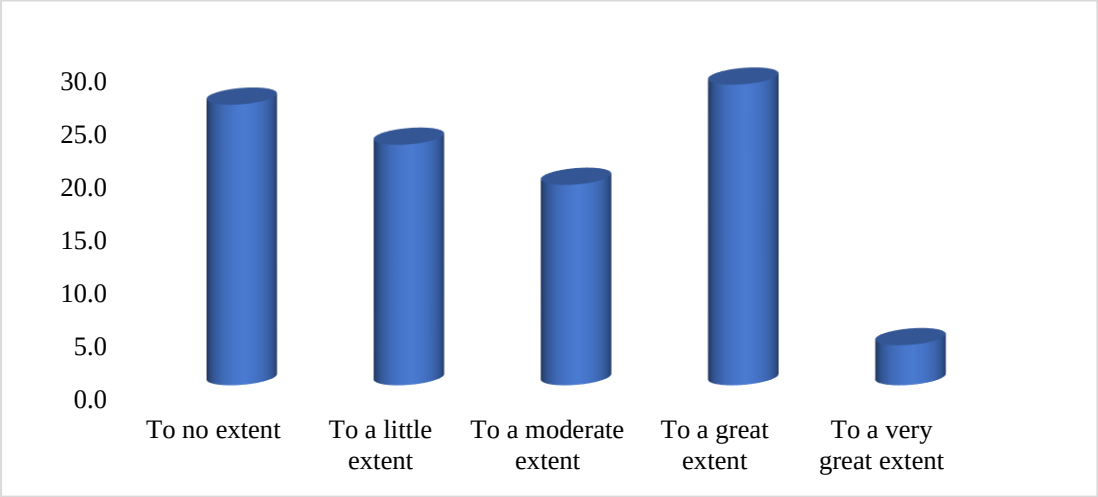

Figure 4.4: OpEx principle Understanding in the company

This section sought to find out the extent to which employees how well do they understand Operational Excellence principle. As showed on the above graph, majority of respondents replied that they did not understood about operational excellence principle, this implies the company need to work on awareness creation and employee training regarding operational excellence principles for the journey to excellence.

4.4. Health, Safety and Environment

Previous researches done in Ethiopia horticulture industry showed that Health, safety, environment and difficulty of formulating labour union are the major problems which questioned the business sustainability in the sector. So that, this research aims to learn the existence of these major problems in the case company and the practical experience

how these major problems resolved in the organization, if there is any, and its relationship with operational excellence.

4.3.1 Extent of employee Health performance in the company

According to the researches done in this area, more than 60% of employees got sick because of chemical and respiratory problem [13] which is very dangerous for the sustainability of the business in the industry, whereas from the analysed data about 83% of respondent replay that, there are no employees who are sick because of work related issues.

Table 4:1, Health performance in the company

Health:	No extent	little extent	moderate extent	great extent	very great extent
Are there employees who are sick because of work related issues	41.5	41.5	15.1	0.0	1.9
Respiratory tract problems are an issue in the company	39.6	39.6	20.8	0	0
Employees are exposed to skin problems	35.8	43.4	20.8	0	0
Employees are exposed to eye problems	34.0	43.4	22.6	0	0

Respiratory tract problems are not an issue in the company, 80.2% of respondents agreed the issues are reflected slightly in the company. About 79.2% of respondents replied that employee's exposer to skin problems and eye problems while they execute their day to day activities are very minimum. These are confirmed through reviewing HSE department PPE distribution procedure and schedule and through direct observation in the green house. The company has good practice during chemical spray time. No one is allowed to enter in the greenhouse immediately after chemical spray. Employees should wear full PPE if they have to enter in the greenhouse before the recommended re-entry time. All chemical sprayers have their own PPE (as shown in the below figure). These PPE's are replaced as per the materials lifespan, and it is strictly followed that whether they are properly equipped before starting the work. And

to ensure that these employees are in good health there is regular medical check-up for all associated workers.

Also, it is observed that there is medium level clinic inside the farm. The clinic has different services, including family planning, examination, laboratory and pharmacy. One health officer two senior nurses, one pharmacist, one labradorites and receptionist work in the clinic.

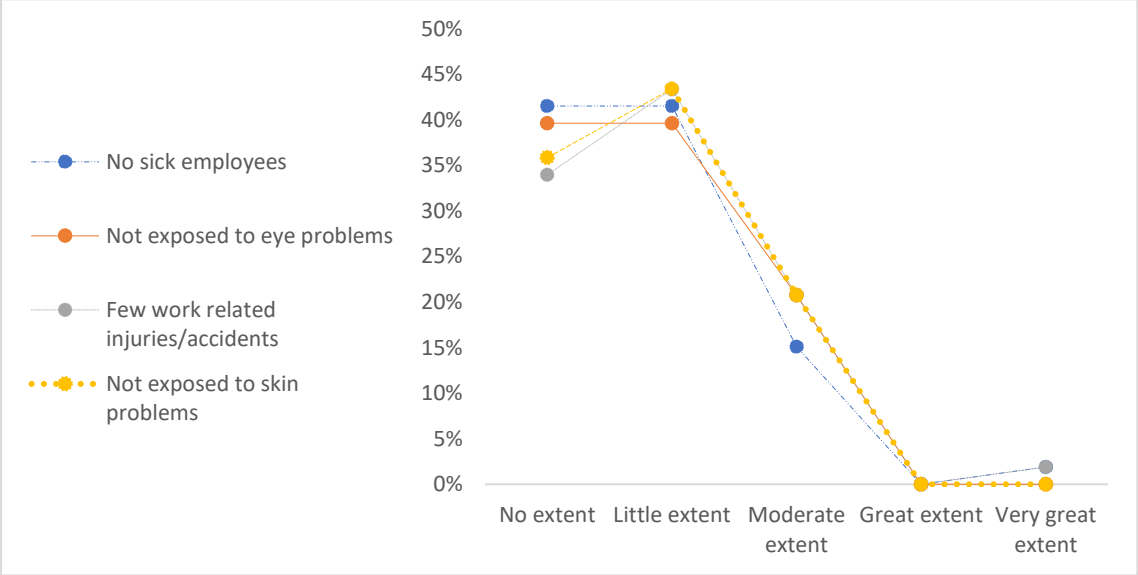

Figure 4:5 Employee health performance in the company

Employees health regarding work related issues are showed on the above graph and it is reflected the cases are seen in the farm to little extent.

4.3.2 Extent of employee Safety performance in the company

According to OSHA standard, establishing an effective Safety and Health Management System that is suitable to employees' different work responsibilities and workplace conditions is an essential strategy to eliminate or control hazards before they lead to fatalities, injuries and illnesses [9]. The study wanted to establish the extent to which various effects of employee's safety on company's performance which leads to excellence. These are reflected in the performance of the farm. The findings showed in the table below.

Table 4:2, Safety performance in the company

Safety	Mean	Std. Deviation
Work related injuries/accidents are few or zero in the company	1.92	.845
There is a system placed to assess workplace safety	4.49	.794
Risks associated with physical workplace exposures managed properly	4.09	.877
Risks associated with chemical workplace exposures managed properly	4.30	.793
Risks associated with workplace exposures to biological agents managed properly	4.21	.879
Workplace safety is a priority for the organization.	4.81	.392

From the study findings as shown in the above table, the respondents agreed that the effects of operational excellence strategies were revealed to a great extent in the performance of Syngenta flowers Ethiopia cuttings Plc. Mean = 1.92, value presented small number is because of the way how the question was asked in the questioner, majority of the respondents replied that Work-related injuries/accidents are few or zero in the company were to less than a little extent. This is meaning the respondents agreed the issue is less in the company. It is observed that the company has incident free recording board, whenever the incident happened in the site the recording start from 1 and the aim is to achieve incident free 365 days. From the company history they are able to achieve only one time. This implies that to achieve the target the company need to work differently. From the observation the company use different methods to ensure employee safety. Like using safety nets, safety belt and helmets during working at height (shown in the below picture).

Documents accessed on how the company assess the need of PPE's according to the nature of the jobs. (Not allowed to share the document because of the company confidentiality policy). And the respondents agreed that there is a system placed to assess workplace safety and manage risks associated with workplace exposures to physical (Mean =4.49). Chemical and biological agents that may adversely affect workforce safety (Mean=4.09 & 4.30, respectively).

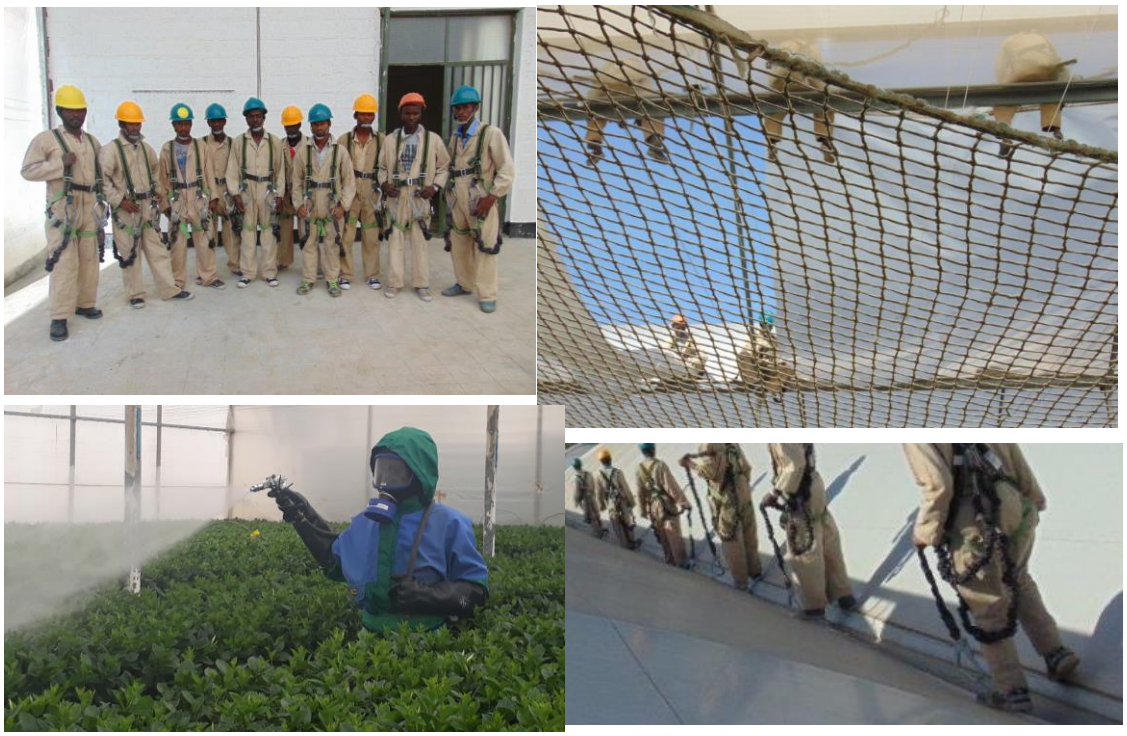

Figure 4:6 Some of **P**ersonal **P**rotective **E**quipment in the company

It is observed that the company is working to comply OSHA standards, some of the indicators are; during recruiting process every employees get health and safety rules and regulations induction before starting the work. Everyone is responsible to asses and report Hazards, employees' safety risks and health, weekly to HSE department. This is linked with their yearly performance evaluation. Regular weekly health and safety training and discussion take place, providing PPE, having Health care centre in site. Employees are requested to fill work permit and signed by the authorized person before they start work at height and hazardous area. In general, the data gathered and analysed showed that the company has a system placed to asses and control employee's workplace safety.

