

**SUSTAINABLE BUSINESS PRACTICE AND CASE
STUDY OF SUSTAINABLE ORGANIC FARMS IN
NEPAL**

**Jyväskylä University
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ABSTRACT

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Title Sustainable business practice and case study of Nepalese organic farms	
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Abstract <p>Sustainability has become a paramount topic at present time. Emerging and long-running businesses want to be sustainable and have been working towards achieving it. Initially, companies used to be sustainable for reputation but now they have understood its importance and aiming on minimising environmental impact, maximising economy and improving social impact. From building sustainable technology to producing sustainable food as well as good employee management, companies have been trying their best to bring sustainable change.</p> <p>Nepal is a developing country where the main source of income is agriculture. Agriculture sector is a huge means of support to Nepalese people and many people still fully depend on agriculture for livelihood. With growing consumer awareness, the demand for organic products is increasing rapidly in Nepal, which contributes to the establishment of organic farms. In the theoretical section, sustainability and sustainable business practice in general is explained. Henceforth, research has been conducted on sustainable practices around the world, and how it resonates with practices in prominent organic farms of Nepal.</p> <p>In this research, sustainability practices in different organic farms have been analysed. Even though sustainability is a new emerging topic in Nepal and not all the business adapts sustainability. The main idea was to analyse what sustainable practices are performed in organic farms, what the current challenges are and how it can be resolved with a proposed framework. The research finding shows the result from different organic farms and their sustainability choices. Different types of problems and solutions were analysed and a conceptual framework was designed considering different factors and the current situation which can be implemented to make farms more sustainable.</p>	
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<p>Tiivistelmä</p> <p>Kestävyydestä on tullut tärkein aihe tällä hetkellä. Kehittyvät ja pitkään toimivat yritykset haluavat olla kestäviä ja ovat pyrkineet sen saavuttamiseen. Alun perin yritysten maine oli kestävä, mutta nyt ne ovat ymmärtäneet sen merkityksen ja pyrkineet minimoimaan ympäristövaikutukset, maksimoimaan talouden ja parantamaan sosiaalisia vaikutuksia. Yritykset ovat yrittäneet parhaansa mukaan kestävän muutoksen aikaansaamiseksi kestävän teknologian rakentamisesta kestävän ruoan tuottamiseen sekä hyvään henkilöstöhallintoon.</p> <p>Nepal on kehitysmaa, jossa pääasiallinen tulonlähde on maatalous. Maatalouden ala on valtava keino tukea nepalilaisia, ja monet ihmiset ovat edelleen täysin riippuvaisia maataloudesta toimeentulonsa puolesta. Kuluttajien tietoisuuden kasvaessa luomutuotteiden kysyntä kasvaa Nepalissa nopeasti, mikä edistää luomutilojen perustamista. Teorettisessa osassa selitetään kestävyys ja kestävä liiketoimintakäytäntö yleensä. Tästä lähtien on tutkittu kestäviä käytäntöjä ympäri maailmaa ja kuinka se resonoi Nepalin merkittävien luomutilojen käytäntöjen kanssa.</p> <p>Tässä tutkimuksessa on analysoitu kestävän kehityksen käytäntöjä eri luomutiloilla. Vaikka kestävyys on uusi ilmiö Nepalissa, eikä kaikki yritykset sovi kestävyttä. Pääajatuksena oli analysoida mitä kestäviä käytäntöjä syntyy luomutiloilla, mitkä ovat nykyiset haasteet ja miten se voidaan ratkaista ehdotetulla kehyksellä. Tutkimustulos osoittaa erilaisten orgaanisten tilojen tuloksen ja niiden kestävyysvalinnat. Eri tyyppisiä ongelmia ja ratkaisuja analysoitiin ja suunniteltiin käsitteellinen kehys, jossa otetaan huomioon erilaiset tekijät ja nykytilanne, jotka voidaan toteuttaa mautilojen kestävyden parantamiseksi.</p>	
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CONTENTS

1	INTRODUCTION	7
1.1	Topic discussion.....	7
1.2	Research question	7
1.3	Structure of thesis	8
2	THEORETICAL FRAMEWORK	9
2.1	Sustainability	9
2.2	Sustainable business practice	11
2.2.1	Social dimension	12
2.2.2	Environmental dimension.....	12
2.2.3	Economic dimension	14
2.3	Sustainable marketing.....	14
2.3.1	Customers (Product)	15
2.3.2	Cost (Price).....	16
2.3.3	Communication (Promotion).....	16
2.3.4	Convenience (Place)	17
3	RESEARCH FRAMEWORK	18
3.1	Sustainable business case examples around the world.....	18
3.1.1	Orsted	18
3.1.2	Neste	19
3.1.3	Cisco System Inc	19
3.1.4	Chr. Hansen Holding A/S	19
3.1.5	Autodesk.....	20
3.1.6	Good eggs	20
3.1.7	Impossible foods	20
3.1.8	Advancing Eco Agriculture	21
3.1.9	Freight Farm	21
3.1.10	Niman Ranch.....	21
3.2	Sustainable farming.....	22
3.2.1	Crop rotation	23
3.2.2	Intercropping.....	23
3.2.3	Organic farming.....	24
3.2.4	Permaculture	25
3.2.5	Natural pest management	25
3.2.6	Use of renewable energy	26
3.2.7	Proper water management.....	26
3.3	Agriculture and organic farming in Nepal	27
3.3.1	Traditional and Modern farming system.....	28
3.3.2	Organic Farming in Nepal.....	29
3.3.3	Status of Organic farming in Nepal	30
3.3.4	Sustainability in organic farming	31

4	METHODS AND DATA	33
5	RESEARCH FINDINGS AND ANALYSIS.....	35
5.1	Sustainable business case in different organic farms in Nepal	35
5.1.1	Panchawoti Agro farm.....	35
5.1.2	Hasera agriculture research and training centre.....	40
5.1.3	Shree Tara Cow and Organic Farm.....	41
5.1.4	Everything Organic Nursery (Evon).....	41
5.1.5	Jhule Organic Farm	42
5.1.6	Site Ba Organic Agriculture Farm	43
5.1.7	Ashapuri Organic Farm	43
5.1.8	Herb Nepal	44
5.2	Interview and data collection.....	44
5.3	Interview results	46
5.3.1	Hasera Agriculture research and training center.....	46
5.3.2	Shree tara cow and Organic farm.....	47
5.3.3	Everything Organic Nursery	48
5.3.4	Progress of Panchawoti Agro farm	49
5.3.5	Jhuley organic farm	50
5.3.6	Site Ba Organic Agriculture	51
5.3.7	Ashapuri Organic Farm	52
5.3.8	Herb Nepal	53
6	DISCUSSION	55
6.1	Government rules, policies and certification.....	55
6.2	Conceptual framework for integrating sustainable business practice in Nepalese organic farms.....	57
7	CONCLUSIONS.....	60
	REFERENCES.....	62
	APPENDIX 1	69

LIST OF TABLES AND FIGURES

Figure 1: Three dimension of sustainable business practice	11
Figure 2: Conceptual framework for sustainable agriculture in Nepal.....	58
Table 1: Ongoing and future projected costs of daily meals	36
Table 2: Interview participants	45

1 INTRODUCTION

1.1 Topic discussion

In recent times, sustainability in business has become a rising topic. There are various companies integrating sustainable practice in their business. However, the case is different in developing countries like Nepal. Nepal is an agricultural country where the majority of the population is fully dependent upon agriculture. Agricultural sector in Nepal is degrading due to high use of chemical fertilizer (Deshar, 2013). Likewise, only some organisations are thoughtful about organic production and not many organisations practice sustainability at their business. Sustainability is still a new topic in case of business in Nepal as there are several factors crippling the development process such as a weak government system and political instability (Chaudary, 2018).

Agriculture sector being a major source of income to Nepalese people is critical to understand where it is going and what can be done to improve it. Nowadays with modernisation, Nepalese agriculture practice is transforming from conventional to organic as there are many organic farms established throughout Nepal and the demand of organic products is increasing day by day as the consumers realize the health benefits from organic consumption. However, there are different factors hindering the practice which must be studied (Dahal and Dhakal, 2016)

There has not been abundant research done on organic farming and sustainability practices in Nepal. Hence, I wanted to write my thesis related to agriculture business, especially focusing on organic farming as I have done my internship on establishing a sustainable organic farm in Nepal. Therefore, I will be using my experience, practical expertise and theoretical knowledge to complete this thesis.

1.2 Research question

The research aims to describe the current state of sustainability and sustainable business practice in general and around the world; and how those practices are implemented in organic farms of Nepal. The thesis aims to underline the current situation of organic farming and sustainability practices of organic farms in Nepal in detail. The thesis also examines how sustainability is integrated in Nepalese organic farms and what can be done for further improvement. A conceptual sustainability framework will be designed on the basis of the research according to the rules, regulations, infrastructures and present situation of the organic farms.

The main research questions are as follows:

Current state of sustainability integration into organisational practice in organic farms in Nepal and proposal of an improved sustainable model.

The sub questions are:

1. What are the sustainable business practices around the world?
2. How sustainable are Nepalese organic farms?
3. What kind of framework is needed for integrating sustainable business practice in Nepalese organic farms in the present context?

The thesis will have numerous theoretical and practical implications. The theory section will contain literature on sustainability in general, sustainable business practice, sustainable marketing, sustainable business cases around the world and sustainability in organic farms. Similarly, on the practical side, current status of organic farms in Nepal and sustainability integration in organic farms will be studied in depth and conceptual framework will be suggested for further improvement.

1.3 Structure of thesis

The thesis discusses sustainability in six chapters. Chapter 1 is introduction where discussion has been made about thesis topic and the reasons for the choice of this topic. Similarly, Chapter 2 describes the theoretical research made on the field of sustainability and sustainable business practice in general. Likewise, Chapter 3 is research framework which describes in detail about the research done about various sustainable companies around the world, sustainable farming practices and explains in detail about sustainability practices in the agriculture and organic sector of Nepal. Chapter 4 exhibits methodological choices and research finding of sustainable business case in different organic farms. Chapter 5 comprises discussion and suggestion of conceptual model for sustainable business practice in organic farms of Nepal. Finally, chapter 6 concludes the research and suggests the changes needed for improvement.

2 THEORETICAL FRAMEWORK

2.1 Sustainability

Sustainability is one of the pressing topics in present time. As the population in the world increases, the demand for resources increases. More use of resources has brought more problems in the society. However, contemporarily people have become more concerned about the protection of the environment and society. In this context, sustainability has become a mid-way to protect the future by using and maintaining the resources in a responsible manner.

Sustainability has been defined in various terms in different books where some have defined it as the ability to use the resources in a responsible manner so that they are not all consumed while others have defined it as educational practice for developing countries and universities (Kelly, 2009 and Aber, 2009). The understanding of sustainability by students and local communities helps to turn the concept sustainability into usability. However, the basic theme of all the definitions is that the resources on earth should not be overused as exploitation of these resources will make circumstances difficult. Among others, Brundtland (1987) has tried to sum up everything and defined it in most simple terms. According to Brundtland (1987), "sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Sustainability is classified into three aspects; which are social, economic and environmental (Elkington, 1997). The concept of three pillars of sustainability focuses on profit, people and planet. The aim of these pillars is to help companies to measure its achievements and growth in terms of profit, impacts on society and the environment (Haris, 2000 and Alhaddi, 2015). These aspects help people to understand sustainability on a deeper level and aware them about its advantages and disadvantages. The businesses which are familiar with sustainability aspects are already a step forward in the business world. Sustainable development is possible only if there is balance between these three pillars. Therefore, to balance these pillars of sustainability, there is also a need for supportive practices and policies. If these three pillars of sustainability are not balanced then the whole system will be unsustainable. However, in many cases and many countries, sustainability is viewed more from an environmental point of view where other aspects are ignored and are moreover stuck with environmental management. Both Dalal Clayton and Bass (2002) have tried to explain that sustainable development will integrate the objectives of all other aspects where it is possible and trade-off where it is not. Every country has viewed it from their own possible viewpoint. Developed countries are considerably in front even though developing countries are moving towards achieving sustainable goals.

Social sustainability system is when there is fulfillment of all the basic needs of individuals and groups such as human rights, healthcare, education, labour practices, employment, housing etc which deals with social well-being of society (Frontstream, 2013). Elkington (1997) states that companies practice social sustainability by implementing fair business practices to labour, human capital and community. Some examples of social initiatives taken by companies are providing training programs to their employees, fair wages, safety initiatives, and sustainable agriculture. Social aspects are often overlooked in business. However, they are very important as they can affect the performance and sustainability of the business (Alhaddi, 2015).

Environmental sustainability focuses on protecting the environment by maintaining a balance between use and renewable resources, avoiding over depletion of natural resources in such a way that environmental quality is preserved (Harris, 2001). Environmental sustainability can be maintained in various ways such as by minimising the use of resources, reuse, recycling and regeneration of resources, replacing the non-renewable resources with renewable resources, minimise waste generation, prevent pollution and also adaptation of different environmentally sustainable models (Braccini and Margherita, 2019). The need of achieving environmental sustainability is very important to live in a pollution free and clean environment. Environmental pillars are given more importance as compared to other pillars because if the environment is affected then it cannot provide adequate amount of goods to society which will automatically affect the economic growth (Baruah, 2000).

Economic sustainable system is the framework built by organisations for creating value and profit in business without affecting the environment and people. The main idea of economic sustainability is to make continuous and best use of socio-economic resources so that it provides long term economic growth. However, economic sustainability will automatically be there if environmental and social sustainability is fulfilled (Schmitz, 2012). Baruah (2000) explained how economic sustainability is calculated by different countries in terms of GDP (Gross Domestic Product) on the basis of their production throughout the year. Nevertheless, higher GDP does not make the country sustainable but people can make it if they focus on the quality of living. Following and balancing all three pillars of sustainability will not only profit the company but also enhance reputation and create a positive impact on people (Braccini and Margherita, 2019).

There are several national and international organisations working on balancing all the three pillars of sustainability such as UNEP (United Nations Environmental Programme) which focuses on environmental aspects, the WTO (World Trade Organisation) focuses on economic aspects and OECD (Organisation for Economic Cooperation and Development) focuses on both social and economic aspects (Baruah, 2020).

