

Determinants of Youth Involvement in Agriculture Sector in Sikkim

A Thesis Submitted

To

Sikkim University



In Partial Fulfilment of the Requirement for the
Degree of Doctor of Philosophy

By

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July 2020

Dedicated to

Annadata (Farmer)

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I, Suman Ghimiray, hereby declared that the research work embodied in the thesis titled '**Determinants of Youth Involvement in Agriculture Sector in Sikkim**' submitted to **Sikkim University** for the award of the **Degree of Doctor of Philosophy**, is my original work and it has not been submitted for any other degree of this University or any other University.

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All the assistance and help received during the investigation have been duly acknowledged by him.

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Acronyms

HYV	:	High Yielding Verities
NSSO	:	National Sample Survey Organization
WB	:	World Bank
IMF	:	International Monetary Fund
GDP	:	Gross Domestic Product
FAO	:	Food and Agriculture Organization
ASER	:	Annual Status of Education Report
RBI	:	Reserve Bank of India
GOI	:	Govt. of India
TNCs	:	Trans National Companies
WTO	:	World Trade Organization
IFAD	:	International Fund for Agricultural Development
CTA	:	Technical Centre for Agricultural and Rural Cooperation
IYFF	:	International Year of Family Farming
AFA	:	Asian Farmers Association
CSDS	:	Centre for Study of Developing Societies
UN	:	United Nation
EPRC	:	Economic Policy Research Centre
NDP	:	National Domestic Product
UNDP	:	United Nation Development Program
ILO	:	International Labour Organization
AI	:	Artificial Intelligent
IT	:	Information Technology
IAMR	:	Institute of Applied Manpower Research
COVID-19	:	Corona Virus Disease 2019
ICT	:	Information and Communication Technology

NYP	:	National Youth Policy
SMEs	:	Small Medium Enterprise
ARYA	:	Attracting and Retaining Youth in Agriculture
KVK	:	KrishiVikash Kendra
ICAR	:	Indian Council for Agricultural Research
GNI	:	Gross National Income
SEM	:	Structural Equation Model
PCA	:	Principal Component Analysis
DEA	:	Data Envelopment Method
SFA	:	Stochastic Frontier Approach
CCR	:	Charnes Cooper & Rhodes
BCC	:	Banker Charnes & Cooper
OECD	:	Organisation for Economic Co-operation and Development
NABARD	:	National Bank for Agriculture and Rural Development
MGNREGA	:	Mahatma Gandhi National Rural Employment Guarantee Act
FICCI	:	Federation of Indian Chambers of Commerce and Industry
MSP	:	Minimum Support Price
ATMA	:	Agricultural Technology
NCRB	:	National Crime Records Bureau
TRIPS	:	Trade Related Intellectual Property Rights
GMs	:	Genetically Modified Seeds
NMSA	:	National Mission on Sustainable Agriculture
PKVY	:	ParamparagatKrishiVikashYojana
ZBNF	:	Zero Budget Natural Farming
MOVCD	:	Mission on Value Chain Development
PWD	:	Public Work Department
PDS	:	Public Distribution System

KCC	:	Kishan Credit Card
FPO	:	Farmer Producer Organization
WYR	:	World Youth Report
DMU	:	Decision Making Unit
RTS	:	Return to Scale
ABC	:	Anant Bering Club
ITI	:	Industrial Training Institute
IARI	:	Indian Agriculture Research Institute
POP	:	Package of Practice
VLW	:	Village Level Workers
SPREAD NE	:	Society for Promotion of Rural Economy and Agricultural Development North East

Abbreviations

et al.	:	And others
ST	:	Schedule Tribe
SC	:	Schedule Caste
OBC	:	Other Backward Class
Rs.	:	Rupees
K	:	Thousand
%	:	Percentage

Glossary

<i>Sukhim</i>	:	Old name of Sikkim
<i>Kazi</i>	:	Local Aristocrat
<i>ChaarDaam</i>	:	One fourth of total amount
<i>Elakhadar</i>	:	Area Incharge
<i>Elakha</i>	:	An Area
<i>Anna</i>	:	One of the 16 th of One Rupee
<i>Banda</i>	:	Share of Land Descendants
<i>Mandal</i>	:	An official related to land revenue
<i>Thikadar</i>	:	Supervisor under <i>Kazi</i>
<i>Paharia</i>	:	Reffered to Nepali Peasant
<i>Raiyat</i>	:	Peasant in general
<i>NazarJanchay</i>	:	Revenue Surveyor or Evaluator of Land Revenue
<i>Adhiya</i>	:	Share cropper on 50-50 basis
<i>Adhiadars</i>	:	Peasant cultivating as 50-50 basis
<i>Kut</i>	:	Annual fixed rent for cultivable land
<i>Kutiyar/Kutdar</i>	:	Peasant cultivating land as <i>Kut</i>
<i>Bustiwallas</i>	:	villagers
<i>Chakhureys and Pakhureys</i>	:	Tenents who are cultivating land of Monastery
<i>Karbari</i>	:	Local level official under Kazi
<i>Mukhtiyar</i>	:	Local official under Kazi
<i>KaloBhari</i>	:	Black bag pack
<i>Jharlangi</i>	:	Free manual work system assigned by Royal revenue officials
<i>Theki</i>	:	Wooden Utensil
<i>Bethi</i>	:	Wage less labour
<i>Gharlauri Khetala</i>	:	Labour from each household

<i>Kuruwa</i>	:	Labourer waiting for consignment
<i>ZaminKhajana</i>	:	Land tax
<i>DhuriKhajana</i>	:	House tax
<i>Nilami</i>	:	Bidding process
<i>Kudki</i>	:	Local level Bidding for resources
<i>Durbar</i>	:	King Palace
<i>Sukumbasi</i>	:	Landless citizen
<i>Hal</i>	:	Pair of bullock for ploughing is locally called <i>Hal</i> and in another form <i>hal</i> means area of ploughing in a day by one pair of bullocks.
<i>1 Hal</i>	:	1/4 th of one Acre cultivable land
<i>Goath Palanay</i>	:	Practice of livestock rearing in forest area
<i>Gothalo</i>	:	Herder
<i>Layk</i>	:	High altitude region
<i>Aaul</i>	:	Low altitude region
<i>Kulo</i>	:	Small irrigation canal
<i>Gunji</i>	:	T-shirt
<i>Parma</i>	:	Sharing labour system for agricultural activities
<i>Hali</i>	:	Plough man
<i>Kothay Bari</i>	:	Kitchen Garden
<i>Gaucharan</i>	:	Place for Grazing

Chapter 1

SCENARIO OF AGRICULTURE: AN INTRODUCTION

1.1. Background

“Annaat Bhavanti Bhutaani Parjanyaat Anna Sambhabhah¹”

As per the Vedic *shastra*, in the process of evolution, food appeared prior to the birth of human being. The history of human civilization starting from Nile Valley Civilization to Indus Valley Civilization has provided ample evidence about the flourishing of agriculture as the first and foremost livelihood of the people. In the passage of time, agriculture appeared to take different forms in different places due to several factors. Some important factors are location, climatic condition, seeds, fertility of soil and manpower. Advancement of the civilization in terms of development of education, science and technology brought many changes not only in the relations of production but also in the mode of production but never provided confidence of security to farmers to sustain agriculture.

After independence, the production process become more intensive by the use of HYV (High Yielding Variety) seeds, chemical fertilizer, pesticides, herbicides and use of modern mechanized agricultural tools such as tractors, power tiller, harvesters etc. This slowly transformed the agriculture from subsistence agriculture to a commercialized agriculture which increased dependency of farming in market. These steadily raise the importance of financial capital to maintain farming activities and ultimately farming was pushed towards agribusiness from agriculture. Changes in the cropping pattern-from multi cropping to monocropping for the sake of increasing

¹From Shrimad Bhagawat Geeta, 3rd Chapter, 14 sloka.

yield with the help of new tools and chemical inputs resulted in decline in fertility of soil. Consequently, farming started experiencing economic unviable to maintain households' basic needs as compared to household of other sectors. It created exodus farming population towards non-farm sector and this got further intensified due to execution. At present, agricultural sector employs more than 50 percent (i.e. 54.59 percent it includes cultivators and agricultural workers) of total workforce of India but in reality cultivators or farmers are only 9.81 percent of total population (Agri. Statistics at Glance, 2018).

However, the contradiction is that there are many reports (different rounds of NSSO Survey) reported instances that a good numbers of farmers are not willing to continue farming due to many reasons. Even, those who are engaged in farming, majority of them are in the age of retirement. Instead of many new developmental schemes and securities for farmers through institutional provision, this tendency of unwillingness is continuing among farmers and hence a genuine question is who will going to replace farming?

In regional level too same situations is prevalent. Sikkim, located on North Eastern part of India (22nd state of India in 1975) situated in Eastern Himalayan belt covering 7096 sq. km area on total with nearly 77,000 hectare (ha) of cultivable land. Naturally blessed and a pioneer for organic farming created new prospects on agricultural livelihood. But, similar trends of farmers' unwillingness to continue farming (regional hurdles may vary) is observed and same question is relevant in this state too i.e. who will replace them? An alternative and only alternative answer to the question is youths.

But in reality, young generation hardly showed their interest to make agricultural sector as a profession. There could be a various reasons of their disinterest towards agricultural livelihood. In other words, non-farm sectors have not that much of potential to absorb new labour force. So, in one way to sustain it, agriculture need young energy and in other way young generation needs livelihood to sustain them too. Hence, in-depth coordination between the aspiration of young generation and need of agriculture has to be focal point of the entire scenario to get amicable solution for both youth and agriculture.

In one hand, existing farmers are in dire need of the support of others because of their age and other factors and on the other hand young generation aspires to have a secured livelihood. Hence, this is a high time to bring both the things together for win-win situation. As existing farmers has long experimental knowledge from the field and have hereditary techniques of farming and in other hand youths have full energy and strength to do something big and credible.

But, majorly youths are not interested to step up into agricultural livelihood, this posed a question that why youth are not attracted towards agricultural sector or livelihood as is the case in other sectors. It can have many reasons to explain. In one form, what perceptions do the youth's have for the agricultural livelihood, as perception determines the action of an individual. In general, youths don't have good perception towards agricultural activities or livelihood. Now question arise why and how perception towards agriculture become blur among youths as compare to other sectors? it may be because of prejudice about past and present scenario of farming experienced through learning and observed from society.

Hence, to understand it thoroughly, in depth understanding about past and present scenario of farming and life of farmers is of paramount importance. As it because, present mindset or perceptions depend on perceive notion which is determined by its past experiences.

Therefore, study starts with understanding the agriculture from its past and then to analyze the perception of youths towards agriculture. After this, study analyses the technical efficiency of youth involved in agricultural activities (who are very few in numbers) to know the potential of youth for agricultural upliftment. The last part of the study explores on the feature that can attract and retain youth in agriculture.

With this background, chapter is commenced with the importance of agriculture in present scenario and subsequently the causes of distress in agriculture. With this overview, chapter will focus on the universal issues in context of future of agriculture and then implication of agriculture for youth. After observing imperative of youths the chapter explains the determinants of youth for agriculture and then showcase employment scenario for youth from past to future, and similarly problem and status of non-farm sector for absorption of youth. Then, need of youth in agriculture sector. Subsequently, the study area and then statement of problem with motivation of study and then research question and research objective followed by research methodology and chapterization have been presented in detail.

1.2.Glooming Importance of Agriculture

Foster and Henson (1992) say that the agriculture is the basis for any society. With progress of human being activities also changed despite the fact that agriculture as an activity remained there and will remain in future as long as human existence on earth is felt. Human existence is determined by many factors such as nature, society,

culture, economy etc but its survival depends on food, which is an outcome of agricultural activities. For, to perform this activity the amount of land that the human being uses is only a small fraction of the total earth surface. As the human population is growing, pressure not only grows on land for agricultural purposes but also on its ecosystem. Without adequate natural resources (Soil & Water) it becomes difficult to imagine that to produce enough food for growing population from the available small fraction of the land surface (Osborn, 2005). Agriculture sector is strategically positioned to have a higher multiplier and linkage effect on any nation's quest for socio-economic and industrial development (Adesina & Favour, 2016). Altogether it is the foundation for the development of people. Once Jawaharlal Nehru told that "everything else can wait but not agriculture", which reiterates the importance of agriculture for survival which are mainly performed in rural area.

Villages or *Gramas* have always been the backbone of Indian economy and the term itself exist from old Vedic times. In general, it generally comprised a group of houses together with cultivated, fallow and pasture lands. Village and agriculture is complementary to each other, since the beginning of civilization in general and socio-economic in particular in India. At present era, even modern father of agriculture of India MS Swaminathan once advocated that 'future belongs to countries with grains not guns'. This becomes reality in the 2020 pandemic crisis. But, notion of development injected on us as such a way that it is hard to maintain rurality even after the crisis.

Rurality, as contextualized by Chigbu (2013), as it is places of tradition rather than modernity, of agriculture rather than industry, of nature rather than culture, and of changelessness rather than dynamism. It infers that rural area is accumulation of

tradition/culture, agriculture and nature which maintained the essence of rural i.e. rurality. The area where livelihood of inhabitant is derive by using land is rural area as per Halfacree (1993). Hence altogether, village or rural area is defined where livelihood of inhabitant are agricultural based and agriculture is base for all sector to grow. That's why Mahatma Gandhi told that '*future of India lies in village*'.

In India, agriculture and allied activities are more important not only for production and livelihood but for its culture too and then for economy as a whole. It could be because of geographical proximity i.e. tropical range, where varieties of agro-climatic zones do exist and soil is naturally fertile. In addition to this people/farmers have good understanding about seasonality and periodic rotation of weather which was percolated through heredity. Consequently, agricultural based livelihood was and is prosperous in nature.

According to historian Dharampal (1971), Indian agriculture was prosperous than Western country prior to three centuries ago too. For example, agricultural productivity in India was three times more than the Britain per acre. As mentioned above, Asian climate was suitable for agriculture growth, China and India ranks first and second foremost in terms of production of agricultural produce. In the era of 1750, China and India had shared of approximately 70 percent of the total agricultural produce of world.

One among the many reasons of agriculture prosperity was livestock rearing culture. It was in the tradition and culture of India to rear livestock domestically. That provides manure for agricultural activity. This integration of agriculture and livestock, made it possible to have food self-sufficiency and even surplus too. Another fact was, India had millions of different varieties of indigenous seeds. This can be true, because

it has more than 36 agro-climatic zones, each zones has specific varieties of seeds which were preserved by farmers from its ancestral.

After independence, things changed from policy level to agricultural activities level, with the development of international agencies like International Monetary Federation (IMF) and World Bank (WB) and other led to such changes in policy. There is profound shift in state policies from the beginning of 1960s, from domestic demand driven agricultural growth to an export demand driven agricultural growth which led to rapid integration of domestic agricultural markets with global market through the liberalization and neo-liberalization policy in connection to globalization process, in the name of achieving economic development through integration of world economy.

As a result, the traditional agriculture started dominating by commercial agriculture that was unfavorably affected farming scenario. Industrial farming operations polluted surrounding communities, depleted natural resources, emitted greenhouse gases, degraded the land & soils & harmed biodiversity (Thompson, 2019). As Paglin (1965) rightly said that in order to foster economic development – a policy which would be difficult to explain in terms of most of the development models usually applied to India. The net result was widespread food insecurity, hunger, malnutrition & intensifying pressures on environment. Instead, due to existence of local wisdom small and marginal farmers able to feed the people.

Hence, Indian agricultural and allied sectors contributed substantial amount to GDP and export. More than half of the population derived their livelihood from this and still provided major raw materials for growth of other sectors. As a comparison about the importance of Indian agriculture globally, then it is observed that instead of

declining share on GDP (which is just a numeric) it is playing indispensable role for the growth of Indian economy mainly because of prevalent small and marginal farming features.

According to Food & Agriculture Organization (FAO, 2018) statistics, in terms of World area, India's share 2.4 percent which is seventh in position but in terms of arable land it is in second position having share of 11 percent after USA. Population wise, India stand second after China but its rural population (who are the backbone of agricultural sustainability) first in World Wide having 25.6 percent share. In total Cereals third in position and second in both Rice (having share 21.15 percent) and Wheat (having 11.74 percent). In total Pulses first in position by sharing 22.54 percent and second position on Fruits and Vegetable after China. In terms of Cattle, second in position after Brazil and first in Buffaloes in worldwide. On milk, first in position, third and sixth position for Egg and Meat. These shows how much important is Indian agriculture not only for India but also for worldwide to feed the growing population.

These indicate that agriculture is important for human existence. Even it is understood that, human prosperity continues only if essence of village/rural maintained and for that agriculture and allied activities has to sustain. In India, from its civilization agriculture was considered as principal activity for human being. Therefore, agriculture has always opportunity for livelihood because demand for food never ends until and unless human exist or if people need to survive.

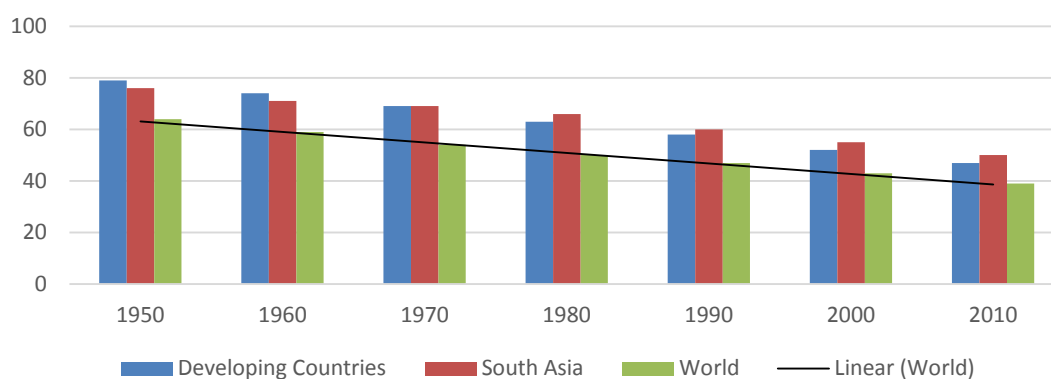
Hence, focusing on agricultural sector is important to attain food security and enhancing rural income to uplift people out of poverty and many other socio-economic solutions. But the way withdrawal of manpower from agriculture is observed in past two decades, it could be the consequences of two sets of reasons as

Chand and Srivastava (2014) pointed out one is related to distress and other is for development. This is major issue to understand.

1.3. Declining Trends of Farming Population

In globalized world people migrate from one place to another in search of better livelihood opportunities is normal tendency until and unless it is choice based. But in context of farming, due to many intentional and unintentional practices by international and national agencies, resulted to migration from farming in search of better opportunities become necessity not choice. As a result, agricultural population declined worldwide (as shown in Fig. 1.1)

Fig. 1.1: Agricultural Population as Percent of Total World population (1950-2010)



Source: FAO, 2014

Similar tendency observed in India too. In reality, as mentioned in background too, actual share of cultivators in total population is 9.81 percent as per 2011 census. Even in total agricultural population i.e. cultivators and agricultural labourers, population of cultivators are declining and agricultural labourer are increasing.

The information in the Table-1.1 shows that percentage of cultivators are declining from nearly 71.9 percent in 1951 to 45.1 percent in 2011 out of total agricultural population (i.e. cultivators and agricultural workers). In other side agricultural labourers are increasing from 28.1 percent in 1951 to 54.9 percent in 2011. This indicates that agricultural policies were not well planned or agriculture as a sector of an economy was not given utmost importance as it needs to be. As a result of decades of developmental policies just helped to boost labour for agriculture but not owner of the farm. That could be the reason, Economic Survey 2015-16 wrote that ‘Indian agriculture is in a way, a victim of its own past success especially the green revolution’.

Table 1.1: Percentage of Cultivator and Agri. Labourers of India (1951-2011)

Year	Cultivators (%)	Agri. Labourers (%)
1951	71.9	28.1
1961	76	24
1971	62.2	37.8
1981	62.5	37.5
1991	59.7	40.3
2001	54.4	45.6
2011	45.1	54.9

Source: Agri. Statistics at a Glance 2014, Ministry of Agri. GoI

In nutshell, in one hand mouths to feed is increasing but those who are bearing responsibility to feed the growing mouths are leaving the responsibility or leaving the farming due to many reason. Then, who will sustain the agriculture to sustain human

life in earth. To do this, as Thompson (2019) said that need an inflow of new preservation minded farmers it could be new generation or youths.

1.4. Who will Rescue Agriculture from its Distress?

Farmers and farm communities have been undermined and consequently weaken their ability to provide nutritious food, nurture agricultural biodiversity and contribute to broader social goals. Farm erosion has different symptoms around the world. In developed countries (North) farms operate in larger scale (small and marginal sized farms disappeared on process) and South (developing nation) where a farm largely operates in small and marginal land. So, farm erosion in the developing countries (South) has greater economic impact on more individuals than it does in the North, leaving poor people even more impoverished. The symptoms of farm erosion are the similar in the South and North, i.e. vulnerable situation persist to small and marginal farmers around the world (Buckland, 2004).

The FAO (2014) estimates that by 60 percent global food production has to increase by 2050 as per prediction of population growth. Under current production patterns, much of the increase would need to come from small land holding farmers in developing countries, including the poorest that cultivates about 80 percent of arable land and produce most of world's food. Improving productivity and intensifying the crop production among these farmers could therefore be key to global food security and ending hunger. Similarly, by the year 2025, 83 percent of the expected population of 8.5 billion will be living in developing countries. However, the capacity of available resources and technologies to satisfy the demands of this growing population for food and other agricultural commodities remains uncertain.

While most of the world's food is produced by small farmers (who are aged) are from developing countries. On worldwide the average age of farmers is about 60 years and many among them are women and poorly educated. Older farmers are less likely to adopt the new form of farming, as argued by Galanopoulos et al. (2011) that the main reason behind the poor adoption level of novel production technique and improved management system are the old age of the farmers and the lack of successors. Improvement could be measure by crop diversification and increasing the crop intensity, which is needed to sustainably increase agricultural productivity, and ultimately feed the growing world population while protecting the environment. It's time to search for alternative, that alternative could be youths. Hence, we need to attract youth in agriculture (FAO, IFAD and CTA; 2014).

There is a convincing evidence of an ageing farmer population in all over the world. Ottosen (2014) found that there is an increase in the proportion of older people living in rural areas and a decline in the proportion of younger people. In same context, Gupta & Thakur (2017) found that rural agrarian dominance has passing “fundamental transformation of the ‘village’ from spatial habitat of the traditional ‘dominant’ to the ‘waiting room’ for aspiring and despairing”. This means the number of rural households who use farming as a platform for other livelihood while waiting for other livelihood is increasing. This is a result of reducing significance of agriculture like an unrewarding livelihood of village in India. For the same, there is need to revisit the conventional political economy models of rural-agrarian dominance.

Similarly, many rural households have diverse livelihood portfolios in which agriculture plays a marginal role and, on other hand the role of subsistence agriculture

in providing a safety net for small farmers cannot be ignored. As per NSSO (2013) only 57.8 percent rural household are agricultural household. Further, a reduction in small farmers' production will not necessarily be replaced by medium and large landholder production (Jakimow et al.; 2013). This can have a devastating impact on food production more generally, entailing price hikes and decreased food security (Hazell et al.; 2010). As a result, due to valuable contribution by small and marginal farmers, the United Nations (UN) declared 2014 was the International Year of Family Farming (IYFF) to recognize the significant contribution of small-scale farmers in feeding the world and caring for the earth. Small scale family farmers feed 70 percent of the world's population and a majority of them are in Asia and Pacific countries (AFA; 2014). Similarly, by 2030, 60 percent of world population is projected to live in urban areas. As urban population consume higher protein food, the demand for meat and processed food going to be rise. This indicates ultimate burden has to bear by small holder farmers to this growing urban and other population.

The other scenario is that, according to FAO, world agricultural population has reduced from 64 percent in 1950 to 39 percent in 2010. Similar trends found in India, where cultivators were reduced from 71.9 percent in 1951 to 45.1 percent in 2011. If similar trend continues, should we consider it as a problem? If not, then growth of population should also be reduced to have sufficed produce to feed population, in proportion to decline in cultivators. But, this is not possible.

Consequently, if young (youth) farmers do not replace the ageing and reducing small scale producers (Lalji, 2010), then there is a doubt in regards that who will feed the growing population? In addition, due to many uncertain factor existing farmers are willing to leave agricultural activity as NSSO, 59th round survey found in India

that an estimated 27% of farmers did not like farming because it is not profitable and in all, 40% felt that, given a choice, they would take up some other livelihood. Likewise, Centre for Study of Developing Societies infer by survey farm household across 18 states says that 76 percent farmers would prefer to do some other than farming and 61 percent of these farmers would prefer to be employed in cities because of better education , health and employment avenues there. The main reason pointed out for giving up farming are poor income, bleak future and stress. Considering all such status of current agriculture, ultimate option to save agriculture from its declining trends, some has to take the responsibility.

As pointed out the solution to crisis of agriculture by Kumar et al. (2019) that, the agricultural crisis would be affecting a majority of the population in India and the economy as a whole in a long way and crisis in farming is a crisis of the country as a whole. Hence, as a remedy to the crisis all efforts should be to make farming profitable sector and attract the youth to participate in it as livelihood. Yet around the world, only few young people see future for themselves in agriculture or rural areas (FAO,2014). Access to technology or finance could improve infrastructure, but none of these efforts will ensure food security if we do not entice young people to enter into farming because youth are future of food security.

Youth can be savior for agriculture, as they are in position of demographic dividend and if they get an opportunity with right knowledge/skills they can change the fate of agriculture. In this context, the obvious question is how the youths respond to this crisis, what is the overall scenario of youth participation in agriculture and their perception towards agricultural activities.

1.5.Potential Relationship Between Youth and Agricultural Activity

Agriculture itself so vast in nature that it ranges from crop cultivation to horticultural activities, dairying to fishing and such others which is directly based on land and nature. Even in allied activities, processing of all agricultural and allied produce have numerous opportunities for young entrance in labour market and its opportunity is never ending until human life exist.

Agriculture sector has potential to generate employment. As Datta & Sundaram (2014) noted that a decades ago India employed 39 workers per 100 acres and classified as a low performance country but in Japan, South Korea, Taiwan 87 employed and in Egypt 71 employed per 100 acres and consider high performing nations with models of small farms in highly labour intensive pattern. The experiences of these countries suggested that in India there is still gap of optimal workforce utilization in agriculture.

This comparison indicates that India's land resources need not be considered the main barrier to increased agricultural employment. Even there is an increase in irrigated area where employment potential increases by increasing crop intensity. As Adesina & Favour (2016) advocated that agriculture has huge and diverse opportunities and potentials that can not only transform the national economy but also tremendously impact the personal life of farmers particularly youth.

Echoing these concerns, the Economic Survey (2014) suggests that if the increase in the number of working age individuals can be fully employed in productive activities, then the level of average income per capita will increase. The youths will surely become a demographic dividend. However, if a large cohort of young people

cannot find employment and earn satisfactory income, the youth bulk will become a demographic burden.

On the other hand, youth unemployment is compounded, as large portion of the population in developing countries tends to be youth. The formal economy is unable to create enough employment opportunities to absorb this rising supply of laborforce. Agriculture and allied activities have potential to generate opportunities to new entrance in labourforce. As Ayinde (2008) found that inverse relationship between agriculture growth and unemployment. In addition, he argued that increase in agricultural growth decrease unemployment and thus can alleviate poverty. Even Bahaman et al. (2010) advocated that agriculture has potential to increase income of the rural poor by providing employment opportunities if properly planned.

It's not only about the employment of youth but future existence of society relied on them. FAO (2014) stated in one of the report for Youth and Agriculture that 'rural youth are the future of food security'. Yet around the world, few young people see a future for themselves in agriculture. Instead of many initiatives taken by many countries to regain the interest of youth, outcome is not satisfactory to attract youth. A study by Adekunle et al. (2012) stated that instead of many new positive factors from expanding markets for primary and secondary agricultural commodities, the involvement of the youth in agriculture has steadily declined in recent years.

Similarly, a report on youth and agriculture of Uganda EPRC by Ahaibwe et al. (2013) noted that if the current constraints on agriculture are not addressed sooner than later, the notion of youth being future farmer might become a myth. If the constraint reduced by different intervention, then it has potential source of gainful employment for unemployed and underemployed youth to revitalize the agriculture

sector. In same line Ramasamy² (2014) propounded in Indian context, that the future of agriculture rests on the shoulder of the youth and it is only the younger generation who can ensure a food secure future for all. In addition, he counted many challenges which makes youth unattractive in agriculture sector.

As it is observed in above that agriculture sector can create opportunities and has potential to absorb the young generation, but young minds are disinterested. What could be the constraints which led the youth to remain away from agriculture, what are the determinants which resulted to this? This next section sketches on constraints and determinants of youth participation in agriculture.

1.6. Constraints and Determinants of Youth Participation in Agriculture

Whether youths are willingly accept this venture as a livelihood or not is an important issue to be examined. Youth's acceptance, attitude and knowledge about agricultural activities are considered as the key for participation in agriculture. As per Hall (2010), whatever be the solutions to this multi-dimensional problem, a great deal of direction and in depth thinking required to attract gadget loving and efficiency prone young people into the agricultural sector. Amongst the trendy and perhaps viable solutions is greater youth involvement in rural development through agriculture. But, Baksh (1984) found that youth's occupational expectations are affected by parental influence and educational expectation through academic performance, peer influence and socioeconomic status exercise varying degrees of influence.

Youths are more attracted towards less tedious and more lucrative jobs than farming, which creates the need to learn the level of participation and identify its

² Dr. K Ramasamy, the vice Chancellor of Tamil Nadu Agriculture University

determinants factors which refrain their participation. Adesina & Favour (2016) found that inadequate training facilities, lack of access of market, credits, low level of technology, inadequate post-harvest infrastructure (storage, processing, transport), low farming profit margin, inadequate extension service, lack of continuity in agricultural programme and inability to establish link between different government schemes are major constraint. At last, social and psychological inferiority complex of being called as farmers is key determinants of non-participation in agriculture.

Similarly, Adekunle et al. (2012) work on constraints to youth's involvement in agriculture categories the determinants factors on economic, social and environmental. On economic factors inadequate credit facilities, low farming profit margins, lack of agriculture insurance, lack of initial capital for production inputs and under social factors public perception about farming and parental influence to move out of agriculture and in environmental factors inadequate land, continuous poor harvests and soil degradation are constraint for youth. Altogether, this study revealed that an economic based constraint seems to be most important determinants for participation.

Sometime migration push and pull factors also worked as a determinants indirectly for not to involve in agriculture. As Akpan (2010) said that economic pull factors like the perception of greater job opportunities due to the presence of industries and companies in cities and economic push factors like poor physical infrastructure and social amenities in rural area, lack of education and skills acquisition and the absence of desirable job opportunities in rural areas.

Ahaibwe et al. (2013) reported that agricultural income as major determinants of youth involvement, which indicates that the probability of youth getting involved

in agriculture increase as the amount of income derived from agriculture increases. In context of formal education, same report reiterated that, those who studied up to some level of secondary education are less likely to get involved in agriculture. It means probability of taking agriculture as a livelihood reduces with the level of education attained.

Hence, it is noted on above, instead of great potential in agriculture youths are not interested to take this sector for their livelihood due to many constraints and determinants which led to refrain them from entering into this sector. If these constraints overcome with possible efforts, the potential of agriculture to absorb and provide handsome livelihood is not impossible task. On other hand, opportunities in non-agricultural sector is also not seen abruptly and led to high unemployment among youths. So, let's understand the employment scenario for youth.

1.7. Employment Scenario for Youth: From Past to Future

As it is natural tendency that, everyone, after education or with the legal age for work, enters into labour market in search for some job or work to run one's livelihood. Attraction towards non-farm sector is more among new entrants in labour market. The reason behind the attraction as found by Sen (2016) that the ratio per worker domestic product in non-agriculture to that in agriculture sector has increased from about 2 in the 1950s to 4.5 now. As a result, per capita income higher in non-farm sector of urban areas than in rural area and its growth having a greater impact on urban incomes.

Consequently, in India, the urban population has grown more rapidly than the rural population. As World Bank (2017) reported that share of urban population

increased from 11.4 percent in 1901 to 34 percent in 2017 (World Bank, 2017). The proportion between attraction or movement of people towards urban areas is not matched with proportion of employment opportunities. In table 1.2, it shows that urban unemployment rate is higher than rural areas in all the given period. In other case rural area has low unemployment rate.

Table No.1.2: Unemployment rate in Rural and Urban Areas from 1972-73 to 2011-12 (in %)

Year	Rural	Urban	Total
1972-73	0.9	5.2	1.6
1983-84	1.7	5.7	2.5
1993-94	1.6	5.6	2.5
1999-2000	1.4	3.8	2.0
2004-05	1.7	4.5	2.3
2011-12	1.7	3.4	2.2

Source: NSSO (compiled by J Dennis Rajakumar, 2018, in NABARD's Rural India Perspective in his article "Rural Economy: An Overview)

It is obvious that everything has some limitations; similarly, the opportunity in urban and organized sector also has its own limitation. The rate of growth of organized sector employment was higher than that of population growth till 1980, but it fell from 2.8 percent per annum during the 1970s to 1.6 percent during the 1980s and plummeted to 0.7 percent in the 1990s. The share of the organized sector in non-agricultural employment has therefore fallen from over 25 percent in the early 1980s

to 20 percent in 1991 and to 17 percent 1999. But within this, the share of the private organized sector in non-agricultural NDP increased much more, from about 14 to 22 percent. Although, employment in the private organized sector increased at about 1.6 percent per annum during the 1990s and but its share in total non-agricultural employment also decreased from about 6 percent to 5.5 percent (Sen, 2016). These past experience showed that there is dilemma on share of growth in economy and employment generation as what needs to be as per the growth share. Hence, future for employment opportunity is also not crystal clear. The world's youth cohort is expected to grow but employment particularly living in developing countries' remain limited, poorly remunerated and of poor quality (FAO, 2014).

UNDP Human Development Report (2015) on 'Population, Labour Force and Unemployment: Implications for the Creation of (Decent) Jobs, 1990-2030' noted that between 2010 and 2030, global labour markets will face the discouraging task of generating roughly three-quarters of a billion new jobs. The challenge of job creation is further magnified by the fact that roughly 91 percent of the new jobs will be required in low and lower middle income countries, where traditions of decent work are not well rooted. In reality, with respect to the need to create decent jobs, the magnitude of the challenge facing the world is without historical precedent.

In this scenario, youth has an opportunity to grab agricultural and allied sector as an alternative employment sector (as explained above). Even it is the need of this era, where there is high unemployment problem among youth. International Labour Organization (ILO) has estimated that nearly 7.5 crores of youth are unemployed around the world and global youth unemployment rate is projected at 12.7 per cent. It further suggested that in comparisons to the adults, youth continue to be almost three

times as likely to be unemployed, and unemployment rates affect them disproportionately.

In addition, the way automation or technological upgradation taking place there is high chances of lower the generation of opportunity for human labour. Study done by Brookings Institution a Washington Think Tank, there is a concern about automation displacing workers in many cases, because new digital tools allow one worker to do work previously done by several. That's why Chaudhary (2017) in his article 'Articulating 'New Normal' for Jobs' stated that technological employment in this age leading to 'less and less jobs and more and more automation and artificial intelligence'. Survey done by Genpact (2017), a global professional services firm, by taking respondent about 5000 from some countries, shows the striking gap of its impact on present and future job market. It found that 28 percent of all respondents worry about the automation intelligent (AI) threat on present job and majority about 58 percent fear that AI impact the career opportunities of their children's and future generation. Even past record is also not good in employment generation in terms of Information Technology (IT) sector. Post reform period in India, IT got much attention, but direct contribution of this sub-sector has been quite small. The sub-sector like transport, storage, communication which includes IT related activities, accounted not more than 1/6th of the total employment in the tertiary sector. Trade, hotel & restaurants continued to play dominant role in employment in this sector & its relative growth during the post reforms decades seems to have been higher than the average for the sector as a whole.

An important aspect of recent growth pattern of the Indian economy has been the apparent sluggishness in the output and employment growth instead of relative

high growth rate of GDP. In manufacturing sector, 'Dualism' issues slowed down the expected dynamic role of this sector in the growth of the economy (Mazumdar and Sarkar; 2009). In India growth led by tertiary rather than manufacturing sector, as a result expectation to absorbed surplus labour displaced from agriculture disproportionately at low level of earning. Growth in tertiary sector has been significantly productivity led rather than employment led. Even in manufacturing sector 'missing middle' tragedy generate productivity and wage gaps between the two extreme size groups is much larger in India than even in other Asian economies. In nutshell, structural changes in employment in India have been very slow. In India, public sector has taken liability in creating employment prior to reform but post reform period not such trends observed. Prior to reform, one third of relative share of employment in non-agriculture has contributed by public sector which significantly decline after reforms

Institute of Applied Manpower Research (IAMR) reported on 2012 as part of Planning Commission that, employment in non-agricultural sectors has not been growing. This jobless growth in recent years has been accompanied by growth in casualization and informalization. Even World Health Organization estimated that 6 out of 10 and 7 out of 10 people live in city by 2030 and 2050. So, question is how to absorb them in cities? India's strong growth in recent year has outstripped job creation & poverty remains a key challenge. As it is sustained average growth rate 7 percent over the last decade has not been accompanied by sufficient growth in employment. The annual demand for new jobs in India is estimated at 12-15 million, leaving India with shortage of between 4-7 million jobs each year. This further compounded by the 300 million people of working age outside of the labourforce lead

to extent of severity and poverty in India provides further impetus for addressing jobs challenges.

Consequently, it show that service sector growth in India has been productivity led and not employment led, thereby contradicting the views of some economists that employment has grown in services because this sector has been repository of low income labour 'pushed out' of agriculture. The heart of the employment problem in India would thus seem to be not an excess absorption of labour in the tertiary sector but the low productivity of the manufacturing sector persistence over time. This prevents the sector to play central role of productivity growth and sector for reallocation of labour as in other countries in the history of economic development. World Economic Forum reported that there will be a loss of around 7.1 million jobs by 2020; major share of this will be from service sector which is one of the relatively high productive sectors which is pulling the interest of present labour force. Even due to pandemic COVID-19 many displaced from jobs especially from tertiary and secondary sector. So, what would be the alternative source of employment. On which sector new entrants will derive their livelihood? There is no any obvious answer for above question.

In domestic front, India's employment scenario is also not satisfactory with respect to youth, World Bank report especially focusing on India, reported that just 8.5 lakh job generated on monthly average in last decade and in currently approximately 12 lakh labour force entered in labour market in every month. But to adjust this bulk of youth labourforce, there are no any prospects in formal economy in picture. Agriculture as an informal sector have option as Pandey (2013) pointed to the rising size of the informal economy in India, where estimated 93 percent of the

workforce is in informal employment and the issues which is elaborated in above makes the position clear that youth has an opportunity in agriculture and allied activities.

As it is known from above, that youth are in vulnerable situation for their employment and sustainable livelihood. Instead of having attraction on non-farm sector, opportunities are not rampant to absorb the new entrants in job market. Consequently agriculture and allied activities is only hope which can absorb and generate opportunity for new generation for sustainable livelihood. Even FAO (2014) recognized that agriculture sector's potential to serve as a source of livelihood opportunities for youth.