4.3.3. Performance of Environment protection in the company

With the expansion of floriculture industry in Ethiopia, there is a growing concern as to its opposing effect on the national environment. To be competitive in the current international market the system forces farms to comply with environmental standards. So that, Fertilizer and pesticide management, organic cultivation, wastewater

treatment and recycling and environmental audit have to be taken into consideration [9].

Table 4:3, Environment protection in the company

Environment:	Mean	Std. Deviation
Leaders represent a philosophical and cultural commitment of environmental and safety systems.	4.26	.732
The environment protected by applying environmental design standards.	4.21	.763
The organization place a system to prevent environment from chemical wastes to the environment.	4.40	.684
Conserve and protect water and natural resources?	4.45	.690

The case company context, leaders represent a philosophical and cultural commitment of environmental and safety systems (Mean=4.26, St div = 0.732). The respondents replied that Protecting the environment by applying environmental standards is (Mean=4.21, St div = 0.763). The organization place a system to prevent environment from chemical wastes to the environment (Mean=4.40, St div = 0.64).

From the direct observation, the researcher has seen that waste chemicals, pesticides and fertilizers never disposed into the environment, there is a machine called Sentinel machine. The machine used to treat the infected water and separate the chemical residues before released to the environment. These chemical residuals collected and kept in restricted area until it is disposed by following proper chemical disposal procedure. The management team work strictly and never purchase chemicals if their expiring date is before 6 month, but it is not documented as a policy this might be violated when the team is changed. Expired and leftover chemicals from treatment machine never disposed inside Ethiopia, the company has an agreement with foreign company, who are working on collecting expired chemicals worldwide. It is very expensive and long process to export these chemicals. Document reviewed showed that the company had sent expired chemicals last year in 2019. Whereas if the company work on fertilizer recycling it will be more supportive to this system. In addition, the

company should work on more to use adjuvants mixing with PGR (plant growth regulators), PGR is harmful to the environment.

It is observed that a system is running to treat and recycle waste waters from all over the farm, it is called Wetland, which is recommended, and the construction process consulted by Ethiopian horticulture association. From the system the final treated water is used for fruit cultivation and gardening, as shown in the below picture. This implies that the company has strictly following environmental standards to protect the environment from waste chemicals and using harvested rainwater for production process after proper water treatment procedure, can indicates that the company has a proper system for conserve and protect water and natural resources.

Figure 4.7: Wastewater treatment/wetland

As the graph below showed safety and environment protection from company residue are not a challenge for the employees as well as for the community.

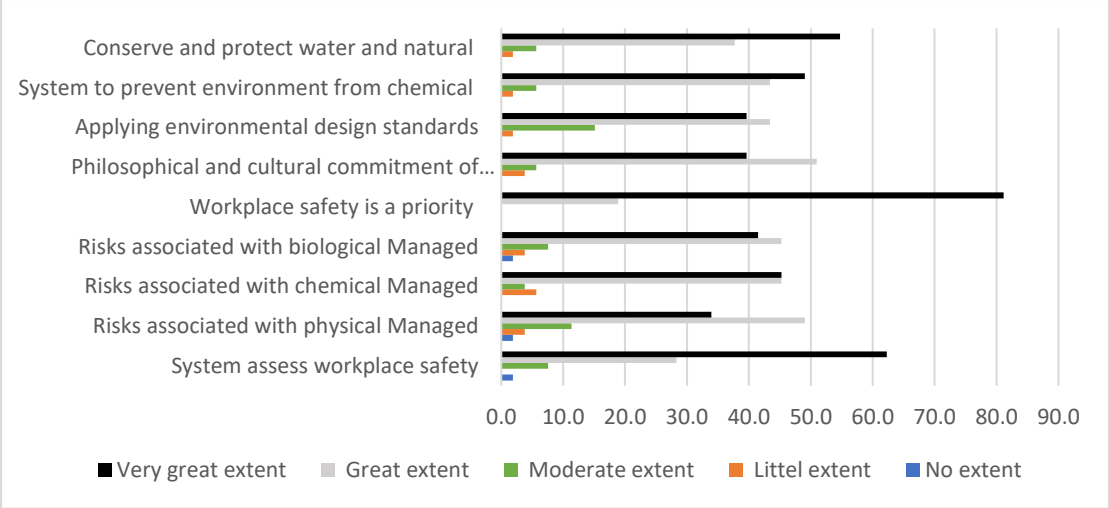

Figure 4.8: Safety and environment performance in the farm

Labour Union

The difficulty of formulating labour unions is reflected in most of flower industries [13], whereas from the analysed data about 81% of the respondents agreed that there is a labour union and the union leaders are working with the management closely. Communication with employees is essential at all levels. Clear and comprehensive communication during collective negotiating allows both sides to understand and own the agreed changes upon positions. Communicating to managers and supervisors the details of a labour agreement and expectations about how the leader expects employees to be treated sets the right leadership quality throughout the organization. Letting employees and the Union know in advance the need for changes in company work rules, policies or even both sides benefits eliminates surprises and builds the trust and ownership. The case company also follow that up with active collaboration on making any changes.

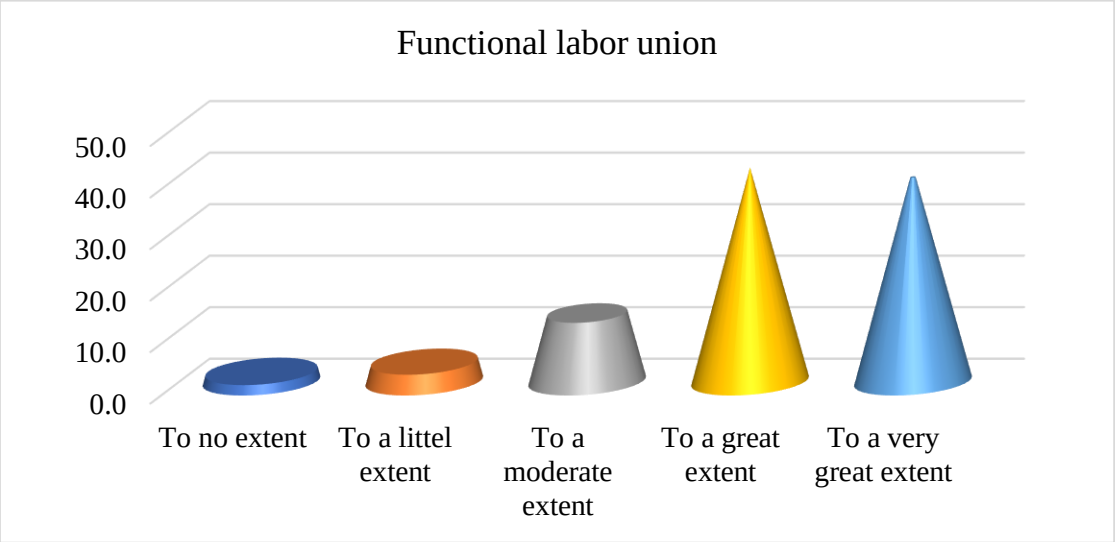

Figure 4.9: labour union performance in the company

4.5. Operational excellence dimension- Culture

Regularly used operational excellence assessment model for manufacturing companies commonly uses the four operational excellence dimensions, those are, culture, continuous improvement, enterprise alignment, and result. These all dimensions have their own guiding principles according to the sectors where the models are used to asses company operational excellence performance. The principles and concepts of this dimension has been reviewed and included in the questionnaire aiming to assess the case company operational excellence current culture and to develop suitable assessment model for flower farms.

Top-down directives or fractional implementation of tools and techniques cannot help to achieve Operational excellence. It requires an extensive commitment throughout the organization to perform allowing to the principles of operational excellence. A culture must be developed where every person in the organization validates a high level of respect for every other person in the workplace. Developing a culture of mutual respect and humility takes a consistent commitment over a continuous period [42].

Table 4.4 OpEx dimension - Culture performance in the company

Culture	Mean	Std. Deviation
Leader's willingness to seek input and listen.	3.96	.753
Leaders create an environment where associates feel respected and energized	3.58	.922
Routine cleaning and orderliness of workplace areas in place and effectively followed and monitored	3.83	.797
There is a collaborative effort of team to achieve a common goal	4.15	.713
The company placed employee motivation system.	3.85	1.038
All employees are encouraged to bring suggestion/improvement ideas.	3.89	.841
Employees frequently get training on how to identify & solve a problem.	3.62	1.122
Problem solving techniques clearly understood within the farm.	3.52	.953
Trainings program frequently reviewed to incorporate future needs	3.49	1.042
There is system for people performance development and empowerment.	3.55	.945
Everyone/individuals respected in the organization.	4.04	.848
Communication is smooth between individuals.	3.75	0.952

In the above table main operational excellence culture principles are described including the respondent's reply with its mean and standard deviation values based on the given scaling measurement. From these 81.2% of employees replied that leaders are willingness to seek input and listen (Mean = 3.96, St. Dev = 0.753). And, 60% of employees agreed that leaders create an environment where associates feel respected and energized (Mean = 3.58, St. Dev = .922)

About 66% of employees replied that routine cleaning and orderliness of workplace are in place and effectively followed and monitored (Mean = 3.83, St. Dev = .797). During site observation it is observed that awareness creation posters/mottos posted on visible areas, like "start clean and stay clean" and employees are trained about 5S concept and implementation with the support of Ethiopian Kaizen Institute (EKI). Training document accesses from HR file which shows content of the subject and training attendants list with their signature. 80% of employees replied that there is a collaborative effort of team to achieve a common goal (Mean = 4.15, St. Dev = .713).

From the analysed data, 62.2% employees replied that all employees are encouraged to bring suggestion/improvement ideas. (Mean = 3.89, St Dev = .841). The observation showed that there are suggestion boxes placed at easily accessible areas for Bright Idea program input. Bright Idea Program was inaugurated in Syngenta Este Africa (three farms including ETCU). Whereas the system is not running as planned in ETCU. Bright idea boxes are empty. Few submitted ideas are evaluated and prioritized but not implemented. This implies that the company need to identify the gaps and re-initiate the program.