2.2 Sustainable business practice

According to Schmitz (2012), sustainable business is defined as the business which is developed considering the interest of all the current and future stakeholders ensuring long-term health impact, survival of business and is concerned about social, economic and environmental impacts of their operation. Furthermore, sustainable business tends to have a positive impact on society and its economy by keeping in mind that it doesn't harm the environment. However, it is focused on environmental impacts to a greater extent than the triple bottom line (Schmitz, 2012). The businesses which incorporate sustainability practices can do much better than normal businesses by reducing cost, satisfying their employees, boosting the local economy and establishing a good image in society.

Sustainable business practice is getting more attention in an exponential level. There are many companies integrating sustainable business practice in their business. Before the companies used to be sustainable in the world from a reputational point of view, whereas now they are sincerely concerned about different factors of sustainability such as saving energy, going green, motivating employees and long-term value (Clayton and Bass, 2002).

Sustainable business practices are focused on three dimensions of sustainability such as social aspects, environmental aspects and economic aspects (Schmitz, 2012). In Figure 1 below the three dimensions of sustainable business practices are illustrated.

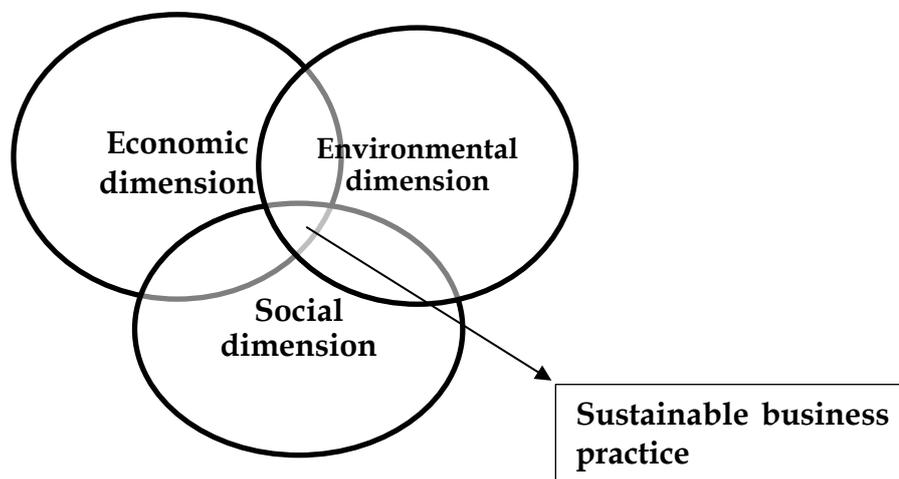


Figure 1: Three dimensions of sustainable business practice (Schmitz, 2012).

2.2.1 Social dimension

Social dimension of sustainable business means the activities carried by business related to society and social justice (Dempsey et al., 2011). The motive of this dimension is to make the business operation socially responsible and profitable internally as well externally. The social dimension covers the practices carried out internally which are related to employees, working conditions, salary, safety and healthcare, training, creating opportunities, providing a good working environment, employment policies and laws (Schmitz, 2012). The external social impacts of sustainable business include the impact on local communities and the whole country. To make the business socially sustainable, the business formulates innovative strategies and brings changes in their way of service (Juangbhanich, 2019). Sustainable businesses are very careful about the impacts of the whole process of business from start to end. It might either be sourcing of products or producing them or supplying them as sustainable business is thoughtful and reasonable. Business cannot be sustainable if the production and operation are done in an unsustainable manner; thus, it is necessary to take every step in such a way that does not harm anyone. Furthermore, socially sustainable business monitors the supply of products to ensure that no human rights have been violated. Sustainable firms' practice, maintain and monitor the policies so that employees are not discriminated against and their right is protected (Clayton and Bass, 2002).

Social performance in any kind of business is difficult to measure compared to other dimensions of sustainable business. Huq and Stevenson (2018) have explained how challenging it is to implement socially sustainable practices in developing countries. However, socially sustainable business has a strategy for every sector to improve their business. Sustainable business tries to hire people who are from the same community as well as recruit people from outside the community so that communities will grow and develop. Similarly, sustainable firms provide equal opportunities to all the employees and also tries to create diversity within the organization. Likewise, sustainable business provides sustainability training to all the staff so that they will have basic knowledge about sustainable practices which can be incorporated in the business such as interaction between firms and employees, providing benefits for their quality of life, using energy saving lights, more use of online services and less use of printed materials, serving organic food in the office, motivating employees, appraising them and providing feedback for sustainability performance, fair payment to employees and human resource flexibility (Huq and Stevenson, 2018).

2.2.2 Environmental dimension

Environmental dimension is the most focused and looked after aspect of sustainability which focuses on the protection of the environment as the importance of economic aspects of sustainability is increasing (Harris, 2000). Clayton and Bass

(2002) researched that different UN organisations and other international organisations are working together for numerous decades for preservation of the environment. Different types of environmental monitoring programs have been conducted and more awareness has been created for sustainable environmental practices (Clayton and Bass, 2002). Periodic reviews and different types of assessment were done by the UN with collaboration with different international organisations to ensure the progress and challenges that come along sustainable development practice. There have been different critiques that sustainability is more concerned about environmental aspects and underestimates social and economic dimension (Schmitz, 2012).

Environmentally sustainable business should focus on reducing environmental impact caused by their business operation and track the performance internally as well as externally. The internal activities related to sustainable practices are eco efficiency, increased resource productivity, recycling and reducing waste, less use of natural resources, pollution control and energy saving (Barbara, 2003). Many companies purchase recycled furniture, donate unwanted items and make more use of recycled papers, cans and bottles (Schmitz, 2012). However, the environmental impact can be higher for some companies and smaller for some depending upon the type of business.

The external activities are also considered in sustainable business which includes the impact caused during production, supplies and transportation of goods. Sustainable business purchases environmentally friendly, green, less toxic and recyclable products and also encourages minimal packaging. Furthermore, it provides priorities for locally produced products so that there is less pollution from transporting the goods and at the same time, the economy of the community rises up (Harris, 2000). The motive of environmentally sustainable business is to provide second life to products so that nothing is wasted. Schmitz (2012), has explained how sustainable business design environmentally friendly purchasing policy so that more properties are given to green and harmless products. Attention is also given to water and energy usage in a company so that less water is and energy is consumed. There are several ways to reduce water use such as recycling water, collecting water from showers, dishwasher in tanks which can be used for other purposes. Similarly, sustainable businesses watch out possible ways to reduce the usage of resources that emits carbon dioxide gas which contributes to climate change. Businesses are more concerned about carbon footprint because of carbon tax; hence carry out carbon footprint analysis, which helps them to find energy use and carbon emission. Besides production and supplying process, Viswanathan and Varghese (2018) have pointed numerous changes that companies apply in order to green the business such as use of 100% virgin paper products, closing electronics when they are not used, use of reusable mugs, use of recyclable materials, use more digitizing documents, establishing green office and green teams who focus on educating employees and making business environmentally friendly. The shift towards the green business not only saves the

environment but also grows the company and its market towards a sustainable future (Viswanathan and Varghese, 2018).

2.2.3 Economic dimension

The third dimension of sustainability is the economic dimension, which is the economic impact of a business which it has on its community and different stakeholders (Caceres and Perez, 2018). Sustainable business provides equal importance to economic aspects of business internally as well as externally. Sustainable business creates value responsibly and ethically by ensuring quality and efficiency, with a long-term objective. Economic aspects not always mean profit and loss in business as it covers a wider aspect. However, profitability of business is very important for its existence, but it is not without sustainable values and practices (Schmitz, 2002). Krstic and Avramovic (2018) have stated that economically sustainable business makes the best use of resources by considering the highest level of wellbeing. Likewise, resources are used and produced in such a way that is economically beneficial (Krstic and Avramovic, 2018).

Sustainable business focuses on long term economic growth of the community and looks after job opportunities to local community, reasonable salary, tax flow, impact on the private and social service sector as well as other areas to ensure that positive impact is created by business. Economically sustainable business also ensures that business is externally sustainable, which means they monitor goods supplied from different suppliers so that other businesses also share the same sustainability goal (Schitnz, 2002).

The economic dimension of sustainability has been less developed compared to other dimensions because of a lack of resources. Likewise, in many low-income countries it is hard for business to be economically sustainable which would require donations from other countries (Clyaton and Bass, 2002). Schmitz (2012) has explained how different corporate businesses have contributed to bring a positive impact on its community and its people. For example, Murphy oil corporation through the El Dorado program had donated \$50 million for providing scholarship to students for 20 years which later helped to increase school and college enrolment in the local community (Schitnz, 2012). Similarly different small sized businesses try to gain sustainable economic growth by providing employment opportunities, industrialization and innovative solutions (Caceres and Perez, 2018).

2.3 Sustainable marketing

Marketing is a crucial part of business which interconnects business and customers. It acts as a bridge to communicate customer needs and values to the business

organisation. Different authors have described sustainable marketing in different ways. However, sustainable marketing is no different than other marketing as it helps in fulfilling the customers' needs, values and demands without causing any harm to the natural environment. Sustainable marketing not only meets the financial target but also brings competitive advantage in business with good performance.

The concept of sustainable marketing was first proposed by Sheth and Parvatiyar (1995). It has explained the objective of sustainable marketing which is focused on sustainability of the environment and society. Firstly, marketing in a sustainable way which means considering any harmful effects to the environment and society. Secondly, marketing sustainably which means marketing with a set of ideas, values and practices.

Sustainable marketing strategy is imperative for companies to grow and compete with others markets. It can be achieved with strategic planning, proper set of sustainability practices and use of marketing mix tools. Marketing mix is a framework which is used for effective marketing. It helps in marketing planning and practices. There are two types of marketing mix, which are marketing mix 4P and marketing mix 4C. The 4P marketing mix was proposed by McCarthy in 1950 which consists of four elements such as product, price, place and promotion. (Londhe, 2014). It is regarded as a traditional way of marketing which is often criticised and construes about products and production point of view (Belz and Peattie, 2012).

In 1990, Bob Lauterborn introduced a new marketing mix model 4C which is more customer-oriented consisting of four elements such as customer, cost, communication and convenience (Londhe, 2014). The 4C approach was developed considering the principles of sustainable development and customer satisfaction. Sustainable marketing needs a balance of both 4C and 4P models which is customer satisfaction and seller point of view. Both Belz and Peattie (2010) have explained how different variables play an important role in sustainable marketing.

2.3.1 Customers (Product)

The 4P model focuses mainly on products, its development, quality, brand, packaging and also other factors such as service and warranty whereas the 4C model focuses on customer satisfaction where their motive is to provide goods and services according to customers' desire (Anastasia, 2018). The 4C model develops products with the understanding of what current customer needs are and what future expectations could be. However, detailed research of market and customer requirements is necessary for running the business (Belz and Peattie, 2010).

Sustainable marketing needs sustainable products that are developed sustainably, which means developed by the use of sustainable materials, resources and

energy and does not affect society and environment (Belz and Peattie, 2010). There is a need for balance of both products and customers. Products are the main element of running a business but it must be developed in a unique way by keeping customers' interest in mind and must be tested so that companies know what is right and what can be improved (Anastasia, 2018).

2.3.2 Cost (Price)

The 4P model explains from a manufacturer point of view which emphasises on the price which is the amount of money customers are willing to put in for goods purchased by them, whereas 4C model is more customer oriented and is more on cost prospective. The cost is the total amount of money which has been spent in the production of goods. Price is only one element which will help to decide whether customers are buying products or not. Price is given importance by marketers and it is price based on position which is necessary. However, only focusing on price will not sustain a long-lasting business. On other hand, costs include a wide range of cost factors such as cost of time and conscience to buy the product, cost of not obtaining the alternative, etc. (Anastasia, 2018). The understanding of potential market and customer satisfaction is essential in sustainable marketing to sustain business in the long run which would help to increase price while decreasing cost for customer satisfaction.

Belz and Peattie (2012) have explained how sustainable products have been a topic of research today and how much customers are willing to pay. The price for sustainable products is high compared to conventional products due to additional cost of socio-environmental factors. With the change of time priorities have been shifted towards buying sustainable products which gives more emphasis to customers and the product service-based system (Belz and Peattie, 2012).

2.3.3 Communication (Promotion)

Promotion is a traditional marketing strategy used by businesses to communicate with customers which includes different techniques such as advertisement, providing offers, and public relations. Anastasia (2018), has explained that businesses often try to find out possible new ways to promote and reach out to the people. However, promotion is not self-sufficient and there is a need to focus on niche marketing (Anastasia, 2018).

Lauterborn (1990), stated that communication is regarded as a cooperative marketing strategy which is more inclined towards buyer's perspective. It helps in deeper understanding customers and their needs and wants which will increase sales as well as gain trust from customers. Promotion is manipulative and explained from the seller's point of view (Lauterborn, 1990).

2.3.4 Convenience (Place)

Place is a traditional 4P marketing technique where customers have to go to a certain place to buy the product. Nevertheless, with time people have shifted towards a convenient way of marketing which is much easier. Customers can buy products according to their convenience, from wherever they want and however they want; they are not obliged to visit the stores. According to a 2020 survey of nine countries conducted by the UN, 50% respondents answered that they shopped online due to the Covid-19 pandemic (Covid-19 and E-commerce, 2020). Nevertheless, sellers need to be aware about customer segments and their preference (Lauterborn, 1990).

3 RESEARCH FRAMEWORK

3.1 Sustainable business case examples around the world

The interest of business towards sustainability practices is growing every day. There are different companies striving to minimize environmental, economic and social impacts. Some businesses are doing better in one dimension whereas others are developing in other dimensions. Similar to climate change and its effect on the environment is getting attention, corporations are also starting to keep an eye on green practices and different environmental initiatives. There are different ways that companies are using to become sustainable such as using sustainable products, reducing waste, conserving water, preventing pollution, employment to local communities, employee satisfaction and using sustainable travel policies for employees (Schmitz, 2012).

Different companies in different sectors are striving to bring sustainable changes by taking interest in integrating sustainability into their business practices. There are many small and big sustainable companies around the world who have left an imprint as a trendsetter for sustainable business. Some of the most sustainable companies are in Europe, especially in France and Finland. Financial information company Corporate Knights researched the companies which had shared revenue of at least \$1 billion in 2018. The companies were selected on the basis of key performance indicators such as good employee management such as women on top position, proper budgeting and financial management, better resource management and clean revenue (Sustain EU Asean, 2021). The most sustainable companies and their sustainability practice are presented below.