In spite of this, it is obvious that majority of youth express to see their future in outside the agriculture but many jobs opportunities on & off the farm are confined in agriculture. Even it is undoubtful that share of farming job is declining, which is normal in modern developmental and growth theory. When income rise, urbanization grows, educational level improves focus on non-farm increase not only by new entrants of labour market but also by existing farm sector's labour force (cultivators). But to sustain this process in terms of food availability for non-farm worker, labour productivity of handful farmers should increase. It may be through innovation in production as well as market access for the surplus food produced by farming community. Information and communication technology (ICT) can play vital role from input services to post harvest management till it reaches to consumer. All these are non-farm opportunities which will emerge only when agriculture production sustain. Even non-farm jobs are emerge in larger agri-food system from collectivization, sorting-grading, storing, processing, packaging, logistics, food

preparation at restaurants & hotels and many more, all depends on agricultural production. Therefore many good or prosperous jobs opportunities on and off the farm depend in agriculture and allied activities.

Therefore, if youth gets supportive environment, they will be able to find innovative ways to create a future for them and also contribute to the societies and communities in which they live. Hence, instead of many obstacles to sustain agriculture by the participation of youth, if it is well observed and intervene with relevant mechanism youth will show their efficiency in agriculture. Youth can be the ultimate savior for agriculture through their efficiency and productive nature.

Similar obstacles and issue of agriculture observed in Himalayan belt too. In eastern Himalayan belt, Sikkim is one of the states which is pioneer for organic agriculture, having similar issues. Let's understand the pertinent issues of Sikkim and need of study in Sikkim in terms of farming crisis and youth participation as a savior.

1.8.Sikkim: A Perspective Study

Sikkim a tiny hilly and naturally blessed 22nd state of India situated in Eastern Himalayan region. It is also a blessed region with fertile soil and variety of topographical range which are suitable for variety of agricultural activities. Natural opportunities for agriculture and allied based livelihood activities are unlimited. The sector which comprises of lot of activities ranging from crops cultivation, livestock rearing to plantation and processing seen as one of the sector which expected to offer many job opportunities.

Out of total population (610577) it is estimated that about 75% (456999) of the total population reside in rural area (Census, 2011). Majority of rural population

depends on agriculture and allied sectors for economic, food and nutritional securities. According to hand book of agriculture in Sikkim (2014-15) out of total farmers 54.1 percent of farmer are marginal farmer (having below 1 hectare), 22.6 percent are small farmer (1-2 hectare), 22.33 percent are medium farmer (2 – 10 hectare) and only 1.06 percent are large farmer (10 & above hectares). But in totality farmers of this Himalayan state are declining. The proportion of cultivators to total population of state which shows the declining trend from 58.07 percent in 1981 to 19.22 percent in 2011 (Indiastat, 2013). According to Situational Assessment Survey of Agricultural Household, NSSO (2013), Sikkim has 1,15,000 rural households out of this 67,400 are agricultural households which is 58.6 percent.

Operational land holdings in Sikkim clearly show that majority belongs to marginal and small, due to fragile eco-system and physiology for agricultural ecosystem. And moreover decreasing farm productivity, diminishing marginal productivity of labour, land fragmentation and land loss due to landslides and urbanization and industrialization in the state collectively bound the rural households to participate in non-farm activities for survival or maximizing income by migrating elsewhere. There is steady decline in the number of people depending on agriculture sector and proportionately there is an increase in the number of peoples on secondary and tertiary sectors. On existence of non-farm activity in Sikkim Sharma et al. (2017) found that the majority (54.3%) of non-farm activities pursued in rural Sikkim since 2008-09 and 11.7 percent involved in non-farm sector since more than 21 years that is in govt. Service and other. But the reason which was percolate by this study for the majority of rural household involvement in nonfarm activities which was not prior to 8-10 years is implementation of Mahatma Gandhi Rural Employment Guarantee Act (MGNREGA).

As per the Reardon et al. (2007), access of incentives by individual cum household capacity determines absorption of nonfarm livelihood as an additional or substitute livelihood. In this two factors, incentives may be in requisites of comparative profit and risk of both farm and non-farm activities and capacities consists of different essentials like possessions of human, capital, credit facilities, infrastructure, location etc. There is no specific factors to suggest the cause behind the shift of occupation for livelihood, just like farmers or rural inhabitants attracting towards non-farm sector. For that, there are some context specific, temporal, spatial factors which cause rural household's involvement into nonfarm activities. In addition to this, abandonment of agricultural land is increasing in village due to lack of supporting hand for cultivation to existing farmers from new generation. Instead of government pioneer initiative to make organic agriculture and even after achieving many milestones, it's not able to boost as it should be to attract new generation.

On other hand, unemployment is high among youth. Labour Bureau of India reported in Employment and Unemployment Survey (2013-14) that Sikkim is one of the highest unemployment rate state among the Indian state. So in one way due to farmers are declining led increase in fallow land instead of organic and natural advantages of agriculture and allied activities and in other way youth cohorts are unemployed. So, this positive prospect of organic agriculture in Sikkim can become an opportunity for youth to involve on it and even it is necessity for youth to involve in agriculture sector for their livelihood. In this context, study pursued further to analysis the issues of farmers and determinants of youth involvement in agriculture in Sikkim.

1.9.Statement of Problem

Youths are the future of food security. But farmers' willingness to continue farming is declining due to various factors like socio, economic, political and natural reasons. And in similar pattern, youths are also not showing interest to step up in agricultural livelihood. Hence, these two aspects together raise the question of agriculture sustainability in terms of manpower for its continuity.

The ability of agriculture sector to create an environment, so that youths are willing to embark on this sector is grossly required. The agriculture sector is long left by the youth even if favorable long run potential economic growth. Their awareness and commitment in the agriculture sector which left by them many decades ago need to be revived. Above all, there is pressing need to change the paradigm of youth towards looking the agriculture sector as one of the opportunity for them to be self-employed.

On the other hand, food security is one of the major concerns for the nation and world as a whole. To make food available for all, it is necessary to know what would be agriculture and allied sector look like in 2025 or 2050? Who will inherit and practice agriculture in the years to come? Retaining youth in agriculture pose to be the biggest challenge. It is because, India is fortunate to have a youth full population with over half of the total population of 1.2 billion being under the age of 30. Out of the 600 million young persons, over 60 per cent lives in villages. Most of them are educated. Thus, major share of Indian agriculture also in the hand of rural youth involves in farming (Narain et al.; 2015). With the shrinkage of the land holdings day by day and declining profitability in farms, large scale migration of rural youth towards cities in search of better livelihood which is generating major concern to the

policy makers and the government in one way. In other way, luring of youth to non-farm sector is a greater challenge for sustaining growth of agriculture. Therefore, instant necessity is to attract and retain youth in agriculture for its prosperity.

1.10. Motivation of the Study

Existing farmers are ageing and the youths, who are the only factor, who can replace the ageing farmers staying away from agricultural livelihood. In addition to this, different reports, surveys and study found that majority of farmers are willing to leave the agricultural activity due to various reasons. So, the major factors which motivated the researcher to pursue the research on this issue is the fear of ending rurality in which agriculture is the most important livelihood. Rurality here means the essence of rural which include social, cultural and customary relation among the villagers which exist in support of agriculture and allied activities. But the way farmers are ageing and youth are least interested on agricultural activities then who will continue this activity? what will be the status of food security?, these questions led to think that how to attract youth on agricultural activities as an alternative employment to be a farmer and what determines their involvement, so that essence of rurality remain as usual by continuing agricultural activities.

To involve youth in agricultural activity is to make self-employment or to be agripreneur. The India's National Youth Policy (2014) argued that to promote entrepreneurship is essential in order to enable youth to productively contribute to India's economic development. About 50% of the labour force is currently self-employed, and small medium enterprise (SMEs) employs 70 million people which is approximately 15% of the labour force. Even FAO, IFAD & CTA (2014) stated that

facilitating the youth cohort's participation in agriculture has the potential to drive widespread rural poverty reduction.

Agriculture development specialists and policymakers around the world are concerned of young people who are not interested to stay in rural areas and taking up farming. Agriculture is rarely a first choice for majority. As Paisley (2014) put question, 'are there enough young people committed to creating a viable future for them in the agriculture sector?' Therefore, there is a need to change the mindset of the society and policy from government level as well. As such, Central Government especially Agricultural Ministry of India wants to initiate the programme called ARYA (Attracting and Retaining Youth on Agriculture) under Krishi Vikash Kendra (KVK), Indian Council of Agricultural Research (ICAR).

Hence, there is pressing need to change the paradigm of youth (Abdullah and Sulaiman; 2003) towards looking the agriculture sector as one of the opportunity for them to be self-employed. On these backgrounds this study pursued.

1.11. Research Questions

- What are the reasons that led to declining trends of farmers in the state of Sikkim?
- What are the perceptions of youth with respect to agricultural activities?
- What is the efficiency of youth participation in agriculture?
- What are the features which can attract & retain youth in agriculture activities in hills?

1.12. Objectives of the Study

- To understand the different issues of declining trends of farmers.
- To examine the perception of youth with respect to agricultural activity.

- To evaluate efficiency of youth involved in farming activities.
- To explore the features which can attract & retain youth in agriculture activities

1.13. Research Methodology

Research methodology is a critical part of the research as it highlights the actual process which will determine the outcomes of the research.

1.13.1. Research Design

In the Himalayan region, Sikkim is one of the state of Indian territory which is popular for organic agriculture and shown the new dynamics for agricultural livelihood. For the same reason it is imperative to understand the issues of farming livelihood in this region. Another thing which become rationale to study this issue are, instead of mushrooming industry after North East Industrial Promotion Policy 2007, in Report of Employment and Unemployment 2013-14 by Indian Labour Bureau ranked Sikkim at top position of higher youth unemployment rate among all states of India. Therefore, this study on Sikkim is persuasive where agriculture is becoming important sector due to organic brand and on other hand high youth unemployment instead of industrial development and other sectors. Hence, it is imperative to understand the relationship between agriculture and youth for their livelihood.

The study has considered information from different sources secondary as well as primary. Farmers and youths are main respondent for this study. Some definitions of terms used in study are

- Farmer or cultivators refer to a person who operates land (owned or taken on lease or otherwise possessed) and perform agricultural activities.
- Farming households, household having at least one person as a farmer.
- Agricultural workers are workers for agricultural purpose working in other's agricultural activities.
- Agricultural activities means the cultivation on the field, livestock rearing, bee-keeping, fishery, growing trees or plants and other allied activities etc.
- Agriculture and allied activities means supporting activities for agricultural activities.
- Agripreneur means a person doing farming for commercial purpose.

Youth, has different meaning to different agencies as per the requirement. In general, it refers to young generation of human being, above adolescent age and below 40 years (roughly). As per United Nation, youth is defined as a person between the ages of leaving compulsory education and start searching for livelihood or employment. In such case, compulsory education in India is till the age of 14 years for children under universal elementary education. It means, above 14 years, even it is above adolescent age too, is the cusp for completion of compulsory education and enters into labor market (legally but not necessarily).

With reference to above information about youth, above 14 years may be considered as a youth. According to India's National Youth Policy, 2014, youth is reflect in the age group of 15-29 years which comprises 27.5 percent of the population of India and they contribute about 34 percent in India's Gross National Income (GNI). Hence, there is huge potential of youth by increasing their contribution through accumulating their labour force participation and their productivity especially

in sector which is essential for living being i.e. agriculture which seek young and energetic labour power because existing farmers facing the problem like ageing and other. So, in this context, to understand perception of youth on agricultural activities, the present study considers youth in the age group between 15-29 years. For, youth farmer/agripreneur age limit consider till 35 years of age. It is because, as per pilot survey there is minimal number of youth farmers in Sikkim, hence study has taken upto 35 years of farmers as youth agripreneur/farmer to analyse the efficiency.

1.13.2. Data Source

Initially, secondary information have been collected from different scholarly books, research journals, study by different international, national and regional agencies, report submitted by various committee set by organizations, government etc. and periodic survey like NSSO, Census, Socio-Economic Survey, agriculture census etc. This information used to develop macro idea about the scenario on pursued research issue.

For primary information, primary data through scheduled questionnaire have been collected from 4 villages one from each district of Sikkim i.e. East, West, South & North and youths from same villages. The selection of sample is based on pilot information. Primary information is the major factor for this study to analyse the significant inferences. Information are collected by using various methods like group discussion, survey with structured and semi-structured questionnaire for farmers and youth (as per definition proposed for the study). 150 sample for farmer, for youth as per availability in sample villages, for youth agripreneur at least 30 (due to rear involvement of youth in farming) are considered as per discussion in departmental research committee.

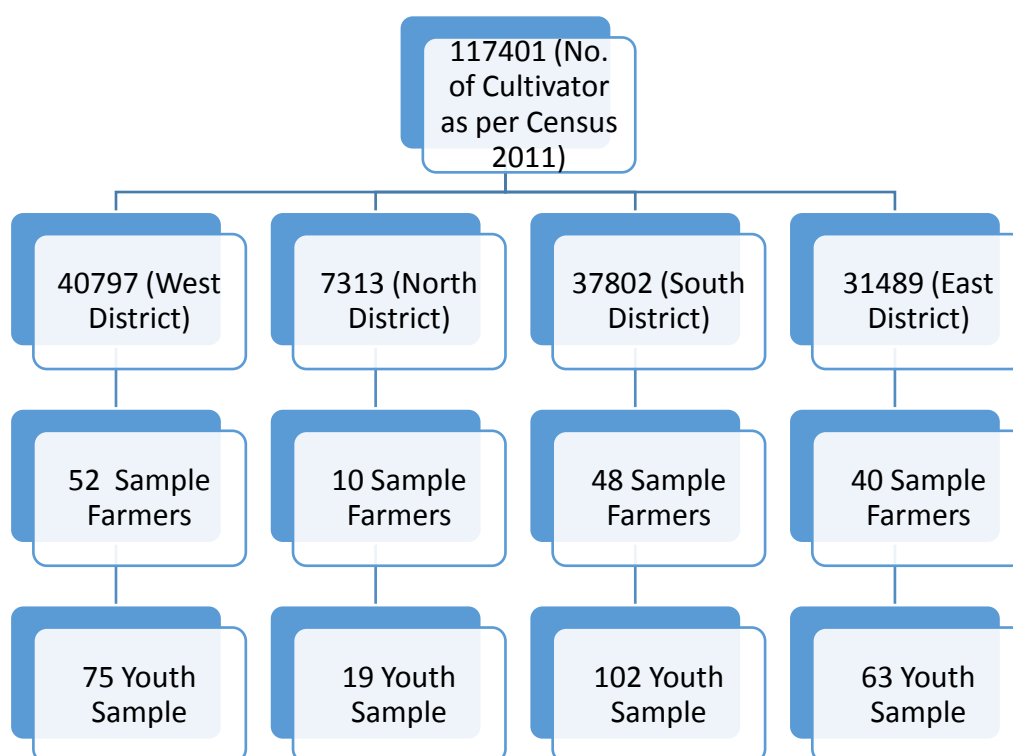


Fig: 1.2.: Sample Design

As a part of sampling, proportionate numbers of cultivators from four district of Sikkim are considered. According to agricultural information of Govt. (2011), West district has 40797 cultivators, similarly 7313, 37802 and 31489 has in North, South & East district respectively. Proportionally, out of total sample of 150, 52 sample from West district, similarly 10, 48 & 40 from North, South & East district respectively have been collected. The samples have been randomly collected from one agriculturally progressive village of respective district. Progressive village has been selected with the consultation of agricultural extension official of respective districts of Sikkim. Hence, village selected for the study are Basilakha from East District, Lum from North District, Rabitar from South Sikkim and Saprey Nagi from West District.

Fig1.3: Map of Study Area



Index: Δ Sample Village Name (written in Green colour)

From same sample farmer households, additionally, data from youth respondent as a sample have been obtained to understand their perception about agriculture and different constraints to participate in agricultural and allied activities. Accordingly, total youths cover to understand the perceptions are 259 from the same household or villages of farmers. To analyze the technical efficiency among the youth agripreneur, who are involved in agricultural and allied activities, 30 purposive³ samples collected from around the state. From them study collected information regarding production (in value) and different inputs used for production in appropriate unit to analyze the efficiency of youth farmers. So total number of youth samples are 289 (259 youth and 30 youth agripreneur).

At last, for the information about factor to attract and retain youth in agricultural activities, 15 professionals who are expert in the field of agriculture and youth empowerment has been selected for personal interview regarding the attracting and retaining the youth in agriculture sector. So, altogether samples for the study are 454 (150 farmers, 259 youths, 30 youth agripreneur and 15 experts).

1.13.3. Data Analyzing Technique

This section contains the technique and procedure of data analyzing for each objective.

a. To understand the different issues of declining trends of farmers

To understand the scenario of farmers from the macro view point the study critically analyzed the macro level information on farmers. For micro level understanding, the study collected information from 150 farmers through survey with

³ Purposive, it is hard to get youth involvement in one or two villages. Therefore, study purposively contacted the youth/young farmers from around the Sikkim.

the help of schedule. In addition to survey, in each village study conducted group discussion with 10-15 farmers to have a general consensus on issues which effecting farming livelihood in their area. Statistical tools, such as descriptive statistics (like means, standard deviation etc) are used to analyse the information. Altogether, analysis performed on both quantitative and qualitative method.

b. To examine the perception of youth with respect to agricultural activity

To understand the perception of youth with respect to agricultural activity 259 youths' respond collected with the help of questionnaire or schedule. The major threshold of the questionnaire is to take out the different aspect of perception towards agricultural activities and to identify factor which determine the individual preference to involve in agricultural activities. For this aspect question is scheduled on the basis of Likert scale technique to analyze the perception on different degree varies from 1-5 viz. like strongly disagree-1, disagree-2, neutral-3, agree-4 & strongly agree-5. This degree of response responded in different factors and feature based question which help to understand the perception of youth. The main reason for this design is that when responding to a Likert questionnaire item, respondents specify their level of agreement or disagreement on a symmetric agrees–disagree scale, assuming equal distances between each item and between each sequential possible answer (Allahyari et al., 2016).

In addition to above descriptive statistics used to analyze the data. At last to get clearer picture all items and factors compiled as per its relation on Economic, Social and Personal perception, Principal Component Analysis (PCA) and Structural Equation Model (SEM) to get appropriate result.

c. To evaluate efficiency of youth involved in farming activities

Efficiency improvement is an important source of production growth in any economy (Muhammad et al. 2009). In study to check the argument about the need of youth for agriculture sector, study analyzes their efficiency. For this study, 30 youth agripreneur⁴ are taken, who are engaged in dairy and vegetable farming in a commercial manner. These respondents are selected on the basis of purposive random sampling from all part of Sikkim. 15 each agripreneur are selected from vegetable and dairy category. Basic statistics and DEA method used for the inferences and SFA model used to know the effect of inputs on output.

For the DEA models, the CCR (Charnes, Cooper & Rhodes, 1978), on this model Constant Return to Scale (CRS) assumption have proposed a model which tries to envelop data by generating an experimental frontier. Further, the DEA model is extended to variable return to scale by Banker et al. (1984) which is terms as the BCC (Banker, Charnes & Cooper, 1984) model. CCR assumes constant return to scales (CRS) and can be either input or output oriented. BCC assume variable return to scale (VRS). Care should be taken that BCC scores can only interpret pure technical efficiency. The pure technical efficiency explains the ability of the organization in applying the physical resources for producing maximum possible output; thus the pure technical efficiency is referred as management efficiency. In order to comprehensive comparison among units, using CCR model is necessary. The CCR scores are a combination of pure technical efficiency and scale efficiency. The ratio of total efficiency (CCR) to pure technical efficiency (BCC) explains the scale efficiency (Sorayaei, 2012). The scale efficiency is a development which an

⁴ People deriving their livelihood from agricultural and allied activities in commercial manner.

organization can earn from advantages of return to scale by changing its size towards optimal scale.

On the basis of the SF model (Aigner et al.1977) the empirical SF model of Cobb-Douglas form along with composite error term is specified for dairy agripreneur in equation (1) and vegetable agripreneur in equation (2)

$$\ln y_i = \ln \beta_0 + \beta_1 \ln lab + \beta_2 \ln medicine + \beta_3 \ln feed + \beta_4 \ln rent + \vartheta_i + \mu_i$$

----- (1)

$$\ln y_i = \ln \beta_0 + \beta_1 \ln land + \beta_2 \ln labour + \beta_3 \ln bullock + \beta_4 \ln seed cost + \beta_5 \ln medicine + \beta_6 \ln manure + \vartheta_i + \mu_i$$

----- (2)

According to Stevenson (1980) the inefficiency component μ_i has a truncated normal distribution to have non-zero mode. This follows $\mu_i \sim N(0, \sigma_\mu^2)$ and $v_i \sim N(0, \sigma_v^2)$. The inefficiency factors were assumed to be linear to the mean and the inefficiency equations are (3) & (4)

$$\mu_i = \delta_0 + \delta_1 age_i + \delta_2 education_i + \delta_3 experience_i \dots\dots\dots (3) \text{ for dairy}$$

&

$$\mu_i = \delta_0 + \delta_1 age_i + \delta_2 education_i + \delta_3 experience_i \dots\dots\dots (4) \text{ for vegetable agripreneur.}$$

d. Explore the features which can attract and retain youths in agricultural activity

There can be many features which can help to retain the youth in agricultural activity but it is rarely have such research especially for the Himalayan agricultural activity. So for this 15 experts covering agricultural professional, youth agripreneur involve in agricultural activity, govt. official of agriculture sector and other related individuals are selected to take their views. To understand their view study used simple interview technique and analyze with the help of descriptive statistics and case study methods. Then, information analyzed by both qualitative and quantitative methods, to infer the responsible factors for attracting and retaining the youths in agricultural activity.

1.14. Chapterization

Chapter 1: Scenario of Agriculture: An Introduction

This chapter begins with introduction about the scenario of agriculture and youth from global to regional followed by statement of problem and motivation of study. This is followed by research question and objective of the study, which showcase to path for methodology and methods for the study.

Chapter 2: Literature Review

This chapter contains some aspect of theories and literature review.

Chapter 3: Agrarian Crisis: A Historical Sketches

This chapter contains the historical traces of Indian agricultural crisis and then history of agrarian struggle in Sikkim.

Chapter 4: Farmers' Sample Survey Analysis of the Study Area

This chapter gives the glimpse of ground level scenario of famers and farming of Sikkim. It tries to accumulate the issues of farming faced by farmers.

Chapter 5: Youth and their Perception on Agriculture

This chapter contains the perception of youth with respect to agricultural activity.

Chapter 6: Efficiency Analysis of Youth Agripreneur

This chapter tries to analyses the efficiency of youth agripreneur.

Chapter 7: Attracting and Retaining Youths in Agriculture

This chapter explores the features which will helps to attract & retain youth in agricultural activity.

Chapter 8: Summary Conclusion and Suggestions

Last chapter contain summary of study, conclusion and suggestions.

Chapter 2

THEORITICAL FOUNDATION AND LITERATURE REVIEW

2.1. Agriculture: Source of Livelihood

It is established in mythology that prior to emergence of human life nature created food. In *Bhagawat Gita* it is written that '*Annaat Bhavanti Bhutaani Parjanyaat Anna Sambhabhah*' it is the food that created life and food from rain. Similarly, in *Manusmriti* it is mentioned that '*Aagnau Prastahuti Samyaga Dityamupa Tisthatey, Aadityaj Jayatey Bristi Bristay Annam Tatah Praja*' which means that as a result of *yagya* (rain) occur and rain helps to produce food and from food human generated.

Food is produced in two forms or from two kind of agriculture practices according to *Shukla Yajurveda* '*Krishta Pachyaschame, Akrtishta Pachyaschame*' which means in one way agriculture with cultivation practices and another way agriculture without cultivation practice. So, '*Krishi Dhanyam Krishi Maithya, Jantonam Jiwanam Krishi*' which means that agriculture is the source for all resources and ultimately base for human life.

A number of forces are actively involved in agricultural activities like physical, biological, economical and sociological forces. That's why agriculture is not only an occupation but also a way of life. There are some relationships which are of purely economic in nature i.e. input-output relationship, cost and revenue relationship, production decision, price-decisions, maximization of output/profit or least cost combination of inputs; income distribution and trade are some aspects where economists pay attention. Demographic structure, working conditions, customs tradition and rituals of rural population, social capital, social norms and their impacts

on the thinking of rural masses and on their way of living are some sociological aspects.

The nature of agricultural activities is such that it involves the whole family in pursuit of livelihood and hence it becomes a way of life. The very word “agriculture” reflects that it is a culture, a way of living rather than a modern business enterprise. It is a unique sector in which the mode of life, a culture, profession and business are combined together. This unique feature no longer exists in industry or in any other sector. Agriculture is a basic industry as it provides food for all without which nobody can live. It is also true that industrial growth depends on it as it provides major raw material for their growth and expansion. No other sectors take such strategic responsibilities for growth and development of an economy.

Farming has been the oldest and the main livelihood of mankind all over the world. Other occupations evolved in the process of progress of civilization. Even today, more than half of the world’s labourforce derive their livelihood directly and indirectly from agricultural activities. Thus, on the occupational side, agriculture is the biggest industry of the world. As part of agricultural economics combining all economic and social factors of agriculture and its issues of understanding led Taylor to say that “agricultural economics deals with the principles which underline the farmer’s problems”. But contemporary developmental phenomenon changes this understanding and lead to raise various new problems which is not sustainable in nature.

Sustainable development is not just about the planet and protecting natural environment but also about people. From this angle, a prerequisite consideration should be to recognize food security and good nutrition as a cornerstone of

sustainable development. Without that, people cannot live, learn, prosper and lead a healthy and productive life and societies cannot achieve their aspirations for innovation, growth and social stability. Therefore, it should be clear that achieving food security is about much more than simply increasing productivity. It is also about creating better opportunities for people to access food and produces the same (FAO, 2014).

But, due to various reasons agriculture couldn't become a vibrant sector for the development in India and still treated with different eyes. Demand for sustaining agriculture is growing up from many stakeholders. Sustainable agriculture may be defined as any set of agronomic practices that are economically viable, environmentally safe, and socially acceptable (Jeyakumar; 2011). It means sustainability must be supported by the sense of economic, environment and social. This study focuses more on socio-economic acceptability for sustainability. Socio-economic acceptability means society should accept agricultural activity as a prosperous livelihood.

2.2.Agrarian Issues

Farmers produce variety of products that feed not only the humans but also the animals that humans use for several purposes. That's why farmers and farm communities are fundamental to any society and economy. Yet farmers from around the world are facing lot of constraints pressures that are eroding their livelihoods and their capacity to provide these goods and services (Buckland; 2004). These changes can be the consequences of micro or macro policy or scheme which are implemented by global or national authority.

Starting from global perspective, global level policy framework and its neo-liberal policies are fairly responsible for erosion of farms. In last two or three decades, policies aimed for farm development through the market, international trade and modern technology. This has both pros and cons, positive and beneficial effect to some farmers and negative effect to major farm community. This farm policy regime advocated for the reduction of state intervention as necessary for poor people. Moreover, powerful actors such as the USA, EU and transnational corporation have distorted markets, trade and technology in their favour and often at the expense of small farmers around the world, which distress the agricultural way of livelihood (Buckland, 2004). This problem has a good linkage to the economic theories related to the growth

According to Lewis (1954) there is unlimited unskilled labour supply available at subsistence wage and production grows with time and capital gets accumulated. In Neo-Classical era, few Asian economists advocated that even if labour supply is unlimited economic expansion certainly cannot be taken granted by observing Asian scenario. In context of Lewis model, unlimited supply of labour exists in the economy where population is large relative to capital and natural resources. Hence, there are large sectors of economy where marginal productivity of labour is negligible, zero or even negative. Based on this idea Lewis established Dual Sector Model, as theory of development in which surplus labour from traditional agriculture sector (characterized to be low wages, an abundance labour & low productivity through labour intensive production process) is transferred to industrial sector whose growth over time absorbs the surplus labour, promotes industrialization and stimulates sustained development.

In contrast there are many studies, which counter the facts of Lewis idea of surplus labour economy regarding labour in agriculture are mainly stand in disguised unemployment. As Paglin (1965) shows that large scale opportunities for additional employment exists within agriculture and the output of current labour force could be increased by redistribution of labour within the sector. Similarly Mishra (2015) explained the nature, extent and cause of the distress in two perspectives which are interrelated strands i.e. agriculture and agrarian. The former is function of crop production which relates to the inadequacies and inappropriateness of the agriculture development programs and their impact on the farm. The latter is an impact of distribution and which are more closely linked to the farmers and its livelihood of the people involved in agrarian economy, which is altering in present era in the name of agricultural development.

Agricultural changes are not uniform across Asia and the future of small agriculture holders are facing several challenges arising from a range of socio-economic, demographic, structural and institutional factors that could adversely affect its sustainability (Vishwanathan et al. 2012). Whether young or old, it has become very common and usual that fewer individuals have knowledge about the process of agricultural practice and its importance to the individual and to the economy as a whole (Holz Clause & Jost, 1995). This lack of knowledge can be partially due to the increase in population migration from rural to urban areas (Reidel et al.; 2007).

In addition to this, ageing of existing farmers is another major issue for universe. A significant and rising proportion of small land holder farmers across the world are now over 60 years old, especially in underdeveloped and developing countries. Therefore, the ageing of agricultural workers and farmers has become a

trend that needs urgent action (Gorman, 2014). Johr (2012) noted the survey of rural demographics in the USA, Japan and the EU reveal an ageing farmer population. The average age of farmers in the US (58 years), Japan (67 years), one third of European farmers are 65 years old and all OECD countries show similar trends. Even Adesina & Favour (2016) noted that it is practically impossible for this age generation dominating agriculture sector to deliver the expected productivity to meet food needs of the ever growing population.

The study by Keogh (2016) in Australia since 1981 found that the average age of both males and females working in agriculture has increased considerably, with the average now exceeding 53 years. This declining trend may be related to the ageing farmers demographic, the assumption being that older farmers are less likely to adopt new technologies or refrain opportunities to innovate. In similar context, Oladimeji & Abdulsalam (2013) found that age is important to determine agility & physical strength of the farmers.

India and China are not only highly populated country but also two of the largest agricultural producers in the world. Amongst the multiple problems in agriculture both India and China are also facing an ageing workforce in agriculture is prominent one. A Study by Guo et al.(2015), shows that in China, agriculture is facing an ageing workforce which is negatively impacted to agriculture industry. Even the changes in composition of the working age households indicated 58.53 percent of the agricultural producer will likely to quit. As Katyal and Katyal (2018) noted from UNDP that average age of Indian farmers is 60 years. So in India, the progressively increasing age of farmers has led to a phenomenon known as persistence of uneconomic cultivators, groups of farmers who continue to till land without necessary resources,

living a life of insecurity & sub marginal existence. This becomes potential threat for the future of agricultural development.

With respect to ageing population on economic growth, Manton (2008) study found that socio demographic and health conditions in all listed countries have potential effects on population and labour force ageing on economic growth. In European union, as noted by Guo et al. (2015) which is facing dual problem i.e. scarcity of young and new farmers and ageing of the farmers population led to think for some mechanism to ensure the future of the farmers profession. Study found by using Cobb Douglas Production function analysis at 10 percent significant level that ageing farmers negatively affected agriculture.

At the same time, farming has a negative image and do not attract young people; they consider it as a poor man's business that requires hard and dirty work and barely provides a decent living. This is also reflected in the education system where agriculture is never becomes a first choice and where teachers often use agricultural activities to punish undisciplined children (Cuts International, 2013). Similarly, education divides the members of farmer household, in which those who get good education wants to engage in non-farm sector which reduce the workforce in agriculture sector (NSSO, 59th round).

Consequently, most farm lands are abandoned due to insufficient labours. To overcome this problem more farm owners are looking to migrants labours to work in their fields. But it observe, that even for migrant workers, agricultural activities does not seems as an attractive as factories and other commercial establishment (Othman & Ishak, 2009; Abdullah and Sulaiman; 2003). It may be because, as Hiremath (2007) & Umunnakwe (2014) argued that, land based livelihood of a small and marginal farmer

is increasingly becoming unsustainable in India, since their land is not supporting their family's food requirement and fodder for their cattle.

In similar way, Mukherjee (2002) and Umunnakwe (2014) found that rise of mechanization in agricultural activity led to fall on farm employment in India. Majority of farmers of India, who are feeding the nation are small and marginal farmers and their livelihood are facing various challenges. One of the major challenges is productivity and for productivity it is believed that new technology and new pattern of farming is remedies. As Reddy (2013) founds that, technological changes can raise productivity when farm size is large landholding. But to ascertain this relation, multiple factors that affects the relationship between farm size and productivity like efficient use of land resources, intensity of cultivation, soil fertility, balanced technological inputs, managerial efficiency, access to irrigation facilities etc. That could be the reason NABARD (2015) in their monograph stated that the challenges for Indian agriculture are to shift thinking from tonnage centrality (productivity base of measurement in tonnes) to farmer centrality.

As other factors, lack of extension service from authority demoralizes the farmers. As Adesina & Favour (2016) noted that, increased agricultural productivity and enhanced farmers income are only attainable when an effective agriculture extension system is put in place. Generally, the poor chose agriculture as one of their main income generating activities because they believe that it has ability to produce higher productivity with less investment (Silva et al.; 2009, Abdullah and Sulaiman; 2003).

Another issue realized in the rural area in terms of population settlement and their livelihood as per Umunnakwe (2014) is that, now a day's people prefer to have

rural life although not supported by farm activity, significantly involving in non-agricultural income generating activities. It is because of improved social amenities in the rural areas as well as improved linkages to urban centers and greater access to infrastructures is hypothesized to be positively linked to non-agricultural activities and negatively related to participation in agricultural activities. Similarly, Kumar et al. (2019) study about the predictive factors to avoid farming from the region of Ahmedabad, Gujarat found that correlation between factors to avoid farming as livelihood at 0.01 level of significance are age (0.589), education (0.330), farming experience (0.250), occupation (0.446), livestock possession (0.207) and annual income (-0.236). Jodhka's (2012) study support this in his study in Haryana. Similarly, Deshpande and Prabhu (2005) mentioned that more than six decades since independence, several policy initiatives framed by central and state governments do not really reach their intended beneficiaries

Agricultural production requires the joint participation of labour, machinery, fertilizers, pesticides and land among the elements. Agricultural producers will adjust these elements depending on the conditions of rational expectation and judgments experiences. In theory, farming that expect to continue production in the future will have significantly different factors input compared to farmers who do not intend to continue to engage in agriculture production. Furthermore, agriculture producers of different age make different choices regarding input elements (Guo et al. 2015). Given that, it is imperative that government considers how best they can support farmers throughout the different stages of their lives to protect and promote their livelihoods. Supportive government policies will also be important in terms of maintaining or increasing national agricultural production levels. Social policies (including adequate social protection systems) should also address the needs of vulnerable older people in

rural areas, given that traditional family support systems that have typically provided livelihood support have been considerably weakened by rural-urban migration and other factors too. Supporting farmers in later life in this new demographic reality could bring wide stretching benefits. Helping them to adapt to changing climatic conditions, raising their crop yields and income, will make an important contribution to demonstrating the potential of smallholder farming as a profitable livelihood. This may in turn create incentives for younger people to return in agriculture (Ottosen, 2014).

Existing farmers preferences to leave the farming or continue depends of various factors as advocated by Zhou(2009), Guo et al.,(2015) & Ma & Yang, (2005) are agricultural subsidy, production price, food prices, govt. scheme, family support, social security. Existing labour force (farmers) of agriculture activity steadily lowered due to decline in the new labour force employed in agriculture. This, means ageing farmers lacking the support from newer farmer led to emergence of withdraw from farming.

Study done by Kontogeorgos et al. (2014), advocated that direct govt. payment through various scheme resulted in greater migration of labour from agriculture. Therefore it seems that government policy becomes one of the major limitations on sustaining the agriculture labour force. In India, like MGNREGA, Food Subsidy, Skills & Vocational training in other than farm sector etc are invisible factors. Even FICCI & KPMG (2015) report on ‘Labour in Indian Agriculture: A growing Challenges’ states that factors such as higher remuneration in alternate sectors along with the relatively lower rise in wages in agricultural occupation as compared to other sectors have led to the migration of workforce away from agriculture which has

resulted in labour shortage and consequent escalation of cost of cultivation furthermore, government scheme like MGNREGA which have facilitated migration of labour to other segments need to be reformed. Study done by Prasad (2014) on MGNREGA and labour shortage in agriculture in Bundelkhand region of Uttar Pradesh found that main cause of labour shortage are rural out migration and MGNREGA works. Correspondingly, Chand and Srivastava (2014) argued the rural labour markets are significantly changing due to increase in opportunity other than agriculture sector. The effect of the expansion of MGNREGA in terms of number of household and duration of workdays leading to reduce supply of labour for agricultural activities. Likewise, Harish et al. (2011) study on Karnataka found that execution of MGNREGA led to scarce the labour by 53 percent and 30 percent for agricultural operation like weeding and sowing respectively. Even they observed decline in area of labour intensive crops like Tomato & Ragi to the extent of 30 percent due to execution of this program.

Minimum Support prices are one among the factors affecting the farming population. Farming sector considered as prone to poverty and uncertainty. So to safeguard the benefits of famers, an attempt made with the help of price support policy (i.e. MSP). This was executed mainly to motivate farmers to ensure value to the product and induce farmers to continue cultivation. But high MSP also pushes up to the price of commodities in the Market. In return vulnerable poor, low purchasing power family i.e. farming family faces the problem of hike in price of other commodities, as other sector borrow raw material directly indirectly from primary sector. That's why when there is overall rise in price level, it erodes the purchasing power, raised the cost of living and lowers the real value of saving led to think leave agriculture and shift to other sectors. As a fact, to control inflation historical database

suggested that low inflation retain whenever agricultural production is high and sometime bumper production resulted to negative inflation (i.e. in 1953-54, -12.5 %) and in same decade inflation was 13.8% due to demand pressure. This indicates, agriculture sustainability has major solution for balanced economy (Solanki, 2013).

On risk for future food security, Guo *et al.* (2015) that, those intending to abandon farming regardless of age (old and young) their input and output is lower, indicating that this intention is not conducive to improving agricultural production. It means intention set due to the many factors to abandon agriculture is really seen as a crucial factor. In other side, if we can sustain the aged farmers in farming, then there is advantage, to lead more efficient combination of input to make unit of labour more effective because of their (aged farmers) experiences. Even Deshpande & Prabhu (2005) propounded that the absence of any welfare provisions for farmers can affect the economy, if not addressed in time. In a broader economic perspective, farmers who have turned to entrepreneurship and have tried to adopt new ventures are most likely to be discouraged due to absence of safety nets. The phenomenon of continuous discrimination threatens the well-being of the farming sector in the future if it is not dealt in present.