As presented in the above table, 76% employees agreed that the company has placed employee motivation system (Mean =3.85, St. Dev = 1.038). As one of motivation system, Performance related pay (PRP) is applied in the farm. The system is functional in the farm for majority of the activates executing in the site; like harvesting, crop maintenance, green house preparation, chemical spraying, scouting, packaging and pump house workers. Whereas there are some areas which are not included in the system because some of them are not easily quantifiable. The already implemented system is guided by policy, anyone can quantify his/her performance and can calculate the payment automatically. The St. Deviation value indicate that the system is not applied all over the farm, so that it is recommending working on different way of motivation system to incorporate those employees who are not involved in the system. Another motivation system the farm using is team events. As document reviewed from production and finance department, employees had been involving team events. The program held once in a year when the production season is over, this is only for above team leaders' position. And for all employees there is "employee celebration" which is taken place in the farm after Ethiopian new year.

According to the results, 66% employees replied that employees frequently get training on how to identify & solve a problem, (Mean = 3.62, St. Dev = 1.122). Also, 52.8% of employees agreed that problem solving techniques clearly understood within the farm, while 28.3% of them said it is understood to a moderate extent (Mean = 3.52, St. Dev = 953). Similarly, 62.3% of employees replied that trainings program frequently reviewed to incorporate future needs to more than a great extent, while 22.6% said it is to a little extent (Mean = 3.49, St. Dev = 1.042). 58.5% of employees replied that there is system for people performance development and empowerment to

more than a great extent, while 32% said it is to a moderate extent (Mean = 3.55, St. Dev = .945). 77.3% employees replied that everyone/individuals respected in the organization is to more than a great extent (Mean = 4.04, St. Dev = .848). Since training the employees is very crucial to the journey of excellence the company need to work more on training on technical knowledges of problem solving and identification. According to the respondents the communication culture reflected to a great extent. 64.1% of replies showed that communication is smooth between (Mean = 3.75, St. Dev = 0.952).

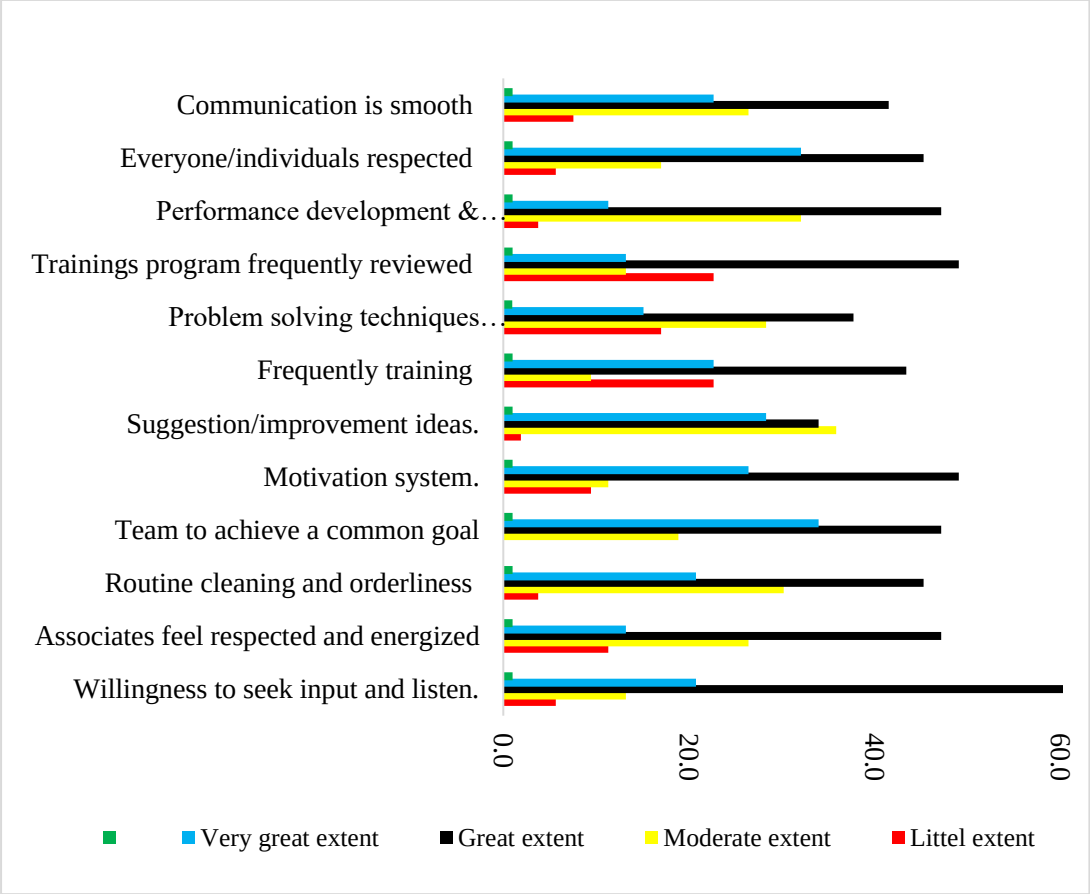

Figure 4:10: Operational excellence culture performance in the company

As shown in the graph above, operational excellence dimension specifically operational excellence culture is reflecting in the company more than to a great extent. This doesn't imply that the company achieved excellence whereas it showed it is the way to excellence.

4.6. Operational excellence dimension - Continuous Improvement

Continuous process improvement initiatives require resource and time and hence should be monitored in order to ascertain and ensure that they are effective and add value to the organization [38]. The focus for continuous improvement cannot be only quality or cost but also must combine all aspects of value as perceived by the customer, including innovation, quality, cost, flexibility, quick delivery and a comprehensive view of environmental, health and safety of the employees. [42]

Table 4.5 OpEx dimension-Continuous Improvement performance in the company

Continuous Improvement	**Mean**	**Std. Deviation**
All inputs are available for a good process and to get intended outputs.	3.87	.850
Leaders frequently evaluate and identify the gaps from the process.	3.64	.915
Employees trained to use scientific thinking to improve the processes.	3.42	1.191
Leaders focus on shortening lead-time from the beginning of the value stream to the end of the value stream.	3.60	.899
Rate of production match with the level of demand	3.92	.853
Processes/ value streams clearly mapped and KPIs determined at different levels.	3.76	1.004
Employees have a mindset of ownership and accountability to not pass defect to the next process	3.73	0.961
Everyone respects individuals in the process.	3.89	.885
Process have consistency & repeatability.	4.02	.688
Process are standardized.	4.02	.688
Leaders insist on direct observation.	3.79	.941
Individuals focus on the collection of all the necessary steps required to deliver value to the customer.	3.92	.889
Everyone keeps things simple and visible in all area.	3.79	.857
Identification and elimination of wastes is known and implemented	3.96	.645
Everyone integrates improvement with their work.	4.04	0.753
Continuous improvement integrated in employee's annual performance targets.	3.81	.756
Leaders relying on Data & Fact in decision making.	3.77	.818

The study found out and summarized as the above table, 71.7% of employees replied all inputs are available for a good process to get intended (Mean = 3.87, St. Dev =

.850). And, 64.2% of employees replied leaders frequently evaluate and identify the gaps from the process (Mean = 3.64, St. = .915). One of the indicator here is production capacity improvement project, as reviewed from the production document. This project leader is R&D section and work with all workers in the specific greenhouse. Pelargonium yield improvement is the project name. Before starting the project, focus team is formulated and one variety selected. Cost benefit analysis done. Project charter prepared. Team brainstormed on the possibilities. Action plan prepared for the trial. Trial done on small area. Analysed the trial result and upscaled to 7.2 hector in 2018/19 production season. Because of this result yield is improved by 6% compared to production season 2016/17, with similar production area. This output enables the farm to increase sales capacity with the same production cost.

From document review, the study found that, the company has yearly process improvement workshop, supervisors and all senior staffs participate in the workshop. One month before the workshop brainstorming session held in two section, one for management team and one for other senior staffs. The brainstorming session focus on process bottlenecks, waste reduction, quality & productivity improvement, employee safety and health, environment protection and any other challenges faced in the business. All the output from brainstorming session collected and summarized by process improvement specialist. Collected ideas/initiatives categorized as quick wins and project initiatives. Ideas categorized based on their implementation time, complexity, investment and payback period, following to cost benefit analysis. One of the output from this process is disinfectant cost saving. It is through replacing expensive disinfectant (Meno) with cheaper price disinfectant (TSP), whereas both disinfectants had similar efficacy. From 2014/15 production season meno consumption is reduced by 64% in 2016/17. This enable the farm to save money (because of company confidentiality policy process improvement workshop process flow and other related documents are not attached)

According to 47.1% of employees reply, employees trained to use scientific thinking to improve the processes (Mean = 3.42, St. Dev = 1.191). Document reviewed that, the company work with known institution to develop employees' skills, like Ethiopian kaizen institute, GETRO Ethiopia & CCL leadership certification companies. Currently second round OpEx 1st level certification training is ongoing for 8

employees which is organized by Syngenta Global Business improvement team. Even though these training were facilitated for more of leaders and senior staffs only. This implies that the company has not working on improving frontline employees' skill.

From the study findings , 56.6% of employees replied leaders focus on shortening lead-time from the beginning of the value stream to the end of the value (Mean = 3.60, St. Dev = .899) 73.6% of employees replied rate of production match with the level of demand (Mean = 3.92, St. Dev = .853). 60.3% of employees replied processes/ value streams clearly mapped and KPIs determined at different levels (Mean = 3.76, St. Dev. = 1.004). 64.2% of employees replied employees have a mindset of ownership and accountability to not pass defect to the next process (Mean = 3.73, St. Dev = 0.961). 77.4% of employees replied everyone respects individuals in the process (Mean = 3.89, St. Dev = .885). Only 24.5% of employees replied and agreed process have consistency & repeatability (Mean = 4.02, St. Dev = .688). This support the next question that, 85% of employees replied process are standardized (Mean = 4.02, St. Dev = .688). Reviewed documents show that the company is working on to standard process and preparing standard operating procedure, process mapping and value stream mapping. Hence, to achieve excellence the company still need to work more on process standardization.

The study recognized that leaders insist on direct observation (Mean = 3.79, St. Dev = .941). 71.7% of employees replied individuals focus on the collection of all the necessary steps required to deliver value to the customer to more than a great extent. 70.8% of employees replied everyone keeps things simple and visible in all area to more than a great extent.

The study also found that, identification and elimination of wastes is known and implemented (Mean = 3.96, St. Dev = .645). 81.1% of employees replied everyone integrates improvement with their work. to more than a great extent.