3.1.1 Orsted

Orsted is a Danish company and regarded as the most sustainable company in the world which produces gas and oil. It has transformed and improved more in past decades and become one of the largest renewable energy companies in the world. At present time, it provides clean energy to almost 13 million people (Orsted, 2020). Orsted carries out all operation and practice in a sustainable manner with proper resource management, good business conduct and employee well-being and development considering long term sustainable development. It conducts different programs to ensure that all the stakeholders such as employees, partners and suppliers are respected and satisfied. It follows the UN sustainability goals for its sustainability programs and decarbonize its operation and minimize the emission. The next goal for Orsted is to become carbon neutral from 2025 (Theodorou, 2020).

3.1.2 Neste

The second most sustainable company in the world is Neste which is an oil producing and marketing company from Finland. It focuses on producing and marketing oil products with less environmental impacts. Neste uses Neste Renewable Diesel production process to produce renewable diesel, gasoline, aviation and marine fuels. Neste uses different innovative and sustainable practices. The renewable jet fuel that they produce comes from waste and sustainable material. Similarly, bio-based plastic and chemicals are produced from waste and residual fats. Neste has progressed much by implementing sustainable practices in their operation that significantly reduced carbon footprint and target to fulfill their green goals (Theodorou, 2020).

3.1.3 Cisco System Inc

Cisco is an American multinational technology company which is involved in selling and manufacturing networking devices and products connected to telecommunication and information technology. Cisco has been distributing green energy and sustainable utility in its operating system. The company has been using a decarbonization strategy to provide clean and economical energy to local people (Theodorou, 2020). Similarly, Cisco boosts the model of thinking globally and acting locally to develop respectful relationships between company stakeholders. It has developed a connected workspace so that there is collaboration of employees and is beneficial to the environment. Cisco has been doing different environmental management and energy management initiatives to reduce energy intake, reduce emission, increase efficiency and manage business operation in a sustainable way (Cisco, 2020).

3.1.4 Chr. Hansen Holding A/S

Chr. Hansen is a global bioscience company established in Denmark which produces natural ingredients for food, health, pharmaceutical and agricultural business. It is regarded as the most sustainable food ingredient company. This company prepares natural solutions such as enzymes, natural colors, probiotics that helps their customers to bring good quality products in the market and minimize harmful agricultural practices. Chr. Hansen has followed the sustainability goals framework from the UN. Their main focus is on reducing food waste, providing efficient food production and promoting sustainable food consumption. Furthermore, they have developed sustainability strategies for better farming, less waste and good health of people. It was ranked as the most sustainable company in the world in 2019 according to Corporate Knights list. Chr. Hansen along with partnership with Better Energy has committed to use 100% green electricity for its danish operation by 2020. The sustainability performance is reported in sustainability reports every year (Hansen, 2020). According to Chr. Hansen sustainability data sheet 2020, sustainability for products, people and planet is a priority in

daily business activities, providing a better and safe environment for employees and inspiring them to do more. There is diversity in the workplace having a high percentage of female directors and also female workers working in companies. Their target is to create a gender balance in work as well as in equality in the pay system (Hansen, 2020).

3.1.5 Autodesk

Autodesk is an American software company which develops software to design and build different technical drawings such as AutoCAD, Revit, Fusion 360, Maya, 3D max and many more which are used widely for architecture design, games design, film design, manufacturing industries and so on. Autodesk has integrated sustainability in their business by building sustainable technology that uses energy and material which is sustainable, upgrades the product design, produces less waste, saves money and natural resources. Autodesk provides sustainability solutions to customers through its product design and services throughout the asset's lifecycle. It uses 100% renewable energy for its operation, provides donations and grants to innovators, reduced greenhouse gas emission by 41% over the last ten years, encourages employees from different cultures and backgrounds, supports them and considers their ideas for a better world (Autodesk, 2020).

3.1.6 Good eggs

Good eggs are an online food delivery company which promotes sustainable agriculture by delivering fresh groceries to families and local communities. They support local farmers to produce sustainable food and generate income so that money does not go outside. The foods used by them are produced by sustainable farmers using renewable energy and animals are raised by using regenerative agricultural practice. The food produced are certified organic products without using any fertilizers and pesticides (Myers, 2018). Furthermore, good eggs have good labor practice where there is a safe working environment, transparency between employees and company and have followed all labor practices standards. They have been improving and introducing new ways to remain sustainable every year. At recent times they are making changes and improving delivery packaging systems so that they are safer, reusable, recyclable and composted (Sullam, 2020).

3.1.7 Impossible foods

Impossible Food is an American food company founded in 2011 that produces food from plant substituting meat items. The aim of impossible food is to develop food which is nutritious and does not cause any harmful effects on the environment and health. According to their life cycle assessment, the substitution of

meat, fish and dairy products helps to reduce usage of 96% less land, 87% less water, 89% less greenhouse gas emissions and 92% less aquatic pollution (Moses, 2019). The main products produced by them are impossible burgers and sausages which gives a similar taste like meat even if they are completely made of plants. The replacement of plant-based food products instead of meat is an approach towards sustainable development. However, giving up meat is not easy but it makes a high difference (Quantis, 2018). When the demand of cows decreases, it will decrease greenhouse gas emission and slow down deforestation. Impossible Foods is a sustainable company which has clear environmental targets and smaller environmental footprint. The company has developed a team of sustainability task force where employees from different divisions participate together to implement sustainability in every possible way (Moses, 2020).

3.1.8 Advancing Eco Agriculture

Advancing Eco Agriculture (AEA) is a sustainable agriculture company which grows crops using regenerative agricultural practice to improve crop quality, maximize crop diversity, protect soil and the whole ecosystem of the farm. The AEA management team carries out deep research and analysis on soil components and inputs that are needed for better crop production (Myers, 2018). On the basis of soil and sap reports, advisor recommendations and organic certification requirements they make their own separate crop management programs for growing different vegetables, fruits, corn, brassicas and many more. The crops produced are of high quality with higher yield and with no pesticides or herbicides (Advancing Eco agriculture, 2021).

3.1.9 Freight Farm

Freight Farm is an agriculture technology company founded by Brad McNamara and John Friedman that manufactures container farms for hydroponic farming. Freight Farm can grow different crops such as lettuces, leafy greens, brassicas and many more. This system of containers helps to grow fresh food locally throughout the year without use of soil rather with use of water and light energy. The main goal is to make food accessible to people anytime and create a sustainable and secure future for them. The containers are 12 meters in length and have capacity of 4,500 growing sites and environmental sensors which helps to monitor climatic conditions. Freight Farm is a revolution to agriculture technology as well as the smartest production for environmental and economic benefits saving 90% of water compared to traditional farming (Freight, 2021).

3.1.10 Niman Ranch

Niman Ranch is a sustainable meat farming company which was started in 1970 as a family-owned business in the small town of San Francisco. Later, Niman Ranch beef became popular for its good taste. The meat produced are beef, lamb

and pork. The cattle are raised traditionally with care, strict protocols, animal expert and sustainable methods. Niman Ranch consists of a network of 740 family farmers and ranchers (Myers, 2018). They are also 100% certified humane and implement sustainable practices in the whole farms system. Niman Ranch considers all three aspects of sustainability in their business. Traditional methods such as rotational grazing and raising fewer animals are practiced to protect the environment. Likewise, in order to help the economic aspects, farmers are given premium prices and allowed to sell the products in the nation's marketplace. Niman Ranch has supported independent farmers, local communities and makes visits to different farms to build good relationships and watch if the animals are treated well (Ranch, 2021). In 2020, Niman Ranch was awarded as the first ever sustainable farmers of the year for the efforts done by them to protect the environment (Ranch, 2020).

3.2 Sustainable farming

There is a need for sustainability in farming and agriculture because food and other supplies are an integral part of human life. If farming is unsustainable then eventually there will be a decrease in production (FAO, 2017). There might have been different scientific substitutes but it is never going to be enough. Hence, it is necessary to practice long term farming in such a way that sustains the present as well as future population without causing any harm to the environment.

Sustainable agriculture has three main objectives which are ensuring environmental health, social integrity and economic profitability (Greentumble, 2015). The idea of incorporating sustainability in the agriculture system has increased in present state. The main goal of sustainable agriculture is to practice agriculture in such a way that maintains both natural and human resources in the long run. There are different factors that need to be considered such as impact on the environment, impact on communities, labor working conditions, health and safety and other different factors (Sarker, 2017). Some farmers focus on some aspects such as gaining profit whereas some focus on environmental protection but it requires a proper balance of all three factors.

Mason (2003) has stated that sustainable agriculture is a philosophy, a system of farming (Mason, 2003). This system allows farmers to farm with natural methods without causing adverse effect on soil and agroecosystem. Sustainable farming falls under sustainable agriculture which mainly focuses on production of food, plants and animal products using different methods and practices that profit farmers, saves the environment and health (Greentumble, 2015). There are different advantages of sustainable farming such as reuse and recycling of resources which can be used as fertilizers for soil, protect soil from harmful chemicals, pre-

vent pollution of water and air from farming activities, promote energy efficiency, and help provide work to local communities (Sarker, 2017). Among various predominant sustainable farming methods practiced, some are described below.

3.2.1 Crop rotation

Crop rotation has been used by farmers for a long time in order to grow and rotate a variety of crops in sequence so that their crops yield efficiently. The rotation of crops is planned in different seasons or different years in such a way that the crops that are planted this year would refill the nutrients that are lacking for soil which were consumed last year (Mohler and Johnson, 2014). Different crops produce nutrients which are better than adding other synthetic fertilizers. This creates balance in the soil system and protects fertility of soil. Similarly, diversity in crops controls soil diseases and makes them healthy and nutritious. Crop rotation helps to replace the older crop which might have diseases hence the development cycle is disturbed so there is no need for chemical fertilizers and herbicides which in turn improve the environment (Soomro, 2020).

Johnson and Toensmeier (2009) have described in detail how crops are rotated in certain models by farmers according to what they want to achieve. Expert farmers plan the rotation to gain income and enhance soil quality. Many different types of crops are managed in the same farms where there is a fixed schedule in every field. Johnson and Toensmeier (2009) have explained how farmers have different tests and fail and have come to a certain point that there are circular rotations for specific fields.

On the other hand, there are different challenges of crop rotation such as it is difficult to determine which type of crop and quantity is good enough to make profit as well as maintain soil quality. Some are profitable whereas some are not. Crop rotation also depends upon the farm size where large farms include cover crops for a year or a season which protects soil, raises up soil organic matter and works as a habitat of useful insects. Likewise, small farms have limited area so it is difficult but it is possible for short term cover crops rotation. Successful farmers rotate short sequences crop so that they are able to achieve profit and improve soil quality. In order to achieve good yield and practice good crop rotation, it is necessary to develop a plan and execute them on a year or seasonal basis or considering market opportunity, demand and biological factors (Mohler and Johnson, 2014).

3.2.2 Intercropping

According to Eskandari and Mousavi (2011), intercropping is planting two or more crops in the same field at the same time during a certain planting season or

time frame. There are different ways to intercrop the plants such as row intercropping, mixed intercropping and relay intercropping. Mixed intercropping is when two or more crops' seeds are mixed together and sow them at the same time randomly. Likewise, row intercropping is when crops are two or more crops planted in alternate rows. Relay intercropping is when two or more crops are planted in such a way that the second one is planted when the first one has grown and is about to harvest (Eskandari and Mousavi, 2011).

There are many benefits of intercropping different species of plants such as increased productivity of land where using small land, decreases use of chemical fertilizers, reduces pest diseases and damage, enhances soil quality and increases nitrogen intake in plants and brings stability in farmers because even if one crop fails than the other can compensate it; hence reduces economic instability (Paudel, 2016).

3.2.3 Organic farming

Organic farming is regarded as one of the most sustainable ways of farming because of its environmentally friendly production and good set of management practices (Leifeld, 2012). Organic farming has been growing its popularity over the years as people are more interested in buying organic products. Organic farming has been defined by different names by different people such as biological farming, sustainable farming and so on. Laffan (2008) has defined organic farming in simple terms as farming sustainably without use of any artificial chemical such as insecticides, pesticides, herbicides and without causing any harm to the environment and society. Some of the practices of organic farming are crop rotation, intercropping, composting, biological pest control and so on. In good organic farming setting, farmers treat employees with respect and care to make them feel as an integral part of the farm (Mason and John, 2008).

The international Federation of organic agriculture movement in September 2005 has acknowledged some of the important principle of organic farming such as principle of health, ecology, fairness and care which promotes biological cycle, protect soil health with right amount of organic matter, makes efficient use of resources by reuse and recycling so that it does not have to depend upon external resources and minimizes pollution of soil (Chanu, Devi and Irungbam, 2020). Nieberg and Dabbert (2001) have explained how organic farming had a large positive impact on the environment and human health compared to conventional farming at that time. At the present time, people are more conscious about organic farming and its positive impact on the environment and biodiversity. However, strong policies are needed at this time (Chanu et al. 2020).

3.2.4 Permaculture

Coined by Bill Mollison, permaculture is derived from two different words: permanent and agriculture (Mason, 2003). In the beginning, it was a method of sustainable agriculture but with time it has become a process for holistic ecosystem design and social system. It is designing a system which is sustainable for human settlement and natural systems. Moreover, it is the arrangement of systems which are already there in such a way that conserve more energy. It is an organic way of gardening which creates a balanced and self-contained ecosystem. Some of the techniques of permaculture are controlling water runoff, harvesting rain-water, preparing hugelkultur (garden beds), agroforestry and domesticated animals (Vanorio, 2020).

The designing of a permaculture site needs proper planning and designing of the system. There are three different norms which must be considered while designing the system such as care for the earth, people and fair share (Bach and Krebs, 2018). Other factors that need to be considered while designing permaculture are land structure, soil, availability of vegetation and water and weather (Bach and Krebs, 2018). In the permaculture system there is use of perennial plants such as fruit trees, nut trees and shrubs which are all together under one ecosystem. There are many benefits of properly designed permaculture such as self-sufficient ecosystem where plants and animals in the farm are enough to sustain each other, even from small area a lot can be achieved, productivity is high because different types of crops are used throughout the year, nutrients from one plant can be used for another and vice versa (Mason, 2003).