The phenomenon leaving agriculture due to unfavourable conditions is not desirable even though there is increase to employment. Therefore, the development discourse needs to link the distress in agriculture to livelihood issues of people as Mishra (2015) argued. Sikkim's agriculture also cannot be aloof from the above problems, where farmers are small and marginal. Subba (2016)⁵, study done in

⁵⁵ Subba, Bitu (2016). "Food Security and Management in Sikkim: Role of Public Distribution System and Mahatma Gandhi National Rural Employment Guarantee Act" PhD thesis submitted to Sikkim University, access from Sikkim Central Library on 9/8/18

Sikkim argued that due to poverty and hunger many residing in rural areas migrating towards urban areas to secure livelihood conditions, and leads to slum in urban area making condition worse. In order to solve hunger, poverty and migration strengthening agriculture sector is must. So altogether, it can be observed that agricultural development policies and programmes as well as technological and institutional developments have heavily focused on planning from macro-perspectives without understanding the importance of micro environments and the socio-ecological systems that shapes smallholder livelihoods (Vishwanathan et al., 2012). Therefore the understanding of farmers' environment in micro level is essential.

In the era of Globalization, effect of issues raised in one part of world can have impact in other part of world. As such, Sikkim 22nd state of India which is known for one of the pioneer state on 'Organic Agriculture' has also facing such challenges as explained above. All above literature provide the glimpse of scenario of agriculture and farmers' of global and national level and to some extent regional level. But it is rarely found that the study which focuses on farmers scenario of hill region especially Sikkim, which is only organic state in the country. So, this study focus to understand the scenario of farmer of Sikkim and the factors which affecting their livelihood.

2.3. Youth Perception and Agriculture

This section contains the study about the perception of youth on agriculture. Before this a brief of the various theories of Occupational choice have been discussed as these also determine choice an occupation and hence, the creation of perception towards a particular occupation. Occupational choice is study of understanding the relationship between the interest and personality, which emphasized the ego-

involvement and ego-strength in the process of choice and there importance of self-acceptance in personal adjustment in particular livelihood.

Ginzberg in 1951 advocates that choice is a developmental process over period of time which is largely irreversible, periods of occupational choice distinguished in three viz. those of fantasy, tentative and realistic choices. On process of time, theory develops with the criticism of previous work and addition of perspective, approach and factors to understand the occupational choice or perception to adjust in particular livelihood. To understand factors which influences an individual perception or occupational choice Super (1949), O'Hara (1958) developed the self-concept of vocational choice; Roe (1956) proposed that early childhood environments and parental attitude are principal factors for influencing both vocational interest and occupational behaviour. Bordin et.al. (1963) relates theories to have the personality characteristics relevant to a given occupation. Holland (1959) assumes that at the time of vocational choice, the person is the product of interaction of his/her particular socio-cultural heredity and environment. Field et.al. (1963) suggested to take into account of the changing situation and flexible combinations of an individual's perception which are subject to situational influences. Variation of knowledge of alternatives, its rationality and its discrimination between alternatives constitute the limiting conditions within which individuals choose occupations by arriving at a compromise between their preferences and expectancies (Blau et al. 1956).

Occupational choice is a developmental process that extends over many years. There is no single time, specific for the decision of all possible careers by young people, but there are many crossroads at which their lives take decisive turns which narrow the range of future alternatives and thus influence the ultimate choice of an

occupation. At last, an individual's qualification and other which may be unknown or beyond an individual control like economic conditions, employment policies etc influence the choice of occupation.

Moreover, one of the major factors which influence the decision can be found out through analysis of historical changes in the social and economic conditions. Occupational choice and entry depends on two aspects, an individual decision of careers led in terms of skills and interest which have been affected by the past social structure, whereas occupational opportunities and requirements for entry are determined by the present structure. Determinants of occupational entry depends on various factors like the demand of new vacancy may be technical and non-technical, rewards which not only include income, prestige and power but also opportunity for advancement, congenial fellow workers and information people have about an occupation. Two characteristics of individuals are complementary to the types of occupational requirements viz. their technical skills to perform various occupational duties and their other social characteristics that influence hiring decisions. Finally, value orientations determine the relative significance of different kinds of rewards and thus the attractive force exerted by them. Preparation of children career choice depends on the financial resources of family's position in the stratified social structure. Even parents' value orientations, their child rearing practices, the number of children and the likelihood that the family is organized along authoritarian rather than egalitarian lines.

Therefore, internal conditions which govern the occupational entry depends on different process of personality development and the external conditions that govern the entry have their roots in historical changes in the social structure. In turn, changes

in the social structure also affect the course of personality development, and historical changes, in turn may well be contingent on the emergence of new personality patterns. The study of historical trends in occupational selection also involves analysis of the processes through which the patterns of selection at an earlier period influence those at a later one.

The factors which influence the youths decision ranges from childhood environment, education and its curriculum, socialization, occupational goal, economic factors like current wages and its future expectation and expected risk and others are directly and indirectly influence the perceived perception for occupational choice. Individual perceived values are major elements to understand the occupational choice or goal. Values are a social fact which influences the behaviour of individuals and consequently, the structure and organization of the labour market (Schwarzweiler, 1960). Similarly, status/prestige is another important dimension of occupational choice.

As the preceding sections show, there is a good amount of evidences showing the rising trend in withdrawal among youth from farming occupation. The trend is stronger in the regions with low value of agricultural production per capita and in villages close to towns. At the individual or household level, the trend is stronger among rich, educated and youth with non-farm skills (Sharma; 2007). It could be because of lack of positive perception of agricultural activities.

Perception refers to consciousness of a particular objects and events by means of sense. Negative impact seen because of conventional perception of agriculture led to the current shortage of individuals with knowledge and expertise in the food and agricultural activities. People see agriculture as relevant to their daily lives with

respect to what they eat and how does food is processed, but they do not see the relevance of participating in agriculture as a career by youth (Alston & Crutchfield; 2009), in which building positive belief and perception about agriculture is necessity.

The decisions of an individual's to select agriculture as a field to actively engage to make a career may be predicted by examining their beliefs about agriculture. Beliefs shape the perception of an individual or youth. There can be many factors which helps to build the perception. Alston & Crutchfield(2009) found that the perception of agriculture plays a significant role in relation to the participation in agricultural activities.

Youth perceptions of agriculture have developed from parents, school, and counsellors. And even the background of the family is seen as an important factors, where parents may influence the perception on career development (Amiziet al.; 2015). Anderson (1994) also had same argument that parents influence and molded their children for their future. Study by Olaniyi et al. (2011) on Oyo State of Nigeria regarding the perception of rural youth and utilization of agricultural information, in which they found positive and significant relationship existed between perception and utilization of agricultural information with farming experience and household size.

Accordingly, gaining insight into youth perceptions of agriculture allows researchers and educators to develop methods to educate better and inform youth about agriculture. Agricultural literacy is a critical need. The cultivation of agricultural interest among youth can ultimately lead to agricultural awareness and workforce to support agricultural practices that allow society to thrive (Holz & Jost, 1995).

A study by Narain et al. (2015) in Bundelkhand of Uttar Pradesh about youth perception, found that rural farming youth are declining day to day and educated youth not shown interest in farming. But youth power is a big opportunity for India. If educated youth choose to live in villages and launch the new agriculture movement based on the integrated application of science and social wisdom, untapped demographic dividend will become greatest strength.

So it is necessity to analyze the youth perception towards agriculture and its activities. And addition to this, even it is appropriate to find out the different constraint factor of youths which refraining them to participate in agriculture in next section.

2.4. Youth Efficiency in Agricultural Activity

This section contains the importance of youth participation in agriculture for efficiency in agriculture.

Muhammad et al. (2009) stated that efficiency improvement is an important source of production growth in any economy. As they found that there are many factors which affected the efficiency of youth in agriculture viz. size of family, use of extension services, and education level of youth and years of farming experience. As per Oladimeji & Abdulsalam (2013) identified the determinants of technical efficiency as household size, farming experience, level of education, labour farm size & non-farm income.

To increase youth involvement in the agriculture sectors is more important than ever, as a rising global population and decreasing agriculture productivity led that youth must play pivotal role in ensuring food secure future for themselves and

future generation. But the concern is whether youths performing efficiency in farm activities has potential to utilize the resource efficiently and optimally. As studied by Pechrova (2015) on finding the technical efficiency of young farmers in the Czech Republic found that young farmers are more efficient (67.6%) than other non-young farmers (59.1 %). It may be because Devis et al. (2013) established the facts that young farmers has longer planning horizon and investment more to the growth as compare to older farmers. The very facts suggested that due to less life remain for older people they would not think for long term plan as compare to youth who has whole life to derive their livelihood from the same, makes them planned for long period with efficient investment.

Abdulai et al. (2018) found that agriculture mechanization & level of formal education did not have positive effect on technical efficiency whereas agriculture extension had a positive effect. Saiyut et al. (2017) by analysing panel data for 2009-2013 of Thai agriculture found that labour force over 60 years increased technical inefficiency & while labour force aged between 15-59 years reduced technical inefficiency.

Sharma et al.(2000) from their study revealed that for cereals production most of the farmers are operating at low level of efficiency due to use of traditional cultivation methods. It could be because of lack of technical knowledge about improved packages of practices, improper or low levels use of fertilizers non availability of required inputs timely. This indicates that there is scope to improve the operation of farmers & move into high technical efficiency level by adopting suitable cultivation practices. Hence, they suggested that hill farmers should be educated on

relocation of resources, adoption of new inputs and technologies for improving production & profitability.

Idiong et al. (2007) stated that, labour productivity is a function of age because it believed that old tends to adhere strictly to traditional methods of production and young people tends to be more willing to adopt new production method in order to increase their output. The results of the estimation of the inefficiency effects model revealed that the coefficient of age of the primary decision maker was positive. This signified that aging farmers have more inefficiency than young farmers. Accordingly, study further pursues to analyze the efficiency of youth agripreneur.

Stloukal (2004) stated that abilities of farmers decline in older age due to less health in developing countries & Li & Sicular (2013) showcase the reason that older farmers possibly lack motivation in improving & expanding farm productivity. Hence, Saiyut et al. (2017) suggested that the government should establish policy options to encourage younger entrants into the agriculture sector as well as foster them to become smart farmers.

2.5. Attracting & Retaining Youth in Agriculture

This part mainly dedicated to collaborate the study which advocates the implication of youth on agriculture sector and their importance.

Youth are the future of food security. Indeed, a coordinated response to increase youth's involvement in the agricultural sector is more important than ever, as a rising global population and decreasing agricultural productivity resulted that youth must play a pivotal role in ensuring a food-secure future for themselves, and for future generations, as advocated in a study done by FAO, IFAD and CTA (2014).

Muhammad et al. (2009) stated in their study that there is an increasing trend of disinterest in agriculture by the emerging younger generation due to increase in preference in white collar jobs, which led them to remain in the labour market rather than take up activities/jobs in the agricultural sector. Therefore it can be connected to the fact that very little is known about the productive potentials of agriculture and allied activities led to less attraction and consequently not retain them in agricultural livelihood

As per report 'Youth & Agriculture: Key Challenges & Concrete Solution' by FAO, CTA and IFAD (2014) the six challenges to attract and retain youth in agriculture by accumulating various case studies from across world for each challenges like youth insufficient access to knowledge, information and education, limited access to land, inadequate access to financial services, difficulties accessing green jobs, limited access to markets and limited involvement in policy dialogue. It found that if these challenges are intervene with relevant policy and schemes, youth are most productive for agricultural development. As a result, it has potential to drive widespread rural poverty reduction among youth & adults by addressing the untapped potential of youth cohorts.

Overton and Scheyveus (1999) propounded that agriculture unfortunately consider non prestigious occupation and it is often associated with poverty. Able young people seek careers in higher paid urban based occupations and there is a real danger that agricultural knowledge may be eroded if there are not enough members of future generation committed to continuation. It can be because of education which is imparted to student, which influences the selection of livelihood. Abdullah and

Sulaiman (2003) anticipated that those who have tertiary education they consider agriculture is not the right place to be.

But, farming has become a knowledge intensive and there is need for retaining graduates (may be agriculture or other skills) in villages in order to achieve the desired technological upgradation of farm enterprises. There are several ongoing technology transfer and extension mechanisms like the ATMA. Krishi Vigyan Kendras, lab-to-land programmes and regular extension services also exist. In spite, of these efforts the gap between ‘scientific know-how and field level do-how’ is widening. That is why it is essential to take steps to attract and retain (educated) youth in farming⁶.

All through history, youth have been the indications of change from winning independence for nations, to creating new technologies that upset the status quo, to new forms of art, music and culture. Supporting and promoting the development of India’s youth must be one of the foremost priorities, across all sectors and stakeholders, of this nation (NYP, 2014). Similarly, agriculture is one of the sector which adjusted more than 50 percent workforce and more than 60 percent of population depend, is not able to grown as it should to be, so youth as above stated always be a source of changes and transition, now agricultural activities need the enthusiastic hand and mind of youth.

Abdullah and Sulaiman (2003) rightly pointed out that after the analyzing the youths perception on agriculture that, youth as the future of the nation must be sensitive and sensible in their career development. They should think not only for

⁶ consultation on attracting and retaining youth in farming held on 28th may, 2006 – summing up by prof m.s. swaminathan, chairman, ncf.

their future but also of their families, societies and to a larger extent that of nation or global. Therefore, access to technology or finance could improve and infrastructure developed, but none of these efforts will ensure food security if we do not entice more young people to enter into farming (Rob Vos; 2014). Therefore there is high need to showcase the importance of youth for agriculture and vice versa and find out the mechanism through which youth can attract and retain in agriculture.

On one study done by Moss et al. (2013) titled 'Farm to School and Nutrition Education' analysis by intervention consisted of two nutrition education classes and a farm tour to the 3rd grade students. They found significant differences on concerning knowledge of fiber ($p < .001$) and knowledge of vitamins and minerals, reported vegetable consumption behavior at school and farm exposure were also significant ($p < 0.05$). Altogether they suggested that nutrition education and farm tours can positively affect school aged children's nutrition and fruit and vegetable consumption behavior. This indicates that agricultural education and exposure helps to get knowledge and its importance for life which will boost motivation to attract and retain youths in agricultural activities.

These above literatures indicate the importance of youth to sustain agriculture for sustainable future. Here opportunity cost of leaving agriculture can be less economically, but socially and in context of food security it has unrecoverable opportunity cost, that's why involvement of youth on agriculture is important.

2.6. Research Gap

There is crucial need to take step forward to attract and retain the youth in agriculture not only for food security but also for providing employment opportunity

for tackling youth unemployment problem and increase the efficiency of agricultural activity.

Altogether, study rarely found that the study about the farmers and the study about the factors which affect the youth to involve in agriculture sector as a livelihood option, in Himalayan agriculture especially in Sikkim. Therefore, this study focuses to understand the scenario of farmers and perception of youth about agricultural activities and their involvement in agriculture in tiny Himalayan state, Sikkim.

Chapter 3

AGRARIAN CRISIS: A HISTORICAL SKETCH

3.1. Introduction

Agriculture is the most ancient livelihood sector on earth. With the process of development agriculture is opened to global economies and steadily the viability of small farmers and small farms are destroyed (Kumar et al. 2019). It is a result of perceived mentality which believes that growth can only be achieved through industrial development based on theory and ideology originated in Western part of the world, which focused to other than farm sector for so called growth, neglecting the farming sector.

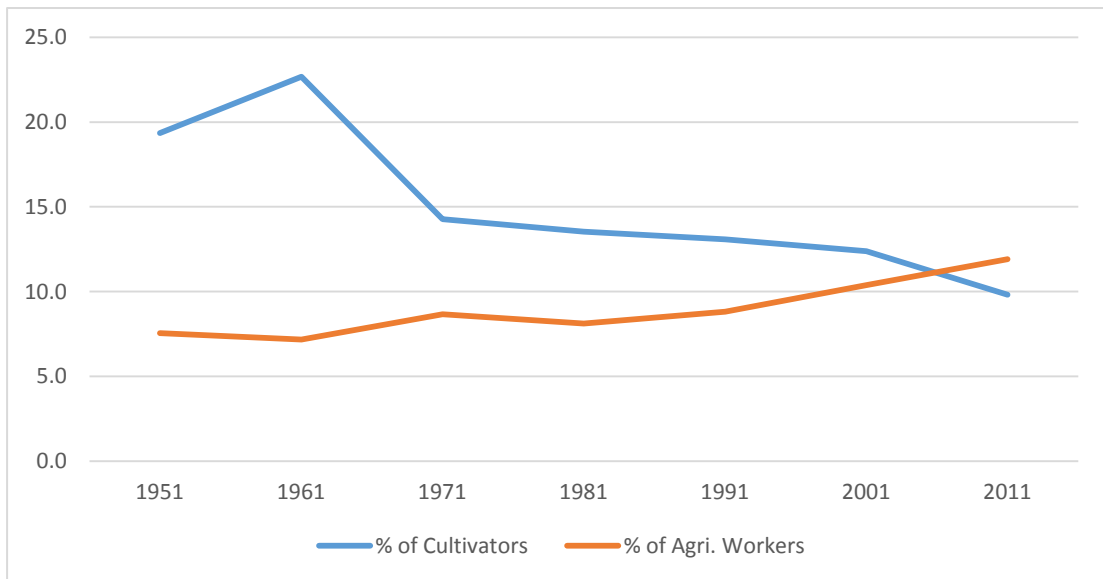
The way growth of population is taking place, it necessitates a higher rate of economic growth in order to maintain the same standard of living of the population. So it leads to higher demand which increases burdens and the consequence is to make greater effort to accelerate the growth. On other side, rising population leads to increase in the labour force. This rapid growth of labour force creates a higher supply of labour than demand leading to unemployment and decline in real wage rate. Rapid population growth induces intensification of subsistence in which diminishing return on labour is traded for increased production. This process has also affected cropping pattern land-use strategies, resulting in major environmental and social obstacle (Schroeder, 1985). Division of land increased with the pace of development. Indian farming, the most significant source of survival for marginal and small farmers in the world are facing today a crisis of extinction (Kumar et al. 2019).

Small and marginal farmers constitute the largest group of cultivators in Indian agriculture. Due to many developmental factors farmers are struggling to survive and resulted in increase in number of agricultural suicides among small and marginal farmers (National Crime Records Bureau, 2011). While indebtedness is often cited as the immediate reason for distress (Satish, 2006) and deeper issues are related to vulnerability to risks in agriculture production, led them to leave farming.

While small and marginal farmers have the advantage of intensive knowledge on farming and access to family labour with no cost, but they are suffering from of high transaction costs other than labour inputs (Hazell et al., 2010). Inability to access credit and insurance services and vulnerability to vagaries of the climate, pests and other risks further complicate the picture of small and marginal farmers (World Bank, 2008). Recently, greater import competition has added to the difficulties of the smallholders in India (Desai and Joshi, 2014).

Also, changing patterns and practices of agriculture initiated by the large farmers are impacting the small and marginal farmers in the rain-fed areas, who started to opt for cash crops and high yielding varieties without sufficient understanding of its associated risks (Dave, 2012). In past two decades witnessed high levels of indebtedness, increasing unemployment and resultant migration along with a generalized distress in the rural areas of India (Ghosh, 2004 & Suri, 2006). As a result number of cultivators is declining in other hand agricultural workers or labourers are increasing as shown in Figure 3.1.

Fig 3.1.: Percentage of Cultivators and Agricultural Workers with Total Population in India (1950-2011)

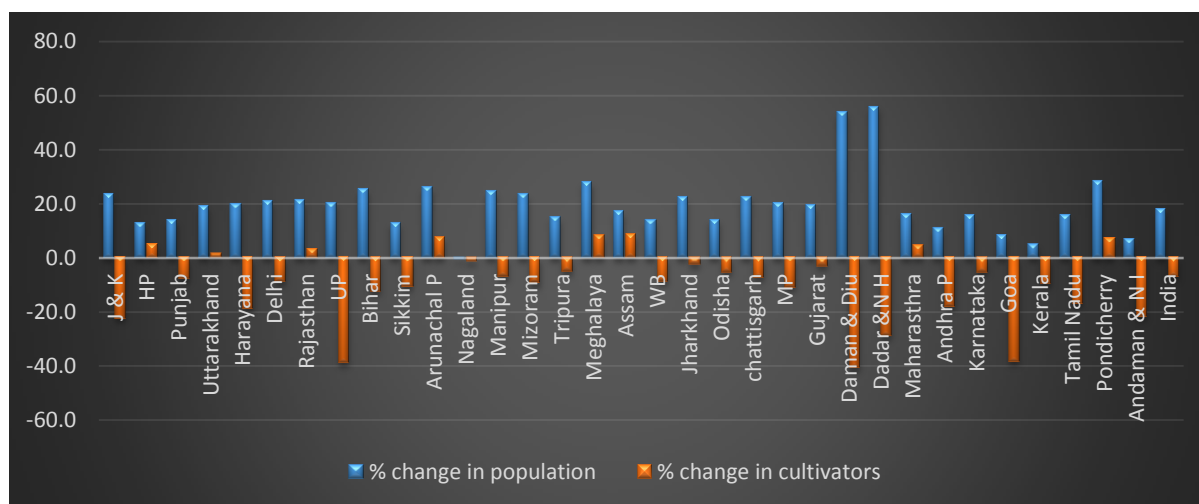


Source: Agri. Statistics at Glance, 2018, GoI

The share of the agriculture sector in GDP is also continuously falling. India's agricultural potential is largely untapped although it has the second highest arable land in the world. Instead of its importance, there is high tendency of declining farmers observe in farming. As stated earlier too, cultivators are reduced from 71.9 percent in 1951 to 45.1 percent in 2011 (in terms of total workers). But, on other side population is increasing, which means demand for food is increasing. This inverse relation between cultivators and population growth really concerns for sustainability of life. In reality, share of cultivators to total population of India is only 9.81 percent according to 2011 census. The Figure (3.2) shows the state wise differences in population growth and cultivators decline from 2001 to 2011. Only 7 states have observed positive growth in cultivators viz. Himachal Pradesh, Uttarakhand, Rajasthan, Arunachal Pradesh, Meghalaya, Assam and Maharashtra and one Union

Territories i.e. Pondicherry but lesser than growth of population. In rest of the states and UTs, cultivators are declining and population is growing.

Fig 3.2. State-wise Percentage Change in Population and Cultivator (2001 to 2011)



Source: Agricultural Statistics at Glance, 2014

In the Figure (3.2) it is seen that cultivators are declining in Sikkim. To understand present scenario of Sikkim's agriculture, one needs to understand the national scenario because in India one state cannot be kept aloof from effect of national issues and policies. So we need to look at what history says and is observed in this regards, what could be the factors which led the farmers to be victim in process of development. Even Economic Survey (2015-16) stated that present scenario of Indian agriculture is victim of its own past.

3.2. History of Indian Farming: Prior to Independence

In India, agriculture and its activity was highest in position as compared to other activity. It was because of geographically proximity (i.e. tropical range), where varieties of agro-climatic zone exist and suitable weather condition. These natural features establish the importance of agricultural practices in India. In addition to these, soil is fertile and soft in nature. In above all, here people/farmer had good understanding about seasonality and periodic rotation of weather which has been transmitted from generation to generation and cultivate crop as per need. All these features made farming as a livelihood was/is well-off.

As per different historical sources, agriculture was dominant mode of livelihood to support human population from the early period of Neolithic era (about 8000-4000 BCE). Even it was found that Wheat and Barley cultivation and rearing cattle, sheep and goat was prevalent for food purpose and for clothing hint of cultivation of Cotton in Neolithic era were exist. Similar, progress on agriculture took place in different ages from Iron Age to early Common Era and then Mughal Era to Colonial British Era.

On the basis of information collected from London based India Office library, library of House of Common and British Museum by Dharampal (1971), Indian agriculture is always prosperous than other part of the world. As mentioned above, Asian climate was suitable for agriculture growth, China and India was foremost in terms of production of agricultural produce. In the era of 1750, out of total agricultural produce in world, China and India had share of approximately 70 percent.

One of the reasons for prosperity of agriculture was population of livestock. It was/is in tradition and culture of India to rear livestock domestically. That gives the fertile manure for agricultural activities. This integration of agriculture and livestock, made it possible to produce as per requirement. Another fact was, nation had millions of different varieties of indigenous seeds. As India has more than 36 agro-climatic zones and in each zone there were regions specific varieties of seeds conventionally cultivated having high nutritional value.

If this was the Indian agricultural scenario, then how its prosperity declined? What were the factors? Who are responsible? Source begins with the entry of British in India.

Since the beginning of British Era in India, they deliberately destroyed our social and economic structure and discouraged the agricultural activity through different laws. As it is known that Indian society and economy was supported by an agriculture and its allied activities. Then, the British destroyed this congruence by implementing the law called *Lagan* (tax). Dharampal found that for long periods in the late 18th and the 19th centuries, the tax on land in many areas exceeded the total agricultural production from very fertile land. This was particularly so in the areas of the Madras Presidency (comprising current Tamil Nadu, districts of coastal Andhra and some districts of Karnataka and Malabar) resulted to one third of the most fertile land left out of cultivation between the period 1800-1850 (Claude,2000).

Through this law, arrogance of British began to realize by Indian farmer. Those who doesn't able to pay the *Lagan*, British forcibly snatch the farmer's resources and does *Nilami*, fire the house and many a time kill the farmer and their family members. Another plan which British started was selling of land of farmers through different

land laws, which was never thought of by farmers that land can be sold out. It was because; farmers treat land as their mother. This was implemented to destroy farming by selling agricultural land for other purpose.

More prudently to destroy the farming, British surveyed to understand the back support of agriculture activities. They found that cattle especially cow was epicenter for agricultural activities. It gives manures and helps ploughing the land. Consequently, Britishers started promoting slaughter houses to reduce the population of cattle and about 300 slaughter houses started in the beginning. In this way, British began export of meat, especially of Cow and Bull to England and other part of European country, because white people had good taste of these red meats. It was estimated that about 48 crores of cow and bulls slaughtered since 1760 to 1947. Earlier, agricultural activities and livestock rearing were considered as two sides of same coin. Diplomatically and deliberately British broke this relation.

In these ways, entire agricultural tradition was destroyed within a century of British rule, which led to increase in poverty, food crisis and famine became a realities. Majority of famine was result of British policies and led to failure of food distribution mechanism (as Amartya Sen was also pointed out in his work on famine) rather than monsoon failure. Other reason could be the commercialization of Indian agriculture which implies that production of crops for sale rather than family consumption (Mulage, 2017).

All the common resources or individual owned natural resources controlled by the British. In 1865, the British made an act called Indian Forest Act to transfer the power of forest control from community to British Government and then restrict to villagers and farmers to enter into forest for the collection of fodder, firewood and

other daily requisite which were naturally provided by forest to human inhabitants. On the other hand big contractors were allowed to cut trees for commercial purpose, resulted to deforestation and to erosion of soil.

Another mechanism was price determination of agricultural produce by the government. In *Mandis*, wholesale markets, the British officers fix the price of produce in such a level in which farmers couldn't fetch much of gain. Further, they restrict to sale of one village produce to another village. Many a time, it ordered to farmer to cultivate special item like *Indigo* in Champaran, Bihar, because at that time it had good market in Europe. But, its cultivation could destroy the soil fertility, that's why British didn't want to cultivate in their own country. That's could be the reason in later days Mahatma Gandhi interferes in this cultivation.

Similarly, *Afim* (Opium) cultivation promoted in Malawar, East India Company had good business of Opium in Chinese market. That's why China had history of Opium Trade War with British. Places where agricultural production were bit good, the British started cultivation of non-food crops and profit earned by British company, Indian farmers became marginalized, food production start declining, poverty increases and famine prevalent and hundreds and hundreds of people died due to the starvation. For this, British, never tried to prevent famine and not provided instant support, because they thought it will be easy to control people if people are reduces through such crisis.

In the meantime, due to World War II, food and meat were supplied from India for soldier, instead of having food scarcity in India. In one way production was less, whereas tax hike on whatever the farmer produced and, it was sent to feed British army. To control the food distribution, British government came out with system of

Food Distribution in 1939. The purpose of food distribution was to showcase some good initiative by British to provide food to everyone in low price in limited quantity.

Similar trends and policy orientation have been observed even after independence. Agricultural history of India post independence greatly determined by international factors. International factors here means the agglomeration of world economy process to develop many institutions for cooperation to have trade and integrated market for their produce by implementing different global policies, which lead to gradual increase in farm distress.

3.3.Agriculture in Post-Independence Era

In August, 1947 India got Independence from British rule, but many things which lay by the British in terms of system had continued in Independent India too. In the mid of 1960s decade, failure of monsoon and other resulted to the scarcity of food led to milestone changes in agriculture of India. To increase the production of food grain India started new form of farming in the name of Green Revolution. Green Revolution is fundamentally chemical centered industrial farming practices.

In one hand, due to drought and insufficient monsoon, agriculture productions within a nation were not enough to feed the nation and India was seeking food import policy. On other side, chemical based company or nations were searching for markets to use chemicals because after world war there were abundance of chemical stock left out after using in arms and ammunition. So, it was best time to promote chemical based farming, through chemically originated seeds in the name of hybrid seeds or high yielding variety of seeds, to feed the hungry.

Meanwhile, monoculture practice increased at a faster rate and the opportunity cost was destruction of diversification of natural system. It only focused on

production of one particular crop. In which, it destroyed other natural weeds and insects by pouring variety of insecticides and pesticides, to show case the yield of single crop. Consequently, “*diverse more to mono more*” started, earlier ‘more’ consists of varieties of produce at a time and now ‘more’ defined as productivity of a particular crop at a time. In real Indian farm mechanism, other produce (means weeds, straw, grasses etc) with a particular crop was considered as required ingredient for the produce which played a role of bio-manure, internal pesticides and insecticides weeds and other bio-diversity.

In addition to this monoculture, in the name of increasing productivity Genetically Modified seeds (GM) entered into India since last two-three decades like BT cotton. Monopoly of seeds production steadily grows in India under various companies. It was promoted in the name of increasing productivity and lead to farmers’ income. Earlier local seeds had regeneration capacity, which means seeds once used for production, the seeds of same produce can be used as seeds for next cropping cycle. But, this, so called high productive variety of seeds has no regeneration capacity, which means corporate snatch the power of regeneration of seeds monotonically. This led farmers to purchase seed and additionally other chemical pesticides and insecticides to increase productivity out of nature’s jurisdiction, which put them in debt circle, led to many more suicidal cases of farmers. On this way, this monopoly culture not only destroyed farmers physically, economically, socially but also biologically and slowly it led farmers out of access to seeds by themselves and forces them to be regulated by market for inputs.

Seed Corporation, who produces Hybrid and GM seeds, start lobbying with International agencies like World Bank, WTO, UN and national governments to make

regulation like Trade Related Intellectual Property Rights (TRIPS) and others. Through which corporation like Monsanto and others start promoting GM and other hybrid seeds. Consequently, international agencies and national govt. framed a law and scheme through which hybrid and GM seeds enter into farming by showcasing its benefit of high productivity. On other hand, farmer who was distress by not able to support their family and necessity seen it as a seeds send by god for increasing their life standard, without knowing its long term effect, which was hide by policy maker and promoter (knowingly or unknowingly) with short term benefit provided by corporation in the process of lobbying. This led the inception of seeds monopoly, in which farmers replaced indigenous variety of seed with hybrids. Altogether market start regulating the farmer from seeds to its output.

Hence the question of sustainability emerged. Even Howard (1940) wrote in his book “An Agricultural Testament” about Indian farming system that ‘farm in India is permanent as forest and ecology because it gives the space for regeneration’. It is because our forefathers had believed that more space you leave for other organisms the more food security persists.

After a decade of its use, negative effect began to visualize like soil fertility decline, reduction of microorganism, human health illness increases etc. Then government realized that it will not only affect the farmer and agriculture but also on process will obstruct the economy. Hence, government steadily shifted its policy from chemical based farming to nature based farming under scheme National Mission on Sustainable Agriculture (NMSA) in which Paramparagat Krishi Vikash Yojana (PKVY), similarly Zero Budget Natural Farming (ZBNF), Organic, Permaculture etc.

It may be the result of issue raised on nutrition value in available foods. As food security law says that 'accessibility of food in economically feasible and should be nutritious in nature'. If food availability automatically assures its nutrition, then why lawmaker used the word nutritious food even after having mention of accessibility of food in food security definition. This means, accessibility doesn't directly assure the required nutrition level for an individual. This indicates is possibility of having food which has less nutritious value instead of having in volume.

Another fact, India is having diverse agro-climatic zone and that makes irresistible of one variety seeds in one climatic zone to another. This agro-climatic zone is not made by human being; it is natural existence since inception of life. Accordingly, nature gifted plants, herbs, animal, insect and varieties of seeds adaptable to each agro-climatic zone. Every zone has its own way of resilient nature to respective seeds. If we congruent it with present genetically modified seeds and hybridize seeds, which is made with help of genetics of particular variety, which may not suitable or not able to absorb nutritional value of specific agro-climatic zone. Just by using chemical and other affected substances in nature productivity may ensure but nutrition contain is big question. .

Population is considered to be the major factor which forced to change the pattern of farming, by advocating for large farm size to sustain economies of scale. In contradiction to this ideology, FAO reported that smaller the farm higher the output. It may be because large farms principally cultivate mono crops to get mass production, but small farms by nature, needs to produce all the requisite for life which intensify the diversity. In India where 80 percent of farming practice is in less than a hectare,

that's may be reason instead of increase of chemical based farming Indian farmers still able to feed its citizen.

Altogether, faulty diagnose and inappropriate prescription has accelerated the decline of the farm and aggravated poverty (Buckland, 2004). This led to increase the farm indebtedness, which become a vicious cycle. To get good yield farmers used hybrid seeds and chemical inputs by borrowing money from lender (formal or informal) and when crop failed or prices not met the cost of cultivation, they were in burden to pay debt. Consecutively, regaining hope in another crop cycle, with same process farmers followed but result could not solve their burden, rather, the burden accumulated. This makes them psychologically, morally, socially, economically weak and forced them to take weird decision i.e. suicide. As per National Crime Record Bureau, Accidental Deaths and Suicides in India (2015), in total 12,602 recorded suicides in India, out of which 87.5 percent recorded in seven states (Maharashtra, Karnataka, Telangana, Madhya Pradesh, Chattisgarh, Andhra Pradesh and Tamil Nadu). This data indicates that 3 farmers in each 2 hours we are losing, which is 2 percent higher than 2014 record (12,360).

As per above past experience of our nation, Sikkim initiated Organic farming practices from 2003, and became pioneer among Indian states. So this study tries to understand the scenario of farmers' plight in this pioneer state. Prior to this, let's understand its history of Sikkim's agriculture.

3.4. Sikkim: History of Land Possession for Agricultural Activities

Sikkim as a term, define by different communities in diverse forms. As Upadhyay (2017) noted, it is crested land by Gorkha (Nepali) derived from Sanskrit

word '*Sikhim*'. In Limboo (Subba) by princes of 2nd king Tensung Namgyal '*Su*' '*Khim*' meaning as new place. By Lepcha, as they are native inhabitants, named 'Ren-zong' meaning heaven. And when Bhutia emigrated from Tibet, this name 'Ren-Zong' was insignificant in their language and renamed it as 'Dya-Zong' or 'Denzong' or land of rice or valley of rice field.

History, prior to 1642 (when Namgyal Dynasty began) was haze. As per folktales, Lepchas, Limboos, Magar and Kirat has had their dynasties in different parts of Sikkim prior to Namgyal Dynasty. After consecration of first Chogyal King Phuntsog Namgyal as a King of Kingdom, by de-facto King became owner of entire lands belonging to the territory of Sikkim. On process of time, feudal bureaucracy was established taking existing elite as new landed aristocrats. Land grants with ownership right usually transferred to families of pro-state member, who rendered services to the state by the King of Sikkim.

After Treaty of Tumlong, 1861, land grant also started to Nepalese peasants to get settled in Sikkim. For them, land allocated in such area where settlers need to clear the land, built a house and crafts the land for productive purpose or agricultural purpose. Hence, in 1867, a formal grant of lease was accorded to two Newar brothers at Rhenock viz. Laxmi Das Pradhan and Chandra Bir Maskey and later on with grant of lease the bottom class of agrarian society of Sikkim began to dominate by the Nepali peasant.

Till the beginning of British era, there were twelve *Kazis* who exercised authority over specific territories of lands. These officers collected revenue from the peasants settled in their jurisdiction and paid a certain fixed contribution to the King. Further, cultivator did not have a claim to the soil they tilled, but, cultivator could

settle down on the unoccupied areas without any formality and no one could uproot them except the King. The system of tax collection in this form was adopted long back in 1747 with the appointment of Rabden Sarpa as a regent of baby King Namgyal Phuntsog.

Transformation in agrarian sphere emerges after appointment of the first British Political Officer to Sikkim J.C. White in 1889 and it was considered as beginning of British era for Sikkim. New land reforms initiated by White, seized many land holdings by erstwhile *Kazis*' and Monasteries', which was granted by earlier Kings in different periods. New land estates were created in South, West and East Sikkim and handed over to the local *Kazis*. To protect native interests, Revenue Order No. 1 enacted on 17th May, 1917, this protected land of Bhutia and Lepcha community. On process, shifting cultivation was forbidden in 1925.

The ownership of land, could be taken in two forms, one is lease by accepting yearly payment system and another way to secured land rights by paying *Chaar Daam* (one fourth of land value). Under *Kazis*, *Elakhadar* or manager were appointed on commission basis to administer in given area or *Elakha*. One can take lease of land at varying rates from one *Anna* to eight *Anna* per acre for different periods by Lepcha-Bhutias and Nepalis respectively. Those who secured cultivation right by paying *Chaar Daam*, could transfer his land in the name of his children (*Banda* system). The task of *Banda* as it was known had to be made before the village *Mandals* and elder peoples of village.

On the other side, those who secured estates known as *Elakhas* in contract (as per procedure by filling form) were called *Elakhadar* or *Thika* known as the *Thikadars*. By 1925-26, number of such *Thikadars* and *Elakhadars* of estates were

viz. 13 of such *Elakhas* were under the direct control of State, 16 under the managers of private estates of His Highness and five under different Monasteries and other *Elakhas* were divided among various landlords of which 21 were *Kazis*, 6 *Bhutias*, 8 *Lepchas*, 10 *Nepalese* and 1 *Plainsman*.

Till 1930-31, the state had not followed the policy of the sale of State lands instead the State was allotting them in a lease. A free grant of such land was allowed to all *Paharia* (administratively referred to *Nepali* peasant) who wanted to settle in the Kingdom. Ordinarily, a *Raiyat* (peasant) was not permitted to acquire more than 20 acres of cultivable land. In a case of *Mandals* of the various blocks of an *Elakhas* maximum access of land could go up to thirty acres. The *Raiyats* who could afford to pay *Chaar Daam* got a plot of land for self-cultivation. They had to pay their land tax along with house tax to their *Mandals* in cash which was fixed by *Nazar Janchay* (*Revenue Surveyor*) yearly. The *Raiyats* who could not afford to pay the *Chaar Daam*, a new tenancy system was created.

New tenancy system were, *Adhiadars* (50-50 sharing of produce between owner and cultivators), *Kutdar/Kutiyars* (fixed amount to be pay to land owner) and *Chakhureys* and *Pakhureys* are tenants who were given land from Monastery for cultivation in lieu that they had to render manual labour to the Monastery and the *Lamas*, but don't possess land rights. Hence, two significant agrarian classes emerged one as *Bustiwallas* who owned lands and another as *Pakhureys* who were landless. To manage all these tenant pattern, as briefed above, structure of aristocrat were made from *Kazi* to *Karbari* in general. In between *Elakhadars*, *Thikadars*, *Mukhtiyars*, *Mandals* and many more had diverse power to control tenancy.