The study also found that operational excellence approaches are reflected in the case company. As continuous improvement is one of the dimensions that indicate the journey to excellence. Some of the indicators that the company has adopting continuous improvement are, process improvement projects were implemented in the company aiming to reduce production cost and increase productivity. From the

documents reviewed on process improvement projects, Bed steaming project is selected to present here. Objective of bed steaming project was to minimize steaming process time, to improve employee safety and reduce labour cost, since the process required very high number of workforce. Steaming is one of the process take place in the company during greenhouse preparation. It is a process of planting media sterilization; the media must sterilize earlier plant sticking. Before 2016 the company uses chemical for sterilization, which is very harmful chemical. And then improved to bunker steaming method. This process required and increased number of employee, even if the process doesn't use chemical, instead it uses boiler steaming method. Since 2019, the team again come up with different sterilization method, called bed steaming. This is very simple, easy, safer for employees, requires very few employees and cost-efficient process. The company able to reduce number of employees required for this process by 30%, shorten processing time by 45% and it safer for employees. Therefore, improvement stages were; chemical sterilization – to- Bunker steaming – then- Bed steaming (see figure 4.11).

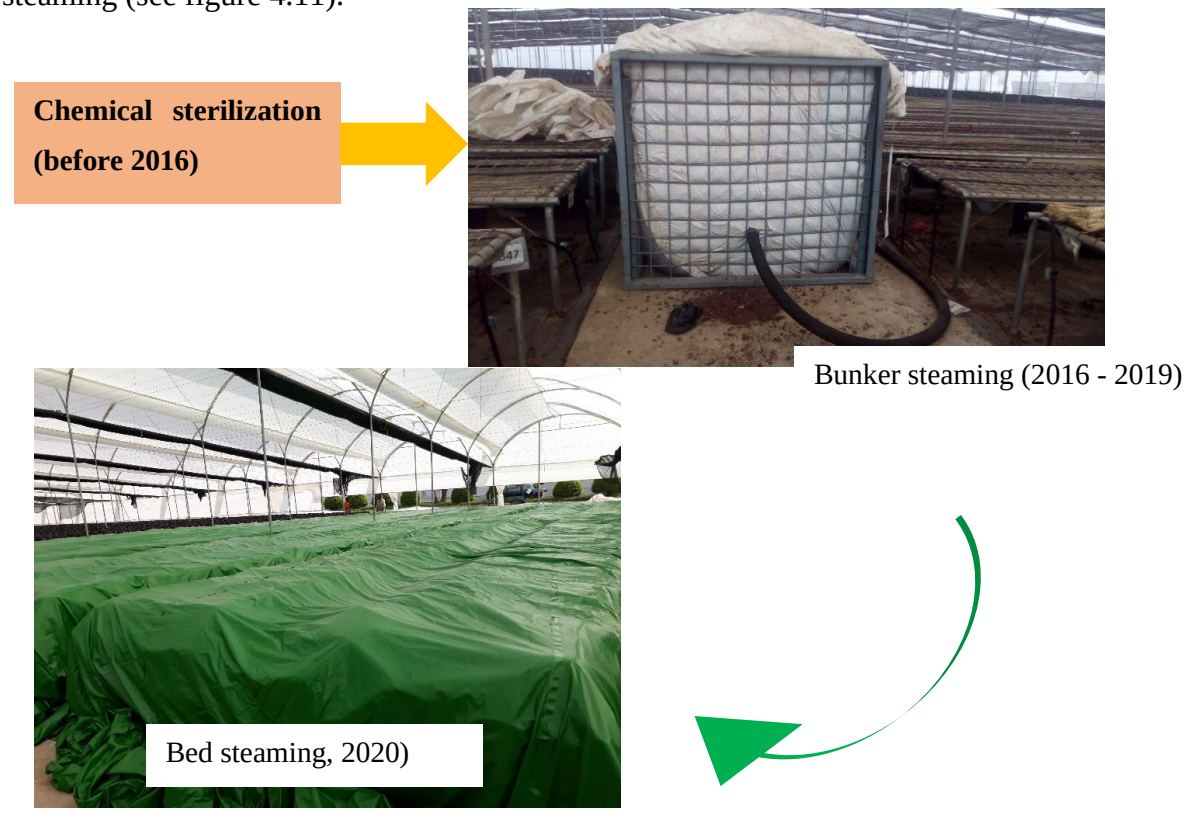

Figure 4: 11. Media sterilization improvement stages in the company

The analgised data found out that, 67.9% of employees replied continuous improvement integrated in employee's annual performance targets (Mean = 3.81, St.

Dev = .756). 67.9% of employees replied leaders relying on Data & Fact in decision making (Mean = 3.77, St. Dev = .818). Whereas this contradict with, everyone integrates improvement with their work. (Mean = 4.79, St. Dev = 5.502). The study is in line with Njenga [38] who concluded implemented continuous improvement had effect on the performance of the company which leads to excellence. These are, services and product quality, streamline organization process, increase organization competitive advantage, increase productivity and reduce waste. To ensure the proper implementation of these projects the company has process improvement specialist employed, who meant to work on continuous improvement initiatives, to control and monitor what had been achieved and what needed improving.

4.7. Operational excellence dimension - Enterprise alignment

To succeed in the business, organizations must develop management systems that align work and behaviours with principles, direction and work commitment, in ways that are simple, comprehensible, actionable and standardized. The significant reason why most of the modern management failed is not focusing on execution, instead they focus on strategy and planning. focusing on aligned execution called "Principle-based Strategy Deployment." [42], enterprise alignment has guiding principle with its focus areas: Create Constancy of Purpose and Think Systemically [25].

Table 4.6 OpEx dimension – Enterprise alignment performance in the company

Enterprise Alignment	**Mean**	**Std. Deviation**
Leaders agree on philosophical and strategic direction that provides a uniting vision.	3.94	.713
Guiding principle established which govern the organization	4.13	.676
A system built to ensure constant communication, both up and down	3.89	.720
Continuous improvement culture sustained.	3.83	.722
Leaders go and see where things happening to assess the current situational realities	3.92	.862
Leaders create a long-term focus.	3.64	.873
All systems aligned.	3.42	.765
Everyone keeps on the same (single) page and pointed in the same direction	3.42	.789
Some level of detailed work description for how to do daily work applies at all levels of the organization	3.62	.938

The study established, 71.7 % of employees replied that leaders agree on philosophical and strategic direction that provides a uniting vision (Mean = 3.94, St. Dev = .713). 83.1% of employees replied guiding principle established which govern the organization (Mean = 4.13, St. Dev = .676). And, 75.5% of employees replied that there is a system built to ensure constant communication, both upward and downward (Mean = 3.89, St. Dev = .720). 75.5% of employees replied continuous improvement culture sustained (Mean = 3.83, St. Dev = .722). This was achieved through increased production efficiencies, improved employee productivity, stronger teamwork and cooperation among the staff and departments, excellent production process and delivery systems, innovation, clarity on roles and responsibilities and alignment of organizational vision, mission and objectives with its day to day activities. The findings imply that the OE strategies being adopted by the case company have helped to sustained continuous improvement culture and contributing to its enhanced and sustained business performance in the market. Whereas this doesn't mean the company has achieved excellence, but it is the indicator of the journey.

The study found that, Leaders go and see where things happening to assess the current situational realities (Mean = 3.92, St. Dev = .862). One of the indicator here, is observation document review result, there is biweekly management visit to the selected area, production team take the lead to organize and sent recurring meeting invitation. All management team members and leaders are forced to have weekly HSE observation inside the site and must report any observation to HSE manager. These observation reports summarized and presented during monthly management meeting.

From the analysed statistics, 60.4% of employees replied Leaders create a long-term focus (Mean = 3.64, St. Dev= .873). And, 51% of employees replied all systems aligned (Mean = 3.42, St. Dev = .765). 41.5% of employees replied Everyone keeps on the same (single) page and pointed in the same direction (Mean = 3.42, St. Dev = .789). 60.4% of employees replied Some level of detailed work description for how to do daily work applies at all levels of the organization (Mean = 3.62, St. Dev = .938). Since the main purpose of the business is growing plant/flower, it is very important to have and to make sure all systems are aligned. Few system in the farm are, daily attendance checking and reporting system, performance related pay system, the system

to distribute and provide proper PPE, cutting/product transportation/collection system from green houses to cold room, chemical spraying system, boxes packaging system, irrigation system, logistics until delivered to the planned destinations, if one of mentioned systems are violated it won't be possible to deliver the right quality product at the right time to the valued customers. The study recommended that the company need to prepare standard operating procedure all over the company for the sake of system alignment.

4.8. Operational excellence dimension - Result

Customer satisfaction assured when the customer information and understanding is mutually shared by marketing and operations. Workers needs to know clearly who their customers are both internal and external and should make customer satisfaction their primary goal through their day to day activity. Customers are served individually and rapidly, and experiences that their need for personalization, high quality, and efficient deliveries are satisfied [31, 43]

Table 4.7 OpEx dimension – Result performance in the company

Result	**Mean**	**Std. Deviation**
Everyone focused on the appropriate strategic activities and driving continuous improvement.	3.68	.773
"voice of the customer" clearly heard throughout the entire organization.	4.02	.791
Leaders systematically discuss all business results with employees, encouraging questions and discussion.	3.83	.797
Leaders follow the linkages to determine the cause-and-effect relationships and how goals can be achieved.	3.87	.703
System to measure customer feedback been developed and put in use.	3.92	.910

The study also recognized that the respondents agreed the following features of operational excellence were reflected in ETCU to a great extent. The features are, 56.6 % of employees replied Everyone focused on the appropriate strategic activities and driving continuous improvement (Mean = 3.68, St. Dev = .773). And, 77.4 % of employees replied "voice of the customer" clearly heard throughout the entire organization (Mean = 4.02, St. Dev = .791). 69.8 % of employees replied Leaders

systematically discuss all business results with employees, encouraging questions and discussion (Mean = 3.83, St. Dev = .797). 68 % of employees replied Leaders follow the linkages to determine the cause-and-effect relationships and how goals can be achieved (Mean = 3.87, St. Dev = .703). 66.1 % of employees replied System to measure customer feedback been developed and put in use (Mean = 3.92, St. Dev = .910). Senior staffs have weekly business Skype/ZOOM call with global sales and marketing team to discuss on customer feedback. External quality report sent to the site weekly basis. |Based on external report and internal report from quality department there is weekly meeting with agronomist, supervisors and team leaders, on that day afternoon they set meeting with all general works. These implies that operational excellence approaches implemented in ETCU have had a significant positive outcome on company performance. These findings are similar with Nyangau [39], concluded that OpEx has the overall means of working that balances stakeholder concerns and increases the chance of long-term organizational success through operational, customer related, financial, and marketplace performance excellence.