3.2.5 Natural pest management

Natural pest management is an important part of sustainable farming which is taken in consideration by all farms. The main idea is to not use any synthetic chemical fertilizers to control the pest or diseases instead use insects, birds, plants and mechanical techniques (Greentumble, 2015). The use of chemical fertilizers is not good because they kill useful insects and destroy microbial diversity. Likewise, food grown in such manner is not healthier and has bad effect on health in the long run. There are different reports which show how toxic they are for human health and the environment (Dubey, 2011). Hence, sustainable farms try to find a solution which is more natural and helps to eradicate pests. This is achieved by different sustainable farming practices such as crop rotation and intercropping where rotating a variety of crops reduces the need of chemicals, kills harmful pests and helps to balance the ecosystem. Similarly, birds, animals and insects are predators because they eat insects which are harmful for crops. The aim of sustainable farming is to minimize the pest up to such a point that does not cause harm to crops and does not cause ecological imbalance (Mason, 2003).

3.2.6 Use of renewable energy

The use of renewable resources and renewable energy is a must for sustainable agricultural practice. Renewable energy such as solar power, wind power and hydroelectricity is used for long term benefit and have no effect on the environment. Solar energy is cost effective and reliable and can be used for various operations in agriculture production (Chel and Kaushik, 2011). Farms use solar panels in order to store solar energy which is used for various production tasks such as electricity, heating, pumping, lightening, ventilating etc. Solar energy is also used for drying grains and crops naturally by establishing a solar crop drying system. Similarly running water, rainwater and river water can be used for generating electricity as a hydropower energy. It is the largest source of renewable energy in the world (Donev et al, 2020).

Chel and Kaushik (2011) has stated that use of renewable energy has become an important priority by the European government and has made a commitment to fulfill 20% of energy sources by renewable energy by 2020 (Chel and Kaushik, 2011). There are many benefits of using renewable energy such as less pollution, less greenhouse gas emission, low cost and efficient production.

3.2.7 Proper water management

Water is a vital resource of sustainable farming so proper management of water is necessary not only for the agriculture system but also for environmental and economic benefit. Sustainable water management focuses on balancing the water availability and its demands in such a way that is cost effective and environmentally acceptable. The most attention is given to irrigation of water so that water is not wasted. Agriculture utilizes 70% of total water withdrawal and is used for irrigation. Proper plan and schedule are made on when to irrigate and how much quantity of water is required which completely depends upon the type of crop and soil requirement for water. Unplanned irrigation systems lead to different problems such as soil and water degradation (Chartzoulakis and Bertaki, 2015). Similarly, rainwater can also be stored in a tank so that it can be utilized when necessary. Waste water can be recycled and used for irrigation (Mason, 2003).

3.3 Agriculture and organic farming in Nepal

Nepal is a beautiful country situated between two large countries, China and India. It is a himalayan country consisting of different geographical features, climatic conditions and variety of agriculture production. The population of Nepal is 30 million and it occupies an area of 147,181 sq. km. It is divided ecologically into three different regions: terai (the plains), hilly and mountain regions. The mountain region is in the north with an altitude of 4,877 to 8,848 meters where there the highest peak of the world Mount Everest lies. Similarly, in between mountains and terai there is a hilly region which consists of hills. It is the most populated area of Nepal which lies in between 610 to 4,876 meters. Terai region lies at the lower flat area in the southern part of Nepal (Bhattarai, Yousef, Greife and Narahariseti, 2020). Nepal is popular in the world for Mount Everest, Lord Buddha and high-altitude trekking.

Nepal is an agricultural country where about 83% of the total population depends upon agriculture for their livelihood (CBS, 2011). The agricultural sector has a major contribution in the national GDP of Nepal which is 28%. Agriculture sector is large means of support and source of employment for large amount of people but it is still not given much attention by the stakeholders. There are many families in villages who are fully dependent on agricultural production for their living. Instead of upgrading the agricultural sector, a large population of workforce are heading overseas in search of employment. According to CBS (2011), the total percentage of people traveling abroad was 7% which is increasing everyday. Hence it is necessary to develop the agricultural sector to reduce poverty and increase the economy of the nation (Chaudary, 2018).

Agricultural purposes are fulfilled with different production from different ecological regions. The land structure and climatic condition makes a high difference in the type of crop production, hence crop diversification is also practiced. Crop diversification is growing types of crops which have higher benefits and high demand in the market (Sharma, 2001). The food produced in terai region is high because of fertile soil and climatic conditions. Different types of crops like rice, wheat, lentils, maize, legumes, fruits, and vegetables grow in the Terai region. The hilly region has two different types of climate: temperate at higher hills and subtropical at lower parts so different types of rice, fruits such mango, banana, pineapple, guava and potatoes are grown. Likewise, potato, maize, apple, walnut, apricot grow in the mountain region. Among different crops, rice is the most important crop of Nepalese community which is consumed by every family (Chaudary, 2018).

3.3.1 Traditional and Modern farming system

Gauchan (1999) has explained how diverse farming system of Nepal was as it was practiced mainly according to agro-ecological zones, where they have different land structure and different social and cultural values. The cultivation of type of crops was dependent on different zones. There was a high number of people dependent on agriculture for their livelihood. Traditionally the main farming sources were a variety of crops, food grains, forestry, and animal husbandry (Gauchan, 1999). The Nepal government was focusing more on high production with use of chemicals and pesticides. Nevertheless, in some places, they use composting where soil fertility was maintained by using manure from animals and forest which was a good environmental practice. However, the production was not enough to feed the increasing population demand. There was a lack of modern farming equipment. Farmers had to struggle hard to earn income even though it was not enough to sustain a good life. Overall, there was poor management in the agricultural sector. At present, the dependency of the population on agriculture has decreased and the agriculture system is slowly improving (Dahal and Dhakal, 2016).

Modernisation has made it easier for effective irrigation, harvesting and availability of equipment. Today, different types of modern farming technology are used for crop production. In the modern farming system, much attention is given to improve soil quality and fertility. Likewise modern technology has been used to produce fertilisers and pesticides which has increased the rate of production. There is an increase in facilities like modern machinery, transportation facilities, and proper storage for crops. The fertility of soil is also increased by addition of nutrition. Agriculture has been an important aspect of sustainability and sustainable development.

Nevertheless, there are many drawbacks with the new agricultural system (Jagannath, 2017). The introduction of pesticides in Nepal has increased its import and formulation. Some of the pesticides used are Malathion, Chlorpyrifos, Cypermethrin and Deltamethrin (Jagannath, 2017). The use of fertilisers and chemicals have deteriorated the soil quality, killed useful insects and created ecological imbalance in the system. Conventionally farming is concerned about increasing production but not bothered about sustainable use of natural resources. Conventional farming systems are economically profitable but not healthier compared to organic so at the present farmers are more inclined to organic farming (Pant and Pokhrel, 2009). The farming system of Nepal was organic until the 1950s before the green revolution in southeast Asia but after that use chemicals drastically increased. However, due to increased awareness, understanding of adverse health and environmental impacts, the farming system is changing to organic farming (Dahal and Dhakal, 2016)

3.3.2 Organic Farming in Nepal

Organic farming has been in practice in Nepal for a long time, possibly not known as organic farming, however, the farming system was similar. Traditionally, people were not aware that techniques they are using in different regions of hills and terai were named as organic. Moreover, it is also because organic farming needs certification and proper recognition which would be a lengthy process thus they chose to avoid it. Organic farming in Nepal was firstly prioritised as a five-year plan in between 2060 to 2064 BS (2004-2008 AD) (Tamang, Dhital and Acharya, 2011). The development of agronomic biofertilizers and biopesticides has made organic production easier however in terai region farmers still practice both indigenous and conventional farming practice (Pant and Pokhrel, 2009).

With modernisation, people have shifted the interest towards improving the agricultural sector. The demand for organic agriculture is increasing around the globe. There are about 1.8 million farmers in 162 countries who farm organically and the number is still increasing (Dahal and Dhakal, 2016). Different types of natural and organic farming practices reduce the excessive use of fertilisers and chemicals that causes harm to human health, animal health and the whole ecosystem. Some of the farming practices are alternative agriculture, natural farming, permaculture, integrated pest management, planting cover crops, sustainable agriculture and organic agricultural practices. At the present time, organic farming has been a method to have sustainable agricultural development because it focuses on producing environmentally friendly, economically profitable and socially acceptable products. Organic agriculture needs a proper management practice system prohibiting the use of chemicals where the approach is towards tomorrow's ecology rather than today's economy (Pant and Pokharel, 2009).

From an economic point of view, organic farming is considered economically not viable due to low production rate. There are different examples of countries where organic farming has declined the yield of production. Similarly, there are also some countries where organic farming has increased yield production and economic efficiency. The use of organic farming systems caused reduction in yield of production in east Africa compared to conventional practices by 10- 15%. Badgley et. al (2007) have explained how there was loss in yield production in Europe and America due to the shift of organic agriculture (Badley et. al, 2007). The situation is a bit different in case of developing countries, where there has been higher yield. This is also because of different factors such as lower labour cost, lower production cost, pricing policy, region etc. Organic farming provides better yield than conventional systems because they can produce even in unfavourable conditions such as heavy rain, cold and heat. Hence it is contrary to say that organic farming is not profitable (Dahal and Dhakal, 2016).

3.3.3 Status of Organic farming in Nepal

Organic farming is popular in Nepal among farmers, institutions and local individuals. The demand for organic products has been increasing and people are understanding its value. Some of the organic farming practices in Nepal are crop rotation, intercropping, natural pest management, composting and biofertilizers. Variety of products are produced through these techniques. Many organic products such as tea, coffee, honey, and cardamom are exported to foreign countries. Nepalese tea and coffee have a large national and international market. Likewise, the demand for organic vegetables is also high in Nepal (Tamang et. al, 2011).

There are different factors affecting organic farming such as lack of knowledge and clear understanding of organic farming, lack of quality and standard measurement system, lack of correct governmental policies, length certification process and small size of farms. In villages, small farms do not have access to good transportation facilities, training facilities and are technical incapable (Dahal and Dhakal, 2016). Organic farming sector is viewed more as a source of income generation from international export. Many farmers are practicing organic farming to sell the products in the international market as the demands are high but have not thought about it from a health and environmental point of view. Farmers are not clear about organic production and measurement techniques for them. There are many farmlands in different places of Nepal which are naturally organic where no chemicals have been used and reached. Farmers in such places practice traditional farming ways which are similar to organic farming (Burlakoti, Beach, Lynch and Halde, 2012).

Organic farming has increased with time which is evident from the fact that in recent five years, there has been more organic farming production in Kathmandu valley and nearby area due to good transportation, big market and different organisation support (Bhatt and Doppler, 2011). There has been different development in case of rules and regulation as National Agriculture Program has been set by the ministry of agriculture to prepare the certification rules ~~and policy~~ and policy of organic farming. Similarly, different international and national organisations are working together to promote certification, production, marketing of organic farming (Tamang et. al, 2011). There has been limited research done in this field which is well documented and available thus it is difficult to know the exact status of organic farming and where it is heading towards. However, from what is found online, it is clear that it still needs much improvement. It requires good governmental policies, practices with quality check, rules and regulation, responsible marketing and awareness (Pant and Pokhrel, 2009).

3.3.4 Sustainability in organic farming

Sustainability in organic farming means it must be ecological and economical to farmers and the whole society. Basnyat (1995) had defined sustainability in the context of Nepal as the means to produce maize and finger millet in a land in such a pattern that the productivity of land is not disturbed. As stated in the study of sustainable agriculture in Nepal conducted by Basnyat (1995) showed that farmers in farms were not interested in sustainable agriculture, rather they were more concerned about their farm's productivity and increasing farm income. At that time, sustainable farming had a different definition from a farmer's point of view. Many people especially in villages were doing farming because they had no other choice. Most of the people had land but no income source so basically farming was a survival strategy (Basnyat, 1995).

Both Caceres and Rigby (2001) have explained about the close relationship between sustainability and organic farming. Organic farming is an approach to practice sustainable farming. Sustainability in organic farms is still a new concept for Nepalese agriculture which provides healthy food and a better environment for workers. According to the study carried out by Banjara (2016), many people feel the need for sustainability in organic farming; it discourages the use of pesticides and chemical fertilisers. It has scope of development in future because conventional farming practices in Nepal were similar to organic farming (Banjara, 2016). There are farms who are aware about sustainability issues and have tried to make their farms as sustainable as possible by using different techniques without using chemicals, practicing reuse and recycling techniques. There are also some farms who are completely unaware about what sustainability means. Only few are thoughtful about organic production (Singh and Maharjan, 2017).

Agriculture situation of Nepal is hopeful, farmers in different farms are moving towards organic production and incorporating sustainability in their practice. They are implementing different sustainable organic farming practices which focus on environmental, social and economical aspects of farm. Some practices are crop rotation, cover crops, organic fertilisers, composting, manure, biofertilizers etc. However, the income generation varies depending upon type of crops. Some crops provide higher income whereas some have low. For example, potato, carrot, cauliflower have high net return. In this regard, organic farms can become more sustainable with a balance of high profit turning crops with a mix of other sustainable technique such as intercropping to sustain the soil.

There are some farms which provide attention to social sustainability of farms however many are still unaware (Singh and Maharjan, 2017). Organic farms are adopting the changes but still have not progressed much in the social system. Organic farms need to provide training and education to farmers to improve the farming system and condition of workers (Singh and Maharjan, 2017). The clear understanding of sustainable organic practices, involvement of farmers, training

programs, platform to share ideas and information, proper research on farms and market, governmental support is needed to excel in sustainability dimensions in a developing country like Nepal (Singh and Maharjan, 2017).

Sustainability varies with time, sustainable for one may not be sustainable to another. Sah and Manandhar (2009), have selected some sustainable agricultural practices considering the condition and availability of resources which can be used in farms of Nepal. Some of the sustainable agricultural practices that could be sustainable in case of Nepal are water harvesting, use of solar energy, irrigation programs, resource conservation practices and so on. Water harvesting can be done because Nepal is gifted with many mountains whose snow melt in summer to increase the flow of natural water. The rainwater and the wasted water can be used for irrigation of crops. Similarly, the weather of Nepal is favorable for agriculture thus solar energy can be used for different purposes such as drying fruits, heating water or rooms. The use of resources conserving technology benefits with low cost and does not affect the environment. Different types of irrigation technology such as treadle pump and drip irrigation can be used to irrigate effectively without much use of water. Other common sustainable technologies are maize planter, dryers for paddy and coffee pulper.