3.5. Historical Traces of Farming Distress in Sikkim

It is a natural fact that in a power relationship, the subordinate often has to tender services to higher authorities. Similarly in context of Sikkim's history of farming, *Zamindari* system was prevalent in form of *Kazi*, *Thikadars* and their subordinates like *Mandals*, *Mukhtiyars* and *Karbari* etc. These elites were always privileged of being a super class in the society. They had framed the social norms, values, and ethics for their own expediency so that their dominance in the society would always remain unchallenged. These norms and different forms of other mechanism were used to suppress peasants in hegemonic manner by feudal in the existing social set up of the Kingdom. Different mechanism was followed for suppression, in context of forced labour like *Kalo Bhari*, *Jharlangi*, *Theki-Bethi*, and *Kuruwa* and imposition of heavy taxation

Kalo Bhari in Nepali language understood as Black Cargo. The name originated to the cargo as *Kalo Bhari*, as it was wrapped in card boards and put under gunny bags painted with black tar. Peasants had to serve as porters to carry this cargo from *Geil Khola*, Rangpo, Kalampong, Teesta and other location to Tibet on order of authority. It was probably begun after British took Sikkim as protectorate state and signed convention between Anglo-Chinese Convention in 1890 for beginning of trade between British and Tibet. The main purpose for this convention was to transport of goods from Sikkim to Tibet and they used local peasants as a labourer for export-import of goods. The goods which were carried by peasant coated in black tar, popularly called as *Kalo Bhari*. *Kazi-Thikadar* supplied the labour (Peasants) to British, which was compulsory for peasant to provide labour in any critical situation of home if name called out. For labourer, British had fixed the rate of Rs. 2/day. But

Kazi-Thikadar, usually played role of broker and could only pay 6 *Annas* per day to the labourers and siphon all other amount they obtained from British.

Jharlangi, was known for the free labour service provided by peasants to British through local lords or for the purpose of smooth trade between British and Tibet or to construct infrastructure like road and trade routes etc. As and when ordered by British, local lords (*Kazi, Thikadars, Mukhtiyaars, Mandals, Karbari*) allocate labour from their respective *Elakhas*. As a *Jharlangi* labour (i.e. peasant of that time) had to leave his home at least for a week and more for an unknown venture on own arrangement of food and shelter in work place. There was no fixed time or place for *Jharlangi* labour. Any time the peasants were called by the *Kazis* to carry cargo and the obligated lot had to reach the ordered location in time, if not then they had to face rigorous penalty. Similarly, locals' lords also took advantage of this process and used labour for their own domestic purpose in free basis.

Theki-Bethi, here *Theki* means wooden utensil used to keep and preserved curd by Nepali. On special or festive occasion peasants had to provide gift to local lords, British officials and Kings. *Theki* was to be filled up with meat, curd, bananas, beaten rice, local beer etc. Along with such kind of gift as and when asked by lords, peasants also had to provide free labour to *Kazi, Thikadar, Mukhtiyaar, Mandal* etc. This form of wage less labour called *Bethi*. The *Bethi* form of forced labour used for ploughing, terracing of lands, and hollow out the agrarian fields, construction of channels and other works. At least one member of a household was obligatory, therefore, *Bethi* was also known as *Gharlauri Khetala*(labour from each household). Altogether, mostly *Theki-Bethi*, was form of forced labour being associated with the villages and village level official existed during feudal phase of Sikkim.

Kuruwa, in Nepali means wait for a long time. In other form, labour who waits for long time in one location for commodities to transport from one place to another. The *Kuruwas* (a labourer), after getting the order from lords they had to reach in said location (mainly in *Geil Khola*, Teesta, Rangpo, Melli and 27th mile places at present in West Bengal area) and had to wait until goods reached in location, and then peasant had to carry them till its destination place. This *Kuruwa* (waiting for goods) was part of *Kalo Bhari system* (carrying the waited goods).

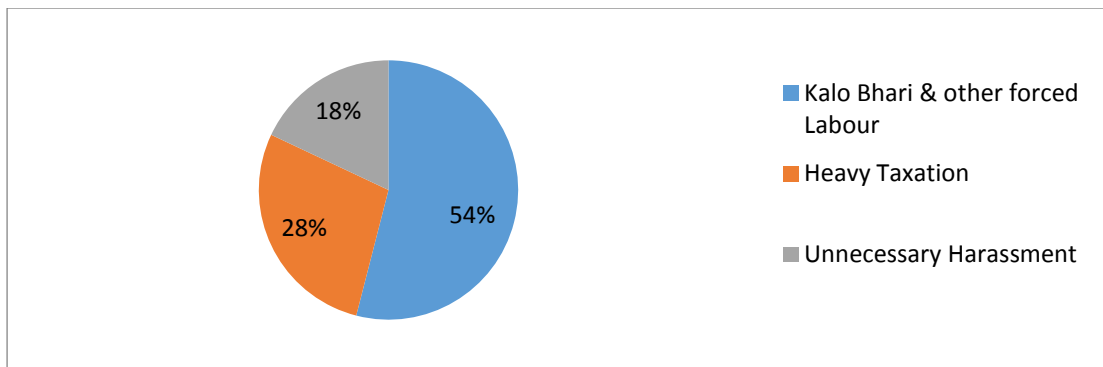
The extent of exploitation, suppression by lords to peasants was reflected on Government Notification issued by the General Department too, bearing No. 8146-08/G dated 19th June 1926 that states:

“On and from the 1st January in each year, landlords and managers of estates may attach the movable properties of defaulting *Raiyats*, after serving the usual notice upon them..... if the taxes and rents are not paid in within two months after the notice been served, the landlords or manager concerned should report the defaulting *Raiyats* to the Durbar with a view to obtaining the sanction of the Durbar to sale the attached property”

So, continuity of all these form of suppression crossed the limits of peasants’ tolerance led to emerge resistance. It was the greed and excessive nature of the authority that became burning factors for peasants’ resistance.

As indicated by in Figure (3.3), that peasants were greatly disappointed with *Kalo bhari* and other forced labour system (54 percent) and then heavy taxation (28 percent) and other unnecessary harassment (18 percent).

Fig 3.3.: Distribution of Major Causes of Peasant Disappointment



Source: Upadhyay (2017)

The peasants had to deposit their taxes on time which include *Dhurikhajana* (house tax) and *Zamin Khajana* (land tax). *Mandals*, were responsible to collect taxes from the peasants of their respective places. If peasants failed to pay on time of said amount, there was a provision to pay on next year, with compounded interest. For the payment of tax, *Mandals* had to issue a receipt confirming the payment and counterfoils of such receipts recorded in a register of demand and collection. In some cases, *Mandal* and other local lords used to issue wrong receipt taking advantage of the illiteracy of the peasants, if they had any grudge against the peasants or if they had eyes on their (peasants) property. More pathetically, if the amount of tax happened to be registered wrongly, peasant had no option to appeal.

In addition, crop failures, monsoon failure, drought and many other reasons led peasants fail to pay taxes. As a result, at last peasant had to surrender his resources like livestock, land etc. For this kind of situations, there were many instances observed from the field that tender for the land or other resource to generate value to repay tax was organized in center place of the *elakhas* by authorities. This process of *Nilami* (tender or bidding) in Sikkim was known as *Kudki*. For this, one or two days

before, assistant of local lords informed the public by beating tin in *elakhas* regarding the process of *Kudki* of such and such peasant due to non-payment of taxes. On the day of *Kudki*, the minimum amount (value of bidding) for *Kudki* decided by lords and start bidding process. But hardly any normal or other peasant could afford to put amount on bidding. Hence, those who had eyes on his/her resources, who have surplus wealth especially family of local lords, directly or indirectly bid the peasants resources. In this way, local lords started accumulating good lands on their or family name.

In Sikkim, as elsewhere in the country, the movement for democracy and greater political and civil rights was based on the demand for the abolition of the *Zamindari system*. At last *Zamindari system* was abolished in 1949, after long struggle by peasants, and was immediately followed by an official notification making it compulsory for all revenues against land raised by revenue agents to be deposited directly with the government. The private estates of the *Durbar*, and the monasteries' land were left untouched by this new land regime. As the debate on land reforms and its vital role in initiating changes in the agrarian society for a rapid transformation picked up, land reform issues gradually gained ground, with both political and social dimensions.

The State of Sikkim issued a Notification, No 3082/L.R, in 1954, which had some progressive elements of land reforms. The lower ceiling of land holding was ensured by the provision of the 'sale of land in execution'. Similarly, upper ceiling was also notified but provision for the execution was hazy led to ineffectiveness of land reforms. After the merger of Sikkim in India in 1975, the government intervened mainly to provide legislative measures against the termination of cultivation rights

and for the continuity of cultivation by existing cultivators. This was done in view of the problems faced by the cultivators, who cultivated land owned by others under precarious terms and conditions.

Among the numerous land reform measures adopted by the State Government, the most notable are the enactments of Sikkim Agricultural Land Ceiling and Land Reforms Act 1977, for the imposition of ceiling on agricultural lands to prevent the concentration of land in the hands of a few persons with a view to bringing about equitable distribution of agricultural lands to serve the common good. In which, 12.5 standard acre declared as limit by five members of family and if family exceeds of five members additional 2 standard acres for each member excess of five, however, that the ceiling area shall not exceed 20.5 standard acre.

Sikkim Cultivators' Protection Act 1985, has provisions for protection of cultivators against termination of cultivation from land cultivated and the Land Bank Scheme of 1997 (vide notification no.388/LR dated 13.08.1997). These acts and measures helped to make the transition from a feudal past to a more egalitarian society, relatively smooth. The Land Bank Scheme is the latest welfare scheme introduced by the Government of Sikkim to consolidate land reform measures in the State. The objective of this scheme was to provide land to landless citizen (*Sukumbasi*) of Sikkim. Later on 5th September 2011, Land Revenue and Disaster Management Department issued notification on the name of Sikkim *Sukumbasi* (Landless) Welfare Scheme, 2011 to provide 0.25 acre for construction of dwelling house, cultivation and other allied activities with a view to raise the income of such *Sukumbasi* and bring them above poverty line with lease of 99 years. It is important to note that this scheme puts the onus of looking for suitable cultivable land on the

beneficiary who can select the land of his choice. Majority of families have benefited from this Scheme.

The success of this scheme reinforces the fact that the programme of land reforms implemented so far has not led to any significant distribution of land in Sikkim. This has had adverse effects on both social cohesiveness and agricultural productivity. Since 1983, however, the composition of landholdings is expected to have changed due to normal partition of families, resulting in fragmentation of holdings, as well as the acquisition of land by the State Government and the Army for security and other purposes. However, in line with the Revenue Order No. 1 of 1917, the land belonging to the two indigenous tribal communities of the state have remained unaffected and unalienated.

In fact, Sikkim has a tradition of protecting traditional land tenures and there is considerable sensitivity regarding the maintenance of customary laws governing ownership and banning alienation to outsiders. Some of the old laws of Sikkim have been upheld by the highest court of law in the country. There have been several safeguards for ensuring land rights of the two indigenous tribal communities, the Bhutias and the Lepchas. The first step in this direction goes back to 1917, when the Government of Sikkim issue the notification termed as Revenue Order No. 1, which prohibited sale or transfer of land belonging to Bhutias or Lepchas to non-Bhutias or Lepchas without the permission of the State⁷. This is still follow in the state.

In the late 1980s, the Sikkim Alienation of Land (Regulation) Bill, 1989, and the Sikkim Transfer of Land (Regulation Bill, 1989) were also passed by the State

⁷The Notification No 3082/L.R., dated 24 March 1954, issued by the Land Revenue Department, of the Sikkim State and signed by Tashi Namgyal, the Maharaja of Sikkim, reinforced the Revenue Order No. 1 of 1917. This notification remained in force even after 1975, and has been strictly implemented.

Legislature. These bills respectively aimed at restricting alienation of land by the members of Bhutia and Lepcha communities of Sikkimese origin to persons other than Bhutia and Lepcha of Sikkimese origin and also by Sikkimese in favour of non-Sikkimese. It is important to note that this regulation is applied even in cases that could conceivably be in the larger interest of the State in terms of providing employment opportunities. As in the case of private industrial enterprises, it is possible to obtain on lease land belonging to tribals, but only after obtaining the permission of the State Government.

On the other side, distribution of operational landholdings in Sikkim is skewed. In 1990–91 the lowest class of landholders, the marginal holders, representing about 50 percent of landholdings, held only 10.3 percent of the total operational land area. In the case of the Scheduled Tribe (ST) farmers, land distribution is not as skewed. The number of marginal farmers is much lower (42 percent) whereas the semi-medium and medium farmers together owned more than 35 percent of the operated holdings over 57 percent of the operated land. However, in this case also, large farmers, who constituted hardly 5 percent of the ST farmers, had a giant share of over 28 percent of the land area under their possession. This indicates that the traditional patterns of land holdings in Sikkim have not undergone any significant change. It is similar to what Gupta & Thakur (2017) postulated the debate, which predominantly prevalent in our Indian society that ‘caste inheres class and class inheres caste’, could be the significant factors for power of dominance in term of land holding and their influence in rural society.

3.6.Current Scenario of Land Holdings and Farming

The total land area of the state is 709600 hectares out of which farming is practiced in about 10.47 % area i.e.74,343 hectares and rest of the area constitutes of forest cover, permanent pastures, culturable waste, barren and uncultivable land put to non-agriculture use, land under miscellaneous tress and groves etc⁸. The state is divided into five agro-climatic zones- Tropical, Sub Tropical, Temperate, Sub Alpine and Alpine Zone. Majority of agricultural lands falls in tropical, subtropical and temperate zones.

Operational holdings, implies the farmers who are holding the cultivable land for farming purpose. As per agriculture census, Sikkim had 74,928 no. of operational holdings out of which 48.74 percent (36,523) were Schedule Tribe holders and 51.25 percent are Schedule Caste, Other Backward Caste and General. Out of which, 97.95 percent operational holding is wholly owned and self-operated and only 2.05 percent are leased in/out (in local term *Andhya* and *Kutiyan*).

Table 3.1.: Operational Holding, Ownership and Irrigation Status of Sikkim

Sl. No	District	Total No of Operational Holdings	ST No of Operational Holdings	Wholly owned and Self operated Holdings	Wholly leased in holdings	Wholly Irrigated	Wholly Unirrigated Holdings	Partially Irrigated Holdings
1	North	3570	3041	3562	8	27	2019	1524
2	East	24566	10107	24046	382	351	12583	11632
3	South	22829	10537	22073	457	410	14702	7717

⁸ Sikkim Organic Mission, FSADD & HCCDD, Govt. of Sikkim by D.T. Bhutia, 2015

4	West	23963	12838	23712	96	1060	12157	10746
	State							
	Total	74928	36523	73393	943	1848	41461	31619

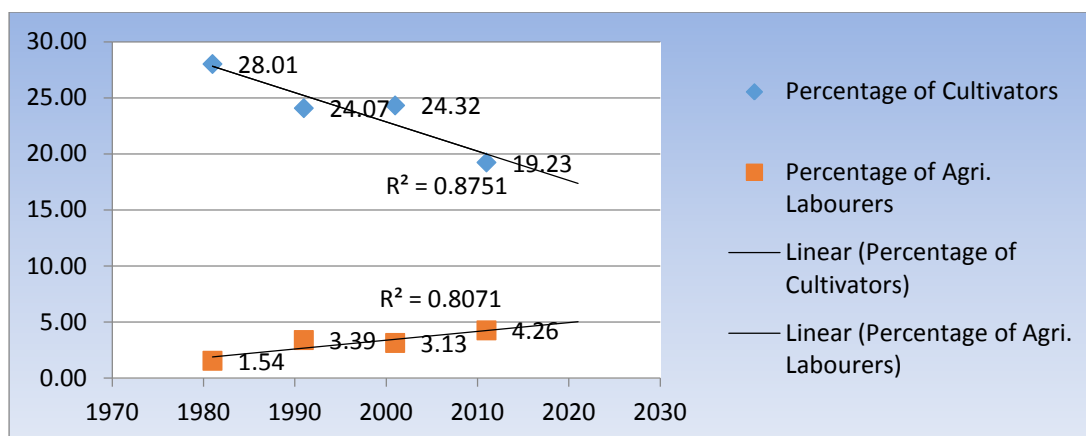
Source: Sikkim Agri. Census Report, 2011

Out of total 74926 operational holdings, only 2.47 percent holdings have access of wholly irrigated and 42.2 percent are partially irrigated and 55.33 percent are wholly unirrigated. The main crops are maize, rice, buckwheat among cereals, urd & rice bean among pulses, soyabean and mustard among oilseeds. The main horticultural crops are orange & pears among fruits and ginger, cardamom, turmeric and cherry pepper among spices crops, cold crops, peas and beans, tomato, potato among vegetables crops. Besides production of potato and pea seeds, off season vegetables cultivation is done extensively at high altitude areas. Of late, cultivation of flowers like cymbidium orchid, rose, gerbera, anthurium are slowly becoming good source of income to farmers.

Only 11 percent was agricultural area in the period when State legislated to have “Total Organic State” in 2003. Even, by default Sikkim was traditionally following natural process of cultivation. On that period, Sikkim had average fertilizer consumption rate was 5.8 kg per ha, which was far below the national average and 3rd lowest fertilizer consumption state in the country⁹. Instead of many initiatives, farming is not seen as prosperous livelihood by the existing farming community and even by new generation. Given below figure (3.4), indicates that percentage of cultivators is declining in decadal form and agricultural labourer are increasing.

⁹ Statement of Chief Minister on legislative assembly of Sikkim, 2003.

Fig. 3.4.: Cultivators and Agricultural Workers of Sikkim (1970-2030)

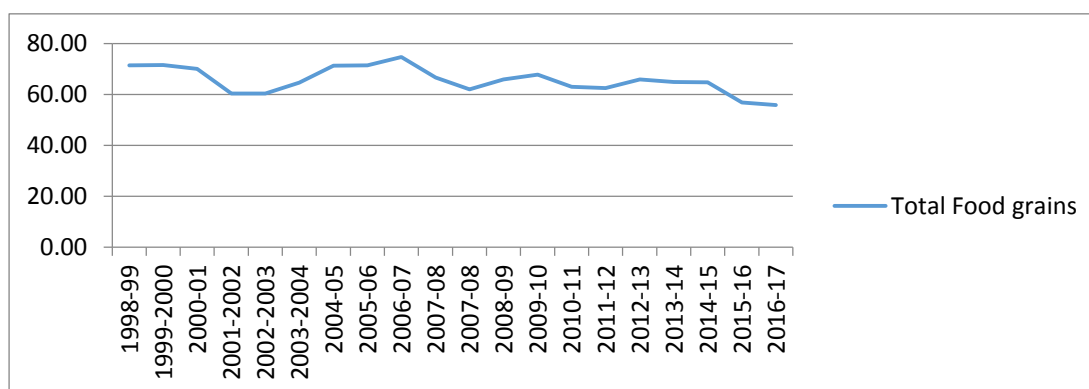


Source: Sikkim A Statistical Journal, 2013

3.7. Status of Production and Area of Cultivation

In global level, concern generated to save the area of cultivation from material development activities to sustain the food chain for growing population. As per data available in Sikkim from 1998 to 2017, it has been found that area of cultivation is declining or uses of area for cultivation is reducing.

Fig. 3.5.: Area of cultivation for Total Food Grains (1998-2017) (in 000' ha)



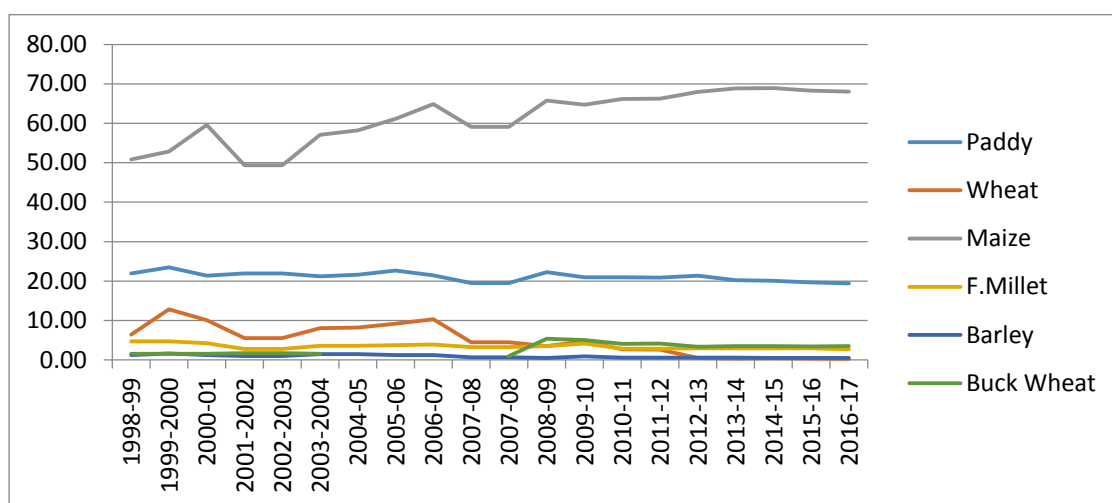
Source: Sikkim Agriculture Census Department (2017-18)

In 1998, 71.37 thousand hectares were cultivated for food grains which is reduced by 21.17 percent in 2017 i.e. 55.87 thousand hectares. After, 2003-04, year in which total organic initiative was declared, some level of area of cultivation increased upto 74.67 thousand hectares in 2006-07, after that it again start fading. This increased from 2003-04 to 2006-07 may be because of glamour of organic initiative but slowly declined may inclined by many reasons like not able to fetch the benefits of organic directly.

Figure (3.6) indicates the production of different food grains from 1998-2017. As it shows, Maize and Buckwheat production were increased but all other food grains production were decline with the time frame. Paddy was 21.96 thousand tonnes in 1998-99 it declines to 19.45 thousand tonnes in 2016-17, Wheat in same year decline from 6.42 thousand tonnes to 0.29 thousand tonnes, Finger Millet from 4.71 thousand tonnes to 2.69 thousand tonnes, Barley from 1.22 thousand tonnes to 0.48 thousand tonnes. Only Maize and Buckwheat increase from 50.80 and 1.55 thousand tonnes to 67.99 and 3.48 thousand tonnes respectively. Maize and Buckwheat increased due to govt. initiative for distribution of hybrid variety of seeds of maize for baby corn and other variety and buckwheat is one among the four crops for cluster development under Mission on Organic Value Chain Development (MOVCD) govt. flagship programme.

Other than food grains, Sikkim is also known for some fruits like Orange (Mandarin variety) and spices like Large Cardamom, Ginger, Turmeric etc. and Flowers. All this come under horticultural crops.

Fig. 3.6. Production of Varieties of Crops in Sikkim (1998-99 to 2016-17) (in 000' tonnes)



Source: Agri. Census Department, Sikkim (2017-18)

Total fruits plant area covered in 2013-14 were 14.653 thousand hectares, total vegetables (around 19 varieties of vegetable) cultivate in 14.806 thousand hectares, total spices (Cardamom, ginger, turmeric) grown in 26.56 thousand hectares and flower grown in 0.222 thousand hectares area (Sikkim Organic Mission, 2015).

Instead of all, the state depends on import of food grains. For example, per capita availability of rice is just 158 grams/day where in case of India it is 417 grams/day in an average. Though maize used to be staple in earlier decades but now it's hardly used as staple food in Sikkim but has steady increased over the period. Increased dependency on agriculture where gross state domestic product has declined. The share has declined from 48.7% in 1980-81 to just 18.8% in 2006-07 (Ali, 2017) and further decline till dates. Now, the government started taking initiative to to increase the share of agriculture in SGDP in the name of Green Economy.

As study found above that, there are many historical, international and national factors which affected the farming in process of time. From neoliberal globalization era, all things started determined by market, in which agriculture was not away from its influence. The way agriculture was practice with social capital, got converted from agriculture to agribusiness. In the name of modernity, own aboriginality in term of seeds, biodiversity, conventional farming practices eroded by market influence through promoting new varieties of seeds (with zero regeneration capacity) with chemical inputs and technology. As a result economic cost of cultivation increased without having confidence to match up the return on investment led to demoralizing the farming practices. These led farmers to see doomed future in farming which led them to search for alternative and in process of time number of farmers declined from farm in national level. This means, in the process of making agriculture as an economic activity from cultural activity it led to farmers' insecurity in their livelihood.

Similarly, in context of Sikkim, farmers had never seen good days in their life historically. Even after new form of agricultural practices i.e. organic initiative, farmers' expectation couldn't be realized. Provision of land and its ownership was skewed historically. Those who were practicing farming or say actual cultivators in Sikkim owned lesser amount of land than those who never involved in cultivation directly belongs to family of erstwhile lords enjoyed the major share of land. So, if agricultural practices need to be sustained then the provision of land ownership should to be changed. For that, mechanism must be such that it will secure rights to own land by cultivators, which will encourage for farming with long term investment plan. It is because, if cultivator lacks the ownership of land then it will not boost confidence to have long term plan for cultivation and resulted to leave the agriculture in search of

alternative livelihood. Consequently, decline in farmers will lead to increase in fallow land and ultimately production will decline.

In nutshell, farmers need should be the center of any developmental approach and policy proposal. It is because farmers have own conventional knowledge to sustain farming, just need outer support. As farmers himself a successful entrepreneur who takes more risk than any other business in many ways. But farmers faced lot of hurdles, so they were discouraged to be engaged in farming. Hence, if farmers would be supported then their knowledge can translate into healthier farms for sustainable production and rich agricultural biodiversity to ensure food security for society.

Chapter 4

FARMERS' SAMPLE SURVEY ANALYSIS OF THE STUDY

AREA

4.1. Background

The preceding chapters sketched the problems of farming. So to understand the issues of farmers and their situations, this chapter tries to analyze the ground realities of farmers of Sikkim. As it observed in above, in process of time numbers of farmers are declining and many who are involved in farming are not willing to continue it and even don't want to pass this livelihood to their new generation. After taking the macro level understanding as how farmers are neglected and trapped in many situation, this chapter focused on micro level understanding of farmers' issues and its different factors which affecting their livelihood and sustainability.

4.2. Socio-Economic Profile of Sample Farmers

Household Survey is done in all four districts of Sikkim and information from 150 farmers has been collected in a schedule format. Table (4.1) shows the basic information of farmers. Number of sample collected from each districts viz. 52 from West, 48 from South, 40 from East and 10 from North as a proportion of cultivators according to census 2011. Among the samples, 85 percent are male and 15 percent are female. Average formal years of education of farmers on three district (South, West, East) are same i.e. 4 and for North 3 years. Concern generated when study found that average age of existing farmers are more than 50 years (i.e. 54.55 years), in which 55.17 years in West, 51.19 years in South, 56.22 years in East & 55.7 years in North. Average monthly income of farmers is Rs. 6624.125.

Table 4.1. Basic Socio-Economic Details of Sample Farmers

District	Cultivators (2011 census)	Selected Village	Total Household	Sample	Male (No.)	Female (No.)	Avg. Education (Years of schooling completed)	Avg. Age (Years)	Avg. Monthly Income (Rs.)
West	40797	Saprey Nagi	139	52	49	3	4	55.17	6721.5
South	31489	Rabitar	92	48	39	9	4.2	51.19	6437.5
East	37802	Basilakha	55	40	32	8	4.1	56.22	6387.5
North	7313	Lum	68	10	9	1	3.17	55.7	6950
Total /Average	117401			150	127	23	3.86	54.55	6624.125

Source: Field Survey, 2018

4.2.1. Community and Religion

There is folktale in Nepali “*Sherpa le choday ko Jamin, Bahun-Chettri le Bachey ko Gai-Bastu, Kailay Kam Lagdaina*” {Land left by *Sherpa* (belonging to Schedule Tribe community), Cattle sold by *Bahun Chettri* (belonging to General category), No longer Productive}. Each and every community has different livelihood skills as a

natural inheritance. As per the pattern of livelihood from ancient times in Himalayan belt, this above phrased was developed by forefathers.

Table 4.2. Community & Religion Distribution of Sample Farmers

Community	Frequency	Percentage	Religion	Frequency	Percentage
General	69	46	Hindu	88	58.67
ST	63	42	Buddhist	59	39.33
SC	12	8	Christian	3	2
OBC	6	4			

Source: Field Survey, 2018

Similarly, in study area, it is believed that schedule tribe has good knowledge about land and its usability and general community has good understanding about cattle and its rearing technique. Out of total 150 samples of farmers, 46 percent are general, 42 percent are ST, 8 percent are SC and 4 percent are OBC. In category of religion, 58.67 percent are follower of Hindu, 39.33 percent are Buddhist follower and 2 percent are Christian believer.

4.2.2. Age Distribution of Sample Farmers

Productivity depends on age and experiences of people. As experience grows efficiency to do work improves and in contrast with ageing physical strength to work gradually decline. An increasing proportion of the ageing farmers, mainly in developing countries, affect the agricultural production. It was found that it obstruct the quantity and quality of agricultural labor and shown physical disabilities to work productively. This situation lead to possible cause of problems in expanding production patterns (Saiyut et al. 2017 & Stloukal, 2004).

Table 4.3. : Age Distribution of Sample Farmers

Age of Farmers (in years)	Frequency	Percentage
Less Than 30	4	2.7
31-45	35	23.3
46-55	39	26.0
56-65	43	28.7
65 & above	29	19.3
SD	12.06335995	

Source: Field Survey 2018

This livelihood exist problem of ageing farmers. As per table (4.3), only 2.7 or 3 percent farmers are below the age of 30 years and altogether below 45 years 26 percent (2.7+23.3 %). Upto 45 years of age, peoples' physical strength support to work more but above this age diseases/illness started suffering as per the farmers' experience. Sample shows that only 1/4th of existing farmers are below 45 years and remaining 3/4th (i.e. 74 percent) are already touched the position of older. In normal service rule above 55 years of age is retirement period, but on contrary, in farming livelihood above 55 years shows the beginning that's may be the reason 48 percent (28.7% and 19.3%) and more deriving their livelihood from farming are above 55 years of age. Out of 48 percent, 19.3 percent farmers are above 65 years of their age.

4.2.3. Farmers Income and Alternative livelihood

In every livelihood, satisfaction and wellbeing is significantly derived from its earning in present-day. Farming as a livelihood, has both subsistence and economical in nature. Sample indicates in Table (4.4), 45 percent of farmers earned less than Rs. 5000 per month and 91 percent farmers earned below Rs. 8000 per month and averagely only 9 percent earn more than Rs. 8000 and above.

Table 4.4.: Income of Sample Farmers

Income (Rs.)	Frequency	Percentage
Less than Equal 3000	12	8
3000-5000	56	37.3
5000-8000	69	46.0
8000-12000	6	4.0
12000 & above	7	4.7

Source: Field Survey, 2018

This income level is not only the earning from farming but also from other sources as an alternative to fulfill the need of farmers' family. Only, 42 percent of farmers solely depend on farming to run their family but remaining 58 percent of farmers seek alternative option, along with farming. On which, 42.7 percent of farmers are doing wage worker/labour work on other non-farm sector, 7.3 percent works in government department like horticulture department, State Public Work Department (SPWD) etc and 8 percent work on private institution and business (as shown in Table 4.5).

Table 4.5.: Alternative livelihood of Sample Farmers

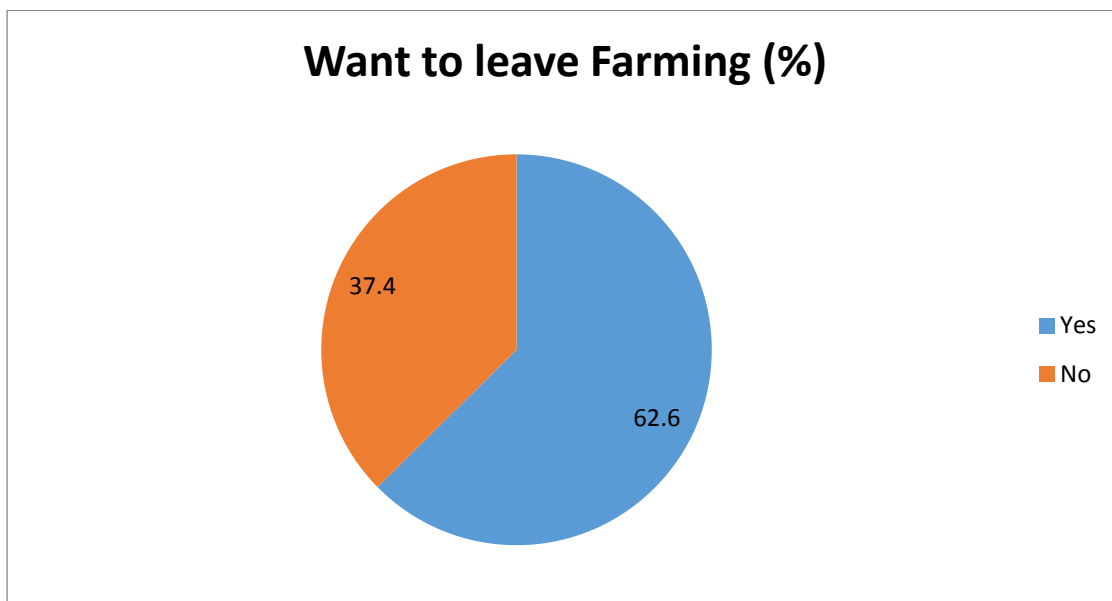
Livelihood	Frequency	Percentage
Farming cum Wage Labour	64	42.7
Govt. Employee	11	7.3
Prvt. Employee	10	6.7
Farming	63	42.0
Business	2	1.3

Source: Field Survey, 2018

4.3. Farming as an Uncertain Livelihood

Economic pressure emerged by various factors affects farmers psychologically, socially, morally. An uncertainty to maintain the household basic needs and desire, created fear about the family sustainability through farming. And in other case, a sense of personal failure is compounded by the fact that others (nearer one) are doing better in non- farm economic sectors. These psychological stresses create fractures within families and communities (Buckland, 2004). The way farmers are striving to maintain standard of living through farming not harvested positive result led to depress from farming. As a result, farmers want to leave farming as a livelihood.

Fig 4.1. Farmers Wants to Leave Farming



Source: Field Survey, 2018

As per Figure 4.1, 62.6 percent of existing farmers are willing to leave farming if they get an opportunity. Only 37.4 percent of farmers don't want to leave because of many reasons viz. one is age, another is don't have any other skills other than farming, some thinks that ultimately food is basic needs to sustain life so it's better to have own foods by producing own self. As Kumar et al. (2019), found in their study that those who wants to leave farming as a livelihood are respondent having medium and high level of social participation and higher education among farmers. This indicates, that those who are having better connection with other opportunities and some level of education to access such is more lure to leave farming.

Table 4.6.: Relation between Farmers’ Income, Age, Education Qualification with Farmers Decision on Leaving

Monthly Income of Farmers		5000 & Below	5000 – 8001	Above 8001	Total	Pearson-Chi-Square Value
Decision to leave (in no.)	Yes	41	46	7	94	16.547***
	No	25	14	17	56	
Age of Farmers		below 50	Above 50			4.693***
Decision to leave (in no.)	Yes	40	54		94	
	No	14	42		56	
Qualification of farmers		Below class 5	Above class 5			1.753
Decision to leave (in no.)	Yes	73	21		94	
	No	38	18		56	
Total					150	

Source: Analyses from Survey Data, 2018

As Table (4.6) infers that, 62.12 percent farmers who are earning less than 5k, 76.6 percent earning between 5k to 8k and 70.8 percent earning above 8k are willing to leave farming. Age below 50 years 74.07 percent and above 50 years 56.25 percent of farmers are willing to leave farming. This show, due to insecurity of fixed earning to maintain basic necessities of family even at the age of 50 years existing farmers are willing to accept alternative livelihood just for fixed monthly earning. Similarly, 65.76 percent having qualification below 5 years and 53.84 percent above 5 years of

qualification are likely to leave farming. To conclude, neither age, nor educational levels are hurdles to leave farming if they get an opportunity.

Table 4.7.: Expected Income from Alternative Livelihood

Income Range (in Rs.)	Frequency	Percentage
Below 5000	2	2.1
5000-6000	15	16.0
6000-8000	20	21.3
8000-10000	40	42.6
10000-15000	16	17.0
Above 15000	1	1
SD	2589.005749	

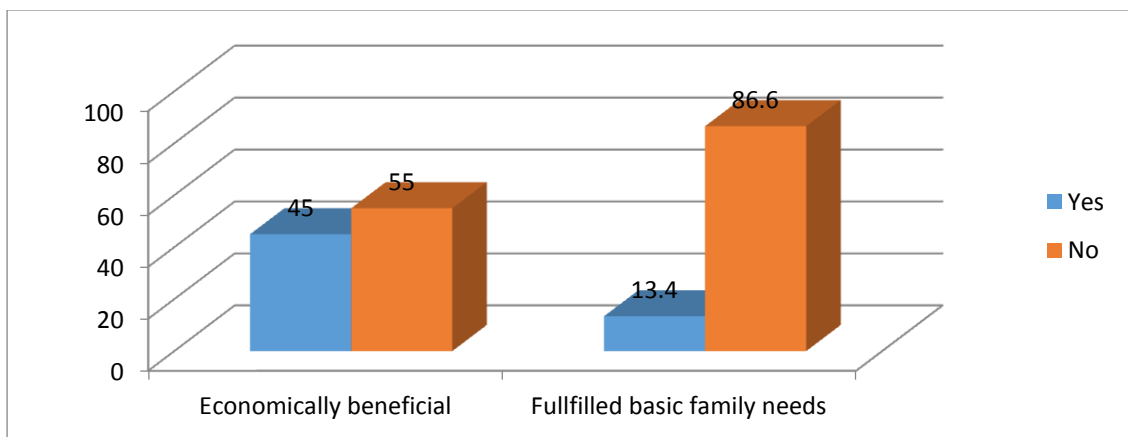
Source: Field Survey, 2018

Among those who want to leave farming, from them, study tries to capture their expectation at what monthly fixed earning level; they are willing to leave farming. 18.1 percent of existing farmers will leave farming if they get Rs. 6k and below as monthly fixed earning and 64 percent of existing farmers will leave farming if they get monthly earning between Rs. 6k-10k. Similarly, 17 percent expected between 10k to 15k and only 1 percent farmers expected above 15k. In which, majority i.e. 42.6 percent farmers anticipated that if they get between 8k and 10k they will leave farming. This indicates that, even if they want to come out from farming their expectation to get earning is not much, as majority are expected less than 10k per month from alternative livelihood.

4.4. Strive to Fulfill Basic Needs from Farming

It is found that majority of farmers are willing to leave farming due to lack of insufficient return to support family needs. So, in process of survey, the aim was to capture the understanding of farmers in terms of economic benefit of farming and its strength to support family requirement. The study observed different views from the farmers' experiences, 45 percent farmers responded that farming livelihood is economically beneficial but on contrary 86.6 percent of farmers profoundly stated that this livelihood not able to fulfill basic family needs. On the other hand, 55 percent respondent did not accepted that farming is economically beneficial livelihood and in contrary only 13.4 percent said that farming can fulfilled the family basic needs.