4.9. DISCUSSION

Beside improving the performance of business; quality, productivity and delivery time, floriculture business is the industry accused for environmental and socio-economic problems, application of inorganic fertilizers under certain conditions high levels of nitrates are toxic to human beings, pesticides, pollution and waste disposal are the major ones [13]. In addition, socio-economically the industry has a problem with the community like labors are suffering from health problem due to toxic chemicals. The main objective of this study is to identify and learn operational excellence assessment models and their applicability in flower industry, including its dimensions and their impact in order to ensure long-term profitability and consistency of the business, and how operational excellence factors influence sustainability of flower business.

In the manufacturing industry, operational excellence is a mechanism for a continuous production improvement at the simplest minimum cost for profit maximization. It is reaching the height of operational efficiency by doing things better, faster, and cheaper [26]. Whereas a relatively it is a new phenomenon in many service industries, and it refers to a significant increase in performance across various aspects including operations [26, 47 & 53]. It is an approach designed to achieve outstanding production

and delivery systems with excellent technical and social aspects in service industries. In this industry [26] it is about process safety, environmental protection, risk mitigation and achieving a consistent world class performance. In the oil and gas sector, mainly health, safety, environment, and quality are the foundation of operational excellence [48] where every employee, contractors, and the environment understood the operational risks involved. As it is learned from this study, operational excellence has been adopted in different sectors. By ensuring the proper implementation of its dimension's excellence will be achievable in flower farms. The dimensions mainly analyzed in this study which fits with flower industry were, health, safety, environment, culture, continues improvement, enterprise alignment and result.

The analyzed data arranged to asses employee health in the company showed that, operational excellence strategies are reflected in ETCU. Issues concerning employee health like; skin problem, eye problem and respiratory problem are to a little extent. The company adopt good chemical spray practice Well-equipped medium clinic is functioning in the site.

The company has placed a system to asses workplace safety and recognized that it is priority to a company. The main procedures followed in the company were; safety induction given to new employees. Required and appropriate PPE's are provided and control how employees are using. In the case company, employees who work at height must use helmet, safety belt and safety net. Employees must sign work permit when it is required. This implies safety factors are adopted. According to the finding the company set target to achieve 365 days without incident, but this was achieved only for one time.

Protecting the environment by applying environmental standards and the organization placed a system to prevent environment from chemical wastes is to a great extent. The company had done major things to protect the environment. Wastewater treatment machine are running in the site. From the newly operated wetland project the company is benefited to use and recycle wastewater. Whereas there are areas which the company need to work, like, fertilizer recycling and reducing chemical usages.

The study found that Syngenta flowers Ethiopia Cuttings Plc. has been following and adopting operational excellence principles, and suggests that protecting the

environment, health & safety of employees are the first and foremost element within the operational excellence journey of flower business, this is the license to operate. Within all activities it is the objective to ensure the safety and health of all employees, customers, and members of the community while respecting the environment. This is accomplished through doing risk assessment and minimization, employee health protection programs, placing proper workplace assessment system, prioritizing workplace safety in the organization, applying environmental design standards, following appropriate disposal procedure and ensured CSR. The finding was like Chevron [58] who noted that, Operational Excellence is the systematic management of safety, health, environment, to achieve world-class performance and it is one of the strategic intents of Chevron.

It is demonstrated that operational excellence culture is reflected in the site to more than a great extent. This was achieved through, leader's willingness to seek input and listen. Associates feels respected and energized. Workplace organization and teamwork are reflected. Employee motivation system placed and functional. Training programs based on future needs assessed, employee development and empowerment, and ensuring smooth communication. It is interesting to note that, problem solving techniques are not clearly understood within the farm by majority of the employees, alternatively, it could simply mean that training on how to identify & solve a problem is conducted rarely.

This is an important finding in the understanding of operational excellence dimensions have an impact to ensure long-term profitability and consistency of flower business. Continuous improvement factors adopted in the site. all required inputs available., Frequent process evaluation & gap identification occurred in the company. Trainings given to creating scientific thinking. Leaders work on lead time shortening, process mapping and KPIs. Employees has ownership and accountability. Some of the process were standard. Direct observation/go and see is applicable in the farm. And some of continuous improvement indicators were, customer focus, keeping things simple, waste identification and elimination, integrating performance evaluation with improvement, and decision making. This implies that the company has adopted this dimension to a great extent. The finding has similarity with Nyangau [39] that stated

operational excellence strategies emphasis on employees' development and involvement. Emphasis on continuous learning and teamwork, customer focus, putting in place efficient delivery systems. Having an effective and visionary leadership. Investments in information technology to drive innovation. Engaging in mutually beneficial and synergy creating alliances and partnerships. Corporate social responsibility (CSR) and ensuring clarity in the firm's strategic goals. The finding established that there are process not standardized.

The study also found out that enterprise alignment and result has been reflected to a great extent. This supported the company to have uniting vision, establishes guiding principle, constant upward and downward communication, sustained continuous improvement culture, long-term focus, aligned systems, ensuring direction, commitment and alignment in the site. When the other operational excellence dimensions are implemented properly it is automatically ensured that, everyone focused on the appropriate strategic activities and driving continuous improvement, "voice of the customer" clearly addressed, transparency, achieving goal. This is consists with the study by Njenga [38] on the influence of operational excellence strategy on performance of Syngenta East , revealed that adoption of strategies such as teamwork, leadership, customer focus and employee development lead to increase competitive advantage, enhancement of continuous improvement and improving product quality and productivity.

Therefore, combined operational excellence dimensions in this study were, Health, Safety, Environment, culture, continuous improvement, enterprise alignment and result. Those are reflected in the case company to a great extent., and they are factors influence substantivity of the business. The dimensions which are reflected in the analysis can be a good example that the company is going for excellence. As discussed above the seven operational excellence dimensions has strong relation with organizational sustainability, Triple Bottom line. The indicators regarding social aspect were, employee health & safety, corporate social relations and operational labor union. Some of the strengths reflected in the case company were; placing a system to assess workplace safety and putting workplace safety as a first prioritizing, and strictly working for employee's health. About environmental aspect the company is following standard environment protection designs and systems to protect the environment. Then

by continuously doing improvement projects and working to meet customer expectation the company exhibited that economically in a good position. In the context of organizational sustainability, the Triple Bottom Line comes to light, which advocates that the traditional business model, that considers only economic factors in the appraisal of a company, should be expanded to a new model by also contemplating the organization's environmental and social performance, as well as the financial [33]. Operational excellence is the formation of sustainable competitive advantage by consistently accomplishing business strategy than the competitors. Whereas to achieve excellence the gaps need to assessed and improved. Some of the weakens detected in the company were; not having a system of resource recycling, communication system needs to improve, Bright idea program need to reinitiate and must have clear and encouraging award system. Only leaders and seniors understand and know operational excellence tools and technical. Since general workers who are operating day to day operation, they need to understand these tools and technics.

So far there is no clear difference stated between quality award models and operational excellence models, whereas operational excellence principles are a bit broader than quality award principles. The use of assessment tools is one of the approaches that can be adopted by organizations to evaluate the level of operational excellence journey.
most of known models discussed in this study were, Shingo, EFQM Excellence Award, MBNQA and Deming Prize. Based on different assessment models reviewed and the actual case company performance, new assessment model is developed in this study.

4.10. FACTORIAL ANALYSIS

Factor analysis was used to clearly identify certain unobservable operational excellence factors from the observed variables in the case company designed with the objective. The analysis is done using descriptive analysis in SPSS. To select those significantly observed variables, communality used. These commonality values measure the percent of variance in each variable explained by all operational excellence dimensions jointly. This interpreted the consistency of the factors suggested. From the analyzed data the is no communality exceeds 1, this implies that there is no a spurious solution. The table is attached at [Annex 2]. The variables that

have higher commonality value was selected and used. With the support of this analysis 57 variables selected.

Table 4.8: Proposed operational excellence dimensions with their factors

Dimensions	Factors
Health	Work related sickness
	Respiratory tract problems
	Exposer to skin problems
	Exposer to eye problems
	Ergonomics
	Psychology
	Medical insurance
Safety	Physical risks workplace exposures
	Chemical risks workplace exposures
	Biological risks agents managed properly
	Workplace assessment system
	Workplace injuries/accidents
	Prioritizing workplace safety
	Provide Proper PPE
	Controlling and monitoring safety rules and regulations are respected
Environment	Philosophical and cultural commitment
	Applying environmental design standards
	Proper waste disposal
	Conserve and protect water and natural resources
	Energy optimization
	Recycling
	Using Biological controlling methods
Culture	Willingness to seek input and listen.
	Associates feel respected and energized
	Routine cleaning and orderliness
	Team to achieve a common goal
	Motivation system.
	Suggestion/improvement ideas.
	Frequent training
	Problem solving techniques understanding
	Trainings program frequently reviewed
	Performance development & empowerment.
	Everyone/individuals respected
	Smooth Communication

Continuous Improvement	Resource availability
	Frequent evaluation and identification of gaps
	Create scientific thinking
	Shorten lead-time
	Production match with demand
	Placing Value stream mapping and KPI
	Mindset of ownership and accountability
	Everyone respects individuals in the process
	Process consistency & repeatability.
	Process standardization
	Leaders direct observation.
	Deliver value to the customer
	Everyone keeps things simple and visible
	Identification and elimination of wastes
	Integrates improvement with day to day work.
	Continuous improvement integrated with performance targets.
	Relying on Data & Fact in decision making.
	Resource recycling
	Inventory management
	Technology
	Scheduled CI workshop & Ideation program
Enterprise alignment	Uniting vision.
	Guiding principle
	Communication, upward and downward
	Continuous improvement culture sustained.
	Direct Observation
	Long-term focus.
	Aligned system
	Direction focus
	Detailed work description (standard Operating Procedure)
	Information management system
	Emergency response procedure
	Relationship with externals (Gov't, Community & competitors)
Result	Strategic activities and driving continuous improvement.
	"voice of the customer"
	Transparency
	Achieving goals
	Measure customer feedback

Thus, operational excellent dimensions and related factors should be incorporated into the model to be built. Accordingly, the model combines dimensions that help for assessment of operational excellence in flower farms. The below model is designed using factorial analysis.