4 METHODS AND DATA

It was necessary to plan and design the research in order to find out the correct information needed. My research had begun by studying the background information regarding the organic farms in Nepal. Before I headed to field work in Nepal for an internship, I searched online for published reports on successful sustainable practices all over the world. Then, during the internship, I, with my supervisor, made field visits to different organic farms to learn about startups like Panchawoti Agro Garden. This was the foundation to turn Panchawoti Agro Garden as well as the entire Panchawoti Home environmentally sustainable and to understand the situation of sustainability choices in Nepalese organic farms. I was clear from the beginning that I would want to write my thesis on what I have seen and learned during that time because this would be very useful information as Nepal does not have much research done in this field. However, there were challenges because Nepal is still a developing country therefore information from online sources were difficult to gather.

There are two types of research methods which are normally used to collect data which are qualitative research and quantitative research. Quantitative method is used to collect the data so that it could be analyzed using statistical treatment. This method is more numeric and uses mathematical models for data analysis. There are different ways to carry quantitative research such as descriptive, experimental and non experimental methods (Williams, 2007).

Qualitative research method is used to analyze words and expression moreover without using numbers. This method is best to understand human emotions, behavior, relationship between different individuals and surroundings (Bryman and bell, 2003). Qualitative methods are less structured and flexible compared to quantitative and useful for describing the collected data. There are different types of qualitative methods such as case study, phenomenology, narratives, ethnographies, grounded theory and mixed method. From the research and study, it was clear that case study of qualitative research would be a suitable research method for this thesis. This is also because the study needed interaction with different people, understanding their culture and opinions (Bryman and bell, 2003).

Data collection was done using qualitative interviews. There are two approaches to qualitative interview: structured, unstructured interview and semi-structured interview. In case of structured interviews, the interviewer has predetermined questions, unstructured interviews where the interviewer starts asking questions spontaneously and can discuss freely with respondent and semi structured interviews have predetermined questions but more likely to discuss freely about their opinion without hampering the business. Semi-structured interview was carried because it is flexible and provides opportunity to regulate question and speak in

detail. Semi structured interview combines both structured and unstructured style (Bryman and Bell, 2007).

Primary data has been collected by eight semi structured interviews which includes four interviews during my field visits that I had conducted during my internship and four phone interviews. Similarly, secondary data has been collected from literature reviews, database and internet. The thesis is based on the qualitative research which was done with different organic farms, experts and stakeholders. It was carried out as discussions with farmers and possible consumers. Interview involved data collection through direct interaction between researcher and participants which provided a deeper understanding on the desired topic (Hair et.al, 2015). Several questions were asked to them regarding their working environment, how they view sustainability and what they do to have sustainable business practice, sustainable consumption and production. The question was prepared with proper understanding of questionnaire design by (Hair et.al, 2015) and (Eriksson & Kovalainen, 2011). I had few key interview questions for all the interviewers. In some places, people were very welcoming and they would give answers to all the questions but in some places, they were a bit reserved. They didn't want people to know about their inside story on how they do and what they do. The information collected was analyzed to prepare a conceptual framework for better sustainability practice in Panchawoti Agro Farm and to write my thesis.

5 RESEARCH FINDINGS AND ANALYSIS

5.1 Sustainable business case in different organic farms in Nepal

5.1.1 Panchawoti Agro farm

Panchawoti home is a paid old age retirement home in Nepal established in 2017 to bring positive change in society regarding old age homes. There are paid and unpaid government old age retirement homes in Nepal, but they are not equipped with good facilities. Panchawoti home is a quality old age home with well-designed suites having best class infrastructure which is established to provide comfortable and luxurious living to elderly people. It covers an area of 10,000 sq.m and provides luxurious living with dignity and respect to senior citizens. During the establishment process, Panchawoti Home was thoughtful about the environment and sustainability. Therefore, established a project called Panchawoti Agro Garden in the premises of Panchawoti Old age Home. It was established in 2018 with four staff members with the capacity to fulfill the requirements of at least two meals on a daily basis.

Although the primary reason was to minimize cost of food, the agro garden was molded for sustainable consumption and production. This project produces organic vegetables, fruits and meat which is consumed by residents of Panchawoti home and the local community. I had an opportunity to work as an intern in Agro garden where my task was to integrate environmental sustainability and sustainability business practice.

Therefore, in order to collect data, I was tasked to communicate with similar startups and organizations, who are working in the field of sustainable agriculture and horticulture. This task was carried out to develop a strategy based on proven implementation. This also encouraged on-site engagement and data collection, which would aid in a database which could be studied for future analysis. The data included information such as type of plants, yield, lifecycle and sustainable practices such as usage of fertilizers, waste management, types of waste produced and profit due to sustainable practices. Because not all local agro farms and organizations had sustainable practices in place, it was difficult to collect clear data.

The primary objective of Panchawoti Agro Farm is to serve organic produce to the residents of Panchawoti Old age Home, the mother organization. The secondary objective is to integrate sustainable development, cost minimization, good governance and customer empowerment.

	Without agro farm	With agro farm	Future projection
Meals per day	80	80	120
Monthly cost (NRs.)	640,000	550,000	480,000

Table 1: Ongoing and future projected costs of daily meals

Table 1 shows how products from the agro farm can aid in reducing daily food costs for the old age home. Serving four meals per person daily, for a total of 20 residents and staff, the cost was NRs. 640,000, which was reduced to NRs. 550,000 due to profits from consumption and sales to local communities. The projection is to house 30 residents and staff, which will increase the demand, while the production capacity will be increased as well.

The secondary objective was to establish an agro garden that follows sustainability such as sustainable consumption practice lifestyle through organic production. Therefore, adoption of organic farming via sustainable methods such as intercropping, crop rotation, seasonal farming and other common and innovative methods. Thus, as an intern I developed different strategies to make panchawoti home self-sufficient and bring sustainable changes in business. Strategy was developed on the basis of published research, quantitative analysis and qualitative analysis carried out during visits to different organic farms.

The detailed explanation of different sustainability strategies and practices that took place has been explained below.

Strategy of Productivity and implementation

The first strategy of sustainable agriculture was through organic production. The main aim was to produce in such manner that does not harm soil, or pollute water or harm the environment. Therefore, we tried to produce vegetables organically by using organic methods of production. This would help to improve the fertility of soil and conserve biodiversity. The use of such organic methods produces nutritious food, reduces risk of yield failure and enhances food security with maintaining ecological balance and its sustainability. Some methods applied in organic productions are as follows:

Intercropping

Intercropping is a sustainable way of farming where two different types of crops are grown in the same plot (Paudel, 2016). Even though intercropping is more

common in places with above average annual rainfall, we decided to practice it nonetheless. By this method, different crops can be intercropped in different seasons. According to Journal of Nepal Agriculture Council (2016), Kathmandu has a subtropical climate, thus intercropping of Cole crops such as cabbage, cauliflower, other crops such as maize, mustard, garlic, potatoes and coriander can be done. Thus, plantation of maize with green beans, spinach with marigold and tomatoes with cabbage was initiated, which in fact, is a very common practice in Nepal's agricultural style.

Crop rotation

Crop rotation is another approach to support sustainable practice by planting one crop followed by another crop one crop by season. The reason for choosing this pattern was higher yield and building healthy soil by rebalancing its minerals. When we made our visit to agro farms, we had found that farmers are practicing this method so we thought of practicing it in Panchawoti agro farm as well. With crop rotation, different crops can be consumed by consumers in different years or seasons. When we rotate crops, it helps to prevent diseases which could be built over time with the same crops. Similarly, with different plants, different nutrients are used which helps to make soil healthy and balanced.

Usually crop rotation is mainly practiced by farmers who wants to earn more income from high yield but the reason for incorporating this strategy into Panchawoti Agro farm was to protect soil and provide different taste to consumers in different years (Mohler and Johnson, 2014). Unfortunately, crop rotation was not kept in mind during the initial stage, therefore was proposed to be practised from the following year. Different strategy of rotating four types of crops was developed.

Year 1: Fruit (Cucumbers, tomatoes, eggplants, melons)

Year 2: Leaf (Lettuce, cabbage, spinach)

Year 3: Legume (Beans, peas)

Year 4: Root (Radish, carrot, garlic, onion)

However, since the staple food in Nepal comprises onion and garlic in every meal, it is proposed that root vegetables will have a two-year period.

-Use of Organic Fertilizers

The other sustainable practice was use of organic fertilizers. The fertilizers used in these productions were from animal waste and food waste. There was no use of pesticides which would harm soil and contaminate water. This would help to improve soil quality and minimize environmental pollution. At the moment of

reporting, Panchawoti agro farm had two cows, two goats and numerous chickens. In the initial phase, their excrement was not sufficient to fertilize the entirety of the agro farm. However, since the agro farm is located in a village area, organic fertilizers were bought or bartered from local residents. The increment in the number of residents in Panchawoti Home in turn increases the organic waste produced, which was also used after careful sorting.

Environmental sustainability: Proper water management

Initially, the water used for irrigation came directly from the water supply. There was no proper waste water management as it was all drained out to the sewage. Therefore, it was necessary to assess water flow, its usage and how can it be used efficiently in the farm. To top it off, people living in Panchawoti were not aware about water conservation. They did not know that even small practice in daily life would help to conserve water so that there would be proper management of water in the agro farm as well as the whole Panchawoti area.

Therefore, the waste water from the kitchen was redirected to a reservoir which would flow into the agro farm. This would be monitored on a usage basis. It has also been planned that there would be storing of rainwater in rain water tanks for crop irrigation. Water from the bathroom, however, was not used as it contains soap and other chemicals from washing.

Waste management in Panchawoti home

Kathmandu has a culture of mixed waste, which means all the waste is collected into the same bin, which is collected by the garbage collector, which in turn reaches a landfill. There is poor waste management practice of waste dumping without proper sorting. Annual waste of 524,000 tons of municipal solid waste generation is picked up from open areas and dumping sites (Asian Development Bank, 2013). Likewise, there was no proper management of waste in Panchawoti home. In order to minimize waste production, it was necessary to manage waste in an efficient way so that Panchawoti home and Panchawoti agro farm becomes sustainable. There was a need for proper education for everyone from employees and old people living there. So, I tried to tell everyone about what can be done and how to do it. I implemented the waste management practice from what I have learned and my previous experience in Helsinki Reuse and Recycle Center. A pamphlet was drawn with easy instructions to aware the residents about waste sorting and its importance. We had started waste sorting by which wastes are separated into different containers such as paper, cardboard, metal, glass and food (bio) waste. From this, useful waste is chosen and recycled, whereas food waste is decomposed and used as bio fertilizer for the agro farm. Panchawoti is steadily following the principle of reduce, reuse and recycle.

In the later stages, it was proposed that fixed bins with large sealable openings and reusable large jute or hemp sacks to be used. This will further reduce the amount of plastic used, and mimics the practice in Finland.

Social Sustainability

Social sustainability is the management of business impacts on staff members, consumers and local communities. It is necessary to take social responsibility as a part of business. The organization should pay attention on health and safety, wages and working environment of employees. There are now six staff members working in Panchawoti Agro farm and ten as a whole in Panchawoti home. Therefore, safe and sound atmosphere in the workplace was a requirement. Upon asking a few staff members, I found that there was a lack of communication between stakeholders. I, along with my supervisor, had made plans that would be implemented to improve the basic business practices in Panchawoti home. Some of the working points were as follows:

- Developing transparent communication practice with staff members.
- Weekly meetings where everyone could share their ideas on how to better themselves and the organization.
- Involving supportive stakeholders in important matters, asking their opinion and involving them in decision making process so that they would also feel inclusive.
- Training the staff to convert these action plans into practice.
- Increasing pro-environmental behavioral practice in the office.
- Educating staff members about water and electricity saving.
- Increasing salary by a certain percentage every year.

Sustainable marketing strategy

The primary consumers of Panchawoti agro farm were the residents and staff working and living there. Besides that, the products were sold to local communities. Sustainability was taken into account in every aspect of planning, development and implementation. However, Panchawoti agro farm does not believe in marketing them to be green or sustainable. This is because nobody would be willing to pay high for sustainability when they have just started to know about it. It takes time in Nepal for people to appreciate sustainable products. Rather Panchawoti agro farms wanted to conduct awareness programs and teach locals about being sustainable and the importance of sustainable products. This builds trust and safety. Panchawoti Agro farm did not want to go to consumers, rather consumers came to them. Therefore, no specific sustainable marketing strategy was applied as of date.

Sustainable marketing is when production meets the consumer's needs, wants and demands. Therefore, the production in Panchawoti agro farm, at the moment,

is limited as per the demand. As shown in Table 1, the current demand is for 80 meals a day, with future projection of 120. This limited production is done to meet the demand in level terms without any waste of resources. For secondary customers (local community), a booth was set up in the office, where locals can pre-order products. This gives a green light to ramp up production in this particular product, which will aid in efficient production.

Economic Sustainability

As planned under social sustainability, educating the staff members about water and electricity savings plays an important part in economic sustainability. Turning the tap off when it is not in use reduces water usage. The collection of wastewater and rainwater also aids in water conservation. On the other hand, use of inclined land for irrigation does not require pumps for the rain/wastewater collected in the reservoir to be used. The collection of bio waste from within the Panchawoti home and manure from agro farm animals adds to the natural fertilizer, reducing costs. Long term plans like this use the available resources efficiently in order to balance the profits with responsibility.

The primary strategy was to make and implement the sustainable initiative of using what is available at hand. Therefore, weekly meeting and discussion was done on the topic of "How can we be as sustainable as possible." It is expected that each and every stakeholder gives at least a little effort in their daily activities to become more sustainable.

5.1.2 Hasera agriculture research and training centre

Hasera is one of the well-known agricultural research centres in Nepal. It was founded in 1992 by Govinda Sharma. It is located in Patalekhet, approximately 42 km away from Kathmandu valley. Students from all over the world arrive there to learn about agricultural practices. Hasera mainly focuses on sustainable development through sustainable agriculture. Training regarding sustainable farming, permaculture and overall community development are conducted here. This was one of the best visits among other organic farms due to the fact that the owner himself had studied overseas and implemented the system in his farm. I learnt many new concepts and ideas. Hasera focuses on permaculture which was a completely new concept to me.