Fig.4.2. Economic and Basic Need Fulfillments by Farming (in %)



Source: Field Survey, 2018

One way or other, famers themselves is in dilemma that whether economic earning renders family needs or livelihood. Due to confusion between economically beneficial and fulfillment of family needs led farmers to strive. It indicates that, direct economic return (cash conversion from farming) is only considered as economic but not the things which supports family needs without economic return like food, fodder,

firewood, vegetable, milk produced for own self from farming. Hence, notion of only cash return as an income from farming traumatized it. That could be the reason that 97 percent of farmers said that farming is declining in general and specifically in terms of number of farmers and land under cultivation being uneconomical. It could be the consequences of making agriculture as an agribusiness, because business is always for profit making but agriculture is life making or way of life. Hence, beginning of measuring agricultural output in monetary term led the decline in value of agriculture.

4.5. Land Status and Family Structure of Farmers

Land is primary source for all sectors to grow. To feed the growing population, land is the only source to produce the nutritious food through farming. Hence, continuity of farming depends on access to resources and degree of independence to use land by farmers (in terms of ownership of land). Out of total sample, 11.3 percent of farmers farming on others land due to lack of own land, as a *Kutiyan* and 88.7 percent farmers are farming in own land out of this 25.6 percent farmers, who own small and marginal land holding, additionally cultivate other's land as well in forms of *Andhya* or *Kutiyan*.

It is observed from above that farming is becoming as uncertain livelihood. With the progress in time, cultivation is declining as a result of many factors. One and foremost factor is reduction in family size. Even if the family is joint, majority of family members are not involved in farming. Between, 2005-06 to 2010-11, marginal land declined by 1.4 percent, small by 1.95 percent and large by 21.53 percent and only medium farm size is increased by 3.64 percent.

Similar trend is observed in the field survey too. As shown in Table (4.8), twenty years ago cultivation was done in more than 15 *hal* (above 4 Acre) was 25.3 percent (by 38 sample) of total sample but at present no one cultivates this much land. Farmers cultivate between 8 *hal* to 15 *hal* (i.e. more than 2 and less than 4 Acre) of land was 30 percent (by 45 samples) in earlier and at present only 16.6 percent (by 25 samples). Between 5 to 8 *hal* land cultivated by 26 percent (by 39 samples) earlier and at present 14.6 percent (by 22 samples). In contrast, between 2 to 5 was *hal* earlier cultivated by 17.3 percent (by 26 samples) but now it has increased to 58.7 percent (by 88 samples) and below 2 *hal* earlier by 1.33 percent (by 2 samples) now by 10 percent (by 15 samples). This shows, area of cultivation is contracting as compared to earlier. It could be the reason as stated above.

Table 4.8.: Differences in Cultivation of Land (Present and 20 years ago)

No. of hals*	Present (2018, survey time)	20 years ago
2 hals & less	15	2
2-5 hals	88	26
5-8 hals	22	39
8-12 hals	19	35
12-15 hals	6	10
15-20 hals	0	19
20 hals& above	0	19

Source: Field survey, 2018 (* 1 Acre = 4 hals)

Hence, cultivated area is also declining as per the field survey too. Prior to a decades ago, on total, cultivated area was 1546 *hals* (approximately 386.5 Acre) and at present same sample farmers cultivating only 666.5 *hals* (approximately 166.62

Acre) i.e. 56.9 percent less than earlier. On the other hand, those farmers who were continuing farming gradually reduce their area of cultivation.

One of the direct connections that the study finds with this observation is structure of family i.e. joint, nuclear and holiday joint¹⁰. Two decades ago, 88 percent of sample farmers household were joint family structure, but now only 34 percent of sample household are joint in nature. So there are differences of about 54 percent of household. Census 2011 too found that in Sikkim, 71.38 percent couples lived in single family. Even in joint structure, number of family member is less because of orientation to have less family members and as a influence of slogan like '*Syanu Pariwar Sukhi Pariwar*' (small family happy family) to control the population, ultimately cause the manpower dearth in the agricultural field.

Differences on cultivation of land area observed in households, where structure of family also get changed, from joint to nuclear and to holiday joint. Even if some household are joint but majority of them are holiday joint i.e. their family members worked or study outside the village and just visit to home during holidays. As Ogundele and Okoruwa (2006) reported that higher family size does not necessarily translate to higher use of family labour because some of their young members prefer other jobs than farming.

Holidays joint, essentially indicates that member of such family work or study outside the village and visit their native place in holidays. The study found, that majority of households who are pursuing agriculture as a livelihood to sustain family needs and educate their children, now left behind. The reason which came out from

¹⁰ Holiday joint indicates family cum together in festivals and vacation, but in other days lives outside the village for other purpose like job, study etc.

the respondents are lack of manpower in the native place (village). After having education, new generation started non-farm professional life, which is located on outside the village. Now, parents/farmers become old and not having supportive hand to cultivate in field led discouragement to do cultivation. In addition, children who started earning from other sources, advice or force parents to stop doing farming. As many farmers said that their children advise them by saying, 'you had worked hard to make us educated and better feed, now we are able to earn as much to feed you, so doing farming'. Further, division of land among family members is another cause of reduction in cultivable area.

Even it is found that those who have large land holdings all around the Sikkim, hardly 5 percent among them does cultivation by themselves and majorly depend on *Kutiyara* and *Adhiyara*. Majority of fertile and low land of Sikkim are owned by *Kazi's*, *Mandal's* and *Karbari's* family¹¹. This indicates that those who have land resources, which are not deriving their livelihood from farming, but those who have less or lack of cultivable land, derive their livelihood by doing farming. So lack of ownership, refrains the farmers to dedicate and make long term plan or investment in farming in others land which created ultimately uncertainty on deriving livelihood from the land leading to search for other works,so to decline in farming. On the other hand, less land holding and lack of grazing land are other concerns to rear livestock to support farming.

¹¹ Kazi, Mandal, and Karbari are term used in king period those who have power to allocate the land for cultivation and even collection of revenue. At that time they capture land by different means like *Kudki* (Nilami).

4.6. Connecting Grazing, Livestock and Farming

Livestock is essential factors for farming. In reality, livestock rearing and farming are complementary activities to each other, one without other is unsustainable. Sikkim or Himalayan region had a livelihood of rearing large number of livestock in forest area or in pasture land, where fodder for grazing were abundant. This form of practice was known as “*Goath Palnay*”. It was prevalent till 20 years ago.

People were rearing the livestock (Cows, Ox etc.) in large manner in pastoral form. As a usual practice, in summer farmers used to take livestock in higher elevation in forest pastures area for grazing (in Nepali *Goath Palnay*) and in beginning of winter after harvesting took down all livestock and stalled in paddy land after harvesting the paddy for manuring in periodic basis in different terrace when there was no restriction on grazing in forest area.

In 1998, Govt. of Sikkim imposed ban on grazing and evacuated the herders (*Goathalo*) from forest and for that some got compensation for livestock @ 5k – 10k per cattle¹². The basic reason to ban on grazing was to protect forest, as per verbal information by the officials, that in process of grazing there were huge cutting of trees in purpose of construction of cattle shed, firewood for daily purpose of herders etc. So to preserve forest government decided to ban grazing, considering grazing or *goath* system was one of the major factor for such. As a result, only in Barsey Sanctuary area of West Sikkim, 288 families practiced pastoralism in 2000 and rear total 6324 livestock (5370 Cows, 370 Buffaloes, 506 Yaks and 135 Sheep) but in process by 2005 it reduces to 463 livestock i.e. fall by 96 percent (The

¹²As per officials who were deployed on that process from Animal Husbandry department, Govt. of Sikkim.

Mountain Institute, 2005¹³). This resulted to fall in average herd size of family, as prior to ban 21-22 cattles per family (6324 cattles by 288 families) and after ban 1-2 cattles per families. Due to lack of grazing area in village herd size drastically change.

As a result, herders found difficulty to keep large herd size in village area, led to decrease in herd size. This compels herders or farmers to stall feed their livestock which was hard to manage. Gradually number of herd size declined and in process indigenous cattle breed also get extinct and replaced by productive breed like Jersey and hybrid cattle in cow shed. At present, scenario is totally different.

Table 4.9. Number of Livestock Possess by Sample Farmers

Livestock	Total No.	Avg.
Goat	286	1.9
Cattle	254	1.7
Bullocks (pair)	55	0.36

Source: Field Survey, 2018

As per the field study, it is found that one farmer/farming family has 1-2 goats, 1-2 cattle on an average and similarly other like pig, chicken as per socio-cultural acceptability of various communities. This shows that herd size of livestock in farming household is insignificant and which ultimately hamper the agriculture and its yield due to less availability of manure and a symptom of decline of farming.

This indicates that livestock which is integrated part of farming itself is in vulnerable situation. Altogether it is making farming livelihood as incapable to fulfill

¹³The Mountain Institute (2005). People's Opinion on the Impact of "Ban on Grazing" in Barsey Rhododendrum Sanctuary, Sikkim, India. In collaboration with WWF-India, Forest Department of Sikkim EDCs.

basic needs led farmers to think for other alternative livelihood. As in earlier, due to *goath* system there were huge number of cattle rearing that helped to provide enough manure for farming purpose and ultimately good yield and suffice to feed their family perennially. Besides, for any emergency need or financial need, farmers had enough food stock and cattle size, they used to sell one or two to fulfill their needs instantly, made farming as prosperous livelihood. At that time in the list of wealthier farmers were listed as per availability of area of cultivation, forest area and no. of livestock. But now, due to modern developmental crooks this nature based status of richness is replaced by money based richness. Consequently, farming and its related activities becomes less prestigious livelihood in present day.

On same line, numbers of pair of bullock population are very less are also thin in villages. Study found only 1/3rd of sample farmers' rear pair of bullocks (i.e. 36 percent of farmers) for ploughing purpose. On the other hand, some institutions and government extension agencies promoting power tiller for plough. But it has as own limitation in hill terrace farming. As Prasad (2014) suggested that mechanization is considered as alternative to labour shortage but it has limitation like costly, unfeasible for small farmers, high maintenance charges. In addition, this farm mechanization cannot resolve the problem of manure as what can be by pair of bullock can provide.

4.7. Wild Animal and Agricultural Produce

Wild animal is a major stakeholder for the sustenance of eco-system. Reduction in any number of wild animals also vanished some kind of flora and fauna. On other hand, wild animal becoming curse for farmers by damaging the crops. Farmers frequently grieved about the damages done by wild animal. Even majority of farmers responded that, now the situation is as such that, 'whatever left as *Adhiya* by wild

animal is becoming our food'. It means, farmers are now *adhiyara* (share croppers) of wild animal, because whatever food left by wild animal becomes farmers' food. Region specific wild animal damages the crop viz. in high altitude area (in Nepali it is called *Layk*) Boar, wild pig and in low altitude region (in Nepali it is called *Aaul*) Monkey, *Dumsi*, Peafowl, *Kala*, *Lotharkay* etc.

One surprising thing observed about Peafowl (Peacock) is that, earlier Peafowl were only seen in plain areas, now they are seen in Himalayan belt too. It may relate it with effects of climate change or global warming, because Peafowl inhabiting in lower part of Himalayan belt indicates that they are experiencing same environment as like in plain area.

Another reason for high crop damage by wild animal could be the scarcity of foods and fruits available for them. The fruits which are grown in forest are naturally for wild inhabitants, but in the consumerism world every product are marketable either produce in forest or homestead. Now, people start collected forest fruits for market purpose viz. *Katus*, Avacado (*Phamphal* or *Pumchi*), *Chuiri*, *Niguro*, *Thotnay*, *Pangra*, *Kafaland* many more. This practice led dearth of food for wild animal, compels them to gradually enter into human settlement area in search of food and eat the crop which is grown in land. Consequently it cause of human animal conflict.

Similarly, by this reason and another, farming community leaving the cultivable land near the forest area and start concentrating in land nearby to home area. Some planted trees as a long term investment and some left the fallow land. Even in fallow land, by natural process trees start growing like *Uttis*, *Byapari*, *Malato*, *Chilaunayetc* make more forest area which gradually reach nearby to human settlement. This new

man made forest made path easier to reach the settlement area or cultivation area for wild animal.

This fallow land based forest makes wild animal easier to damage more crops led to demoralize farmers to do cultivation. Having said that, it is not ignored the fact that earlier there was no human animal conflict or instances of crop damage by wild animal. Earlier period too, wild animals damaged the crops but no more impact because there was full of crop sown in large area and even if animal damage, it could be negligible on total. In addition, there was enough manpower for protection of crops from wild animal. But now, crop cultivation done in lesser area by less number of farmers and crop damage by wild animal on process to feed it's starve become huge loss to farmers. As earlier, there was plenty of cultivated area makes negligible amount of crops damage but now due to less cropping minimal damage also affects farmers' overall produce. This tendency, makes more farmers to demoralize and unwilling to continue farming by saying '*Janwar le Kehi Rakhiday po Kheti Garnu*' (If wild animal keep something for us then will continue farming). This cold war between farmers and wild animal totally alienated cultivation.

4.8. Farmers and their Food Insufficiency

Food, cloth and shelter are basic necessity of human life. In the era of market based economy, this basic necessity especially cloth and food determine by brand value but hardly people would like to know about the concern of its actual producer. Those who have money they never realized the scarcity of food resources to feed their stomach. But, in contrary those who produce food by working hard in field to feed others, they themselves experience insufficiency of food to feed their own family.

Sikkim, which is landlocked state historically known as valley of rice i.e. Denzong. However, those who are producer, they themselves have uncertainty that whether they will be able to feed their family sufficiently or not. As per study, 34.67 percent of farmers said that if they have to depend on their own produce then it will only suffice to feed their family upto 2 months in a year, 49.33 percent of farmers produce food suffice only for 3 to 4 months and 5 to 6 months for 14 percent. Only 2 percent farmers said that their produce is sufficed for more than 6 months. The god of food i.e. farmers themselves are in vulnerable situation to access food for a 365 days from own land then how we can expect other will have suffice food to feed in coming days.

Table 4.10: Food Self Sufficiency of Farming Household

Months	Frequency	Percentage
Upto 2 month	52	34.67
3-4 month	74	49.33
5-6 month	21	14.00
Above 6 month	3	2.00

Source: Field survey, 2018

This means, even farmers of Sikkim do not have sufficient food feed their family by their own produce. The state which is now popularly known for Organic tag and historically it was considered as ‘valley of rice’ has such perilous situation in terms of food security. So, as per farmers respond, they manage to feed their family

through Public Distribution System (PDS). On an average, every months they purchase food from market and PDS about 53.5 kg to feed the family.

4.9. Impact of Public Distribution System on Farming

To have equitable distribution of available food resource to the people of nation, this PDS system was initiated through ration card. PDS is divided on different categories to distribute food as per the resource availability and its accessibility for productive use to support family needs. In this study, nearly 88 percent of total sample (i.e.133 out of 150 farmers) avail this PDS facility and other 12 percent (17 farmers) are not able to access this facility as they are emigrants or settled from long back but not having document of state like domicile, ration card etc. which curtails to access such facility of government. But they cultivate land of others by taking it in lease or *Kut* or *Andhya* as a *Kutiadar* and *Adhiyadar*.

Table 4.11. Beneficiary of PDS

	Frequency	AAY	BPL	APL
Avail Food Subsidy	133	14	99	20
%		10.5	74.4	15.0

Source: Field Survey, 2018

The objective to execute this scheme was essentially to feed the needy people and protect them from starvation. In the meanwhile, with the pace of development and progress in urban and rural area and implementation of many other schemes to create employment in rural area through which cash flow increase, led to attract people more

on that. It is the nature of human being that everyone works hard to feed ourselves and the family members. Sometime free and availability of something makes people forget the value and their capacity to gain that by own strength or hard work.

Village is known for its agriculture and allied activities, but now a days this activities are synonymous to hard work due to its nature of physical activities to feed the family. Even it is obvious that to feed the family people used to do hard work in the field to produce food. But, the provision of food at minimal rate through PDS system to feed the family made life easier. Prior to this provision, people had to work hard to feed family but now due to this relief, without hard work people are able to feed their family makes a feature among people to refrain to do hard work. Consequently it affects the farming, as per the villager’s experience.

Table 4.12. Impact of PDS on Farming Community

Food Security Impact on Farming	Yes	No
People work hard to feed family	150 (100%)	0
PDS Lessen the burden to feed family (<i>experience of PDS beneficiary i.e. 133 farmers</i>)	115 (86.6%)	18 (13.4%)
PDS availability started lessening farming (<i>experience of PDS beneficiary i.e. 133 farmers</i>)	102 (77.3%)	31 (22.7%)
Lessening the farming will secure food security	6 (4%)	144 (96%)

Source: Field Survey, 2018

From above Table (4.12) it is inferred that cent percent farmers said that everyone works hard to fulfill the basic necessity of family or to feed the family. This PDS, as

86.6 percent of farmers said, that benefit of food subsidy in terms of food security lessens the burden to feed the family. Earlier they had to work hard without bothering the sun and rain in the field to produce food to feed the family and in addition, there was no other earning source like casual work and non-farm opportunities. Now, people have opportunity to earn daily wage from varieties of casual work in non-farm activities, which is not seen in farming directly. Consequently, instead of working hard in agricultural field without any direct cash, people attracted towards non-farm opportunities. The sample data found that 77.3 percent said that PDS and other substitute are one factors which lessens the farming activity in village area. Instead, farmers themselves reiterate that lessening farming will not secure food (96 percent), but the trend is to attract other than non-farm opportunities are more like in MGNREGA work and is others.

4.10. Impact of Rural Employment Generation Scheme on Farming

Rural employment generation scheme was initiated to provide alternative employment opportunities to rural labour force. It has both positives and negative impacts on socio economic prominence in rural areas. Firstly, it increases employment opportunity within village, led to economic independency and then labourers dependency on landlords decline. The negative side is that it created labour shortage for agriculture and increased wage rate in the rural areas due to minimum wages act (Prasad, 2014).

Infrastructural development and other livelihood support activities are scheduled in this scheme. To support farming activities under MGNREGA in Sikkim, different works have been done like cow shed construction, small canal (*kulo*) made for irrigation purpose, land terracing etc. That may be the reason 74.6 percent of farmers

refer that MGNREGA scheme helps to support farming. Instead of its beneficial execution in terms of supporting infrastructure for farming, as per the verbal communication with farmers, it lacks ownership and led inadequate execution of work. In other words, inappropriate used of labour at its potential. In nutshell, it tries to mean that just for the sake of attendance or to fill MR (muster roll), job card holder or beneficiary work for some time and earn the days. That's why villager used to say '*khali duita dhunga sarayra din bitauchan*' as this statement is read as 'just by shifting two stone from here to there work for a day complete'.

That may be the reason majority (72 percent) of farmers realize that because of its nature of practice people are habituated in its time pass work culture led refrain to work hard and only want do easy task led to increase laziness. It indicates that employment scheme given alternative earning sources to rural people but side by side it hampers the work culture too. As Chand and Srivastava (2014) advocates in their study that MGNREGA not only offered source of work and employment but it also affected labour market in the following ways firstly by setting up benchmark for wage rate, secondly through its effect on the work culture and by changing the work environment for rural labour. It involves very light and non-strenuous work compared to agricultural activities. Once workers get particular wage for doing very light work by working in a leisurely, he/she would look for same kind of treatment in farming and other works too and seek higher wages for work requiring hard labour.

Table 4.13. Impact of MGNREGA on Farming

Response	Yes	No
MGNREGA helpful for farming	112 (74.6 %)	38 (25.4%)
MGNREGA refrain people from doing hard work	108 (72%)	42 (28%)
Farming decline due to MGNREGA programme	97 (64.6%)	53(35.4 %)
Availability of farm labour is easy	12 (8%)	138 (92%)

Source: Field Survey, 2018

In addition, the scheme creates a sense that for every work cash is suitable than kind. Prior to execution of such schemes people have their own labour management system for farming and other purpose as known as *Parma*. It is an indigenous social capital for farming though which villagers used to share labour to each other for all agricultural activities. But exchange of money for similar kind of work through different schemes and local activities shrink *Parma* system, due to cash culture. As a result, nearly 92 percent of farmers said that hard to get labour for farming and which directly or indirectly aiding to weakening farming due to manpower issue apprehended by 64.6 percent farmers. On the other hand, Harish et al. (2011) stated that due to guarantee of 100 days work in MGNREGA, the unique character found in labour that when there is no employment, earlier people worked in their agricultural fields, but now making it difficult for the farmers to carry out agricultural operations.

This scheme offered on an average 60 days of employment out of prerequisite 100 days of employment as per the farmers those who are beneficiary or job card

holder of MGNREGA. It adds the earning of farm family at the rate 177 per day, therefore as per average employment generated days beneficiary earn Rs.10620 (177*60) annually. This is direct cash to beneficiary account (through DBT provision), as some said that this amount is more than what agriculture produce directly able to earn annually. But, this farm earning is calculated by accounting only surplus agricultural produce sales to market or other, excluding the produce consume by them from same farm and other subsistence use to rear livestock etc.

Consequently, due to cash flow, 50.7 percent of farmers preferred MGNREGA than farming if both option are available. Other 49.3 percent farmers preferred farming than MGNREGA. But out of 49.3 percent, nearly 60 percent said that they prefer farming just because of the irregularity of MGNREGA payment and if, payment made in timely manner than they may change their preference.

Table 4.13. Preference between Farming and MGNREGA

Options	Frequency	%		Yes	No
Farming	74	49.3	Lack of other options doing farming	121	29
MGNREGA	76	50.7	%	80.6	19.4

Source: Field Study, 2018

Earlier, there were no such opportunities to the farmers to derive their livelihood alternatively. Now due to many options in non-farm sector, farmers preferred other than farming. That could be a reason 80.6 percent farmers said that they are doing farming due to non-availability of other permanent options. Similar things found in study done by Subba (2016), that there has been clash between the MGNREGA work and the agriculture season. Most of the villagers didn't found enough labour in times

to sow seeds, weeding and in harvesting time due to simultaneous work going in MGNREGA. Thus, it created dilemma for the worker on whether to go for agricultural activities or to go do MGNREGA work. In case of MGNREGA they have presumption, if they fail to go later there was every chance of cutting their name from scheme list. As a result decline in areas of cultivation and increased fallow land.

4.11. Inadequate Supply Chain Management and Credit Facilities

For agricultural produce government of India provided Minimum Support Price (MSP) for nearly 24 products (now after COVID-19 crisis, it increased to 76). Even some states have their own MSP schemes. In case of Sikkim, govt. decided sometimes back to give MSP for some produce but that was not continued. This was recorded when study tried to understand the awareness about MSP on farmers. Only 11.3 percent of farmers confirmed of knowing about MSP but never got any benefit of it. Even NSSO report (2003) reported that 92.6 percent farmers unaware about MSP.

Table 4.15. Awareness of MSP

	Yes	No
Heard about MSP	17	133
Percentage	11.33333	88.666667

Source: Field Survey, 2018

In addition to this, farmers never get a price what they expected for their produce. At least 70 percent of farmer stated that they never get expected price and 96.7 percent said that there is no supply chain management from government side. Even there is no such credit facility for farming as propounded by 90 percent of

farmers other than inadequate Kisan Credit Card (KCC) provisions. As per farmers' anticipation, organic initiative could change the status of farming community but till date they are waiting to realize their expectation.

Table 4.16. Status of Supply Chain and Credit Facilities

Status of market and credit	Yes	No
Farmers get expected price of produce	45 (30%)	105 (70 %)
Any govt. supply chain	5 (3.3%)	145 (96.7%)
Any credit support for farming	10 (10%)	135 (90%)

Source: Field Survey, 2018

4.12. Farmers Take on Organic Initiative

From 2003 onwards, Government Of Sikkim implemented organic farming and on 2016 Prime Minister of India, Mr. Narendra Modi visited Sikkim and declared it as first Indian state as 'Organic'. Prior to organic farming, chemical inputs (fertilizer) were used but it was far less than national average per hectare. As per the farmers, production or yield declined (78.6 percent) with the organic practice as compared to earlier pattern of farming for some years and then now yield is normal. So, with the changes in inputs use differences are observed in yield.

But 73.3% percent of farmers said that they do not appropriate any higher prices for their produce as it is stated by promoter (from politician to beaurocrats) in the time of implementation of organic farming. And in contrast 26.7 percent shared that they have realized higher prices as compared to inorganic produce.

Table 4.17. Farmer’s Response on Organic Farming

Organic Scenario observed by Farmers	Yes	No
Organic is beneficial (holistically)	88 (58.6%)	62 (41.4%)
Organic Practice retain production as earlier	32 (21.4 %)	118 (78.6%)
Organic fetch higher price as compare to outside	40 (26.7%)	110 (73.3%)
Boosting encouragement to farmer by organic	73 (48.7%)	77 (51.3%)

Source: Field Survey, 2018

These beneficial groups are vegetable growers who get a bit higher prices but those who cultivate paddy and other conventional produce do not get the same. Altogether, 58.6 percent said that organic initiative is overall beneficial and 41.4 percent not experience as such benefit at all.

The next thing is to understand extent of recognition in different aspects of organic execution by farmers. In Table (4.18), level of extent is divided in 5 levels i.e. Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. As per reliability check of the given factors, consistency of five factors (excluding easy to adopt) as measured through Cronbach’s alpha is 0.706. It indicates that 70.6 percent of the variance in the scores is reliable variance and 29.4 percent is error variance.

Whether it is of economically beneficial, 56.6 percent agree and 34 percent disagree and in terms of sustainable farming pattern 88.6 percent of farmers agree and 10.6 percent strongly agree. Organic farming is preferred due its quality of foods by 88.6 percent and 10.6 percent referred agree and strongly agree respectively. But 62

percent of farmers said that they are disagreeing on adequate availability of extension service and only 36 percent agree on this.

Table 4.18. Observation of Farmers in Various Aspect of Organic Agriculture

Factors	SA	Agree	Neutral	Disagree	SD
Economically beneficial	13 (8.6)	85 (56.6)	1 (0.8)	51 (34)	
Ecological/Sustainable Farming pattern	16 (10.6)	133 (88.6)		1 (0.8)	
Prefer for Quality food (healthy)	18 (12)	129 (86)		3 (2.4)	
Availability of govt. support (inputs and others)	1 (0.8)	54 (36)		93 (62)	2 (1.6)
Easy to adopt	6 (4.8)	90 (60)		54 (35.2)	
less costing as compare to other farming pattern	6 (4.8)	69 (46)		74 (49.3)	1 (0.8)

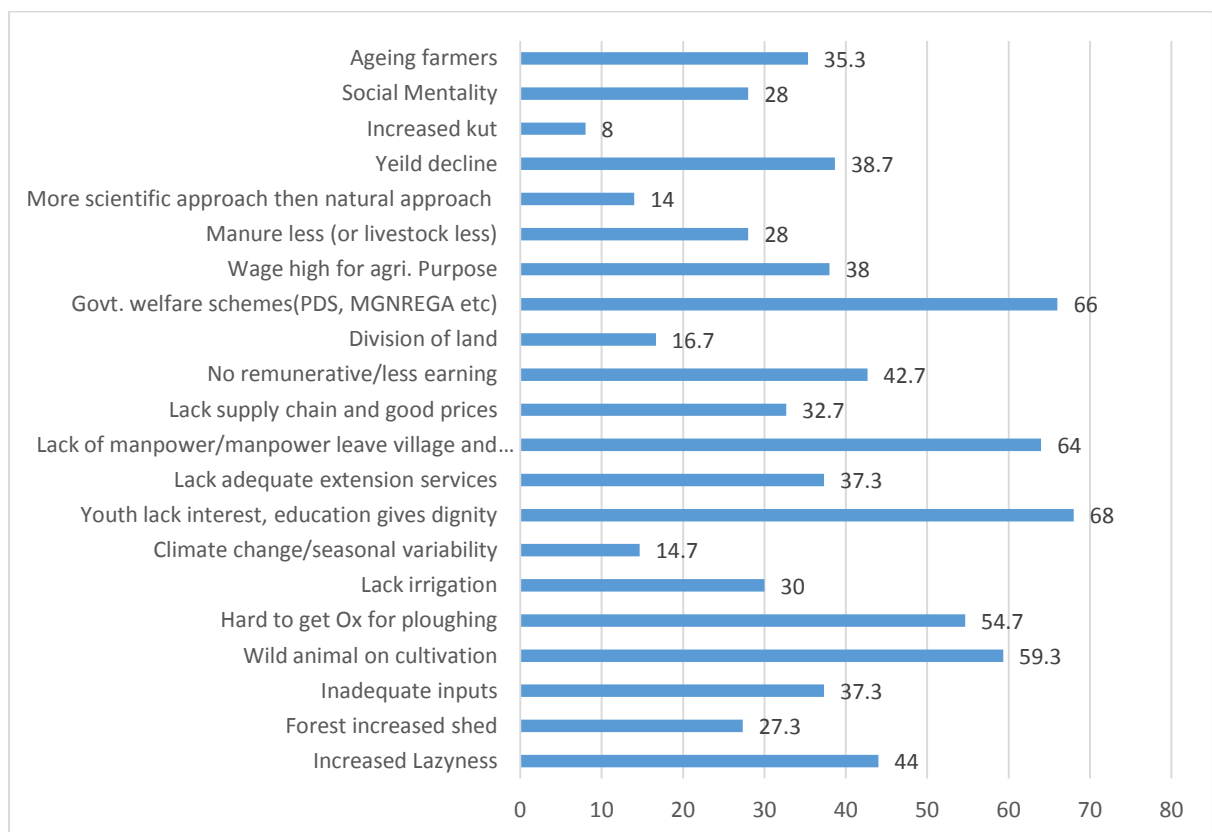
Source: Field Survey, 2018 (in bracket % scores)

And in other hand, 60 percent agreed that organic farming is easy to practice and 35.2 percent disagreed. In terms of cost of cultivation, 4.8 percent and 46 percent strongly agreed and agreed respectively that it is less costing as compare to other farming practice and 49 percent and 0.8 percent disagree and strongly disagreed on less costing. So on an average, 50 percent shared that it is costly because in organic practices labour is major input and its wage is too high (as explained the reason above) that farmers are unable to match the cost of cultivation and its return (as majority is not getting higher prices for organic produce). Hence, instead of good initiatives could not become beneficial at all as a secured livelihood.

4.13. Factors Responsible for Declining Farming

There are many issues which directly or indirectly affected farming practices. As above, study have explained many issues with the field observation statistics from demographic, economic, social issues, production and input support issue and external effect like opportunity in other sector, wild animal affects etc. Altogether, farmers specified the obstacles which they experienced while doing farming.

Fig. 4.3: Obstacles on Farming Observed by Farmers



Source: Field survey, 2018

As per Figure (4.3), obstacle observed by farmers pointed out different issues or factors. Out of many, wild animal effects, non-availability of bullocks for ploughing, lack interest on youth to work on farming due to education and other factors like dignity, lack of manpower or people start leaving village and attracted

towards non-farm sector and govt. welfare scheme like PDS, MGNREGA are listed obstacles observed by more than 50 percent of farmers. Similarly there are many other obstacles observed by less than 50 percent of farmers viz. ageing farmers, social mentality, increased *kut* amount, yield decline, more scientific approach than natural approach, inadequate manure (or livestock less), wage high for agri. Activity, division of land, no remunerative, lack of supply chain and good prices, lack adequate extension services, climate change/seasonal variability, lack irrigation, inadequate inputs, forest increase shed, increased laziness.

As shown above, it is found that there are many obstacles which lead to affect farming tendency. Tendency of impact is declining by different factors has various degree as per observation of farmers. Hence, Table (4.19) dedicated to show the degrees in form of highly, moderately and low impact of different factors on declining farming. To check the reliability and consistency of data, Cronbach Alpha statistics used. Statistical inference show the consistency of factors which lead to decline in farming activity. As an estimate indicates that 73 percent of variance in the scores is reliable variance and only 27 percent is error variance.

In Table (4.19), the study analyses different factors which farmers think has high impact for declining farming. Impacts of factors on declining are categories in different degrees like highly, moderately and low. Accordingly, study compiled the result and its percentage to rank the factors.

Table 4.19.: Declining Farming Indicator Index

Sl. No.	Factors Impacting Decline Farming	Category	Respondent 150)		DFII	Rank
			No.	Percentage		
1	No body to support (they are engaged in factory, or other non-farm sector or outside the village)	Highly	86	57.3	240	4
		Moderately	38	25.3		
		Low	26	17.3		
2	Ageing	Highly	60	40.0	197.3 333	8
		Moderately	26	17.3		
		Low	64	42.7		
3	MGNREGA	Highly	71	47.3	229.3 333	6
		Moderately	52	34.7		
		Low	27	18.0		
4	PDS	Highly	81	54.0	233.3 333	5
		Moderately	38	25.3		
		Low	31	20.7		
5	Lack of irrigation	Highly	36	24.0	188	9
		Moderately	60	40.0		
		Low	54	36.0		
6	Youth Disinterested due to education	Highly	98	65.3	256	1
		Moderately	38	25.3		
		Low	14	9.3		
7	Lack of adequate extension service from govt.	Highly	56	37.3	215.3 333	7
		Moderately	61	40.7		
		Low	33	22.0		
8	Lack assured market chain	Highly	79	52.7	248	3
		Moderately	64	42.7		
		Low	7	4.7		
9	Unavailability of labour	Highly	92	61.3	249.3 333	2
		Moderately	40	26.7		
		Low	18	12.0		
10	Small Land holding	Highly	32	21.3	172	10
		Moderately	44	29.3		
		Low	74	49.3		
11	Wild Animal	Highly	90	60.0	248	3
		Moderately	42	28.0		
		Low	18	12.0		

Source: Field Study, 2018

As per ranks, youths are disinterested due to educational degree is first cause. Sikkim is one among the top literate states, after getting some level of education, youths refrain from work in farm field led to decline in the manpower for field. Even

Chand and Srivastava (2014) propounded similar idea that pursuit of education is being perceived as an important factor responsible for labour scarcity in the rural workforce for agriculture and allied activities. Secondly, unavailability of labour for farming purpose due to many other non-farm opportunity to fulfill the family needs, reduces availability of labour for agricultural activities, as it need hard and physical work.

Thirdly, affect of wild animal in agricultural field. In process of time, increase in forest created the path for wild animal to reach agricultural field in search of food. Another factors as observed by farmers is the fruits which are available in forest are collected and marketed by people, which was actually animals food and it made wild animal to enter into agricultural field to mitigate their hunger. This resulted, in destruction of major share of produce by wild animals such as Wild Pigs, *Dumsi*, Monkey, Squirrels, Mouse, Peacock etc (as per altitudes). Lack of assured market is in third rank. On other side there is high market demand, but lack of supply chain and farms gets price low as compared to what consumers pay. Collectively, in one way, products are not harvested as expected due to wild animal damage and in other way whatever remained after consumption of wild animal in time of harvest not able to get good market price due to lack of proper supply chain management affected farming.

Fourth one is, nobody is there to support existing farmers as new labourforce are engaged in factory or other non-farm sector outside the village. Fifth and sixth are PDS and MGNREGA, as explained in above. Lack of adequate extension services from the implementing agency or authority to help the farmers for the development of agricultural activities is seventh in rank. This show, how self-reliant farming mold towards dependency on others, in the name of agricultural development or extension

services. It should have just a supplement to their activities but ways its services are rendered in past years it became necessity for farmers, which eradicate own wisdom of farming.

Eighth factor, which lessens the farming, is ageing of farmers. With the growing age (average age 54.55 years of farmers), physical strength to work steadily decline at that time aged farmers need supportive hand, but rarely he/she is able to get supportive hands (as explained above) which make them feel demotivated to continue farming.

As, in hill terrain it is hard to manage water for irrigation in perennial basis and majority of cultivable regions are in rainfed area, where there is lack of proper irrigation facility (as 9th factor). Even there are villages, where people have scarcity of portable drinking water even in rainy season. Small land holding (as 10th factor) is major constraint to continue farming and in addition to have more area some farmers cultivate others land in form of *kut or Adhiya*, but in that also rate of *Kut* is increased led to demoralize the farming activities.

4.14. Chances of Improvement: Suggested by Farmers

As noted above there are various obstacles which farmers are facing in farming. On the basis of obstacles, farmers suggested some of the improvement on factors which may lead to change farming scenario of Himalayan belt, especially in Sikkim. Farmers pointed out many issues which can be improved for the betterment of farming livelihood.

Major factors which majority of farmers' emphasized on increased the manpower by encouraging youth into it or by developing such mechanism through which youths

attract in farming. For this farmers themselves proclaim the necessity to pass agricultural knowledge to new generation through teaching agricultural education (i.e. 30 percent), because study found that there is problem of manpower and youth disinterest on farming. So, to boost encouragement in agriculture new generation should get knowledge about it. Another improvement factor which farmers suggested that farmers security in terms of insurance, social security, MSP for the produce which will help the farmers to continue farming. In addition as per own experience, farmers suggested the changes in nature of rural existence due to many new developmental approach especially by govt. scheme on farming, on which, due to MGNREGA peoples start seeing money in every form and PDS facilitate the food in minimal amount without dropping sweat makes them lazy, which led to lacking the interest on cultivation (as this need hardwork) leads to decrease the faming manpower. That's why, 20 percent of farmers advocated to curtail such scheme which changes the working nature and habits of villagers.

Table 4.20. Chances of Improvement for Farming

Sl. No.	Factors	Rank
1	Increased manpower and encouraged youth by teaching agriculture in school to show opportunity	1
2	Farmer security/insurance/MSP/social security	2
3	Closed all schemes and facilities to generate needs to continue farming	3
4	Protection from wild animal	4
5	Set Farmer as brand and develop marketing chain through institution like FPOs, Cluster etc.	5
6	Financial support/subsidies	6
7	Allow <i>Goath</i> or forest grazing to increased number of livestock	7
8	Adequate extension services	8
9	Adequate irrigation facility	9

10	Decrease <i>Kut</i> rate amount	10
11	Land reforms in which cultivators should have own land for cultivation	10
12	Monsoon and other damage compensation	11
13	Close all nonfarm opportunity	12
14	Deforestation allow in cultivable land	13
15	Fertilizer/DAP allow if organic seeds are not available	14
16	Promote indigenous seeds and natural technique of farming	14
17	If crisis/famine comes then only agriculture improve	15

Source: Field survey, 2018

Protection of crop from wild animal damage is becoming major concern in an around villages of Sikkim. In this context, instant solution is to fence all the forest area to minimize the wild animal enters into agricultural field, but it's not an ultimate solution. Just like human being needs food to survive, wild animal also need food to survive, so for this intensive plantation of edible fruit trees in forest area can be sustainable solution. Having said that, issue of wild animal damage become hurdle just because of less amount of farming, hence, if cultivation take place in all the cultivable area then even if wild animal damage the crop it would not impact much to the farmers due to large area of cultivation. So, increase in area of cultivation would automatically minimize the impact of crop damage by wild animal to the farmers.

Another factor is, developing efficient marketing chain with village level micro collection unit. It is a bitter truth that without market, one's livelihood or life would not be sustainable. And in market, prosperity depends on advertisement and its brand value, on this trap farmers' produce doesn't get value. Hence, to get value, farmer's or group of farmer's produce should be branded through FPO or own local farm or farmers group. For daily required items like milk, vegetable etc, collection provision should be mechanized like in milk cooperative system and transport to common location by building marketing chain. In context of institutional building like

FPOs, Cooperative, Cluster, every agencies for agricultural development need to work on convergence so that overlap of institution would not hamper the farmers trust on institution for productive utilization of institution.