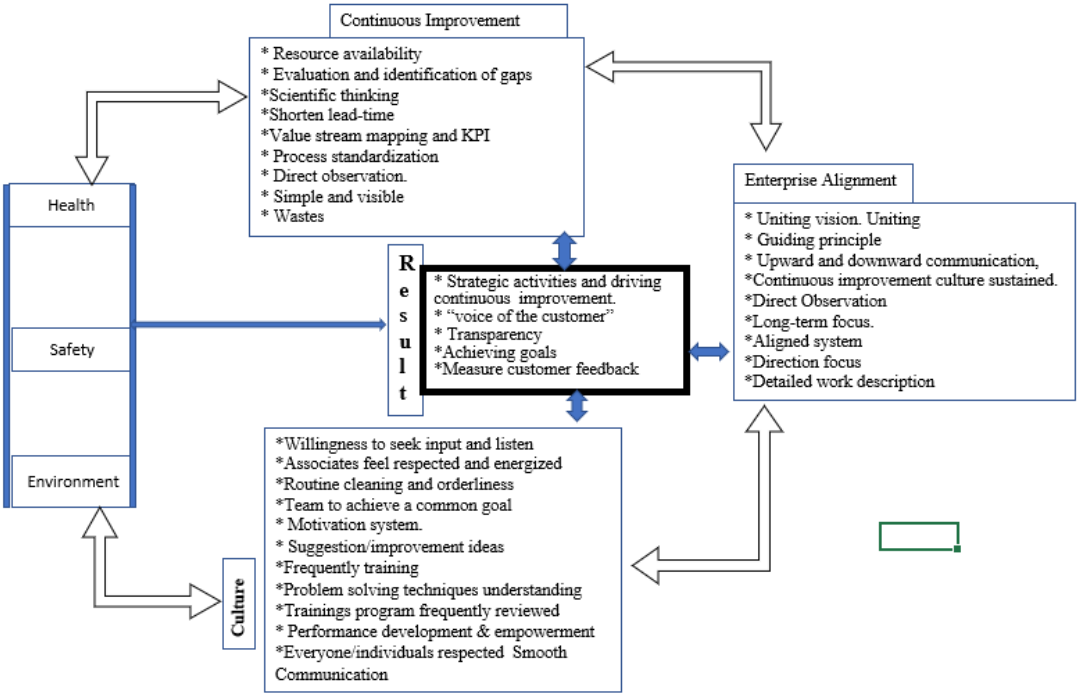

Figure: 4:12: Proposed Operational Excellence model

4.11. MODEL VALIDATION.

Based on the factorial analysis, significant factors in the study selected to develop operational excellence assessment model for flower farms. Expert validation used to validate the proposed assessment model. Employee of Syngenta flowers Ethiopia Cuttings were nominated for the expert validation. The choice was done based on their education background and holistic understanding of the business. According to the selection criteria 9 staffs validated the model. 5 of them were from production,1. head of production, had MBA, 2) Pumphouse head, BSc in horticulture. 3) Operation head, BSc in horticulture 4) Trial specialist, MBA, 5) Technology scientist, Masters of post-harvest management. 1 Finance, Senior accountant, Accounting and finance BA. 1 HR, Assistant. HR manager, Management BA. 1 from IT, IT Manager, Computer

since. 1 from HSE, HSE manager, MBA. Guiding questions used to rate the model and including one open question to get any feedback from the evaluators.

As the expert's responses, 77.7% of them agreed that the model is very good to asses any flower farm operational excellence performance. And 11.11% replied that it is excellent and 11.11% said it is good. In addition to this rating and judgment the expertise recommended and justified to include some parameters in different dimension.

In addition to this rating and judgment the expertise recommended and justified to include some parameters in different dimension. In Health, Ergonomics, workplaces should be designing and arranging to fit the people who use them. Employees need to be Psychology treated in the organization. Medical insurance is one of the privileges that any good company offer. In Safety, if workplace safety is priority to the organization, employees must get appropriate PPE. And there should be Controlling, and monitoring system if safety rules and regulations are respected. In Continues improvement, Resource recycling, inventory management, adoption of technologies and Scheduled CI workshop & Ideation program were the factors recommended to include in this specific dimension.

The experts also recommend that, if any company is working to achieve operational excellence, the company should have to include, Information management system, Emergency response procedure and Relationship with externals (Gov't, Community & competitors) in Enterprise alignment dimension. And it is recommended to link the model with sustainability triple bottom lines, social, environmental and economic aspects. Based on the validation result the below model is amended and designed to fit the objective of the study.

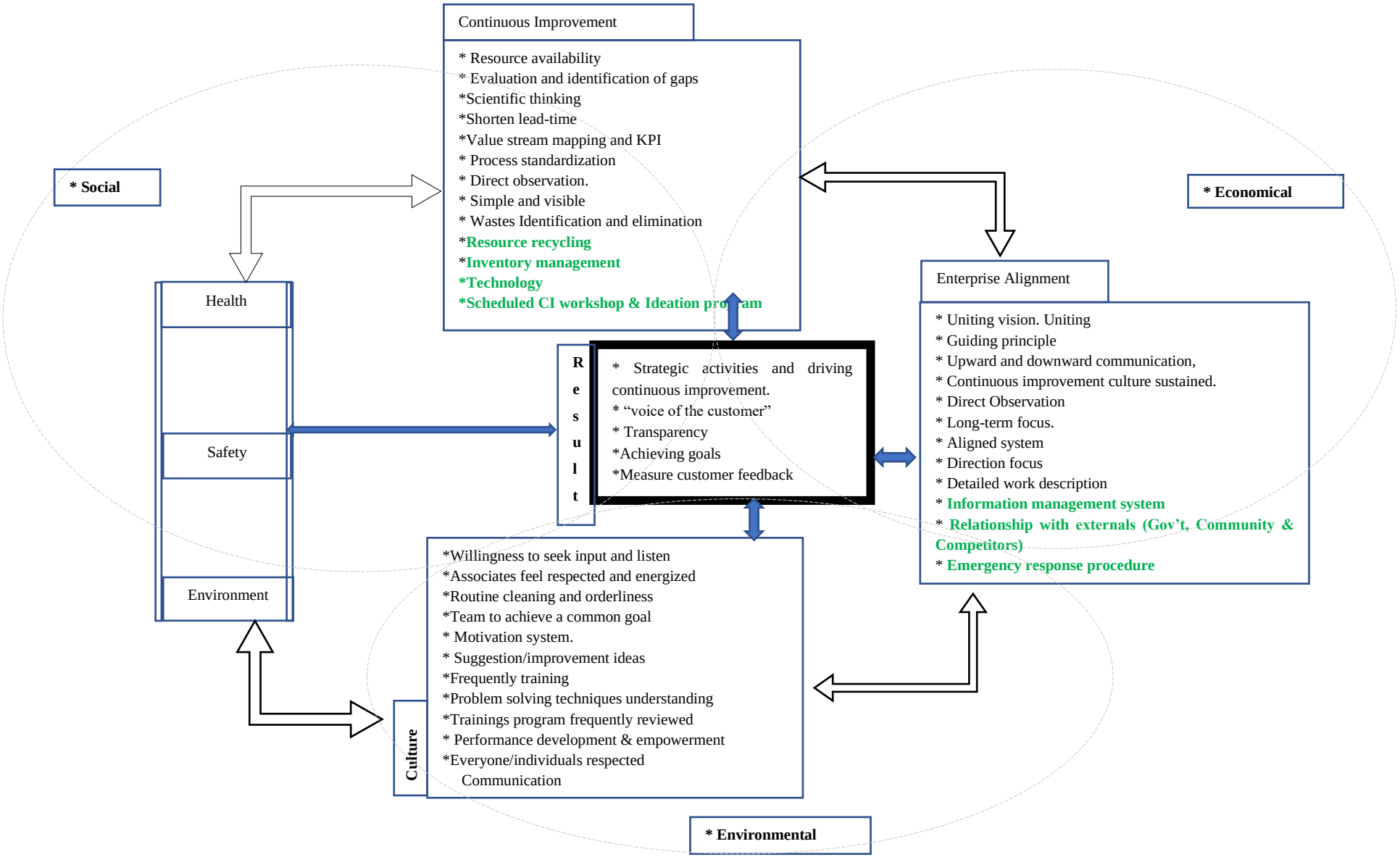

Figure: 4:13: Validated Operational Excellence model

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This research aimed to study operational excellence application and its significance in floriculture industries and looking forward the way to business sustainability and improvement. The study involved collection of quantitative and qualitative data using questionnaire, direct observation and documentation. The quantitative data collected was analyzed by means of descriptive statistics method using SPSS and EXCEL.

The study concluded that Health, Safety, Environment, Culture, Continuous Improvement, Enterprise alignment and Results are the main operational excellence dimension for flower business sustainability. Syngenta flowers Ethiopia cuttings Plc. had adopted various operational excellence strategies with a view of creating better workplace to employees by ensuring their health and safety and attaining a competitive edge in its target market. Operational excellence factors adopted by Syngenta flowers Ethiopia cuttings Plc emphasis on, frequent risk assessment and minimization, employee health protection programs, placing proper workplace assessment system, prioritizing workplace safety in the organization, leader's commitment, applying environmental design standards, following appropriate disposal procedure and ensured corporate social relation.

The study concluded that operational excellence strategies adopted by the case company had a significant influence on its sustainable performance. Sustainability is a state in which an organization or a society exhibits a relation to economical environmental and social aspects [33]. The strategies empowered alignment of people, processes, and technology. These helped the organization to optimize resources, opportunities and performance. The company and its leadership enabled to continuously identify gaps and improve all areas of performance, including decision-making, customer and employee relation and human resources capabilities. They placed emphasis on teamwork and cooperation among the staff and departments, excellent production process and delivery systems, innovation, suggestion system,

clarity on roles and responsibilities. Alignment of organizational vision, mission and objectives with the daily activities

The study also concluded that there are areas which the company are not good at. Since workplace safety is priority to the company, incident free days target is not achieved. Even if the leaders understand operational excellence tools and technic, employees are not aware of these technic and tools. The leaders must work more on to develop the skills and capabilities to train and develop their teams in applying continuous improvement tools and techniques. Resource recycling can be a good contributor for cost saving and environment protection projects. And similarly, the company must work to minimize plant growth regulators (chemicals) consumptions by using adjuvants and biological controlling methods.

And the sustainability of the business directly influenced by operational excellence strategies. All dimensions reflected in this study has shown strong relation with organizational sustainability. These were showed by social aspect, employee health & safety, corporate social relations. Prioritizing workplace safety, strictly working for employee's health. Ensuring standard environment protection designs implementation. Continuously analyzing and improving the process. The whole companies' systems to aligned and working to satisfy customer needs.

5.2 Recommendation

The following recommendations are proposed for the case company, Flower farms in Ethiopia, government policy makers and researchers based on the outcome of the study.

- To stay in the market flower farms, need to make sure all problem concerning employee health, safety and environment protection are systematically improved. So that, the study recommended the company must work to achieve incident free days target. This can be done through revising and changing HSE policies and strategies. Strictly working on safety rule and regulation. Making sure all employees are aware of HSE rule and regulations.