Permaculture, which is known as permanent culture, was originally founded by Bill Mollison and David Holmgren in Australia in the 1980s (Mollison, 1988). The basic idea behind the development of this system is ecological, economic and sustainable management of all resources. Likewise, Hasera incorporated permaculture in their system with the aim of designing sustainable human settlement and preserving the natural system. Permaculture not only deals with agriculture, it also deals with some ethical care for the earth, care for people and set a limit

on population and consumption Permaculture builds resilient culture and communities (Mollison, 1988).

Personally, I liked the concept behind permaculture as it is more about working with nature rather than against it. It is creating a system that is environmentally friendly and sustainable. According to the director of Hasera, Govinda Sharma, the system that we live in is not sustainable so the main focus of permaculture is designing a system that is already there in such a way that conserve more energy rather than wasting energy. Hence, they teach students regarding natural techniques such as method of seed, soil, pest, and integrated farm design. I am very thankful to Govinda Sharma (founder of Hasera) and his workers, who gave us time and all the information regarding organic farming and its management, permaculture and waste management system which was very helpful for me to make a sustainable strategy for Panchawoti Agro farm.

5.1.3 Shree Tara Cow and Organic Farm

Shree Tara Cow and Organic Farm is a small new startup farm which produces different seasonal vegetables and dairy products. It is located in Gothatar, about 5 km away from Kathmandu valley. From ancient time, traditionally, Nepalese used to farm cows at their home for daily milk consumption. In recent times, home farming has become commercially popular. Shree Tara cow and organic farm has many local breeds and crossbred cows which produces 5 to 10 litres of milk per day. They sell milk, cheese and butter to local customers. According to the owner, Yagya Bahadur Budathoki, he has been primarily running the farm by selling milk to the consumers, however, is still not very satisfactory.

Shree Tara cow and organic farm produces seasonal vegetables such as cauliflower, potato, spinach and tomato. According to them, they have been following sustainable farming methods for organic vegetable production but could not manage it properly in a systematic way, therefore had a great loss. They do not, however, use any kind of chemical fertilizers, which is logical as they have cow producing natural fertilizers for their disposal. At present, they are focusing more on sustainable cow farming. I was educated about how they used to farm vegetables and cows and the improvements and growth of the farm. Furthermore, they have answered all the information regarding their farm and their sustainability practices.

5.1.4 Everything Organic Nursery (Evon)

The visit to Organic Nursery was fruitful as it was interesting to see an American woman coming to Nepal and running this business for a long time with the aim of developing Nepal and the local life. This nursery was established in 2009 by Judith Conant Chase in Kavre district. According to her, she established Every-

thing Organic with the aim of enhancing the lives of people through organic production. It generates income and provides quality of life through high value market crops.

They produce different types of vegetables, berries, fruits, and nuts. There were various types of nuts trees which has been brought by founder Judith from different parts of the world. They produce food through a biointensive organic method which focuses on maximizing the yield by utilizing minimum space. This method of production is sustainable which increases biodiversity and fertility of soil. Evon has been experimenting different sustainable techniques to produce variety of nuts, vegetables, carrots, broccoli and many more. Nepal imports walnuts from abroad and people used to think that it is not possible to grow them in Nepal. But EVON has been growing walnuts, pine nuts and chestnuts in sustainable manner (EVON, 2009).

According to Judith, they are dedicated to sustainable lifestyles and sustainable farming. They cross breed plants to generate better crops and nourishing food. This was new information for me, which I considered researching, and had implemented on my sustainability strategy for Panchawoti agro farm. Even though I had heard about it but not seen it in practice. The cross-bread products have high yield and resistance to pathogens. They grow everything organic with the use of organic fertilizers such as pina, bone meal, urine etc. They are concerned about improving fertility of soil; therefore, they use Nepali techniques of *gitimal* which is liquid nutrients for plants and soil. They believe if soil is healthy then you can grow healthy products. They decompose waste material such as excreta from pet animals, grasses, cows, urine, ashes etc. and make compost manure. They have proper management operations for waste where they decompose and use it as organic fertilizers.

5.1.5 Jhule Organic Farm

Jhule organic farmhouse and resort is located 27 km away from Kathmandu Valley, close to Shivapuri Nagarjun National Park. Jhule was established 15 years ago in 23,000 sq. mt. land by Manoj Acharya as an organic farm and organic resort which has been actively involved in upgrading the status of organic agriculture in Nepal. Jhule is famous for production of green vegetables and has 500 fruits and vegetables such as kiwi, chestnut, shiitake mushroom, radish, beetroot and green salad. Jhuley organic farm house is collaborated with Himalayan Organic village and has been involved together in different production and animal husbandry. Both are situated in different places at a distance but run by Mr. Acharya and have been implementing sustainable agriculture and promoting organic tourism.

They have been growing different seasonal vegetables through crop rotation and intercropping. Similarly, it is also promoting agro-tourism and eco-tourism

where tourists from different parts of the world come to stay, learn and experience organic farms. Jhuley farm house is famous among visitors also because of its beauty as it is located at the top of the hill located at an altitude of 2000m from sea level from where people can view different mountains ranges, sunrise and experience organic food. Visitors also come for hiking from different nearby locations.

5.1.6 Site Ba Organic Agriculture Farm

Site Ba Organic Agriculture Farm is located in Tokha, Kathmandu. It was established three years ago with collaboration of 7 team members from different educational backgrounds. They grow different types of seasonal vegetables such as cauliflower, broccoli, tomato, spinach and produce milk and ghee from cow husbandry. Similarly, they also extract honey from beekeeping.

Site Ba organic farm provides fresh and organic vegetables door-to-door of their subscribers in Kathmandu Valley. The home delivery service has made life easier for consumers to consume the product especially those who are very busy. Furthermore, Site Ba have tried their best to protect soil, water and the whole environmental system by implementing different modern farming practices. They have tried to do a variety of things in the same farmhouse to maintain the ecosystem so that they are not dependent on any other outside sources.

5.1.7 Ashapuri Organic Farm

Ashapuri Organic farm was established in 2002, however was registered with the Government of Nepal in 2007. It covers a land of 110,000 sq. mt. and is located in Ashapuri which is 30 km south east from Kathmandu Valley.

For a long time, Ashapuri organic farm has been working to produce a variety of vegetables, crops, herbs and other products by organic farming. They were the first one to introduce a variety of new crops in Nepal such as yacon, shiitake mushroom, chia seeds, artichoke and paulownia. Nevertheless, later other farms also started to produce the same kind of crops. Beside this they produce fresh vegetables such as lettuces, tomato, pumpkin, carrot, radish, cereals such as corn, and different types of tea and syrup.

They have all together five farms in different cities of Nepal. They export a variety of their products to many international countries such as Singapore, Qatar, Australia, Germany, Japan and New Zealand. With the time they have progressed and grown big. Hence, it has become a popular brand to Nepalese people around the globe.

5.1.8 Herb Nepal

Herb Nepal is a social and innovative organic farm established in 2014 in Bhaktapur, Nepal. The farm has been providing different training programs to farmers for sustainable and organic food production. The main aim of Herb Nepal is to protect people's health and the environment. The farm has been providing different services such as farm stay, training programs, herbal products and platform to support and train Nepalese farmers. The farm stay is built in a sustainable manner by using natural building techniques and provide a beautiful natural environment for people to stay overnight.

Similarly, Herb Nepal has been using permaculture and organic farming methods for production which has created a sustainable environment for farms and the local community. The herbs are sustainable and grown organically which are later used to produce a wide range of body care products. The main ethics are earth care, people care and fair share.

5.2 Interview and data collection

Qualitative interviews were carried out in a natural setting so that the interviewees are open to answer the questions (Harris and Brown, 2010). It is also because Nepalese people are usually shy so that people would feel relaxed and feel comfortable which can help to establish trust between interviewer and interviewees. However, the interview was not with many people and mainly with owners and some farmers so they were quite upfront and intellectual than my expectation. The main objective of the interview was to understand the situation of organic farms, identify the importance of sustainability in organic farms and what practices are carried out in the field of environmental, economic and socio-cultural sectors of their business.

A set of questions were prepared and the idea was to gather as much information as possible to know the overall situation of different organic farms specializing in different fields. A semi-structured exploratory interview was carried out so that it was helpful to find out 'why' they chose to open organic farms, 'what' is happening inside the farms and 'how' are the things handled there. Some factors affecting the dimensions of sustainability were also discussed. Some governmental and political issues are also discussed because those were factors affecting the establishment of sustainability in Nepal.

The explanatory interviews were carried out with the respective representatives of respective organizations, working staff and some farmers to collect information, experience and opinions of other stakeholders who are working in the

field of agro farm business (Eriksson & Kovalainen 2011). Interviews were conducted face to face and through phone interviews. The time spent on individual farms was not fixed or pre-agreed. However, some farms owners were not present when visit was made to the farms thus the interviews were re-scheduled. The visit to farms and interviews were carried out along with my internship supervisor. The interview was similar to a topical conversation asked while having a walk around the farm watching the different activities around the farms. This is also because Nepal is still developing in this sector. They do not have many workers working simultaneously in Farms due to lack of manpower. Many of the farms are managed by the owner themselves and their family members or they have limited working staff. In some places people were a bit hesitant when it was informed that it was a formal interview. Therefore, in order to make them comfortable the interview had been carried out like a discussion pointing towards the questions. However, some personal information regarding the organization were confidential and were requested not to include them in the thesis. Below in Table 2 all interview participants are presented.

Category	Organisation	Representative	Method
Agriculture and training centre	Hasera Agriculture research and training centre	Mr. Govinda Sharma and working staff	On site visit
Cow and vegetable farm	Shree tara cow and Organic farm	Yagya Bahadur Budathoki and his farmers	On site visit
Organic nursery	Everything Organic Nursery	Judith Conant chase	On site visit
Organic Farm	Panchawoti Agro farm	Hemraj Gautam	On site visit
Organic farm and resort	Jhuley Organic Farm	Manoj Acharya	Phone interview
Organic Farm	Site Ba Organic farm	Deependra Thapa	Phone interview
Organic farm	Ashapuri Organic Farm	Prem lama	Phone interview
Organic farm and training center	Herb Nepal	Ram Tamang	Phone interview

Table 2: Interview participants

Development of the interview questions was easy because there was a clear idea on what was expected and evaluated (Hair et.al, 2015). The collected information was helpful to develop a strategy for Panchawoti Agro farm and to write this

thesis. All the questions were asked during the field visit to respective organic farms. But in case of Panchawoti Agro Farm, a telephone interview was carried out with my supervisor to know the current status of organic farm after the implementation of sustainability strategy. The questions asked to participants are listed below.

1. Why did you start organic farming?
2. What does 'sustainability' mean to you, personally and professionally?
3. What types of sustainability practices are implemented in your farm?
4. Do you reuse and recycle the waste produced in the farms?
5. Do you have a long-term commitment with employees? What type of activities are carried out in farms for business growth?
6. Do you practice greenwashing?
7. What type of farming you practice and what are the challenges you have to face in general and towards sustainability?
8. Do you have any formal and legal policy for sustainability practices in the farms?
9. What marketing strategies do you use?
10. Do you feel running a farm provides a good way of living?

5.3 Interview results

5.3.1 Hasera Agriculture research and training center

According to Govinda Sharma and his working staff (Hasera agriculture and training centre), the main reason for establishing this organic farm was to bring change in the agricultural sector. It was established many years ago when there were not many organic farms in Nepal. The objective of establishing this organic farm was sustainable development and providing permaculture training to students all over the world. He had studied abroad thus from his education background of agriculture and permaculture he wanted to build an environment in Nepal where people from different countries would come and stay at farms and learn from the roots about how organic agriculture is practiced. He has been providing training courses regarding permaculture, farm designing and organic certification and also conducts many workshops every month regarding sustainable agriculture and organic farm management.

Govinda Sharma explained that there is no proper definition to define sustainability, however he is trying to implement it by keeping a balance between the use of resources and trying to minimize waste. Personally, in daily life he uses organic food grown in their farm and also serves organic food for people who stay at the farm. They have been teaching and practicing the 3R principle of reduce, reuse and recycle in their area. He claims that they have been minimizing the use

of paper and plastic. They use less paper and more online platforms to market their products. They have been using common toilets and bathrooms to save water. They have been practicing sustainable farming methods such as permaculture, intercropping and crop rotation. It was interesting to see terrace farming in some part of the farm. He explained that these kinds of methods prevent soil washing by rain during the rainy season, makes soil healthy and controls pests and diseases. Similarly, in case of waste management they deposit waste from the kitchen and make compost manure which is used as fertilizers.

When asked about the employees he said his wife has been working, supervising and organising the farm for a long time. Besides her he has a good team of workers handling each area on the farm. He believes in providing an environment that encourages workers to grow and progress. The farmers that I had met there were happy and enjoying at the same time doing their work. Many workers in Hasera have been working for a long time. He supports local employment from the local community. He has been donating 1% of the earnings every month from the farm into socio-economic development of the local community.

They claim that they have never greenwashed people about their products. People who come for training or to buy products market Hasera by talking about it with other people. Therefore, it is a word-of-mouth marketing strategy for them. Mr. Sharma says it is important to build trust with consumers in any kind of business to go on a long run. They have been earning good amount of profit from different training they conduct as well as the organic production. It was a thrill to see that there are places like Hasera in Nepal which is growing rapidly and brings together students from all over the world. They said due to political instability and lack of governmental support, organic farms are still not in a place where it could be. Nevertheless, Hasera is a certified organic farm and member of Nepal Permaculture Group (NPG), Organic Association Nepal (ORGAN) and Organic Certification Nepal (OCN).