Adequate financial support for farming is another suggestion. Instead, if existing farmers get good farm get price for their produce then need of financial support in terms of credit facility would not come in a path. This will help the farmers to take more independent decision and by working away from debt trap.

Allow *Goath* or animal grazing in identified *gaucharan* and pasture area of forest, which helps to increase the number of herd size and ultimately solve the problem of manuring and availability of bullock for ploughing. At present, due to lack of feed and fodder farmers are rearing less number of livestock on an average. So, livestock grazing need to allow in each village by allocating specific area.

To have adequate extension service on farming is another suggestion by farmers. On this context, what study found that farmers are habituated on extension services in such a manner that for everything, from seeds to sell its produce, farmers are majorly dependent on extension agencies. Hence, need the changes in process of providing extension service on such a manner that it will not eradicate the wisdom of farmers. And another factor which need to improve is irrigation facility.

Decrease *Kut* rate amount and land reform in which provision to have ownership of land for cultivator are another factors for improvement. In context of land reform, those who are performing cultivation they lack ownership of land and majority of lands belongs to erstwhile aristocrat families who never involved in

farming, so it's a time to implement land reform if state really wants to sustain the agricultural activities and then food security.

Due to different agro-climatic zone irregularities of monsoon and occurrence of hailstones and other factors like wild animal damage crops for that there should be immediate compensation mechanism to show moral support for farmers is need of the day. As another factor suggested boosting farming by farmers is by closing all non-farm opportunity in the agricultural area. It is, because nonfarm opportunities is more attractive in terms of direct earning led people inclined towards non-farm and resulted to dearth of manpower for farming.

Similarly, farmer suggested allowing deforestation in cultivable land. It means land which was cultivable but due to above reason people leave land fallow for a period of time which became a mini forest in time frame. So, to increase agricultural activity allows deforestation in such fallow land.

Another factor farmers uttered is to allow fertilizer/DAP for farming, it means allow inorganic inputs. After organic initiative, inorganic inputs were ban which is mainly useful on cultivation of hybrid and chemically treated seeds. As earlier, famers used to have own indigenous seeds but with the influence of market, hybrid seeds start circulating to farmers with the help of govt. agencies in the name of high yielding varieties of seeds which slowly extinct the indigenous seed. At that time, with HYV seeds, inorganic inputs were also promoted because for the HYV seeds such inorganic inputs were complementary to get expected result. Now, even if organic initiative banned the inorganic inputs but the available seeds are not organic. As a result low yield due to lack of other inorganic input substances for the growth of inorganic seeds. In other hand, organic inputs are provided and even trained the

farmers to make homemade insecticides and pesticides, which doesn't yield good result to protect crops from pest and insects. Only, reason for the same is in one way chemically treated seeds are sown and as a support inputs farmers are encouraged to use organic inputs. This disproportion between inorganic seed and organic inputs led farmers compel to spell out to allow inorganic inputs to increase yield and protect crop from pest and insect, until and unless organic or natural seeds are not access.

Next thing is to promote and preserve indigenous seeds and technique for the cultivation. In addition, farmers suggested to promote multi cropping pattern, as at present in the name of scientific agriculture mono crop was promoted to increase the yield, but farmers doesn't get expected result. Hence, farmers advocated for multi cropping pattern with indigenous seeds as a natural insurance of crop. Similarly, zero tillage farming, permaculture, natural farming, organic farming, zero budget natural farming etc are many techniques of farming based on natural norms and inputs can be execute in tiny Himalayan state of Sikkim with existing organic initiative. Name and approach of practice may differ on all such farming pattern but ultimate goal is to have sustainable and natural farming practices. Altogether, nature itself is a science, hence, it's better to follow natural science rather than modern scientific approach.

At last, farmers advocated that improvement only possible, if and only if when famine or crises arises. This, factor become reality in the meanwhile of this research completion, as survey done in prior to pandemic of COVID-19 in which farmers advocated this famine/crisis as factor for improvement of agriculture. In the meantime of pandemic, reverse migration towards rural area from urban observe and people who left the land realizes the value of land for food. Consequently this pandemic crisis taught the value of foods to sustain life. Now, people start scratching land in the

lockdown period (one form of famine) which was left fallow since years. Hence, for improvement of agriculture there are many factors to upgrade to build confidence in farmers.

In micro level, many obstacle helps to refrain farmers to continue farming like damages of crops by wild animal, farm labour start seeing for easy work like in MGNREGA and other, PDS (its objective was good), but the way it is taken by people affected farming, lack of interest of new generation for farming, availability of non-farm opportunity, small land holding to generate sufficient income and many other. But ultimately, market influence in terms, that creating mind-set money is solution for everything, which couldn't directly earn from farming activities, force to think for alternative made farming in crisis situation. Hence, notion of only cash return as an income from farming traumatized it.

Chapter 5

YOUTH AND THEIR PERCEPTION ON AGRICULTURE

“Yadhaddhi Kurutay Karma Tattatkaamasya Cheystitam¹⁴”

(Action determined by desire)

5.1. Background

From preceding chapters, study has observed that there are many reasons which helped to shrink the farming activities in an around world and Sikkim too. Ground level observation of farming in Sikkim is also very gloomy. One among many factors which are adversely influencing farming is scarcity of manpower. Those who are practicing farming are in their retirement age and young manpower after getting education, absorbed in non-farm sector outside the village. Even if those who are in village rarely show interest in continue farming. Those who are at middle age (above young and below retirement age) are involved in many other casual non-farm activities available within periphery of village.

This condition of scarce manpower for agricultural activities resulted to vulnerable situation to sustain farming. Even it is noted in earlier findings that, farming is already reduced by more than 50 percent as compared to a decades ago. By observing this trend and present manpower scarcity it, would not it be incorrect to say that agricultural activities are in extinction mode. It is obvious, that there is a high chance for its extinction, which raises the question of how human life will sustain if there is no production of food, due to scarcity of manpower. So, who will be the

¹⁴Manusmriti, 2nd Chapter, 4th Slok

future manpower for agricultural activities, ultimate answer would be the present day youths/new generation.

Hence, it is dire need of the time to understand the youths and there preferences and desire for the future livelihood because action is determined by desire. And regarding the question of manpower to the agricultural activities, need to know the perceive notion about agricultural activities by youths. Consequently, this chapter tries to understand the youths' perception about farming or agricultural activities, what determines their perception towards agriculture and many in connection to this issue.

5.2. Understanding Youth

Youth is defined as the period between childhood or an early stage in the development. It is defined differently by various organization and nation as per there social, regional structure. Altogether it is linked to biological process of development of an individual and ageing. Youth is also defined as a social position. Even youth, as a concept, varies from culture to culture and from one society to another (WYR, 2003)

Young people stand at the edge of a hopeful future, eminent for leadership at the family, economy and societal levels. Today's youth is better educated than ever before and have acquired an unprecedented level of knowledge of the world around them. In addition, youth are arguably the healthiest group of people ever to have lived on earth (WYR, 2003). Young people can be dynamic agents of social change, taking an active role in combating many contemporary problems, but they must be given the right tools to work with. United Nations has long recognized that the world's youth

are a resource for the advancement of societies; indeed, they are often the leaders of social, political and technological developments.

Curtain (2000) on his research argued that youth as an economic and social concept, refers to a separate stage in the lifecycle between childhood and adulthood. This period of transition refers to a complex interplay to personal, institutional and macroeconomic changes that most young people have to negotiate in other wholly traditional societies. The relative importance and intermingling of these factors can vary widely not only between countries and its economic development but it can also vary within countries according to socio-economic, ethnic and other social groupings.

It means transition from childhood to youth and to adulthood varies from society to society and culture to culture as per their rituals. So it is difficult to universalize the period of age to refer youth. For example, as united nation derive the range of age from 15-24 for youth, but in some countries transition from childhood to young too adulthood may varies. As per socio-cultural, institutional, economic and social factors youth categories for different age groups by different countries for example 12-24 years old in Taiwan, 14 to 28 years in Kyrgyzstan, 15 to 25 years in Thailand, 15 to 30 years in the Philippines, 16 to 30 years in Indonesia, 15 to 34 years in Mongolia, 15 to 40 years in Nepal and Myanmar, 18 to 35 years in Bangladesh, 9 to 24 years in South Korea and zero to 30 years in Japan (AFA,2015).

Similarly, in consumerism society this transition phase is deriving according to individual stand from dependence to independence. Sometimes, achieving economic and social stability may give the space for transition that comes through stable employment and which may extend into the late twenties and in some due to educational procedure, transition to stable work could take up to around age mid 30s

(WYR, 2003). This could be the reason, Curtain (2001) argued that these different transitions do not take place independently of each other without prior condition from dependence to independence like leaving parental home and setting up new household and entering into close stable personal relationships outside the family of origin through marriage or other way, completing required educational level and finding work or employment to more or less achieving stable livelihood. In which many instances become necessary condition for transition.

Jordan Human Development Report (2000) emphasizes that transition must be from adolescence to adulthood, from dependence to independence and from being beneficiary of society's services to becoming contributors to national economic, political and cultural life. It means, the phase in which person will take right choices and take efficient control of their own lives and social obligation comprise one of society's utmost priorities in terms of ensuring its preservation and development. So altogether, transition of dependent to independent for self-esteem could be consider the base for recognition of Youth.

As defined by National Youth Policy of India (2015), youths are those who are above 14 years old and upto 29 years old, this is the age when a person completes his or her education and search for job or livelihood to sustain life. Hence, this age group is considering for the study purpose as youth.

This chapter focuses on understanding of the youth perception towards agriculture and allied activities. Even though youth can only be savior of agriculture and food security in particular, but, youth has different occupational choice due to educational, economic, social and other perceptual attributes. So now, the need is to understand how perception develops and determined occupational choice.

5.3. Meaning of Perception

The things which an individual observes in an around through sensory inputs and interpret it expressively, this process is known as perception. The main issue of perception is explaining how an individual attach meaning to the sensory inputs or information it receive.

Perception can be subdivided into visual perception, auditory perception, haptic (touch) perception & taste perception etc. Mainly visual and auditory perception is significant to understand general perception. When we look at an object we acquire specific information about it, like its location, shape, texture, size and name. After seeing something, one would acquire information about the objects function. Let's understand by an example of visual system, an individual see books, trees, cars, bushes etc. The reception of information and its registration by a sense organ make up the proximal stimulus or retinal image in retina and then meaningful interpretation of the proximal stimulus is the percept. But, sometime the perception differs with proximal stimulus (things see), like the giant tree is closer than the bushes from car. In reality, an individual see the books, trees, cars and bushes, but it interprets as trees are closer than bushes from car. As a result, some researchers studying perception disagree about the fact that percept is same as what proximal stimulus (retinal image).

So, Galotti (2012) said that perception is a process by which an individual attaches meaning to sensory information what it receives. The act of perception as the construction of mental representation of objects, from the information one perceived. It constructs a depiction that may or may not physically resemble to object being perceived but its cognition and physiological process can recognize as corresponding

to the information perceived. Hence, an individual use both the information in the proximal stimulus and information from existing memory to construct these mental representations. This approach is known as constructive approach of perception. It describes that, people either add or distort the information in the proximal stimulus to obtain a percept. People are not seen as passively taking in all the available information, instead they are seen as active selectors, integrators and constructors of information. The segregation of the whole stimuli (displays) into objects and the background is an important process known to cognitive psychologists as form perception. This is under Gestalt School of Psychology which considers that perception involves the segmentation of visual stimuli into objects and backgrounds.

To understand it with research technique, psychologists studying perception distinguish between bottoms up and top down process. The term bottom up (or data driven) essentially means that perceivers starts with small bits of information from the environment that an individual combines in various ways to form a percept. Bottom up process are relatively uninfluenced by expectations or previous learning. Top down process is alternative or upgraded form of understanding perception concept. In top down (also called theory driven or conceptually driven) processing, the perceivers expectation theories, or concepts guide the selection and combination of the information in the pattern or recognition process. For example, if one know the things from past experience than he/she expected to get things as per its past experience. And in another way, the context surrounding the character, obviously influenced what one perceived. Top down or conceptually driven, processes are those directed by expectation derived from context or past learning or both.

Hence, perception can be determined by many things and processes. So in this context, study pursues to observe the perception of youth regarding the agricultural and allied activities.

5.4. Socio-Economic Profile of Sample Youths

Socio-economic profile of youths contains the gender, categories, age and educational level of youths of the farming household. Out of total 259 youths sample 56.4 percent (146) are girls and 43.6 percent (113) are boys from all four districts of Sikkim. In which 42.1 percent (109) are schedule tribe, 9.3 percent are general, 6.2 percent are schedule caste and 42.4 percent are other backward caste.

Educational level varies from below standard 10 to post graduation and above. About 34 percent of respondents are having less than standard 10 educational level and 37.5 percent are having standard between 10 and 12 educational levels. Graduation and above are 28.5 percent and there are some who have even master degree and still lying idle without any work and some are doing casual labour and engaged in small remunerative works like private school teaching and as a casual labour in factories in urban periphery.

Table 5.1. Socio-Economic Details of Sample Youths

Category	Frequency	Percentage	Category	Frequency	Percentage
Gender			Qualification		
Girls	146	56.4	Below Standard 10	88	34
Boys	113	43.6	Standard 10 – 12	97	37.5
Categories			Graduate & above	74	28.5
General	24	9.3	Ages		
ST	109	42.1	Less than 18 years	85	32.8

SC	16	6.2	18 - 21 years	78	30.1
OBC	110	42.4	22 - 25 years	55	21.2
Source: Field Survey, 2018			26 - 29 years	41	15.8

This study, considers youth between the age groups of 15 to 29 years as a threshold for the study purpose. Among the youths 32.8 percent are between 15 to 17 years of age and 30.1 percent between 18 – 21 years. Similarly, 22 to 25 years are 21.2 percent and 26-29 years are 15.8 percent.

5.5. Future Aim to Become: Preferences of Youth

Today due to more advancement of technology and guidance and counseling, it is expected to have some variations on youth's future aim. Instead, same is observed among youths regarding the future plan to become. Table (5.2), tries to explain the youth's aims to become, in which 62.6 percent have aim to hold govt. job followed by self-employment (15.8 percent) and then 10.8 percent others (which include tourism, music, sports etc). But there are some youths who profoundly said that they would like to be in private job (6.9 percent) just because of high competition or low option in govt. job. At last, only 3.9 percent of youths shown interest to become farmers or engaged in farming.

Table 5.2. Preferences of Youth for Occupation

Aim to be	Frequency	Percentage
Govt. Job	162	62.6
Private Job	18	6.9
Self Employed (Business etc)	41	15.8
Farming	10	3.9
Other	28	10.8

Source: Field Survey, 2018

To have a perception or any kind of expectation or willingness is a result of many factors. Among such factors are social environment where youths grown up and

the scenario which they seen and perspective imbibe through education which they get and expectation of parents to become are many on list. The sample analysis observed different youth preferences as aim to be or preferences to have livelihood in various sectors because of many reasons among such are categories in Table (5.3).

Table 5.3. Reasons for the Various Occupational Preferences of Youth

	Reason for Preference	Govt. Job	Private Job	Self Employed (Business etc)	Farming	Other
1	It's my dream	7	0	7	2	16
2	It is respected Profession	16	0	0	0	0
3	To become rich/successful/future bright	9	3	17	1	3
4	Its Permanent/regular/good salary	77 (47.5 %)	0	0	0	1
5	Govt. job difficult to get	0	13	10	0	0
6	To serve community	8	1	7	7	8
7	Parents are farmers	21	1	0	0	0
8	To get facilities	24 (14.8 %)	0	0	0	0

Source: Field Survey, 2018

Out of 259 youths, 32 youths selected various professions considering it as their dream among them 7 each said government job and self-employment is their dream and 16 have various other professions as a dream and only 2 youths said farming or to be farmer as their dream. On the basis of respected profession it linked to govt. job by 16 youths. To become rich/successful and to make future bright 33 youths selected various professions among which 9 thinks govt. job can make this possible, 3 thinks private job, 3 thinks from other profession and only 1 thinks this can be possible from farming. But 17 think that to become rich and successful one needs to be self-employed (i.e. business etc). On basis of permanent/regularity in

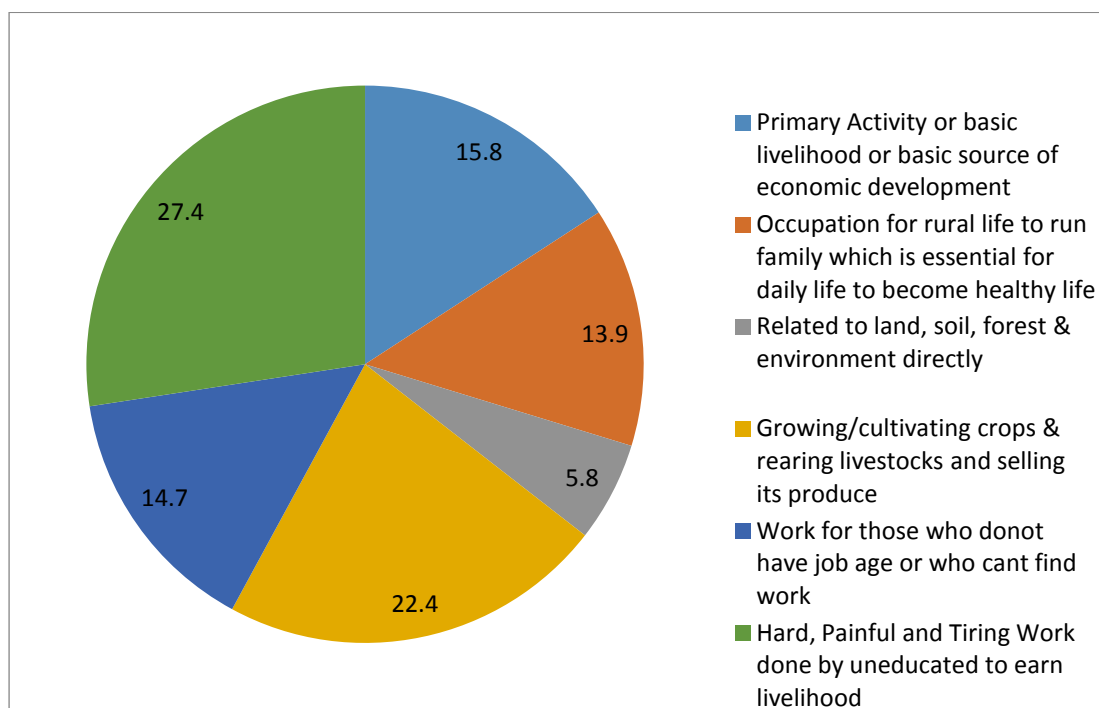
nature with good salary 77 youths selected govt. job and 1 selected others. There are youths about 23 who selected private job (13) and self-employed (10) just because that govt. job is difficult or impossible to get. Even there are 31 youths who opted for various professions to serve the community among such 8 under govt. job, 1 under private job, 7 under self-employed, 8 under other profession and 7 through farming. 22 youths selected govt. job and private job just because their parents are farmers. Some (24) selected their future profession on the basis to access facilities and they think that is possible only in govt. job.

In nutshell, majority 62.6 percent of youths are willing to opt for govt. job mainly (47.5 percent) because of its feature of permanent or regular in nature and have good salary, 14.8 percent to access good facilities like medical and other and 12.96 percent opted govt. job because their parents are farmers. But farming is only selected by 3.9 percent (10) out of total youths, as 2 said it is their dream and 1 said the reason to become success or rich and 7 said that they have opted this farming as livelihood to serve community. Altogether, youths are still in confusion that whether education is to get job for their livelihood because 62.5 percent has the aim to be in govt. job and similarly other in certain percentages. But agriculture and allied activities or farming is rarely seen as a profession or livelihood due to many reasons.

5.6. Youths Perception about Agricultural Activities

It is found in above that youths are more interested in government job and other related jobs but rarely think agriculture and its activities as a profession that's why only 3.9 percent selected farming as their preference. Even out of 10 (3.9 percent) 70 percent selected this livelihood to serve the community, which indicates that farming is considered as social work.

Fig. 5.1. Youths' Perception about Agricultural Activities



Source: Field Survey, 2018

To have youth understanding about the agriculture and allied activities, study tries to accumulate its response in figure (5.1). Out of total, 27.4 percent youth have understanding that agriculture and allied activities are hard, painful and tiring work done by uneducated to earn livelihood and 22.4 percent perceived it as growing/cultivating crops and rearing livestock and selling its produce. Similarly, 15.8 percent and 13.9 percent understand it as primary activity for economic development and occupation for rural life to run family respectively. Nearly, 5.8 percent considers it as work related to land, water and nature directly and 14.7 percent thinks that agriculture and allied activities are work for those who don't have working age/job age and to those who cannot get job opportunity.

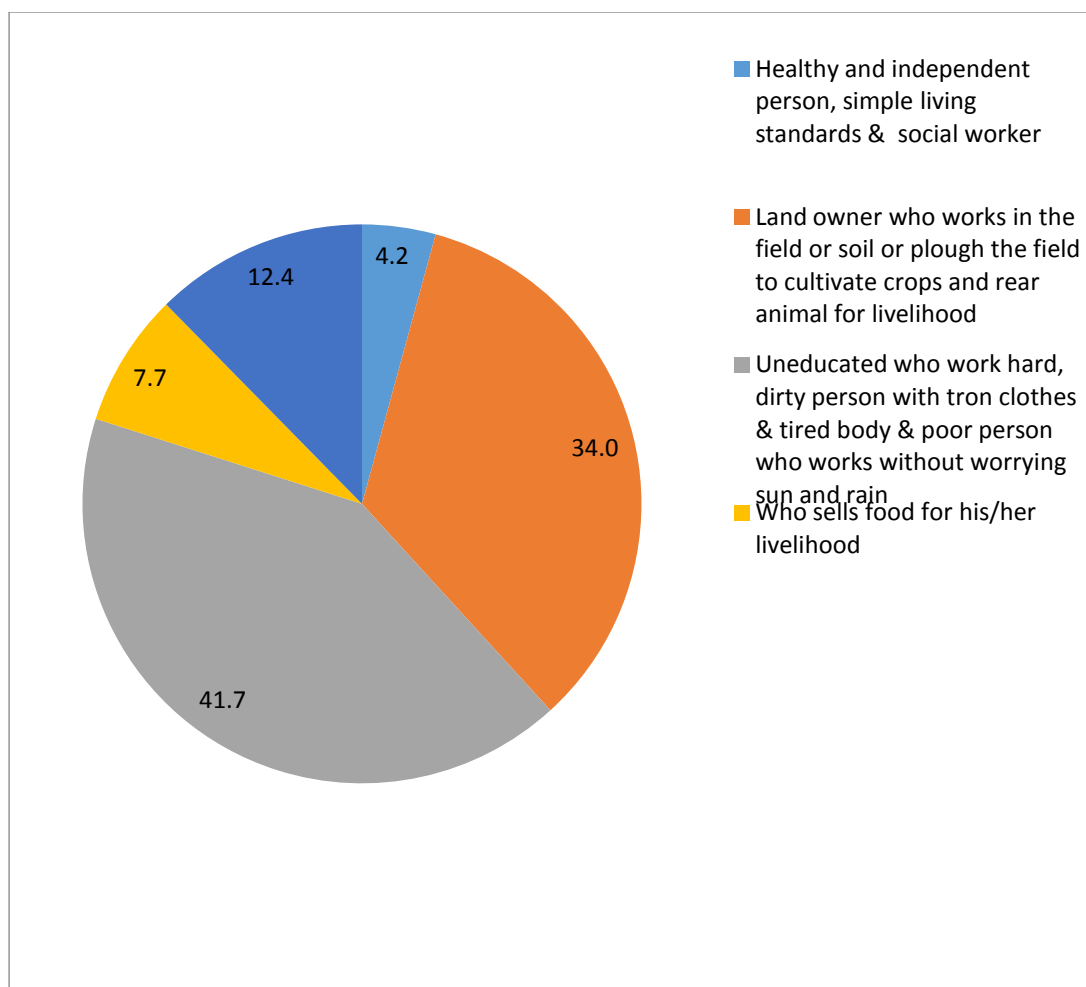
5.7. Youth Perception about Farmers

Farmers, now a days is consider as symbol of hard work and sacrifice for others. They however are successful entrepreneur because they take more risk than any other livelihood activities like to protect their farm from climate change, monsoon failure, hailstorm, wild animal, insects, pest, price fluctuation and many more, hence in reality they are great scientists and economists by nature. But, the image of farmers may be in form of story or in activities not set as respectful position from school, society and other level. That prejudice is stuck in mind of everyone including youth in general. So, what youth thinks about farmers, as youth are backbone of the society and farmers are feeder of the society, in this congruence study try to observe the thinking of youths' about farmers.

Youths the Sikkim, present their view on question “what comes in your mind when you think of a ‘farmer’?” are categorized in Figure (5.2). Starting from small category, 4.2 percent of youth thinks that farmers are healthy, good person and having nature of social work with simple living standard & independent in all rounds. Similarly 7.7 percent of youth have identified farmer as seller of food for his/her livelihood.

About, 12.4 percent of youths who think that farmers are backbone of the society who feed the nation as a servant and their livelihood is most essential for nation. Similarly, one third of total youth respondents who think that farmers are those who are land owners and work in field or cultivate crops and rear animal for their livelihood.

Fig. 5.2. Youths' Perception about Farmers



Source: Field Survey, 2018

But majority of youths (about 42 percent) have different views point about farmers. For them farmers are poor and uneducated who work hard with tired body and dirty person wearing torn cloth and works day and night without worrying sun and rain. Instead of being from farming family, youths have diverse understanding about farmers, what could be the situation of youths who do not belong to farming family? They may have mindset according to what their parents think and society desires to be.

5.8. Status of Parents' Encouragement to Youths for Agricultural Activities

Parents are the primary source of inspiration and factors for the occupational choice. Youth responds on the question 'whether parents encourage you to be a farmer, only 12.7 percent youth responded that their parents inspire for farming and remaining 87.3 percent said that their parents not preferred to make farming as a livelihood. Out of positive responds 3.9 percent parents encouraged in this line only if their children not get any jobs. Only some parents have inculcated in the mind of children that now agriculture has opportunity because it is becoming rare and generating opportunity (3.5 %) and initiative of organic has good prospect to make it livelihood (2.3 percent). Nearly 3 percent parents encouraged their children for farming just to learn about it.

Table 5.4. Status of Youth Encouragement by Parents for Farming

Sl.No.	Reasons for Encouragement	Percentage
1	Only if unemployed	3.9
2	Becoming rare & generating opportunity	3.5
3	Organic can give good earning	2.3
4	To have knowledge	3
Reasons for Not Encouragement		
5	Parents have higher expectation as they are providing good education by working in agricultural field	27.4
6	No fixed earning	20.1
7	Parents are farmers and they suffered a lot to fulfil their needs	22.4
8	No securities and facilities	17.4

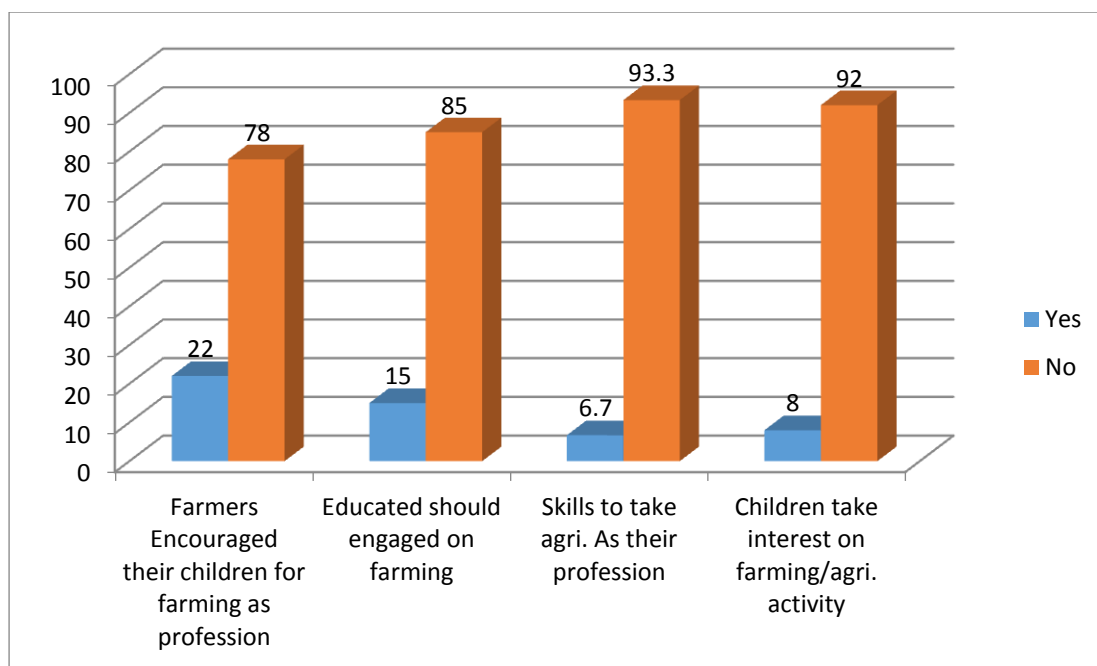
Source: Field Survey, 2018

But majority about 87.3 percent youth responded that their parents don't encourage them for farming. There are many reasons behind this lack, as 27.4 percent youth said that their parents have higher expectation from them. As they argued that, parents used to tell them that 'we are working hard to give you education to make you

fit for govt. job or good job'. Less earning or any fixed income from farming led farming parents to discourage their children to opt for farming as postulated by 20.1 percent youths. There are parents who don't encourage their children to continue their livelihood because they suffer a lot to fulfill the daily needs of the family requirement as responded by 22.4 percent youths. About 17.4 percent youths have given reason of discouragement from their parents towards farming are lack of securities and facilities for farming fraternity as a basic rights.

As it resembles to what farmers think about youths in connection to farming. The Fig. (5.3) confers the four opinions of farmers about youth or their children in terms of agricultural activity. First and foremost is whether farmers are encouraging their children to take agricultural activity/farming as a livelihood to live life as like as other profession or not? Only 22 percent of farmers are willing to encourage or are encouraging their children to make farming as their livelihood after education. But 78 percent of farmers are not encouraging their children to involve in same in which they are striving to make livelihood because they have bitter experiences on this livelihood that makes them refrains to do same struggle by their children. Similarly, only 15 percent of farmers want to see the educated youths in agriculture to make their livelihood and remaining 85 percent farmers doesn't support the involvement of educated youths in agriculture because they believed that education is to move out from agriculture or to get some other job.

Fig 5.3: Farmers' Opinion on Youth Involvement in Agricultural Livelihood



Source: Field Survey, 2018

In terms of skilled possession by youth for agricultural activity, as per farmers' observation by examining day to day activity of their children and other youth of his/her surrounding, only 6.7 percent youths have appropriate skill to practice agricultural activity. And in other hand, farmers confer that only 8 percent of children are taking interest to work on agriculture activity. Altogether, future of agriculture is in vulnerable position if not raise instant concern. From this, it is clear that youths have not realized the importance of agriculture and even parents are also not encouraging them to do so.

5.9. Farming as Social Prestige/Status

Prestige, matters a lots in this globalized competitive culture. Status of any individual or family depends on the possession of resources. Earlier resources referred to only agricultural land, number of livestock and other natural resources, but now

resources are understood as material wealth. This understanding led to create different perceptions of prestige or status in terms of livelihood or livelihood which easily helps to derive such material things. Therefore farming as a livelihood has perceived differently by youth in terms of prestige i.e. only 32 percent youth said it is prestigious and vice versa.

Table 5.5. Farming as a Prestigious Livelihood			
Sl. No.	Reasons for Prestigious	Yes	Percentage
1	Provide basic needs or basic for survival or nation relies on farming	18	6.9
2	Only if more land	6	2.3
3	Feed empty stomach or provide food to others & make others happy	25	9.7
4	Parents are farmers and they know traditional farming knowledge	5	1.9
5	Only if one can sell its produce in volume or mass producer	21	8.1
6	Only few people do this and earn honestly	8	3.1
Reasons for not Prestigious		No	Percentage
7	Hard & dirty labour work done by low class or uneducated worker	16	6.2
8	Backward mindset of society-doesn't hold agri. in high esteem	52	20.1
9	Less money and does not make happy life	25	9.7
10	No facilities and no scope	41	15.8
11	People bargain and don't get what deserves	8	3.1
12	As compare to other profession it is not prestigious	34	13.1

Source: Field Survey, 2018

Categorically, youth have different reasons to recognize the status or prestige of farming community. Out of 32 percent of positive response have various reasons to say so. As per reasons, farming is livelihood which provides basic needs for all or nation relies on farming as per 6.9 percent youths. Similarly, 9.7 percent thinks farmers feed empty stomach and make others happy; 8.1 percent thinks that it is prestigious only when farmers produces in volume and sell; 3.1 percent said it is prestigious because only few people are doing and earn honestly; 2.3 percent thinks only when land is more and 1.9 percent youths think it is prestigious because their parents are farmers and they have traditional farming knowledge.

But, majority of youths i.e. 68 percent think farming is not a prestigious livelihood. Due to many reasons, as farming is hard and dirty labour work done by low class and uneducated worker (6.2 percent), majority of society doesn't recognize it as a prestigious and not hold in high esteem livelihood (20.1 percent), it gives less money and doesn't make happy life (9.7 percent), not any facilities like in other profession and leads to no scope (15.8 percent), other always bargain with farmers and don't get what they deserve (3.1 percent) and 13.1 percent thinks that as compared to other profession, farming doesn't possess same prestige. It indicates that due to various notions prevalent in society which are observed by youths led to perception that farming is not considered as prestigious livelihood in society.

5.10. Is Education a Barrier for Entry to Farming?

Education is wisdom. It is considered to be a process of development for an empty brain child. It should be for development of broad thinking power for anything in society. But this thing has some different inferences as per study. As above, it infers that youths are not recognizing the farming as their preferences to take it as a

livelihood for their sustenance. On same line, study tried to understand the their preferences after degree through the question that ‘whether you want to engage in farming after degree’, data says that 24.7 percent responded as ‘Yes’ and 75.3 percent says ‘No’ on the basis of several reasons mention in table (5.6).

Those who shows interest for farming shown their interest on various aspects such as just for part time as a side income (2.7 percent); to be physically fit by fulfilling own food requirement by using other labour (3.9 percent); 2.3 percent interested to help parents and feed others; 0.8 percent and 1.5 percent preferred that it has same earning as compare to other profession and all people are attracting towards white collar job leads to scarce in farming respectively. Even youths pointed out their interest in farming to be self-employed and independent (1.9 percent) and 11.6 percent will shows interest if not get any job.

Table 5.6. Youth Want to engage in farming after degree			
Sl.No.	Reasons to Prefer Farming	Yes	%
1	Part time for side income	7	2.7
2	To fulfilled own food requirement for physically fit by using labour	10	3.9
3	To help parents or family occupation and feed others	6	2.3
4	It has same earning as job	2	0.8
5	All are attracting in white collar job so more scope in agri	4	1.5
6	To be Self-employed and independent	5	1.9
7	If not get job	30	11.6
Reasons not to Preferred Farming		No	%
8	Not socially acceptable	50	19.3
9	Hard work	7	2.7

10	Less income	17	6.6
11	No security	4	1.5
12	Does not fulfilled daily needs & dream	22	8.5
13	No scope	8	3.1
14	We didn't learn to engage in farming but we learn to do job	54	20.8
15	not interested	33	12.7

Source: Field Survey, 2018

Out of 75.3 percent respondents said that they don't want to engage in farming after educational degree based on various reasons. Reasons behind the 'no' response are many, majorly, 20.8 percent said that they didn't learn to engage in farming but to do job. As this is obvious respond by the youth who all taught story from primary school level that 'there was a poor farmer' and at the time of alphabetic learning like 'A for Apple' similarly 'G for Gentlemen' with image of a person wearing formal coat pant. That imbibes in mind of youths, that to be gentlemen need to wear formal and for that job need to secure. As in farming, one cannot wear formal to do cultivation and whenever story of poor taught always image shown of farmers working in field wearing half dhoti or half-trouser with torn *gunji* or shirt.

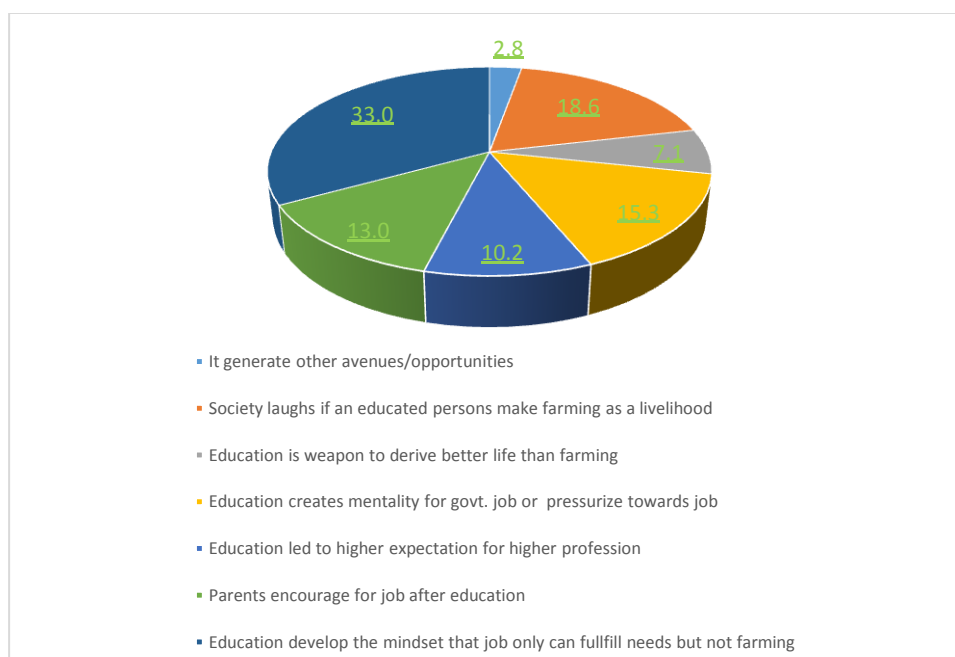
Similarly, 19.3 percent said that farming as a profession after degree is not socially acceptable and due to this reason 12.7 percent said directly that they are not interested in this line at all. Other reason like hard work (2.7 percent), less income (6.6 percent), no security (1.5 percent), no scope (3.1 percent) and 8.5 percent think that it will not fulfill daily needs and their dream.

As noted above, school or modern education resulted to refrain interest on farming due to many reasons. Hence, study tries to understand 'whether education is

barrier to make farming as a profession’, in which study get 83 percent of respond as ‘Yes’ and 17 percent as ‘No’. This indicates that youths don’t have good impression about agricultural activities not because of their own hands on experience but just by seeing or hearing about its flaws without any practical and formal knowledge about it.

Only 17 percent of youths said that education is not a barrier to entry into farming. As they responded the reason behind their response i.e. education will give knowledge to improve agriculture (5.8 percent), it give access to modern and systematic agricultural activities (4.2 percent) and they have view point that any people can do farming irrespective of educational level or even educated can also do farming without any obstacle (6.9 percent).