- To protect the environment and better resource utilization the study recommended that the case company to adopt recycling system, mainly fertilized recycling without affecting Phyto protocols is relevant.

- To ensure operational excellence culture, some of the factors are applied partially in the organization. The study recommended to look different employee motivation method. And, the management team should investigate why Bright Idea Program is not sustained.

- To guarantee long-term profitability and consistency of the business sustaining, continuous improvement factors are recommended, it is reflected by, creating scientific thinking for all employees, a natural method for learning and the most effective approach to improvement. creating process mapping and KPIs for all process, ensuring process standardization.

- The study further recommends that Ethiopian flower farm managers or owners should organize training and workshops for their employees to be trained on the concept and technics of operational excellence and how well to implement it. To ensure that they possess the required expertise in the implementation of the concept in the firm and thereby positively contributing to its success in the organization as well as to the country.

- To ensure fair competition in the sector, the study recommended that the government policy makers should incorporate the adoption and implementation of operational excellence.

- Since this study explored operational excellence application and its significance to flower farm and the way to business sustainability and improvement, the study recommended that similar studies should be done more on other farms with different perspectives and objectives, like significance of operational excellence tools and technics and implementation challenges.

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APPENDIX 1

QUESTIONNAIRE-English and Amharic version

Dear Participant,

This research aims to learn how operational excellence help to solve foremost problems in Ethiopian horticulture industry. Researches done in Ethiopia horticulture industry concluded that Health, safety, environment and social problems are the major one which questioned the business sustainability in the sector. Therefore, your truthful and genuine response are highly appreciated and expected to complete this research. Thank you in Advance for your willingness to fill the questionnaire. Your response will be used anonymously, and no individual response will be disclosed in relation to the respondents.

Section A: General Information

1. What is your highest level of education? Master's degree [ ] Bachelor's degree [ ]

Diploma [ ] Certificate [ ] others (specify)……

2. How many years have you worked in this company?

Less than 1 year [ ] 1-5 years [ ] 6-10 years [ ] Over 10 years [ ]

3.How well do you understand Operational Excellence principle? Use a scale of 1-5.

5-To a very great extent [ ]4-To a great extent [ ] 3-To a moderate extent [ ]

2-To a little extent [ ]1-To no extent [ ]

Section B: Operational Excellence performance in the company?

4.To what extent are the following four operational excellence themes are reflected in your company? Use a scale of 1-5 where 5-To a very great extent, 4-To a great extent, 3-To a moderate extent, 2-To a little extent, and 1-To no extent.

1. Health: Safety: Environment:	1	2	3	4	5
There are no employees who are sick because of work related issues					
Respiratory tract problems are not an issue					
Work related injuries/accidents are few or zero					
Employees are not exposed to skin problems					
Employees are not exposed to eye problems					
There is a system placed to assess workplace safety					
Risks associated with physical workplace exposures managed properly					
Risks associated with chemical workplace exposures managed properly					
Risks associated with workplace exposures to biological agents managed properly					
Workplace safety is a priority for the organization.					
Leaders represent a philosophical and cultural commitment of environmental and safety systems.					
The environment protected by applying environmental design standards					
The organization place a system to prevent environment from chemical wastes to the environment					
Conserve and protect water and natural resources?					
Labor union: Is there functional labor union					

2. Culture	1	2	3	4	5
Leader's willingness to seek input and listen.					
Leaders create an environment where associates feel respected and energized					
Routine cleaning and orderliness of workplace areas in place and effectively followed and monitored?					
There is a collaborative effort of team to achieve a common goal					
The company placed employee motivation system.					

All employees are encouraged to bring suggestion/improvement ideas.					
Employees frequently get training on how to identify & solve a problem.					
Problem solving techniques clearly understood within the farm.					
Trainings program frequently reviewed to incorporate future needs					
There is system for people performance development and empowerment.					
Everyone/individuals respected in the organization.					
Communication is smooth between individuals.					

3. Continuous improvement					
All inputs are available for a good process and to get intended outputs.					
Leaders frequently evaluate and identify the gaps from the process.					
Employees trained to use scientific thinking to improve the processes.					
Leaders focus on shortening **lead-time** from the beginning of the value stream to the end of the value stream.					
Rate of production match with the level of demand					
Processes/ value streams clearly mapped and KPIs determined at different levels.					
Employees have a mindset of ownership and accountability to not pass defect to the next process					
Everyone respects individuals in the process.					
Process have consistency & repeatability.					
Process are standardized.					
Leaders insist on direct observation.					

Individuals focus on the collection of all the necessary steps required to deliver value to the customer.					
Everyone keeps things simple and visible in all area.					
Identification and elimination of wastes is known and implemented					
Everyone integrates improvement with their work.					
Continuous improvement integrated in employee's annual performance targets.					
Leaders relying on Data & Fact in decision making.					

4. Enterprise alignment					
Leaders agree on philosophical and strategic direction that provides a uniting vision?					
Guiding principle established which govern the organization					
A system built to ensure constant communication, both up and down					
Continuous improvement culture sustained.					
Leaders go and see where things happening to assess the current situational realities					
Leaders create a long-term focus.					
All systems aligned.					
Everyone keeps on the same (single) page and pointed in the same direction					
Some level of detailed work description for how to do daily work applies at all levels of the organization					

5. Result					
Everyone focused on the appropriate strategic activities and driving continuous improvement.					
"voice of the customer" clearly heard throughout the entire organization.					

Leaders systematically discuss all business results with employees, encouraging questions and discussion.					
Leaders follow the linkages to determine the cause-and-effect relationships and how goals can be achieved.					
System to measure customer feedback been developed and put in use.					

Thank you for your time!

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ኦፕሬሽናል ኤክሰለንስ ዘላቂነት እና ቀጣይነት ላለው ሲንጀንታ ኢትዮጵያ ከቲንግ ታ.የተ.የግ.ማ የላቀ አፈፃፀም

ውድ ተሳታፊዎች

ይህ ጥናት አላማ ያደረገው ኦፕሬሽናል ኤክሰለንስ እንዴት የኢትዮጵያ አበባ ፋርሞች ውስጥ የሚታዩ ችግሮችን መፍታት ያስችላል የሚለውን ለመማር ነው። በኢትዮጵ አበባ ፋርሞች ውስጥ የተሰሩ ጥናቶች እንደሚያሳዩት የጤና ፣ የደህንነት ፣ የሰራተኞች በአካባቢ ላይ የሚያደርሱት ጉዳት እና የሰራተኞች የመደራጀት መብት ችግሮች ቢዝነሱ በገቢያ ውስጥ አትራፊ ሆኖ ለረጅም ጊዜ መቆየት እንዳላስቻለው ሲሆን፤ የርሶም እውነተኛ እና ታዕማኒ ለሆነ ምላሽ በቅድሚያ አመሰግናለው። ከእርሶ የማገኘውን ማንኛውንም አይነት ምላሽ በሚስጥር የሚያዝ መሆኑን ላረጋግጥሎት እወዳለሁ።

ክፍል ሀ ፡ አጠቃላይ መረጃ

5. ከፍተኛ የትምህርት ደረጃዎን ከሚከተለው ውስጥ ይምረጡ
ሁለተኛ ድግሪ ( ) የመጀመሪያ ድግሪ ( ) ዲፕሎማ ( ) ሰርተፍኬት ( )
ሌላ.....

6. በድርጅቱ ውስጥ ለምን ያህል ግዜ አገልግለዋል?
ከአንድ አመት በታች ( ) 1-5 አመት ( ) 6-10 አመት ( ) ከ10 አመት በላይ ( )

7. ኦፕሬሽናል ኤክሰለንስን ምን ያህል ተረድተውታል? እባኮትን የሚከተለውን ከ1-5 ያለውን መለኪያ ይጠቀሙ።
5 እጅግ በጣም ( ) 4. በጣም ( ) 3.መሀከለኛ ( ) 2. መጠነኛ ( ) 1.ምንም ( )

ክፍል ለ. ኦፕሬሽናል ኤክሰለንስ በድርጅቱ ውስጥ ያለው አፈፃፀም

ከዚህ በታች ያሉት ጥያቄዎች ኦፕሬሽናል ኤክሰለንስ በድርጅቱ ውስጥ በምን ያህል ደረጃ እንደሚንፀባረቅ ለመረዳት ነው። ከ1-5 ያለውን መለኪያ ይጠቀሙ፤ 5. እጅግ በጣም 4. በጣም 3.መሀከለኛ 2.መጠነኛ 1. ምንም .

1. ጤና: ደህንነት: አከባቢ	1	2	3	4	5
ከስራ ጋር በተያያዘ ችግር ምክንያት የታመሙ ሰራተኞች አሉ?					
የመተንፈሻ አካላት ህመም በድርጅቱ ችግር ነው?					
በስራ ላይ እያሉ ጉዳት የደረሰባቸው ሰራተኞች አሉ?					
ሰራተኞች ለቆዳ በሽታ የተጋለጡ ናቸው?					
ሰራተኞች ለዓይን በሽታ ለሚዳርጉ ነገሮች የተጋለጡ ናቸው?					
የስራ ቦታ ደህንነትን ለመዳሰስ የሚረዳ አሰራር አለ?					
አካላዊ ጉዳት ሊያስከትሉ የሚችሉ የስራ ቦታዎቸወ ተገቢ ቁጥጥር ይደረግባቸዋል?					
ጉዳት ሊያስከትሉ የሚችሉ ኬሚካል ያለባቸው የስራ ቦታዎቸወ ተገቢ ቁጥጥር ይደረግባቸዋል					
ስነ ተፈጥሮአዊ ጉዳት ሊያስከትሉ የሚችሉ የስራ ቦታዎች ተገቢ ቁጥጥር ይደረግባቸዋል					
የስራ ቦታ ደህንነት ቅድሚያ ይሰጠዋል					
ኃላፊዎች ለሰራተኞች ድህንነት እና ለአከባቢ እንክብካቤ በትኩረት ይሰራሉ					
የአከባቢ ደህንነት ለአከባቢ ደህንነት በተዘጋጀ ደረጃ መሰረት ይተገበራል					
ድርጅቱ አካባቢው ከኬሚካል ፍሳሾች የመከላከያ አሰራር አለው					
ውሃ እንዲሁም ተፈጥሮአዊ ነገሮች ቁጠባ እና እንክብካቤ ይደረግላቸዋል					
የሰራተኞች ማህበር በተገቢው ሁኔታ ይሰራል					