5.3.2 Shree tara cow and Organic farm

Yagya Bahadur Thapa (Shree Tara cow and organic farm) said that he had been abroad for employment. When he returned back to Nepal, he didn't have much education so he wanted to invest his savings in something he knows. He and his brother started this organic farm for their personal consumption and with the hope of selling organic products in their local market. He thinks organic means without using chemicals. He said even there are many conventional farms claiming them to be organic because people are more fascinated towards buying organic food that it is hard to sustain a conventional farm. He was completely unaware about the sustainability aspects. Nevertheless, he said at the beginning they were completely against using chemicals but could not succeed. After that they started growing vegetables using chemical fertilizers claiming them to be

organic but they failed again. He explained that he understood that even to practice agriculture it is not as easy as it required a lot of hard work. It has been a new learning experience every time since he opened his farm. Therefore, they had to stop producing vegetables. At the moment, they are more focused on cow farming. Recently, they have started new practices to improve soil quality and use organic fertilizers to start their vegetable productions again. Nonetheless, one good aspect about this farm is that they have tried to raise animals in well managed methods where animals can move and graze freely. They mostly use herbal remedies when they become sick. They were planning on using urine and dung from cows as a fertilizer so the waste from animals becomes food for plants. He and his family consume everything grown and raised in their farm.

There was no proper management of waste and they do not know about waste sorting methodologies in practice. This farm is usually run by him, his wife and his brother. They have few local people to look after cows and clean stables in the morning. Mostly they manage it by themselves because they do not want to spend much money on hiring people. At the moment, the main source of income for them is by selling milk. He said all of them are totally dependent upon farms for their living and recently they have started to earn reasonable profit from selling milk. He himself delivers milk to subscribers' houses unless people prefer to pick it up. He says he has been able to build trust in people because he does not alter the quality of milk as other farms allegedly do. They also have a small shop at the front of the farm where they sell tea and milk.

In the beginning, he said that they were greenwashing their customers about their product being organic when it was not but now, he does not do so because he wants to build trust. The main challenge is lack of proper policies and government support. They are not properly certified because of lack of knowledge, strict policies and high price.

5.3.3 Everything Organic Nursery

According to Judith, she loved Nepal for the first time when she came to visit. So later she came with her husband and opened the farm everything organic with the aim of introducing new approach and techniques in organic farming in Nepal. She was the most intelligent and knowledgeable person among the people interviewed from different organic farms. She was aware about everything related to sustainability in her farm. Her aim to work in Nepal was to have sustainable and economic development through organic production. She thinks constantly about the innovative methods to make their farm more sustainable. She has been protecting the environment at the same time providing opportunities to many locals and improving economic growth.

She has been using biointensive techniques by preparing beds, open pollinated seed saving, composting etc. which helps to produce high yield and is highly

sustainable. Majority of their yield is produced by Nepali biointensive practices, where both farmers and the soil are adequately fed. She has been using some common practices such as cover crops, rotating crops and using manure fertilizers. She has been experimenting with different crops from western countries as well as from other parts of Nepal which grow in different climatic conditions. Evon produces apples, walnuts and especially almonds which were considered not possible to grow in the Kathmandu valley.

She also provides training especially regarding improving soil quality and seed saving so it's more sustainable and organic. Many people from abroad come to get training in her farmland she has not made any hostel or place to stay for those trainees. They stay in that village's area near to her farm. So, she was saying she did it purposely so that local communities would have income generating opportunities. They have been using pine wood ash, bone meal and other organic fertilizers for production. They recycle the waste as well as sort them. They have been doing direct marketing, via word of mouth to locals and regular consumers. They have collaboration with different stores who would buy products from them and also local communities can come there and buy products. Their marketing is more customer oriented because they are aware about what customers need and how they can sell them. They also stated that they have been carrying out different small rural agricultural sustainability development projects to improve environmental, social and economic conditions of the local community. According to Judith, she has many great people working together who have a great sense of responsibility. All her employees have been dedicated and working for almost a decade. She provides a good salary and also rewards them when they do good work. They have been following all the policies and laws regarding organic production and never tried to greenwash people.

5.3.4 Progress of Panchawoti Agro farm

According to Hemraj Gautam, the main objective of establishing Panchawoti organic farm was to introduce different aspects of sustainability such as social, environmental and economic practice in Nepali agriculture. The other reason was to produce organic food for inhabitants of Panchwati Home so that they do not have to depend upon external sources for food. The main idea of opening this farm was to implement sustainability practice in the farm so most of the workers know about it. After the implementation of sustainability strategy, he said they have been trying to improve every day in this field.

He said they have been practicing sustainability practices such as intercropping and crop rotation. They have been planting vegetables such as cauliflower, cabbage, tomatoes, spinach which are enough for their farm as well as whole Panchawoti home. They were also able to sell some to local communities. They have numerous chickens on their farm and also sell eggs. As the number of residents in Panchawoti home had increased, they have made a policy of proper waste

management. They compost waste coming from the kitchen and make manure from them. They also use animal manure as fertilisers in the field. They have been practicing reuse-recycling practice. Recently they have also donated unsuitable items and clothes from Panchawoti home to needy people. He said almost all the staff working in Panchawoti agro farm are local because they wanted to encourage community development through employment. Some stay in-premise whereas some work part time. Panchawoti Agro farm is aware of employment satisfaction and wellbeing. They have been conducting weekly meetings with their staff and board members where everyone is free to talk about their difficulties so that they are solved. They have made a rule of increasing salary by 10% to all the employers working there on a yearly basis. They have been training staff and teaching them sustainable behavior. Some of the common practices they have been doing are turning off lights after 9 pm at night, water saving through less use, no use of plastic, largely consuming food produced in farms and not depending upon outside source, transparent communication and weekly feedback. They have been selling products directly to consumers mainly from the local community.

According to Hemraj Gautam, the main challenge they have been facing now is scarcity of labor. He said they have been changing many staff over a year and finding new every time and training them has been a difficult task. There is a lack of strong supervision and governmental support.

5.3.5 Jhuley organic farm

According to Acharya the reason for establishing Jhuley organic farm was to protect the environment and health. He said he was concerned about deterioration of soil and polluted environment so wanted to establish a sustainable and nature friendly organic farm which could provide healthy food for society. He established the farm 15 years ago when organic farming was quite a new topic in Nepalese society. He said he was from an engineering educational background who used to conduct different training in IT courses and wanted to switch from his monotonous lifestyle. He understands sustainability as a balancing factor between environment, society and economy even though the initial investment is high, in the long run there is a sustainable return.

Likewise, he also believes that being sustainable means being self-sufficient where the production and income from the farm should be enough to sustain the farm. He has tried to implement sustainability from every aspect. Jhuley Organic farm is situated near to National park with good natural atmosphere in between two rivers side by side where water conservation and natural vegetation conservation is prioritised. The natural plants are protected and further other plants are planted to control soil erosion and water pollution. Jhuley Organic farm is well known for its Kiwi farming. Similarly, other vegetation are green vegetables, herbs, rosemary, mint, oregano, chestnut, radish, beetroots and many more. He

said he has been practicing mixed and intercropping sustainable farming practice. The plantation is seasonal where they plant at least something paper season so that the farm runs smoothly and sustainably.

According to Acharya, they have been trying their best to implement good waste management policy. However, at the present, they have been collecting biomass and composting. The waste that comes from farm houses, kitchens and toilets are collected in a tank, mixed with biomass and composted. He said they have tried to reuse whatever is available in the farm so that they don't have to depend on outside sources. Jhuley Organic farm has 11-13 regular basis workers and if needed they hire workers from the local community on a seasonal basis. They have been providing employment to local villagers and upgrading the economic condition of that area. They also provide basic and advanced level training for visitors. Besides this, they also conduct weekly meetings and discuss with their staff on how to improve and upgrade their practices so that they are environmentally friendly. Regarding Government policy and practices, he said there has been no help from the government in anything. There is still no proper policy for organic farm certification by the government of Nepal. However, they have certified themselves by the PGS (Participatory Guarantee System) which include members of 4 groups of committee markets, government, consumer and farmers. Acharya said that the farm has not been earning a huge amount of profit however is sufficient to run farms and provide salary to workers.

Jhuley organic farm has been following the 4P marketing strategy. Customers come to buy the products directly on the farm. Likewise, they take food to farmers markets in different outlets. 'Tara Gown Organic Bazar' is also an organic outlet nearby where they sell products on a regular basis. The main challenges they have to face is finding human resources has been a challenge as people are going abroad for employment so there is huge scarcity of labour at present time. He also added that there is a lack of availability of certified seeds in the market so they have to import it from other countries which becomes very expensive and not affordable all the time.

5.3.6 Site Ba Organic Agriculture

According to the farm supervisor Deependra Thapa, the aim of establishing Site Ba was to provide fresh organic vegetables which were grown without use of any pesticides. Likewise, they also wanted to provide home delivery service for their products which was not so common in the context of Nepal in case of organic farms. He said sustainability might mean different things to different people but to him sustainability is keeping balance and doing different things in the same place to make it self-sufficient. In order to make their farm sustainable they have been experimenting different methods in the same farm such as organic restaurants, beekeeping, cow farming, hen farming, growing different types of crops, opening mart within the farm and avoiding use of plastic as much as possible.

Thapa said that they have been separating waste and decomposing waste material and making compost from it. Furthermore, the waste from animals is used as organic manure for plants. He said they have tried to make their farm as sustainable as they can. They have been practicing different modern farming practices such as drip irrigation in order to minimize the use of water. In addition, they have been practicing mulching for their different crops and vegetation. They have been trying to create less environmental burden, protect soil, water and the whole ecosystem with their farming practice. There are 30 staff members working in the farm. They have been training their staff and trying to create a homely environment for them. They have done health insurance for all of their staff, provide meals and educate those who have children and stay on their farm. Overall, they have been trying to provide quality life to their workers. When asked about legalities, he said they are registered and certified organic farm and have been following all the governmental policies that every farm follows. However, they have not been supported by the government and have not received any funds or means of support from the government of Nepal.

He said they have been following customer-oriented marketing strategies. They have been growing crops which are seasonal and in-demand of consumers. Many customers come to buy fresh products from their mart which is located in the same farm site. In addition, they are also members of a seller group who buy their products on a regular basis. They have different mart stores in other places through which consumers buy their products. The income generated from the farm can suffice the farm and the workers, however is not profitable. He said the main challenges that they have been facing is loss of crops from crop disease and weather conditions. The other problem is sometimes due to less sale and high production there have been products leftover on stock.

5.3.7 Ashapuri Organic Farm

According to the owner Prem Lama, Ashapuri organic farm was established 18 years ago with the aim of consuming organic food by himself and making it accessible to people around him. At that time, there were not many organic farms in Nepal. When asked about his understanding towards sustainability, he said sustainability means long term commitment and continuity of the system. He said they have tried to implement different sustainable farming practices and introduced many new technologies such as vermi compost, irrigation, nursery development and different processing items such as juicer, mixture, dryer, grinder etc. Similarly in case of waste management he said, they have been reusing and recycling all the waste products and making compost out of it.

Lama said that they have more than 100 workers working on a continuous basis and hire more local workers for seasonal work. They provide competitive salary to all the workers and make sure that they are satisfied and happy in the working place. Likewise, they have also done health insurance of their workers in order

to insure safety. He said they are the first internationally certified organic farm and have been certified by European standard certification of Germany CERES (Certification of Environmental Standards). They have followed all the governmental policies and have been registered in Nepal and also have licensed to export and import the products.

He said they have been producing different products according to demand of the market nationally as well as internationally. They have been exporting a variety of vegetables, fruits, crops, herbs and many spices such as turmeric, ginger, lemon grass, tulsi herb to Germany, Australia, Hong Kong, China and many other countries. Evidently, Ashapuri is a large-scale private farm which has its franchise in 5 different cities of Nepal and has been producing products in high quantity and high quality. They also have different stores in different places of Kathmandu valley where people can buy their products. He added that Ashapuri is very popular in Nepal as well as in other countries therefore they have not had to implement any marketing strategy to sell their products. He added that they have been earning good profit from this organic farm.

Nevertheless, like any other business he said they also have to face many challenges. However, he tackles them through positive approach. He said that he is happy running this farm and has always been getting appreciation from every person he meets. The main challenge he said was a corrupt government system, no support and supervision from the government. They have to depend wholly on themselves to run their farms.

5.3.8 Herb Nepal

Herb Nepal was established 7 years ago with the aim of earth care; people care and fair share. During the interview, farm manager Ram Tamang said that the main reason to open this farm was to produce organic food without use of any pesticides and provide employment opportunities to local people living there. Likewise, he said that sustainability is a big word which is hard to describe however describes the long-term commitment to protect nature and human beings.

Herb Nepal has tried their best to implement different sustainable farming methods such as permaculture practice which uses fewer resources and works in support of nature. Similarly, Herb Nepal has been practicing monoculture farming practice to maximize the production and make efficient use of soil and climatic conditions. Monoculture is practiced in Nepal in different other organic farms mainly to grow rice (Poudel, 2016). He said that they are aware about proper management systems for waste and have been implementing separating, recycling and reusing techniques. Normal thermoplastics are strictly not allowed in the farm rather biodegradable plastics are used on a regular basis.

There are 15-17 employees working from a long time in the farm, out of which 80% are women. Since the beginning, they have always been prioritising employment for women, providing training to them and upgrading the status of women in their community. The farmers are provided innovative training practice on a regular basis about organic and sustainable herbal processing and production. Herb Nepal is an IDEO.org award winning organic farm and training centre. The main production from herb Nepal is different types of herbs, which are processed and packaged in the farm. They produce 100% natural plant-based skincare and haircare products and have been established as a brand named Koseli. Herb Nepal is working in Nepal and the Netherlands with two teams. Herb Nepal also provides farm stay facilities with unique and peaceful village experience.

According to Mr. Tamang, there is no governmental support to run this organic farm. They are certified according to Organic Certification Nepal (OCN). When asked about the income generation from the farm he said the earning from the farm has been good enough to run the farm and generate a small amount of profit to farm. However, at the moment they are working on expanding Herb Nepal to another big city of Nepal, which is Pokhara. Herb Nepal is in regular contact with different shops as products are sold on a weekly basis to them. Many customers also visit farms to buy the herbs. They have a big chain of market groups so there has not been any problem regarding selling the products. However, the only challenge they have is lack of governmental support and bad weather which has damaged the herbs.

6 DISCUSSION

This thesis aims to bridge the gap between sustainable practices in organic farms throughout the world and organic farms in Nepal. In an ideal situation, it is expected that Nepalese organic farms have sustainable economic growth, social development and environmental safety and development. Sustainable business practices such as production process that use renewable fuel, workplace collaboration with employees, regenerative agricultural practices, crop rotation and many more are practiced by companies around the globe who have sustainability as a goal. Therefore, it is easier to learn from processes that have been proven to work and implement such processes into small scale organic farms in Nepal.