Fig: 5.4. Reasons for Education as Barrier for Faming (in %)



Source: Field Survey, 2018

But majority of youth shared that education is one among the major factors for barrier to enter into farming. As it generates (for this 87 percent is consider as cent

percent) other avenues to make profession (2.8 percent), it is weapon to derive better life than in farming (7.1 percent), and it creates mentality for govt. job or pressure to job (15.3 percent), it led to higher expectation for higher profession (10.2 percent), parents encourage for job after education (13 percent) and education develop the mindset that only job can fulfill dream or needs but not by farming (33 percent). Other than all above, 18.6 percent said that education is barrier because society laughs if an educated person takes farming as a livelihood. These cumulatively reduce the preference to live in rural areas in search of better avenues in urban areas.

5.11. Determinants of Youth's Interest on Agriculture & Allied Activities

Interest on something or some activities is the result of inculcation of many factors like environment, knowledge he/she accrue on process of taking education or degree, parental expectation and many others. Given Table (5.7), percentage of youths (on total sample) postulated the reasons for interest or not interest on agricultural and allied activities categories on broad factors.

Table 5.7. Determinants of Youth's Interest on Agriculture and Allied Activities

Factors	Reasons	Percentage (on total)
Interested		
Simply interested	To carry forward parental livelihood	3.08
Interested on compulsion	Getting a job hard therefore interested to be self-employed in agricultural and allied activities	9.27
Not Interested		
Qualification	Educational degree or mindset after getting education	83
Nature of Work	Hard and tiring work	87.5
Income/Earning opportunity	No fixed earning or no income security	93
Future Expectation	Difficult to fulfilled dream/needs	81
Ability/skills	No Knowledge about agricultural prospect or practical skills	97

Parental Expectation	No Support or encouragement from parents	87.9
Societal Mindset	Lack Social prestige or socially disgraced livelihood especially after having degree	68

Source: Field Survey, 2018

In context of having interest on agricultural activities only 3.08 percent of youths on total sample responded that they are interested by bearing responsibility as they belongs to agricultural community to carry forward parental livelihood. On same line of interest, 9.27 percent youths have shown interest if there is lack of opportunities in other sectors. Hence, they would like to be self-employed in agricultural and allied activities, as it is considered as interest due to compulsion.

On the other hand, major responses are under ‘not interested at all due to many reasons’. As such, mindset of a youths after educational degree compel them to do jobs rather than entering into agricultural field as responded by 83 percent. Similarly, 97 percent of youth shows lack of interest on agriculture just because of inadequate practical skills and knowledge of agricultural prospect even after having different level of qualification. Another major reason of disinterest in agricultural activities seems to be due to its nature of work i.e. hard and tiring work as responded by 87.5 percent of youths.

Lack of fixed earning or income security as responded by 93 percent and to fulfill dreams and needs through agricultural activities as responded by 81 percent makes youth disinterested towards agricultural and allied activities. Social and parental expectation after having education becomes another major cause of disinterest for agricultural profession as responded by 68 percent and 87.9 percent of youth respectively.

In nutshell, study categories this reasons as determinants of youth's interest on agricultural and allied activities on various broad factors. As per above explanation, interest on any occupation or livelihood can be the result of many factors like simply interested, interested on compulsion, educational qualification, skills or knowledge, nature of work, income security, future expectation, parental expectation to opt for livelihood and societal mindset about available livelihood. All these determinants have various degrees of influences to opt for livelihood. It all depends on importance of various factors, or how much importance one will give to particular factor, at the time of opting livelihood. For example, many a time one individual accepts livelihood to fulfill parental expectation without considering other factors. Hence, determinants have various degrees of influences on one individual to opt for agricultural livelihood. It all depends on perception of youth about agricultural activities.

5.12. Youths' Perception towards Agriculture: PCA and SEM Analysis

With respect to the perception evaluation, the data set contains 12 items each consisting an observed variable for youth's perception with regards to agriculture. Responses on perception regarding 12 items are viz. agricultural activities can fulfill needs, agriculture is part of life, agriculture cannot fulfill dream, like to do agricultural activities, will not get respect from society, many jobs in agricultural activities, agricultural livelihood is respectful as same as white collar job, become educated not to make agriculture as livelihood, if there is no job then think for

agriculture livelihood, agri. activities is dirty and hardwork, family will not encourage for agricultural activities and lastly no interest on agricultural¹⁵ activities.

For each of these items, the respondents rate their degrees of perception starting from 1 to 5 i.e. 1 strongly disagree, 2 disagree, 3 neutral, 4 agree and 5 as strongly agree on Likert Scale measures with the aim to reduce the complexity of this item set by extracting several factors. For analysis difference on perceptions of youth towards agricultural activities study used descriptive statistics, factorization method i.e. Principal Component Analysis (PCA) and Simultaneous Equation Model (SME) with reliability analysis by Cronbach Alpha estimation.

SEM is a statistical analysis method that used to quantify the causal relationship between multiple factors combining other analysis methods such as path analysis and variance analysis. Traditional methods are unable to solve multidimensional causal relationship or to measure latent variable directly. So, to solve these problems, SEM is frequently used to estimate the parameters of the latent variable and it deals with complex independent variables in the prediction model. In SEM, the latent variables can be measured by the estimation of observed variable.

However, due to large number of items, the PCA (Principal Component Analysis) is used to reduce the items into certain factors. The Scree plot and Eigen value to reduce the items that can explain all these items and further reliability checked for consistency and stability of each items.

On this basis, the items are labeled as economic perception, personal perception and social perception. On the basis of factor loadings as latent variable like

¹⁵ Here agricultural activities imply all kinds of activities on food crops, non food crops commercial crops horticulture, dairy farming etc.

fulfill no dream, part of life, like agriculture and many jobs available are considered under economic perception. Similarly, social perception and personal perception are also used to explain the rest of 8 items. Overall objective of this process is to know whether each observed items are significant or not and how the latent variables are associated with each other.

So to begin with the analysis process, initially study checked the pairwise correlation among the 12 items (in Table 5.8). In order to determine variable are sufficiently correlated or not, the pairwise correlation along with Bonferoni adjusted significance levels are estimated. For example agriculture fulfils the need is correlated positively with the item agriculture is part of life ($r = 0.6471$; $P=0.000$), need fulfil & like agriculture are correlated 0.6714 (0.000), part of life and like agriculture are correlated 0.5125 (0.000). These result shows that there is high correlation between certain pairs of variables. Then study extract factors and determine the number of factors.

Table: 5.8. Pairwise Correlation of Items

Fa	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ct	Fullff	Part	Canno	Like	No_rs	Many	Rspct_s	Edu_not	No_job_	AA_dirt	Family_n	No_In
or	ill_n	_of	t_full_	_do	pct_s	_Jobs	ame_wh	_agri_pr	then_agr	y_hard	o_encour	terest
s	eeds	_life	dream	_AA	ociety	_AA	ite_job	ofession	i_think	_work	age_AA	_farm
1	1											
2	0.6471*	1										
3	-0.4567	-0.4128	1									
4	0.6714*	0.5125*	0.4001	1								

	-	-		-								
	0.43	0.33	0.5368	0.44								
5	28	01	*	64	1							
	0.31	0.25	-	0.32	0.256							
6	69*	87*	0.2863	89*	2	1						
	0.28	0.25	-	0.26	0.088	0.130						
7	78*	19*	0.1119	19*	8	2	1					
	-	-		-	-	-						
	0.43	0.36	0.5638	0.38	0.562	0.205						
8	28	22	*	56	9*	4	-0.12	1				
	-	-		-	-	-						
	0.43	0.41	0.6171	0.33	0.542	-						
9	46	51	*	36	4*	0.168	-0.1014	0.4902*	1			
	-	-		-	-	-						
	0.46	0.38	0.5208	0.39	0.506	0.155						
10	98	01	*	2	9*	1	-0.1205	0.5523*	0.4845*	1		
	-	-		-	-	-						
	0.40	0.36	0.5769	0.38	0.561	0.196				0.5584		
11	34	22	*	29	3*	6	-0.1913	0.6100*	0.5167*	*	1	
	-	-		-	-	-						
	0.44	0.39	0.5866	0.37	0.529	0.216				0.5331		
12	11	97	*	66	0*	5	-0.2156	0.5531*	0.5621*	*	0.5298*	1

*5 and 1 percent significant level

Response on perception regarding 12 items are viz. 1. Agricultural activities can fulfil needs, 2. agriculture is part of life, 3. cannot fulfil dream, 4. like to do agri. activities, 5. will not get respect from society, 6. many jobs in agri. activities, 7. agri. livelihood is respectful as same as white collar job, 8. become educated not to make agri. livelihood, 9. if there is no job then think for agri. livelihood, 10. agri. activities is dirty and hardwork, 11. family will not encourage for agri. Activities, 12. no Interest on farming/agri. Activities.

For this, study has chosen the method of factor extractions in which maximum factors to be retained so that these factors can be reproduced the data structure. The minimum value of Eigen values to be retained by using 1, which is specified by the Kaiser Criterion. The KMO criterion is to see the minimum requirement criteria for

factor analysis. The result shows KMO (Kaiser-Mayer-Olkin) measure of sampling adequacy value is 0.9178 which is excellent (in 2nd column of Table-5.9). Likewise the variable specific MSA values in the result are above 0.50.

Table: 5.9. KMO and PCA

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		PCA			Reliability Analysis
Items	KMO/Sampling Adequacy	Eigen Value	Proportion	Cumulative	Alpha
1	0.8646	5.56455	0.4637	0.4637	0.8731
2	0.9037	1.3332	0.1111	0.5748	0.8785
3	0.9306	0.8974	0.0748	0.6496	0.8722
4	0.8863	0.78706	0.0656	0.7152	0.8772
5	0.9326	0.62542	0.0521	0.7673	0.8744
6	0.9089	0.51651	0.043	0.8103	0.8911
7	0.8251	0.46373	0.0386	0.849	0.8968
8	0.9382	0.43139	0.0359	0.8849	0.8746
9	0.9212	0.40673	0.0339	0.9188	0.8754
10	0.9473	0.36634	0.0305	0.9494	0.8755
11	0.929	0.33083	0.0276	0.9769	0.8736
12	0.9427	0.27684	0.0231	1	0.873
Overall	0.9178				0.8872

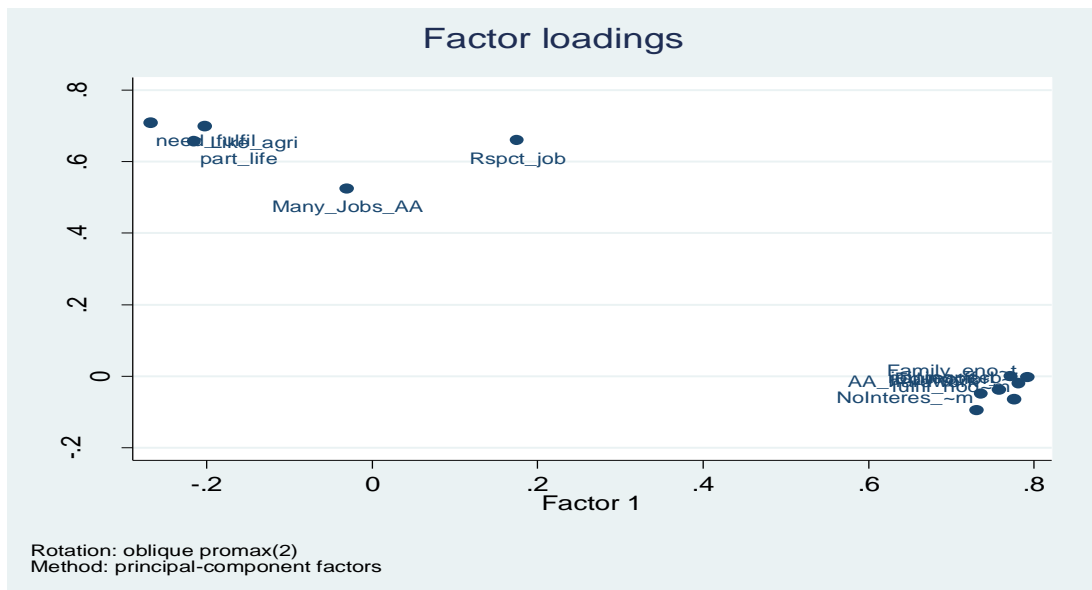
The factor extraction result shows that the number of factors to be retained equals to 2. The result indicates from Eigen values for each items. At first item Eigen value is 5.56455 which extracts a large amount of variance accounts for 5.56455/12 is equals to 0.4637 i.e. 46.37 percent variance and 2nd item with an Eigen value of 1.33 which extracts 11.11 percent variance. From 3rd items Eigen values are less than one.

Hence, using the Kaiser Criterion (Eigen Value >1), the study settled on two factors. However factors 3 contributing only 7.48 percent and 4th factor contributes 6.56 percent making a cumulative percentage of 71.52 percent which is a good indicator.

Items	Factor 1	Factor 2	Uniqueness
1	-0.7392	0.4268	0.2714
2	-0.6538	0.407	0.4069
3	0.7765	0.2105	0.3527
4	-0.6714	0.4421	0.3538
5	0.7412	0.2236	0.4006
6	-0.3886	0.3716	0.7109
7	-0.2879	0.5386	0.627
8	0.749	0.2613	0.3707
9	0.7282	0.2561	0.4041
10	0.7278	0.2087	0.4268
11	0.7507	0.2455	0.3761
12	0.7544	0.1727	0.4011

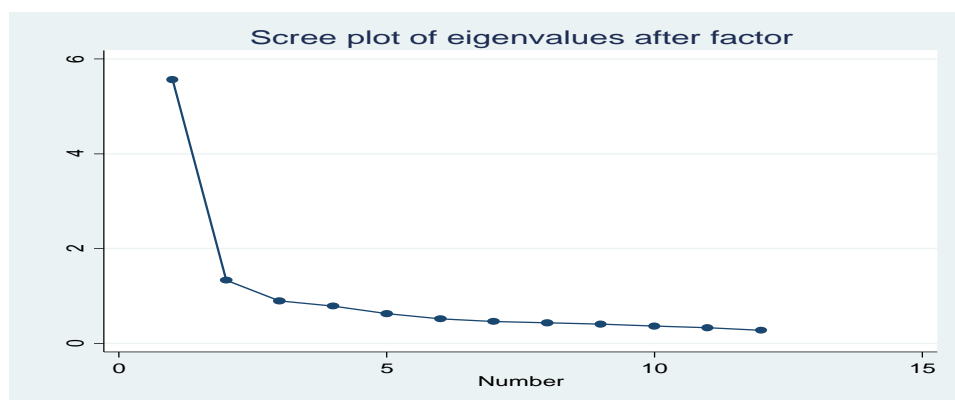
Then, the Table (5.10) labeled factor loadings (pattern matrix) and unique variance along with uniqueness. The uniqueness indicates the amount of variance for each variables that the factor can't produce since all values (except 2: many job AA and respect like other jobs) are below 0.5. Hence the communalities are above 0.5 (1-uniqueness) which is the threshold.

Fig. 5.5.: Factor Loading



In addition to factors extraction through Kaiser Criterion, Scree Plot is used to determine the number of factors. There is an elbow (in Fig.5.6), in which the criteria suggests one factor less than indicates the factor to be extracted, and this indicates 2 factors is justifiable.

Fig: 5.6. Scree Plot of Eigen Values after Factorization



Then from Table 5.11 study observed that AIC has the smallest value for the 3 factor model, whereas BIC's minimum value occurs for two factor solution i.e. 182.447. However, AIC is known to over specify the number of factors, this result

gives confidence that the two factor solution as indicated by BIC is appropriate since there is no Heywood cases (negative estimates of variance or correlation estimates greater than one in absolute value). The two factor model would be appropriate.

Table: 5.11.Factor Analysis with Different Numbers of Factors (Max. Likelihood)					
Factors	LogLik	df_m	df_r	AIC	BIC
Fullfill_needs	-108.847	12	54	241.6938	284.3757
Part_of_life	-27.32	23	43	100.6401	182.4471
Cannot_full_dream	-16.3646	33	33	98.72925	216.1046
Like_do_AA	-10.3996	42	24	104.7991	254.1859
No Heywood Cases Encountered					

To interpret the factor solution, study interprets by rotating the factors. The cumulative proportion of factor loading shows that these three factors jointly capture 100 percent of the variance. To interpret the factors, study first assigned each variable to a certain factor based on its maximum absolute factor loading. As per the result, need fulfill, part of life and like agriculture load highly on the second factor. Education is not to make agriculture as a profession, joining if no other opportunity, agriculture is hard work, family will not encourage, no interest on farming and no respect from society loads highly on the first factor where as there are many jobs in agricultural sector, agriculture occupation is respectful is same as white collar job also loads high in the 2nd factor. The most important thing is that the communalities do not change. The reliability test shows that the scale exhibits a high degree of interval consistency (0.887).

As per the SEM result shown in Table-5.12, the SEM assumes fulfils need, can't fulfill dream and if no job then thinking for this sector are constrained to be 1. The coefficients are all significant at 1% level.

Table No. 5.12: Relation between Latent Variables and Items

Sl. No	Items	Latent Variables	Coefficient	Z-Value	P-Value
1	Agri. Activities can fullfill my needs	Economic Perception	1	41.27	0.000
2	Agri. Is part of my daily life		0.88***	12.56	0.000
3	I like to do agricultural activities		0.9***	13.14	0.000
4	There are many jobs or livelihood in agriculture and allied sector for you		0.4***	5.83	0.000
5	Agri. Activities cannot fullfill my dreams	Personal Perception	1	88.35	0.000
6	I will not get respect from society, if I derive my livelihood from agri. & allied activities		0.98***	11.84	0.000
7	Agricultural occupation is respectful as same as white collar job		-0.27***	-3.2	0.000
8	I am studying or become educated not to make agriculture as a profession		0.91***	12.44	0.000
9	If I will not get any job then only I will think for this sector	Social Perception	1	81.27	0.000
10	Agri. Activities is dirty and hard work as compare to other		0.88***	10.85	0.000
11	My family will not encourage me to do agricultural activities		1.003***	11.67	0.000
12	Personally, I don't have interest on farming		1.005***	11.59	0.000

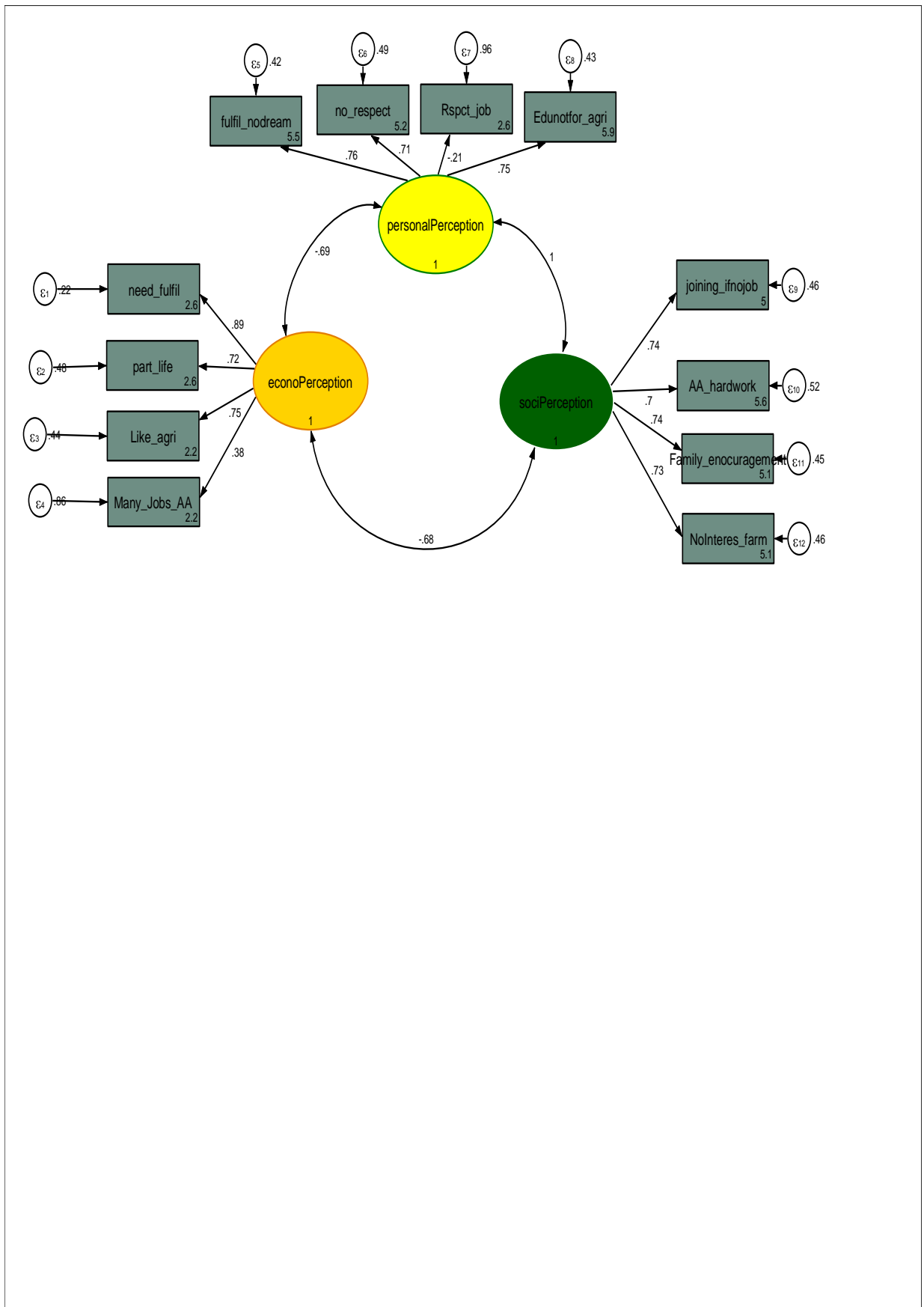
Accordingly, need fulfill, part of life, like agriculture and many jobs available explain by the latent variable of economic perception. Economic perception as a latent variable explains 0.89 unit and the unexplained error term ($1 - r^2$) is 0.22. These values of each item are positive and significant showing that higher economic perception among the youth explains that there is larger need fulfillment. It means the youths treat agriculture as the most needful activities only if it is economically beneficial. All these four observed variables are positively explained by economic perception. Thus the result indicates that economic perception explains each item significantly.

On the other hand personal perception explains fulfils no dream, no respect, respectful job and education not for agriculture. Personal perception explains 0.75 (standardized coefficient) and the unexplained error is 0.44. Youths have personal perception that it fulfill no dream, there is no respect, education not for agriculture. However, personal perception explains weakly the respectful job (-0.22).

Similarly, social perception explains joining agriculture if no other jobs, hard work, no family encouragement, no interest in farming. These four items determine the social perception as per the result shown in (Fig. 5.7).

In nutshell, it implies if the economic perception is very much positive then personal perception is strongly against agriculture because of lack of social prestige. This shows that youths are largely attracted to other types of work (other than agriculture) which have more prestige, more status and ultimately more weight in the society. In a democratic country, the educated youths are very much interested for both money and prestige/status which are lacking in agriculture.

Fig. 5.7: Path Diagram of the Structural Equation Modelling



In this Figure 5.7, latent variables are in circle, observed variables are in rectangle the arrow marks shows that the latent variable explains the observed variable. The number along the arrow mark is correlation i.e. 0.89 (economic perception explains need fulfill 0.89 units). The ϵ_1 to ϵ_2 are error term computed by $(1-r^2)$. The curved arrow among the latent variable shows the covariance i.e. negative between economic perception & personal perception; between economic & social perception).

The associations between structural variables are also significant shown in (Table-5.13). As coefficient shows that economic perception has negative relation between personal perception and social perception, which meant that economic perception can overcome personal and social perception if economic factors are stronger. On other hand, personal and social perception coefficient indicates positive relation between two.

Table No. 5.13: Covariance between the Latent Variables

Covariance		Coeff.	Z-Value	P-Value
Economic Perception	Personal Perception	-0.279	-7.51	0
	Social Perception	-0.27	-7	0
Personal Perception	Social Perception	0.361	8.23	0
LR test of model vs. saturated: $\chi^2(51) = 73.07, \text{Prob} > \chi^2 = 0.0230$				

(1) [Fulfils_Need]EconPerception = 1

(2) [fulfil_No_Dream]PersonalPerception = 1

(3) [Joining_If_No_Other_Job]SocioPerception = 1

Despite all these, the model is not a good fit as indicates by LR test (<0.05) and other test as shown in Table-5.14. Hence, to get model fit slight adjustment done and study modify the elements to get good fit model.

Table No. 5.14: Good Fit Test of SEM Model (Pre & Post Modification)

Fit Statistics	Value Prior to modification	After 1st Modification*	2nd Modification@
LR Test	0.1132	0.0515	0.1022
RMSEA (Root mean sq. error of approximation)	0.041	0.37	0.032
CFI (Comparative fit index)	0.983	0.987	0.990
TLI(Tucker Lewis Index)	0.978	0.983	0.987
CD (coefficient of Determination)	0.973	0.974	0.974

*on the basis of highest MI between e. fulfil no dream & e. joining if no other job (5.831)

@on the basis of highest MI between e.likes agri and e.fulfil no dream (5.419)

Therefore, model modified on the basis of modification index which suggested having a correlation between the error terms of fulfils no dream and joining if no other job. However this improved the model but still LR test is just 0.05 as shown in the 2nd column of Table-5.14.

So the last modification model suggested to have a covariance between likes agriculture and fulfils no dream. The fit statistics presented in the 3rd column (of Table 5.14) shows that LR value is $0.1022 > 0.05$, RMSEA is 0.32 (>0.05), CFI is 0.990 and coefficient of determination is 0.974 on this basis the path diagram of the best fit model shown in (Fig-5.8).

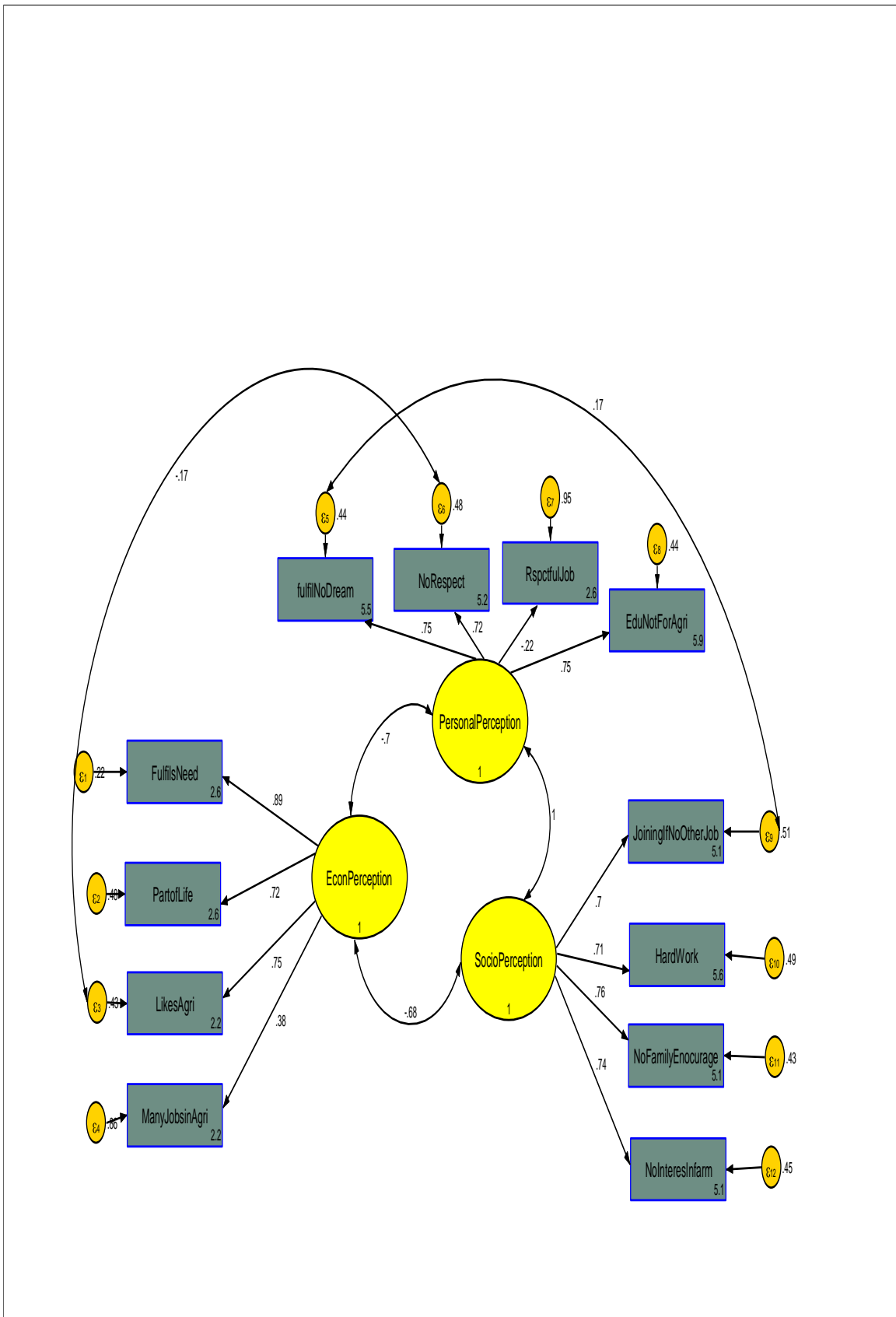


Fig. 5.8. Post Modification Path Diagram

Table-5.15, presents all the coefficients of the observed variable which are highly significant. That means all the latent variables explain these observed variable significantly.

Table 5.15: Relation between Latent Variables and Items (Post Modification)

Sl. No.	Items	Latent Variables	Coefficient	Z-Value	P-Value
1	Agri. Activities can fullfill my needs	Economic Perception	1	41.27	0.000
2	Agri. Is part of my daily life		0.88***	12.55	0.000
3	I like to do agricultural activities		0.91***	13.16	0.000
4	There are many jobs or livelihood in agriculture and allied sector for you		0.40***	5.84	0.000
5	Agri. Activities cannot fullfill my dreams	Personal Perception	1	88.36	0.000
6	I will not get respect from society, if I derive my livelihood from agri. & allied		1.01***	11.55	0.000

	activities				
7	Agricultural occupation is respectful as same as white collar job		-0.29***	-3.26	0.000
8	I am studying or become educated not to make agriculture as a profession		0.92***	11.95	0.000
9	If I will not get any job then only I will think for this sector		1	81.28	0.000
10	Agri. Activities is dirty and hard work as compare to other		0.95***	10.50	0.000
11	My family will not encourage me to do agricultural activities		1.07***	11.10	0.000
12	Personally, I don't have interest on farming	Social Perception	1.07***	11.07	0.000

As per SEM result, the most important part is to see the association among all these three latent variables. There is a negative association between economic & personal perception, economic & social perception. But there is positive association between social and personal perception (shown in Table-5.16). It infer that, if economic perception increase than social and personal perception decline, which means, if importance of economic factors increases then importance of social and personal factors put aside or its influencing power reduce. And in other hand, personal and social has positive relation means if personal factors increase then social factors also increase.

Table No.5.16: Latent Factors Correlation and Significance Level

Factors	Factors	Z-Value	Significance level
Economic	Personal	-7.5	***
Economic	Social	-7.2	***
Personal	Social	8.23	***

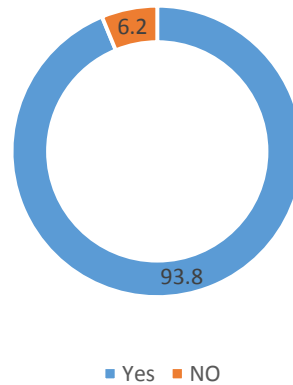
In short, economic factors more influenced the perception than other factors. As the analysis infers that economic perception has negative relation with social and personal perception and in other hand social and personal perception has positive relation. Hence, youth preference of agricultural livelihood determine by economic, social and personal perception. Among these perceptions, economic perception has negative relation between social and personal perception which means even if socially and personally agricultural livelihood is not preferred but economic opportunities/prospect is more on agricultural activities then youths would ready to

join. Similarly, even if economic opportunity or prospect is low youths would choose to be in agricultural activities if social and personal perception is high. Altogether, it infers that economic, social and personal perception has different degrees of influence on choice of agricultural activities as a livelihood by youth. Power of different perception to choose livelihood depend on one individual's priorities or values (may be economic, social and personal) attach to the livelihood.

5.14. Importance of Agriculture Sustainability

As study observed in above, that youths don't possess positive perception towards agriculture and hardly 5 percent of total respondent enthusiast to opt farming as livelihood. So there is question of sustainability of agriculture and allied activities or farming. Sustainability is notion which reiterates that things which are exist in present should be pass to next generation too. However, as noted above, youths are not profoundly interested to take up agricultural activities as a livelihood, but postulated that it matters if it disappears. In response to query about 'whether disappearance of agriculture matters to their life or not', 93.8 percent youth says 'Yes' it matters to them and only 6.2 percent say 'No'.

Fig. 5.9. Agriculture Disappearance Matters to Youth (in %)



There are many reasons behind the respond of youths. Those who have say ‘Yes’ that disappearance of agriculture matter to them because nobody survive due to starvation, nation economically degrade, problems to future generation, village livelihood will destroy etc. On other hand, those who responded ‘No’ have argued that have own agri. land and will do farming and another amazing reasons postulated by youths is ‘scientist will find alternative ways of survival’.

For to understand the perception of youth on agricultural and allied activities, 259 youths have been surveyed out of which 56.4 percent boys and 43.6 percent girls. Out of all, 62.6 percent preferred to be in govt. job and only 3.9 percent preferred to do farming. As it is observed by the study that 87.3 percent parents are not encouraged or do not support their children to be in agricultural activities; 68 percent youths responded that farming as a livelihood lack social prestige and 87 percent of youths responded that educational degree or education is barrier to enter into farming. In nutshell, youths preferred livelihood from which they derive respect, regular/permanent income, access all required facilities. Hence, as a determining factors of youths which encourage or discourage youths to be part of agriculture is

broadly understood as simply interested and interested on compulsion, nature of work, income or earning opportunity, qualification, skills and ability, future expectation, parental expectation and social mindset. Instead of having negative perception towards agriculture, youths have fear that 'how to retain life if agriculture disappear'. This makes the sense that youths recognize the importance of agriculture and allied activities for their life, society, nation and world as a whole. Hence study would like to summarize this chapter with positive connotation that, the need is to make them more aware about the agricultural and allied activities theoretically and practically and convince them that this sector also have potential to fulfill the purpose of life.

Chapter 6

EFFICIENCY LEVEL OF YOUTHS AGRIPRENEUR

6.1. Background

From earlier chapters study have observed many issues of farmers and perspective of youths towards agriculture and allied activities. As there are many obstacles faced by farmers which lessen the farming and the present youth has blurred view about the prospect of agriculture and allied activities raise the question of whether youth can be savior for agriculture and its crisis? Become pertinent, even if, youth step up to make livelihood in agriculture and allied activities. In this context, whether youths are efficient enough to support agricultural concern or not by securing sustainable livelihood in this activities led study to understand the efficiency of youths (minimal in number at present) who are actively engaged in farming activities.

Out of many sub sectors of agriculture and allied activities, the present study has considered vegetables and dairy are such sub-sectors where youth are mainly involved. Dairy has daily return feature by selling its product and additionally it supports other farming activity by providing manure. So in connection to that vegetable production is another activities which also has instant return feature.

Hence, for economic stability youths preferred vegetables and dairy farming, as it is practiced by farmers in the study area. So, this study purposively selected dairy and vegetable sub-sector to measures the efficiency of youth agripreneur. A key factor for this study is to examine efficiency of agripreneur and factor resolution for improvement of inefficient agripreneur. This efficiency aspect will shed light on policy to attract youths in agriculture.

6.2. Genesis of Efficiency

In general sense, efficiency means to be well-organized. It is essential to know about the efficiency of any production process. Even for economic planning, it is key to know how far an existing industry/firm/farm production unit can be expected to increase its output by simply increasing its efficiency, without absorbing further resources. In other words, efficiency means, efficiency of unit to produce as much as possible an output from a given set of inputs. In other words how much less input can be used to produce a given level of output.

Historically, there were many efforts to give reliable measurement techniques for efficiency measurement. For a long time average productivity of labour was used as an adequate technique to measure efficiency but it ignores all inputs save labours. For some time efficiency is measured in form of indices in which weighted average of inputs is compared with output.

Considering all previous measurement process or mechanism Debreu (1951) and Koopmans (1951) gave some shape and refined the efficiency measurement process and offer an idea of technical efficiency. Following its idea of Farrell (1957) more refined it and named as Frontier Approach, which is a comparative measure of efficiency between the obtainable output and the possible maximum output on the production frontier. The possible maximum output of each economic unit is the value estimated from the frontier function. Therefore, if the obtainable output of each economic unit is below the possible maximum output, it means that the production process of an economic unit is inefficient. It leads to two different notions of technical efficiency that emerged to measure the efficiency of decision making units.

For the measurement of efficiency mostly two form of estimation are used i.e. non-parametric and parametric. Parametric methods are used when population is normal and mainly stochastic frontier model one of its kind. Non-parametric models or methods are also known for distribution free methods. In which, there is no any assumptions of normality for population to study. Data Envelopment Analysis (DEA) is one of the examples for non-parametric methods. Deterministic and stochastic are two forms of models under parametric models. The deterministic models assume that any deviation from the frontier is due to inefficiency, while the stochastic approach allows for random error. The deterministic models can be estimated using both Correlated form of Ordinary Least Squares (COLS) & Maximum Likelihood Estimation (MLE) methods.

Efficiency measurement, as mentioned above, in process of time after Farrell (1957), improved by various scholars considering many assumption. As such, Aigner, Lovell & Schimdt (1977) added stochastic frontier approach to measure farm level technical, allocative & economic efficiency using MLE. The disturbance term as the sum of symmetric normal & negative half normal variables is defined to provide on appropriate specification of disturbance term. Two types of error like one is random variation has to face by firm it categorize the abilities of firm to utilize optimum technological source of error which is one sided ($\varepsilon_i \leq 0$), symmetric error. The positive error components represent the symmetric disturbances, which are assumed to be independently & identically distributed. The non-positive error component is assumed to be distributed independently of the positive error component & to be less than or equal to zero (Aigner et al.1977).

Meeusen & Broeck (1977) similar to Aigner, Lovell & Schmidt (1977) infer that the value of production from the frontier results not only from human errors, but some occur from inefficiency which is randomness in the real sense due to specification and measurement errors. A Stochastic Frontier Approach technique allows for measurement of efficiency by decomposition of the error components to normally and non-normally distributed random error components unlike OLS regression analysis (Aigner et al. and Meeusen & Broeck, 1977). As per them, model of SFA can be written as:

$$Y_i = F(X_i, \beta) e^{\varepsilon_i} \quad i = 1, 2, \dots, N \quad \dots \dots \dots (1)$$

Where, Y_i is the output for i^{th} firm, X_i is a vector of K inputs (β is a vector of K unknown parameters), ε_i is the error term. The error term is composed as follows;

$$\varepsilon_i = V_i + U_i \quad \dots \dots \dots i = 1, 2, \dots, N$$

Debreu-Farrell technical efficiency seeks maximum equi-proportionate increase in all outputs or equi-proportionate reduction in all inputs. Initially, Farrell's measure was in the linear programming formulation which gave rise to the DEA models: the CCR (Charnes, Cooper & Rhodes) developed by Charnes et al. (1978) with more precision and suggested a way of dealing with efficiency in practice to constant return to scale. They defined efficiency & justified the necessity for a relative measure rather than absolute measure of efficiency. Further, the DEA model is extended to variable return to scale by Banker et al. (1984) which is termed as the BCC (Banker, Charnes & Cooper) model.