2. የስራ ባህል	1	2	3	4	5
ኃላፊዎች ከስራተኞች የሚመጡ ሀሳቦችን ይቀበላሉ					
ኃላፊዎች ሰራተኞች የሚነቃቁበትን እና የመከበር ስሜት ተሰምቶአቸው የሚሰሩበትን የስራ ሁኔታ ይፈጥራሉ					
የስራ አከባቢዎች የተደራጁ እና ፅዱ ናቸው					
ሰራተኞች በጋራ ለአንድ ዓላማ ይሰራሉ					
ሰራተኞችን በሰሩት ስራ መጠን የማበረታታ አሰራር አለ					
ሁሉም ሰራተኞች የማሻሻያ ሀሳብ እንዲያመጡ ይበረታታሉ					
ችግር በመለየት እና በመፍታት ዙሪያ ለሰራተኞች ስልጠና ይሰጣል					
ችግር የመፍታ መንገዶች ሰራተኞች በደንብ ያውቋቸዋል					
የወደፊት ስራን በሚጠቅም መልኩ ስልጠናዎች ይሰጣሉ					
ሰራተኞች አቅማቸውን የሚያሳድጉበት እና ለተሻለ ስራ የሚበረታቱበት አሰራር አለ					
ሁሉም ሰራተኛ በድርጅቱ ውስጥ የተከበረ ነው					
በሰራተኞች መሀል ግልፅ እና ቀላል የሆነ መግባባት አለ					

3. ቀጣይነት ያለው መሻሻል					
ለስራ የሚያስፈልጉ ሁሉመ ግብአቶች ዝግጁ ናቸው					
አለቆች በስራ ላይ የሚያጋጥሙ ችግሮችን በየጊዜው ይገመግማሉ					
የአሰራር ሂደቱን ለማሻሻል ሰራተኞች ስልጠና ይሰጣቸዋል					
አለቆች ምርት ማምረቻ ሰዓት ማሳጠር ላይ በትኩረት ይሰራሉ					
ደንበኛ የሚፈልገው ያህል ምርት ይመረታል					
የስራ ሂደት ፍሰት እና የስራ ውጤት መለኪያዎች በየደረጃው ተቀምጠዋል					

ሰራተኞች ስራቸውን በተጠያቂነት በመስራት ለሚቀጥለው ክፍል የተበላሸ ስራ አያስተላልፉም					
ሁሉም ሰራተኛ በመከባበር ይሰራል					
ሁሌም የሚሰሩ ስራዎች ተመሳሳይ እና ተደጋጋሚ ናቸው					
ስራዎች ወጥ የሆነ የአሰራር ሂደት አላቸው					
አለቆች አዘውትረው የስራ ቦታዎችን ይጎበኛሉ					
ለደንበኛው ጥሩ ምርት ለማቅረብ ሰራተኞች እያንዳንዱ ስራቸውን በጥንቃቄ ይሰራሉ					
ሁሉም ሰራተኛ ስራውን ቀላል እና ግልፅ ያደርገዋል					
ብክነት የመለየት እና የማስወገድ ስራ የሚታወቅ እና ተግባራዊ ነው?					
ሁሉም ሰራተኛ ቀጣይነት ያለው መሻሻልን በሚሰራው ስራ ላይ ተግባራዊ ያደርጋል					
ቀጣይነት ያለው የማሻሻል ስራ ከሰራተኞች ዓመታዊ ምዘና ጋር የተቀናጀ ነው					
አለቆች የሚወስኗቸው ውሳኔዎች በመረጃ ላይ መሰረት ያደረጉ ናቸው					

4. ድርጅታዊ መቀናጀት					
አመራሮች አንድነት የሚያመጣ ራዕይን በሚሰጥ ፍልስፍና እና ስልታዊ አቅጣጫ ላይ ይስማማሉ					
ድርጅቱ የሚመራበት መመሪያ ተዘጋጅቶል					
ወደ ላይም ሆነ ወደ ታች ቋሚ ግንኙነትን የሚያረጋግጥ ስርዓት አለ					
ቀጣይነት ያለው የማሻሻያ ባህል በድርጅቱ ውስጥ ሰርፆል					
አለቆች በስራ ቦታዎች ተጨባጭ ሁኔታን ለመገምገም ስራዎች እየተሰሩ ያሉበት ቦታ በመሄድ ይመለከታሉ					
አለቆች የረጅም ጊዜ እቅድ ተግባራዊ ያደርጋሉ					

ሁሉም የአሰራር ሂደቶች በቅንጅት ይሰራሉ					
ሁሉም ሰራተኛ በተመሳሳይ ሁኔታ እና በተመሳሳይ አቅጣጫ ስራውን ይሰራል					
የዕለት ተዕለት ሥራን እንዴት ማድረግ እንደሚቻል የተወሰነ ዝርዝር የሥራ መግለጫ በሁሉም የድርጅት ደረጃዎች ይተገበራል					

5. ውጤት					
ሁሉም ሰው በተገቢው የስትራቴጂክ እንቅስቃሴዎች ላይ እና ቀጣይነት ባለው መሻሻል ላይ ያተኩራል					
በድርጅቱ ውስጥ “የደንበኛው ድምፅ” ወይም የደንበኛው ፍላጎት በግልጽ ይታወቃል					
አመራሮች ሁሉንም የንግድ ውጤቶች ከሠራተኞች ጋር በስርዓት ይወያያሉ ፣ ጥያቄዎችና ውይይቶችንም ያደርጋሉ					
አለቆች የመንስሄ እና የውጤት ትስስርን ከግብ ለመድረስ ይጠቀሙበታል					
የደንበኞችን ግብረመልስ መለካት የሚያስችል አሰራር አለ					

አመሰግናለሁ!

APPENDIX 2- FACTORIAL ANALYSIS

Communalities

	Initial	Extraction
What is your highest level of education?	1.000	.892
How many years have you worked in this company?	1.000	.844
How well do you understand Operational Excellence principle? Use a scale of 1-5.	1.000	.834
Are there employees who are sick because of work related issues	1.000	.866
Respiratory tract problems are an issue in the company	1.000	.792
Work related injuries/accidents are few or zero in the company	1.000	.820
Employees are exposed to skin problems	1.000	.791
Employees are exposed to eye problems	1.000	.819
There is a system placed to assess workplace safety	1.000	.877
Risks associated with physical workplace exposures managed properly	1.000	.849
Risks associated with chemical workplace exposures managed properly	1.000	.925
Risks associated with workplace exposures to biological agents managed properly	1.000	.902
Workplace safety is a priority for the organization.	1.000	.864
Leaders represent a philosophical and cultural commitment of environmental and safety systems.	1.000	.907
The environment protected by applying environmental design standards	1.000	.760
The organization place a system to prevent environment from chemical wastes to the environment	1.000	.935
Conserve and protect water and natural resources?	1.000	.893
Labor union: Is there functional labor union	1.000	.884
Leader’s willingness to seek input and listen.	1.000	.755
Leaders create an environment where associates feel respected and energized	1.000	.899
Routine cleaning and orderliness of workplace areas in place and effectively followed and monitored?	1.000	.813
There is a collaborative effort of team to achieve a common goal	1.000	.808
The company placed employee motivation system.	1.000	.878
All employees are encouraged to bring suggestion/improvement ideas.	1.000	.892
Employees frequently get training on how to identify & solve a problem.	1.000	.925

Problem solving techniques clearly understood within the farm.	1.000	.946
Trainings program frequently reviewed to incorporate future needs	1.000	.924
There is system for people performance development and empowerment.	1.000	.893
Everyone/individuals respected in the organization.	1.000	.878
Communication is smooth between individuals.	1.000	.853
All inputs are available for a good process and to get intended outputs.	1.000	.840
Leaders frequently evaluate and identify the gaps from the process.	1.000	.850
Employees trained to use scientific thinking to improve the processes.	1.000	.914
Leaders focus on shortening lead-time from the beginning of the value stream to the end of the value stream.	1.000	.882
Rate of production match with the level of demand	1.000	.920
Processes/ value streams clearly mapped and KPIs determined at different levels.	1.000	.885
Employees have a mindset of ownership and accountability to not pass defect to the next process	1.000	.935
Everyone respects individuals in the process.	1.000	.937
Process have consistency & repeatability.	1.000	.750
Process are standardized.	1.000	.836
Leaders insist on direct observation.	1.000	.774
Individuals focus on the collection of all the necessary steps required to deliver value to the customer.	1.000	.870
Everyone keeps things simple and visible in all area.	1.000	.911
Identification and elimination of wastes is known and implemented	1.000	.874
Everyone integrates improvement with their work.	1.000	.844
Continuous improvement integrated in employee's annual performance targets.	1.000	.887
Leaders relying on Data & Fact in decision making.	1.000	.884
Leaders agree on philosophical and strategic direction that provides a uniting vision.	1.000	.943
Guiding principle established which govern the organization	1.000	.877
A system built to ensure constant communication, both up and down	1.000	.869
Continuous improvement culture sustained.	1.000	.774
Leaders go and see where things happening to assess the current situational realities	1.000	.887
Leaders create a long-term focus.	1.000	.889

All systems aligned.	1.000	.838
Everyone keeps on the same (single) page and pointed in the same direction	1.000	.891
Some level of detailed work description for how to do daily work applies at all levels of the organization	1.000	.857
Everyone focused on the appropriate strategic activities and driving continuous improvement.	1.000	.805
“voice of the customer” clearly heard throughout the entire organization.	1.000	.926
Leaders systematically discuss all business results with employees, encouraging questions and discussion.	1.000	.895
Leaders follow the linkages to determine the cause-and-effect relationships and how goals can be achieved.	1.000	.885
System to measure customer feedback been developed and put in use.	1.000	.951

Extraction Method: Principal Component Analysis.

APPENDIX 3: EXPERT VALIDATION QUESTIONS

Expert judgement guiding questions

Dear Participant, the below questions are arranged aiming to validate the model prepared to asses flower farms operational excellence performance. Kindly evaluate the model based on these guiding questions.

1. How do you see the model concerning employee health protection?

Poor☐ Fair☐ Good☐ Very Good ☐ Excellent ☐

2. How do you see the model in workplace safety?

Poor☐ Fair☐ Good☐ Very Good ☐ Excellent ☐

3. How do see the model in protecting the environment.

Poor☐ Fair☐ Good☐ Very Good ☐ Excellent ☐

4. How do you see the model in sustain operational excellence culture in the farm?

Poor☐ Fair☐ Good☐ Very Good ☐ Excellent ☐

5. How do you see the model for continuous improvement?

Poor☐ Fair☐ Good☐ Very Good ☐ Excellent ☐

6. How do you see the model in enterprise alignment?

Poor☐ Fair☐ Good☐ Very Good ☐ Excellent ☐

7. How do you see the model integrating all the dimensions and brought good result to the business?

Poor☐ Fair☐ Good☐ Very Good ☐ Excellent ☐

8. Anything you recommend adding in the model?

_____

_____

_____

Thank you!