From the research perspective, Nepalese organic farms are able to sustain themselves with minimum amount of waste. However, the efficiency of the farms is limited to the technology and knowledge provided by the owners. This is where enablers such as investors, researchers and government can lend its hand and implement newer policies, practices and methods. This has been proven by the output from the owners of the farms that there is lack of support from any higher body. Therefore, it could be a field that could act as a catalyst to improve current sustainable practices in Nepalese organic farms.

A sustainability framework, as this thesis suggests, could be one method to integrate all factors into one system where an idea sustainable organic farm is imagined. It takes into account the current state of affairs and what the possible solutions could be to solve barriers.

6.1 Government rules, policies and certification

Agriculture in Nepal has been progressing very slowly even though a high percentage of the population is involved in the Agriculture sector. The first five-year plan of development including agriculture development was started in 1956 in Nepal. However, at that time there were no proper development of infrastructures, education and economy so priorities were given in development of facilities such as roads, airport, education and health (Shah, 1981). Around (1975-1980) Nepal government gave more attention to the agricultural sector by providing 29.8 to 30.2 percent of the budget to improve agriculture which would help to upgrade the economy and reduce poverty in the country (Chaudary, 2018).

Governmental policies regarding Agriculture are based on the Constitution of Nepal (Article 51-e) which focuses on development of agriculture such as production, commercialisation and modernisation of agriculture, protecting rights,

land use policy for higher production and so on. In 1995, Nepal Agriculture perspective plan was made with a 20-year vision which regarded a green revolution in agriculture of Nepal where the main objective was to increase productivity through irrigation, proper fertilisation and easy access to roads. There have been many agricultural policy documents since the agricultural revolution. However, the main policy documents till now are Agriculture Development strategy (ADS) and National Policy 2004 (NAP) (Kaini, 2020).

Agriculture development strategy (ADS) prepares the strategy and 10-year plan for agricultural development considering present and past accomplishment. Similarly, National Policy, 2004 aims on rural agriculture development by supporting poor farmers and boosting their productivity. The plans and policies are prepared by consulting agriculturist, environmentalist and economist. The ministry of Agriculture and Livestock Development (MOALD) is regarded as the centre institution for all agriculture policies and development which has developed the five policies regarding production, technical services, financing, crop and livestock insurance and profit guarantee. However, due to lack of resources, supporting legislation, institutional and governmental support nothing has been changed (Kaini, 2020).

Likewise at the moment the 14th plan of Nepal (2017-2019) has given high priority for whole agriculture and rural development. All the policies are prepared but have been very difficult to implement due to lack of proper legislation and resources. The role of government is very important in preparing strategy as well as implementation. Government should think about achieving sustainable growth in agriculture (Chaudary, 2018).

There are different policies which focus on different aspects of organic farming such as use of fertilizers, irrigation, land sustainability, organic coffee, trade policy and so on. National Standard of Organic Agriculture Production and Processing 2007 is the main base of organic agriculture in Nepal which was the result of National Agriculture Policy 2004. However, these policies and standards are unclear, qualitative in nature and more export intended. Those standards mainly describe do and don't do in organic agriculture. It is not revised, supervised and monitored. There is a need for quantitative standards which would completely focus on the production process and maintaining sustainable organic farming. There is a lack of governmental guidelines and support to run small organic farms as Nepal has a 'hierarchy problem'. It is difficult for producers at low level to accomplish their task as the high-level officials demand extra cost. The corrupt system and lack of monitoring from the government is also violating the process of organic agriculture (Khanna & Tripathy, 2018)

There is only one private organisation for organic certification in Nepal which is Organic certification Nepal (OCN) established in 1991. It is accredited by the National Organic Agriculture Accreditation board of Nepal (NOAAB) which was

established by the National Standard of Organic Agriculture production and processing that evaluates the progress of organic agriculture in Nepal (Khanna & Tripathee, 2018). However, there is no governmental body which oversees organic certification (SASEC, 2020).

According to Atreya, 2015, all the bodies provide third party certification for organic farming which are OCN (Organic Certification Nepal Pvt. Ltd), NAASA, ECoCert, The Himalayan Bio organic Agriculture Nepal (HIMBOAC- NEPAL), Coffee Cooperative Union Ltd, PGS (Participatory Guarantee Systems (PGS)). In addition, there are some international organisations that provide certification to Nepalese products such as Certification of Environmental standard (CERES), National Programme for Organic Production (NOP), International Federation of organic Agriculture movements (IFOAM) and many more (Atreya, 2015).

There are still many organic farms which are not certified and have been running without following any standards. This is due to lack of knowledge, understanding and high cost of certification. People have been consuming inorganic products which are claimed to be organic. Organic Certification is important to provide quality and healthy products.

6.2 Conceptual framework for integrating sustainable business practice in Nepalese organic farms

A sustainable model framework for organic farms was prepared by considering different things such as the situation of organic farms in Nepal, area of improvement and governmental support. The interviews, information available online, books and different reports were helpful to prepare the model. Different types of research have been carried out in the field of organic farms and agricultural sectors; therefore, all of those materials were considered. Likewise, different types of sustainability models and business models were studied and used to develop this specific model.

There is a need for cooperation between various enablers such as the farmers, organic farm owners, consumers and other stakeholders to support sustainability. It has been clear after visiting and interviewing all the farms that there has been no support from the government. The only support the organic farms have been getting are from private organisations and different NGOs (Bhatt et. al, 2009). Therefore, the framework invites collaboration between the Government, NGOs, support institutions, consumers, distributors and owners to map a government support plan. The government support plan shall include the threshold infrastructures of an organic farming organisation; such as agricultural policies specific to organic farming, incentives, certifications, training and implementation of the framework itself.

Organic farming in Nepal is completely farmers-based initiation which was established by farmers depending upon their knowledge, education and experience in the agricultural sector. From the research and interviews carried out from different people of organic farms it is clear that it has been difficult for the majority of them to run the organic farm single handedly without proper guidelines and support from the government. Many farmers also said that sometimes it has been difficult for them when there is no yield than expected and they have to face huge losses. When they compare their situation with other developed countries where farmers are supported and motivated, they feel sad for not being able to be in that situation (Chaudary, 2019).

Therefore, ideal sustainable organic farming practices can be formed as a template where the minimum requirements of an efficient organic farm can easily meet the certification criteria. This would not disrupt the already established farms to obtain certification, and would pass the governmental guidelines or policies with relative ease. The policies are mapped with the involvement of all stakeholders listed as enablers in the framework as shown in Figure 2 below.

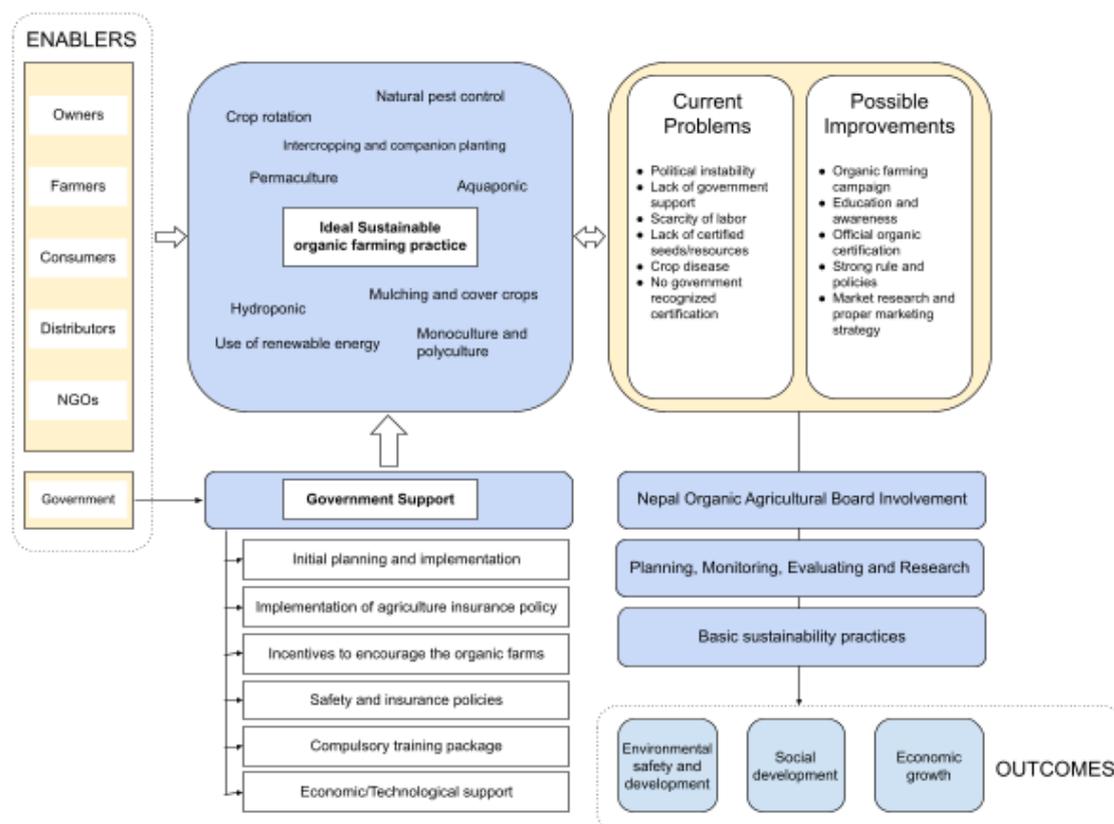


Figure 1: Conceptual framework for sustainable agriculture in Nepal

Data obtained from interviews clearly stated that most of the organic farms are aware about proper organic farming practice and sustainability practice. Based

on their education background and understanding, the majority of organic farms have tried their best to make the farm as sustainable as possible. They have tried to keep the balance between environment, economic and social factors. There are different things which must be improved in order to have a proper sustainable balance. However, it is clear that people have willingness to bring positive change and work hard toward it.

There is a need for a clear goal and vision for sustainable organic farming in Nepal. There is a need to prepare a national policy which would completely focus on sustainable organic farming. There is a need for possible improvements of the existing bodies and committees. There is a need for a development governmental national certification body which is cheaper and can be used by all types of farmers. The government must provide incentives to promote organic farming so that farmers are motivated to do more in future. There is a need for strict rules and regulation that would monitor the progress and provide fines and punishment for needed. Training and organic agriculture campaigns need to be carried out in different areas.

These problems are addressed and solved in the later part of the framework when there is national level involvement of Nepal Organic Agricultural Board in the certification process, especially in the initial phase. Gradually planning, monitoring, evaluating and research of policies and guidelines can be carried out with stakeholder involvement. Organic farming practises such as basic sustainability are also injected in the induction process.

This framework is a mere concept which can be improved upon for efficient implementation. This is possible when the government and stakeholders (enablers) join forces on a roadmap for sustainable agriculture in Nepal. This will favor environmental safety and development of soil, water and air; social development of employment opportunities with production of healthy and nutritious food; and finally economic growth of the local population with minimal effort.

7 CONCLUSIONS

The interest in sustainability and sustainable business practice is growing in organic farms, however, various factors should be considered for proper sustainable development. The essential means is the mindset of people and awareness about sustainable practices. From the visits to different organic farms, the situation and understanding of sustainable business practices were better than expected. Sustainable business practices are practiced in organic farms throughout Nepal, however is limited to the knowledge gained by the owners themselves. Zero waste emerged as a common theme in all the organic farms researched in this thesis, which further aids in a self-sustaining ecological cycle.

Nevertheless, it is clear that there is room for improvement in various sectors. When compared to sustainable business practice around the world, auxiliary practices are yet lacking behind. Nepalese organic farms are inclined towards more environmental aspects of sustainability, and therefore is a need to consider other social and economic factors of sustainability. There is a need for good labor practices, safe working environment for employees, and on an official level: a national standard certification. There is a lack of sustainable marketing practice in Organic farms. At the moment, the marketing strategy in Nepal is more product oriented not people oriented, which was observed from the interviews with respective organic farm owners. Hence, it is necessary to tilt the balance on all the aspects of marketing strategy to grow the business, which could be solved to an extent with 4P or 4C marketing methods.

Sustainability should be the main theme of organic farms from initial planning stage to delivery of products. Renewable resources such as biofertilizers, green manures, organic waste must be used to improve crop health. In terms of marketing, the problem of visibility can be solved with different marketing strategies and marketing mix tools. This grows the consumer base organically. Marketing should be done considering globally practiced 4P or 4C marketing strategy. There also should be equal involvement of the enablers, specifically the farmers, owners and the government. For an agricultural country, the government needs to have a separate governing body that oversees the threshold for the certification of organic farms. This governing body also should be obligated to provide training sessions and disaster management classes for interested farmers. A good governance and supportive government policy are a must to prepare strategy and implement them. Besides this, economic and technical support related to agricultural development can act as the supporting pillars. Farmers should use modern farming technologies and practices for efficient yield. There is a lack of research made on organic farms and sustainability practices hence it is imperative to increase the investment on research and development of the organic sector.

Sustainability should be the main foundation for agricultural development in Nepal. The integration of sustainability develops the agriculture sector which would develop the overall economy of the country. There is a need for more scientists to understand the situation and development of ecofriendly technology is needed.

Thus, considering the current situation and taking the desired future state as a reference, the conceptual framework for integrating sustainable practices in Nepalese organic farms was proposed. The framework takes into account all the stakeholders, resources, regulators and processes. The enablers work together with the support of the government to formulate plans, trainings, policies and regulations. This support blueprint aids in ideal sustainable organic farming practices, which is heavily influenced from common sustainable practices around the world. Input is taken to and from current problems and the possible improvements. Eventually, it is expected that this results in environmental safety, social development and economic growth. It is expected that this framework acts as a stepping stone for further research to improve the current situation.

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APPENDIX 1

Pictures from visits to organic farms



Construction of water storage reservoir in Panchawoti Agro garden



Initial phase of waste separation in Panchawoti home



Before and after view of Panchawoti Agro farm



Hasera Training courses



Cow feeding at Shree Tara cow and organic farm



Biointensive farming at Everything Organic Nursery