The DEA model is a non-parametric mathematical programming technique for the construction of production frontier based on the notion of input oriented technical

efficiency developed by Charnes et al. (1978), which defines a non-parametric frontier & measures the efficiency of each unit relative to the frontier. It assumes constant return to scales (CRS) can be either input or output oriented. In the input orientation the efficiency scores relates to the largest feasible proportional reduction in inputs for fixed outputs orientation it corresponds to the largest feasible proportional expansion in output for fixed inputs.

An improvement arranged in Charnes, Cooper & Rhodes (1978) model from CRS to Variable Returns to Scale (VRS) by Banker, Charnes & Cooper (BCC) (1984). In which technical efficiency from the output oriented VRS DEA of each firm unit is always higher than or equal to that in the input oriented CRS DEA as the VRS DEA is more flexible than the CRS DEA.

Classical CCR & BCC DEA model follow a general concept in which they allow each DMU to evaluate its (in) efficiency in the most favorable way and then propose input reduction and/or output rise by following its best practice units. DEA models derive inputs and output weights by means of an optimizing calculation. Based on that, units can be classified into efficient and inefficient. In inefficient units, they tell us target values of inputs and outputs which would lead to efficiency. The advantage of DEA models is that it suggests how the unit can mend its behavior to reach efficiency. The main aim of DEA analysis is not only to determine the efficiency rate of the units reviewed, but in particular to find target values of inputs & outputs for an inefficient unit. After reaching these values, the unit would arrive at the threshold of efficiency. It tells us how well unit performs within a given based on chosen criteria (Vincova, 2005).

Efficiency measurement allows us to know the levels of efficiency of a particular unit and the factors which may affect the same. So, if the efficiency are low, production units can correct the situation with appropriate measures. Therefore, efficient utilization of scarce resources allows the firm to maximize the production and profits and minimize the costs. On this basis, efficiency of youth agripreneur of Sikkim is analyzed.

6.3. Socio-Economic Profile of Youth Agripreneur

Youth agripreneur, age upto 35 years, who are deriving their livelihood from agriculture and allied activities, are considered for study. As youth hardly interested to step up in this livelihood, instead some (minimal in number) have started farming livelihood, among them 30 youth agripreneur are taken for study. Out of sample youth agripreneur 76.6 percent are male and 23.3 percent are female. Female are mainly engage in vegetable farming.

Average age of youth agripreneur is 30.06 years, in which 50 percent are in between 31 to 35 years, 43.3 percent are in between 26 to 30 years and 6.7 percent are under 25 years and below. Prior to farming, some of the youths had worked in other sector for some years after completing education. Considering educational level 36.7 percent have done graduation, 33.3 percent in between 10 to 12 standard pass, 23.3 percent below 10 and 6.7 percent started agripreneur journey after post-graduation. Among youth agripreneur, below 10 percent has background of agricultural degree.

Table 6.1: Socio-Economic Details of Youth Agripreneur

Category	Frequency	Percentage	Mean	SD
GENDER				
Male	23	76.7		
Female	7	23.3		
AGE (in Years)				
Below 25	2	6.7	30.06	2.77
26 to 30	13	43.3		
31 to 35	15	50		
Educational Level				
10 & Below	7	23.3	12.9	2.29
Btw 10 to 12	10	33.3		
Graduation	11	36.7		
PG & Above	2	6.7		
Farming Experience (in years)				
3 & Below	6	20	6.36	3.67
4 to 7	15	50		
8 to 12	6	20		
12 & Above	3	10		
Income from Farming/Month				
50k & Below	16	53.4	57997.33	37371.07
51k to 80 k	6	20		
81 k to 1 lac	5	16.6		
1 lac to 1.5 lac	3	10		

Source: Field Survey, 2018

In terms of farming experiences 60 percent of agripreneurs are from subsistence agricultural farming family and remaining 40 percent's from other than farming background. Instead, their own journey in farming as an agripreneur varies in years, 10 percent have begun their journey more than 12 years ago, 20 percent initiated from 8 to 12 years back, 50 percent began since 4 to 7 years back and 20 percent has recently started 3 years or below. Total average earning generated from farming per month varies from Rs. 19,200 to Rs. 1,50,000 and on average Rs. 57,997.3. In which, 53.4 percent earn Rs. 50,000 and below, 20 percent earn between 51 k to 80 k, 16.6 percent earn 81 k to 1 lac and 10 percent earn 1 lac to 1.5 lac.

6.4. Technical Efficiency Measurement of Dairy Agripreneur

The measurement of efficiency in production units and the identification of sources of their inefficiency is a precondition to improve the performance of any production unit in a competitive environment (Vincova, 2005). 15 youth agripreneurs (decision making unit) have taken from dairy farming to measure their efficiency and inefficiency level in production process.

Dairy is one of the major sub-sectors of agriculture & allied activities where youths are engaged. Basic statistics says that average monthly value of output from dairy by youth agripreneur is Rs. 1,17,133 considering Maximum as Rs. 4,30,000 to Minimum as Rs. 28,800 per month. Input contains for the analyses are labour, medicine, feed, fixed cost (include cattle), rent. Cost incurred (variable cost excluding fixed cost) for inputs minimum to maximum vary from Rs. 400 (for medicine) to Rs.200000 (for feed) per month respectively. The dairy output consists of Milk, Curd, Ghee, *Churpi* (used in chutney), Paneer etc. The labour input consists of family labour (male & female) and hired labour. Medicine based on different diseases and periodic basis calcium syrup. For feed include green and dry fodder, oil cake, rice bran etc. In fixed cost contain shed construction cost, initial cattle purchase.

Table 6.2: Statistics on Input and Output of Dairy Agripreneur (in Rs.)

	Labour	Medicine	Feed	Fixed Cost	Rent	Output Value
Max	120000	8000	200000	1000000	10000	430000
Min	3500	400	12000	35000	1200	28800
Average	16966.67	2393.333	49400	234333.3	2893.333	117133.3
SD	28521.03	2035.507	51185.68	261482.1	2046.287	112632

Source: Field Survey, 2018

Correlation Table (6.3) suggests that many factors have positive correlation with each other as like, medicine is 86 percent correlated with labour because more use of medicine in modern dairy farming needs more labour, as it has linked with feed. Feed and labour also has 91 percent positive correlation which could be the reason that in Sikkim feed are all imported from Silliguri (nearby largest commercial hub in West Bengal State) which is inorganic and has prone to many illness which required more medicine for precaution of animal health. Similarly others also have positive correlation.

Table 6.3: Input Correlation of Dairy Agripreneur

	Labour	Medicine	Feed	Fixed Cost	Rent	Output Value (VO)
Lab	1					
Medicine	0.861367	1				
Feed	0.912854	0.948816	1			
FC	0.879889	0.899008	0.852696	1		
Rent	0.90966	0.733202	0.790805	0.696041	1	
VO	0.884652	0.963699	0.995636	0.865471	0.745691	1

6.4.1. Final MLE Estimates of Dairy Agripreneur: SFA Method

On the basis of the SF model of Aigner et al. (1977) the empirical SF model of Cobb-Douglas form along with composite error term is specified for dairy agripreneur in equation (1)

$$\ln y_i = \ln \beta_0 + \beta_1 \ln lab + \beta_2 \ln medicine + \beta_3 \ln feed + \beta_4 \ln rent + \vartheta_i + \mu_i$$

----- (1)

According to Stevenson (1980) the inefficiency component μ_i has a truncated normal distribution to have non-zero mode. This follows $\mu_i \sim N(0, \sigma_\mu^2)$ and $v_i \sim N(0, \sigma_v^2)$. The inefficiency factors are assumed to be linear to the mean and the inefficiency equation (2)

$$\mu_i = \delta_0 + \delta_1 age_i + \delta_2 education_i + \delta_3 experience_i \dots\dots\dots (2)$$

As per equation no. 1 and 2, SFA estimation infer that, as far as the parameters are concerned except rent all other inputs have significant impact on the output and labour and rent have negative impact on the output as shown in Table 6.4.

Table 6.4: MLE of the Parameters of Dairy Agripreneur

Parameter	Coefficient	t-ratio
β_0	1.5	7.307 ^{***}
β_1 (Labour)	- 0.0955	- 2.912 ^{**}
β_2 (Medicine)	0.133	5.597 ^{***}
β_3 (Feed)	0.878	24.709 ^{***}
β_4 (Rent)	- 0.095	- 1.483
δ_0	0.252	1.459
δ_1 (age)	- 0.00533	- 0.905
δ_2 (education)	- 0.414	- 6.60 ^{***}
δ_3 (experience)	- 0.0214	- 4.96 ^{***}
σ^2	0.105	2.99 ^{***}
γ	0.984	
σ_μ^2	0.10332	
σ_v^2	0.00168	
LR test one sided error	19.51	

Higher amount of labour indicates underutilization and thereby have a negative impact on the output. On the other hand, medicine, feed which are important for dairy, have positive and significant impact on the level of output. The result suggests that the producing units are using more labour in proportion to other inputs. The result therefore shows a negative and significant impact on dairy production.

Further the LR test supports the justification for the use of SF function against the simple production function. The null hypothesis that the one sided inefficiency term follows a mixed Chi-Square distribution is accepted at 5 percent level of significance. The gamma value (γ) suggests that 98 percent of variation of the total variance is due to technical inefficiency. In the inefficiency component δ_2 & δ_3 are statistically significant and have negatively significant on inefficiency i.e. 1 percent increase in δ_2 (educational level) reduces inefficiency by 41 percent and 1 percent increase in δ_3 (experience) reduces inefficiency by 3 percent (in round figure). The economic implication is that educational level of the farmer (producer) is acting as a significant shifting parameter for production of dairy output. Similarly experience of the farmer is an important and significant factor reducing inefficiency.

6.4.2. CCR & BCC Efficiency Score of Dairy Agripreneur

Further non parametric (DEA) analysis has been done in order to know the details of surplus inputs (Slacks) and the efficient producing units that can act as a peer for the less efficient unit. In Table 6.5, from right to left in each row has value of CCR, BCC scores, return to scale types, reference set for inefficient DMU are given and in last projection of differences in input are plotted in each respective DMU. For every inefficient DMU, the required amounts of changes in inputs of DMUs are determined, so by changing their inputs, these inefficient DMUs move towards efficiency frontier. In same line, projection on differences of inputs combination also estimated for inefficient DMUs to step up for efficient level.

The input oriented CCR & BCC model have been used to compute the efficiency score (θ) and ranking of the DMU (decision making units) the peers, input projections and slacks variable. The mean θ_{CCR} is 0.96 which suggests that, on an

average the farmers have opportunity to improve their efficiency by 4 percent, so that they can reach on the frontier. Out of 15 DMU 7 are fully efficiency and 8 are relatively less efficient and lying above the input isoquant frontier. As far as the reference set is concerned DMU 2 is acting as the highest number or peer for other inefficient DMU. Similarly DMU 14 is seven times and DMU 10 four times acting as peer for others. For example in column (7) of Table 6.5, the reference set for DMU 1 is given i.e. DMU 1 can come to the frontier by adopting a technique which consists of 29.75 % of 2nd DMU, 96.81 % of 10th DMU and 323 % of 14 DMU. On the basis of projection DMU 1 can reduce 62 % of its labour use, 12.28 % of medicine and 12.28 % of feed. Despite this radial contraction, the DMU 1 can still reduce its labour, fixed cost, medicine and feed to still remain on the frontier. As far as the input projections are concerned may inefficient DMUs are projected to reduce large amount of labour cost. This suggests that the DMUs are using excess of labour as family labour is a free source for them. In order to see the scale of operation BCC score is obtained and the mean θ_{BCC} is 0.99. Out of 15 DMU, DMU 1 is operating under diminishing return to scale. This may be due to large size farming which is operating under diminishing return. On the other hand DMU 3, 4, 5, 13 & 15 are operating under IRS showing that they have the potential to expand their output further in order to reach at optimum scale & size. The rest 8 are operating under Constant Return to Scale i.e. optimum scale & size. If we compare CCR & BCC the DMUs who did not change their ranking are 7 in number (2,3,6,7,8,9,10,14). The DMUs who improved their score in BCC are 1,3,5,12 & 15. The DMU who get less ranking in BCC model are 4, 11 & 13.

Table 6.5. CCR & BCC Efficiency Score of Dairy Agripreneur

DMU	θ_{CCR}		θ_{BCC}		RTS	Reference Set	Projection on differences of Inputs					Slack		
	Score	Rank	Score	Rank			Lab	Medicine	Feed	Fixed Cost	Rent	Excess Labour	Excess FC	Excess Rent
1	0.877	14	1	1	DRS	(0.2975) 2 (0.9681) 10 (3.2394) 14	-62.52%	-12.28%	-12.28%	-19.03%	-12.28%	60290.44	67523.09	0
2	1	1	1	1	CRS		0.00%	0.00%	0.00%	0.00%	0.00%	0	0	0
3	0.834	15	1	1	IRS	(0.1919) 2 (0.3262) 14	-46.26%	-16.52%	-16.52%	-18.76%	-70.57%	1784.776	3358.449	1621.65 1
4	0.891	13	0.899	15	IRS	(0.0583) 2 (0.1896) 6 (0.5637) 14	-48.62%	-10.81%	-10.81%	-10.81%	-25.90%	2646.846	0	301.908 7
5	0.987	10	1	1	IRS	(0.0202) 2 (0.1325) 6 (0.3132) 8 (0.0821) 9	-1.27%	-1.27%	-1.27%	-1.27%	-50.30%	0	0	1470.85 7
6	1	1	1	1	CRS									

7	1	1	1	1	CRS									
8	1	1	1	1	CRS									
9	1	1	1	1	CRS									
10	1	1	1	1	CRS									
11	0.974	12	0.976	14	CRS	(0.1777) 2 (0.2642) 9 (0.4515) 10 (0.3753) 14	-4.30%	-2.53%	-2.53%	-2.53%	-2.53%	390.2965	0	0
12	0.995	9	1	1	DRS	(0.00808) 2 (0.0371) 10 (1.2027) 14	-33.28%	-0.42%	-0.42%	-58.43%	-0.42%	2957.086	116024.4	0
13	0.985	11	0.993	13	IRS	(0.0232) 2 (0.3064) 8 (0.5827) 14	-1.45%	-1.45%	-1.45%	-39.71%	-29.58%	0	38258.85	843.877
14	1	1	1	1	CRS									
15	0.996	8	1	1	IRS	(0.00294) 2 (0.0226) 10 (0.5738) 14	-14.23%	-0.31%	-0.31%	-7.57%	-0.31%	487.4403	3267.982	0

6.5. Technical Efficiency Measurement of Vegetable Agripreneur

Vegetable is one of the major sub-sector of agricultural activities where engagements of people are more. Vegetables include Cabbage, Cauliflower, Potato, Tomato, Brinjal etc. As per basic statistics, the average value of output per acre (3-4 months as a cycle of production) from vegetable is Rs. 1,42,800 (maximum as Rs. 2,75,000 to minimum Rs. 30,000). Input contains for the analyses are land (rent), labour, bullock, seed cost, pesticides, manure. Cost incurred for inputs minimum to maximum vary from Rs. 0 (for medicine, homemade organic medicine) to Rs.56000 (for labour) per cycle respectively. Vegetable has its production cycle (between 2 to 6 months), for study purpose 4 month cycle cost is considered. So given cost and revenue is for 4 month cycle crop and land (rent) cost is deduced from per annum cost.

Table 6.6: Basic Statistics of Input and Output of Vegetable Agripreneur

	Land (rent)	Labour	Bullock	Seed Cost	Medicine (pesticides/insecticides etc)	Manure	Output
Max	10000	56000	4800	10000	6500	46000	275000
Min	1500	4500	600	1200	0	2000	30000
Average	3920	28100	1866.667	6320	2873.333	19713.33	142800
SD	3127.768	15361.42	1382.59	3087.221	2117.693	15715.93	88921.09

Source: Field Survey, 2018

Correlation suggests the relation among the factors. This relationship is important to understand because the value of one variable can predict the value of other variable. Land and labour has moderate correlation coefficient (0.58). Bullock and land has high positive correlation coefficient (0.86) it is because, increase in land areas increases the demand for plowing. Seed cost and land has moderate relation

which could be the reason that seed cost will relatively low if farmers purchased in bulk. Pesticides/medicine and land has 0.78 correlation coefficient which suggest that more and more areas of cultivation required more pesticides. Manure and land also has high correlation coefficient and it is obvious that demand of manure depend of area of cultivation. Labour and bullock has more than moderate correlation coefficient (0.73) which indicates that as bullock demand increase demand for labour is also increase. Seed cost and labour has moderate correlation coefficient the reason behind this could be optimum utilization of labour in higher amount of seeds and in fewer amounts of seed there could be disguised unemployment of labour. Medicine and labour also has moderate correlation coefficient i.e. 0.65. Manure and labour has high correlation coefficient (0.90) because high volume manure needs more numbers of labour to deploy.

Table 6.7: Input Correlation of Vegetable Agripreneur

	Land	Labour	Bullock	Seed Cost	Medicine	Manure	Output
Land	1						
Labour	0.58397	1					
Bullock	0.862389	0.733258	1				
Seed Cost	0.521148	0.548835	0.525104	1			
Medicine (pesticides)	0.780516	0.651875	0.742663	0.614969	1		
Manure	0.826225	0.906855	0.882295	0.591768	0.759031	1	
Output	0.789661	0.930036	0.847558	0.562817	0.779866	0.981532	1

Bullock and seed cost has moderate correlation coefficient (0.52) and it is obvious, per day wage for bullock and *Hali* (plow man) is averagely Rs. 700/day whether it will plow for 3 hours a day or 8 hours for more seeds to sow, which could be the reason for same. Similarly, bullock with pesticides and manure has 0.74 & 0.88 correlation coefficient, which indicates more use of bullock means more areas to

cultivate and more areas for cultivation means more pesticides and manure. Seed cost has moderate correlation coefficient with pesticides and manure. In other case pesticides and manure has higher than moderate correlation coefficient (0.77). It is obvious in production process that if we have to increase one unit of any factor farmer need to increase other factors too but degree may differ.

6.5.1. Final MLE Estimates of Vegetable Agripreneur: SFA Model

As stated above, vegetable farming is another sub sector where majority of new generation are attracted. To understand their efficiency level study analysed it on the basis of the SF model of Aigner et al. (1977) the empirical SF model of Cobb-Douglas form along with composite error term is specified for vegetable agripreneur in equation (3)

$$\ln y_i = \ln \beta_0 + \beta_1 \ln \text{land} + \beta_2 \ln \text{labour} + \beta_3 \ln \text{bullock} + \beta_4 \ln \text{seed cost} + \beta_5 \ln \text{medicine} + \beta_6 \ln \text{manure} + \vartheta_i + \mu_i \text{ ----- (3)}$$

According to Stevenson (1980) the inefficiency component μ_i has a truncated normal distribution to have non-zero mode. This follows $\mu_i \sim N(0, \sigma_\mu^2)$ and $v_i \sim N(0, \sigma_v^2)$. The inefficiency factors were assumed to be linear to the mean and the inefficiency equation (4)

$$\mu_i = \delta_0 + \delta_1 \text{age}_i + \delta_2 \text{education}_i + \delta_3 \text{experience}_i \text{ (4) for vegetable agripreneur.}$$

Table 6.8: MLE Parameters of Vegetable Agripreneur

Parameters	Coefficient	t-ratio
β_0	3.245	3.245
β_1 (Land)	0.0813	0.0813
β_2 (Labour)	0.450	4.5
β_3 (Bullock)	0.0389	3.89
β_4 (Seed Cost)	-0.0914	-0.0914
β_5 (Medicine/Pest)	0.0999	0.0999
β_6 (Manure)	0.313	3.13
δ_0	-0.00103	-0.0001
δ_1 (age)	0.009	0.1048
δ_2 (Education)	-0.014	2.79**
δ_3 (Experience)	-0.145	3.48**
sigma-squared	0.019	2.87**
Gamma	0.94	
Log Likelihood Ratio	13.733	

As per Table 6.8, on the basis of equation that, seed cost has negative impact on the output and other have positive impact. Further the LR test supports the justification for the use of SF function against the simple production function. Labour, bullock, manure are significant. Both education and experience have negatively significant on inefficiency. Increase in one year education reduces inefficiency by 1.4

% and increase inefficiency by one year reduces the inefficiency by 15 %. Hence experience is an important factor reducing the inefficiency. The average efficiency score is 0.982. The minimum score is 0.978 and highest score is 0.985. However there is little variation of the efficiency score among the farmers. It may be due to very similar type of techniques adopted by all the farmers. All farmers use same type of input and seeds. The difference in the management only brings difference in efficiency scores. To know better about the excess of inputs used, the extent the inputs to be reduced, DEA model is used.

6.5.2. CCR & BCC Efficiency Score of Vegetable DMUs

Among horticultural crops and vegetable cultivation is more frequent due to its importance in day to day life. 15 youth agripreneurs (decision making unit) who are engaged in vegetable farming are interviewed to measure their efficiency and factors inefficiency level in production process. In Table (6.9) value of CCR, BCC scores, return to scale types and reference set for inefficient DMU, projection differences in input, slack value presented for each respective DMU.

CCR scores shows technical efficiency of DMUs and BCC indicates the pure technical efficiency i.e. management efficiency. As, CCR average efficiency score is 0.92 which denotes that vegetable agripreneur can improve by 8 percent to become fully efficient and on BCC scores average efficiency score is 0.98 which denotes that on full management efficiency youth agripreneur just behind 2 percent. Altogether, as per CCR score 7 DMUs are fully efficient (they are DMUs 2,5,7,8,9,14 &15) out of 15 DMUs and 8 DMUs (i.e. 1,3,4,6,10,11,12 & 13) need some technical support to be overall efficient. On other hand, as per BCC score, 13 DMUs (i.e. 1,2,4,5,6,7,8,9,10,11,13,14 & 15) are fully efficient and just 2 DMUs (i.e. 3 & 12) lack full efficiency by minimal point.

To improve efficiency level of inefficient DMUs (in context of overall technical efficiency i.e. CCR point) the reference set are used. For example DMU 1 can become fully efficiency by taking a convex combination of DMU 2 (0.0356), DMU 5 (0.1415) and DMU 9 (0.3508) to reach the frontier.

Despite proportionate reduction of inputs the firms are still have some excess inputs called slacks. In case of all less efficient DMUs, No. 3, 4, 11, 12 & 13 are maximum number of slack variable comparing CCR and BCC. The scale efficiency suggests that DMU 2, 5, 7, 8, 9, 14 & 15 are most optimum firms in both cases. DMU 1, 3, 10, 11, 12 are under IRS suggests that they have potential to improve their output further either by reallocation of resources better utilization of resources DMU 4, 6 & 13 are under DRS. That means, they have reached their potential capacity and cant expand beyond this stage using the present techniques.

Among the fully efficient DMUs 9 eight times (for 2,3,4,6,10,11,12,13), DMU 2 four times (1,10,11,12) and DMU 15 three times (4,6 & 13). The mean CCR score is 0.92 which is less than the CCR score of being farmers. The input projection shows that the seed cost are the dominant input that is used excessively. The study suggests that the farmers should be provided with subsidized inputs and pesticides so that they can improve on their efficiency level.

Table 6.9: CCR & BCC Efficiency Score of Vegetable Agripreneur

DMU	θ_{CCR}		θ_{BCC}		RTS	Reference Set	Projection on Differences of Inputs						Slack						
	Score	Rank	Score	Rank			Land	Labour	Bullock	Seed Cost	Medicine	Manure	Land	Labour	Bullock	Seed Cost	Pesticides	Manure	
1	0.94	9	1	1	IRS	(0.0356) 2 (0.1415) 5 (0.3508) 9	-58.40%	- 34.52%	-5.03%	- 89.87%	-5.03%	-5.03%	1601.3 15	5160.86 6	0	6787.2 39	0	0	
2	1	1	1	1	CRS		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	0	0	0	0	0	0
3	0.73	15	0.82	15	IRS	(0.0487) 8 (0.5587) 9	-26.50%	- 26.50%	- 43.69%	- 85.52%	-71.80%	-32.75%	0	0	206.25	4722	1132.5	937.5	
4	0.84	11	1	1	DRS	(0.7757) 9 (0.4859) 15	-15.01%	- 15.01%	- 48.40%	- 27.62%	-21.31%	-19.88%	0	0	1602.74 6	1008.4 99	314.8834	1948.137	
5	1	1	1	1	CRS		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	0	0	0	0	0	0
6	0.83	13	1	1	DRS	(0.6386) 9 (0.6516) 15	-18.87%	- 16.59%	- 16.59%	- 27.17%	-18.76%	-19.68%	228.08 06	0	0	1058.2 94	130.3318	1420.616	
7	1	1	1	1	CRS		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	0	0	0	0	0	0
8	1	1	1	1	CRS		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	0	0	0	0	0	0

9	1	1	1	1	CRS		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	0	0	0	0	0
10	0.83	12	1	1	IRS	(0.0123)2 (0.0852) 5 (0.3755) 9	-23.99%	-	-	-	-16.29%	-16.29%	115.54 19	415.132 9	0	6056.7 83	0	0
11	0.95	8	1	1	IRS	(0.0785)2 (0.5347) 9 (0.0908) 14	-4.73%	-4.73%	-	-	-75.31%	-4.73%	0	0	261.831 3	1460.3 02	2470.187	0
12	0.89	10	0.94	14	IRS	(0.1469) 2 (0.5469)9 (0.0246) 14	-10.81%	-	-	-	-76.09%	-10.81%	0	0	405.685 5	5646.0 1	2937.747	0
13	0.79	14	1	1	DRS	(0.9279)9 (0.4029) 15	-20.63%	-	-	-	-29.06%	-22.89%	0	0	995.116	1206.3 49	421.2454	903.5409
14	1	1	1	1	CRS		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	0	0	0	0	0
15	1	1	1	1	CRS		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	0	0	0	0	0

6.6. Mean Difference Test of Dairy and Vegetable Agripreneur

As per the analysis for mean difference test, between CCR value of both dairy and vegetable agripreneur is highly significant. Similarly, mean difference for BCC value also found the highly significant at 0.01 percent.

Table 6.10: Mean Difference Test of Dairy and Vegetable Agripreneur

	Test Value = 0					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Dairy_CCR	69.191	14	.000	.96961	.9396	.9997
Veg_CCR	39.143	14	.000	.92294	.8724	.9735
Dairy_BCC	82.744	14	.000	.98457	.9590	1.0101
Veg_BCC	147.165	14	.000	.99129	.9768	1.0057

6.7. Efficiency Status of Youth Agripreneur

For this study, 30 youth agripreneur (15 Dairy and 15 Vegetable) are considered. BCC scores and CCR scores are used to categories efficiency level. As explained above, BCC scores can only explains the pure technical efficiency of DMU or management efficiency, which means the ability of the DMU in using physical resources for producing maximum possible output. The CCR scores (technical efficiency) are a combination of pure technical efficiency and scale efficiency.

Out of 30 DMUs, 14 DMUs are 100 percent technically efficient. This means remaining 16 DMUs are still lack in 100 percent technical efficiency and hence considered as inefficient. But among 16 inefficient DMUS (in CCR) 11 DMUs (in

BCC) are 100 percent pure technically efficient or management efficient. It means the inefficiency of these 11 DMUs is principally from the range of inputs. Altogether 25 DMUs (in BCC) are 100 percent pure technical efficient and only 5 DMUs are inefficient having score below 1.

Table 6.11: Changes in Efficiency score and RTS

Sl. No.	Status of Efficiency scores and RTS	Dairy No.	Veg. No.	Total
1	No. of DMU total technically efficient (CCR)	7	7	14
2	No. of DMU pure technical efficiency (management efficiency) (BCC)	12	13	25
3	No. of DMU Constant RTS	8	7	15
4	No. of DMU Increasing RTS	5	5	10
5	No. of DMU Decreasing RTS	2	3	5
6	No. of DMU which are 100 % pure technical efficient (BCC) out of technical inefficient (CCR)	5	6	11

This indicates that, present day youths can do better. Instead of lack of agricultural technical knowledge in terms of formal education majority are efficient enough to manage its activities. If they had some technical know-how, in terms of formal education in such background then they would be more efficient.

To conclude, the technical efficiency of 30 youth agripreneur of Sikkim is analysed. As per the estimation 14 DMUs have efficiency of 100 percent. But 25 DMUs are purely technical efficiency (i.e. management efficient). For each inefficient units, reference set and projection for changes are estimated to reach efficiency level. 15 DMUs are in constant return to scale stage which indicates that they are in efficiency level because their outcome incremented in same proportion as per the input proportion. 10 DMUs are in increasing return to scale stage which indicates that

they are in process to reach 100 percent efficiency level and still has space of improvement. 5 DMUs are in stage of decreasing phase, in which these DMUs has to seek to reference set for the improvement of its technical efficiency. Altogether, majority of youth who are involved in agriculture and allied activities are performing in efficient manner to make their livelihood prosperous. As they wants to scale up its activities in this competitive era to sustain in their livelihood in whole life by timely upgrading its knowledge and technology, which is the need of an hour not only to sustain their livelihood but also to feed the growing population.

Chapter 7

ATTRACT AND RETAIN YOUTH IN AGRICULTURE TO SUSTAIN FARMING

7.1. Background

As explained in preceding chapters youths are not having positive perception or in other words lack interest to take up agriculture and allied activities as a livelihood in general. But those who are already into it they are efficient enough to make this livelihood more productive but majority still are in dilemma to opt this livelihood.

In earlier period, on livelihood context, agricultural activities were considered as priority occupation followed by business and industry and then service sector. As in a folktale it is said that '*Uttam Kheti Madhyam Ban Nich Chakari Kukkarma Nidan*' which means agriculture is good, business is medium and service is lowest in value. Even social value of agricultural livelihood was in top most level. Today situation is somewhat reversed with increase in power of market and commercialization and so called modern mentality, agriculture sector becomes less remunerative, risky and highly fluctuate earning source, lacking social recognition led to shift the interest from farm to non-farm.

India presently has the largest youth population (356 million between 10-24 years) in the world even larger than China (269 million). This obviously reflects a bright future for greater percentage of those living in rural areas (around 200 million), if they can be motivated and attracted professionally to agriculture and allied fields.

On the contrary, at present hardly 5 per cent of the rural youth's are getting engaged in agriculture. This is simply because they do not find agriculture a creative, profitable and above all a respectable profession to give better living conditions (MAYA, 2018).

According to the census 2011, every day 2,000 farmers give up farming. The young populations, among the farming communities are hardly interested in agriculture. On the other side, those who have agricultural education or graduate are unwilling to opt agricultural farming, which is called 'great Indian agro brain drain' (Jitendra, 2017). It is well known that GDP share of Indian agriculture is declining, but still more than 50 percent workforce hails from the agriculture sector.

India's economy is growing from 5.6 percent per annum 2012-13 to 7.6 per annum percent 2015-16, still challenges continues to ensure that economic growth translates into better labour market conditions. Majority of workers toil in informal sector jobs, as trends emerge to shift of workforce from agriculture and construction to other sector. The jobs which created in formal sector are actually informal due to lack of employment benefit and social security. On other side, India has the world's largest youth population about 354.4 million aged between 15-29, representing share of 27 percent of the population. To gather the demographic dividend the education and skills are considered a vital to maximize the productive contribution. But, instead of increase in general education levels, the youth unemployment situation continues to be a major challenge (ILO, 2017).

Over the next two decades the agriculture sector in India will undergo significant transformation which will result in both challenges and opportunities for young people, depending on who and where they are. In order to achieve food

security, India must change from extensive production systems to intensive production system. The agriculture sector has the potential to provide numerous employment opportunities in food production, marketing, processing, retail, catering, and research and input sales among others (ARYA, 2014).

The Delhi based Centre for the Study of Developing Societies (CSDS) reported on the basis of survey done in 2014 (State of Indian Farmers) that about 60 percent of farmers are ready to quit farming for a better job in the city and only 18 percent farmers would like to see their children taking agriculture as a livelihood. So in this scenario, there is need of avenues to attract and retain youth in agriculture sector not only for their employment but also for food security.

Similarly in Sikkim, youth unemployment is high. But agricultural opportunities are tremendous to absorb young minds due to organic farming prospect. Even, fallow land is increasing due to decline in numbers of farmers, in general it is a problem but from the side of youths it is an opportunity in disguised to take farming as a livelihood. In this background, this study tries to understand the factors which can attract and retain youths by accumulating expert views and case studies from local level.

7.2. Attract and Retain Youth in Agricultural Activities is Need of an Hour

Father of Indian Green Revolution MS Swaminathan once said that India is a land of youth and that is its greatest asset. Young minds are creative minds and youth are capable of achieving seemingly impossible tasks. Hence, attracting and retaining youth in agriculture assumes great significance with reference to shaping the future of agriculture in our country.

But, the young generation shows interest on it only if farming becomes both economically and intellectually attractive and profitable. The future of food security will depend not only on strengthening ecological foundation but also by attracting the youth to agricultural and allied activities for its sustainability.

There is a need for successful role models or references which attract young people to agriculture and encourage them to stay in this sector. It is essential to create awareness that agriculture is not only equated to farming but also includes many opportunities for entrepreneurship, including production, processing, value addition, branding and marketing. However it is essential to recognize that youth have diverse aspiration and the regional conditions need to be judiciously taken into account while developing any initiative to attract and retain young people into agriculture and allied activities.

So, in this situation we need to develop technology or practice, as per feasibility of the region and innovative ways to sustain agriculture for the youths, who have energy and zeal to do something extra. Because youths are only the alternative factors for continue agriculture to feed the growing population. Hence, need for the day is to, attract and retain youth in agriculture & allied livelihood by creating different socio-economic models in a lucrative manner. With this, on priority basis youth needs to motivate towards agriculture & allied activities and its prospect. But question is how to motivate for the things which lack lucrative opportunity.

7.3. Motivate Youth towards Agricultural Livelihoods

There are many obstacles which are prevalent from early days in agricultural livelihood. As a result youths who are entering into labour market would not see any

option/opportunity and earning option in agriculture and allied activities due to many reasons like lack of agricultural skills, lack of social recognition, lack of entrepreneurial motivation to take up this livelihood, lack of encouragement from family even if family belongs to farming background as like in other profession like medical, business etc. So, to motivate youth towards this sector is not an easy task. Let's understand what theory says about motivation.

To attract and retain youth in agriculture, it is prerequisite to inculcate motivation within them to opt for. Motivation could be positive and negative, positive can encourage for the things and vice versa. As part of general theory of motivation, Abraham Maslow established the theory of motivation in 1943. It is also known as Maslow's theory of human motivation or social needs or Maslow's need hierarchy. According to this theory basic human needs can be structured into a hierarchy of importance with the physical needs of an individual at the bottom and self-actualization at its peak.

The preposition behind this motivation theory about human behavior is human wants are unlimited and as soon as one need satisfied another appear and it is unending process. Another bitter truth theory postulated that only unsatisfied need motivates human behavior. Therefore even if particular need is satisfied, need in general cannot be.

According to this theory basic human needs are categorized in:

- Physiological Needs: As Maslow pointed out, human survives by bread alone- if there is no bread. But if there is plenty of bread desires become unlimited. That's

why he puts this thing in 'belly to brain' proposition, i.e. in each level new need emerge which is called hierarchy of needs.

- Safety Needs: It required to cover protection against threat and deprivation.
- Social Needs: It contain love affection, friendship social groups, as a desire for belongingness and affiliation to gain acceptance.
- Self Esteem Needs: Self-confidence, achievement, knowledge, self-respect for independence and freedom.
- Self-Actualization Needs: It is a feeling of attainment and accomplishment of being satisfied within self. It only comes what man can be, he must be. Even if all these needs satisfied new discontent will soon develop, unless individual is doing what he is fitted for. It refers to the desires for self-fulfillment.

Altogether, physiological needs are the most imperative one but psychologically the need for self-realization is highly important to each individual.

In addition, Hall & Nougaim (1968) advocated that need intensity or say degree of need positively correlated to need satisfaction. It means there are unlimited needs, so need satisfaction will derive as per the degree of needs for particular thing. In nutshell, motivation to do or not depend on need or degree of need, if an individual has, and only option, to continue his family business after some family circumstances then at point of time motivation to opt that will automatically generate, because of degree of need.

An individual like and unlike of work doesn't comes from inherent but by its past experiences. As McGregor (1960) propounded that average human being doesn't inherently dislike work. Depending upon environment of work, infer whether work is source of satisfaction or a source of punishment. If it is source of

satisfaction then it is performed voluntarily, if not then same will be avoided. Even the commitment towards works is consequence of rewards associated with their achievement. The most significant of such rewards is the satisfaction on self-actualization needs.

Similarly, Vroom (1964) suggested that a person's motivation towards the work determined by his or her anticipated value of the entire outcome, both positive and negative, of the action and expected probability that person's goal would be achieved. It means that motivation to choose or attract in some profession depend on prediction of outcome and expectation whether that outcome would achieve the individual's goal or not. In addition, Herzberg (1966) point out that motivation towards work depends on the factors like achievement, recognition, advancement and growth of the work. Personal growth and rewards from livelihood is an internal fuel for motivation to continue the work.

Even on same line McClelland (1961) identified three types of basic motivating needs viz. need for achievement , need for power, and need for affiliation. As per this, motivation towards the work or livelihood directly depends on its nexus to fulfill the need of power, affiliation and achievement. Physical needs will satisfy by sustainable cash flow from agriculture to provide daily family requirement i.e. food, clothing etc. Access of sufficient money will bring safety needs and by availing medical facility, good education and modern needs will feel socially recognized and could established self-esteem. Dedication in agriculture leads to new innovation and farmers could experience self-actualization in their domain. So, by satisfying initial three needs i.e. physical, safety and belongingness will attract the young generation in

agriculture and by satisfying last two needs i.e. self-esteem and self-actualization will retain them in this livelihood.

Considering all these, satisfaction in agriculture seen as a major factor to attract and retain youth. As Maslow's five categories of human need, if satisfy, may attract and retain youth in agriculture. Satisfaction depends on level of motivation to be part of it. By unfolding all these theory on motivation, it surmises that for the sake of motivation towards something is solely depending on need or degree of need. So, ultimate option to motivate youths towards agriculture sector is by engendering need among youth to opt for agriculture and allied livelihood. Need can be understood in two different parameters, in one way, agriculture and allied activities eagerly needed youths for its continuity and another is creation of need or desire among youth to opt for agriculture and allied activities as a livelihood as other sector is lingering in connection of employment opportunities.

In nutshell, urgency seen to start inculcating agricultural education to shows its prospect and prosperity. As a general understanding, until and unless one doesn't get taste of a particular product its demand will not create. Similarly, taste of something or knowledge of something will generate more eagerness to have it. To have motivation to do something depends on how much knowledge or taste one has for the same thing. That's why; to put taste of agriculture in mind of youths, there is dire need to provide knowledge and hands on experience of farming.

7.4. Factors to Attract towards Livelihood

As we know that major chunk of youths who enter into labour market are attracted towards white collar job, just because of more awareness on that in process

of education and in generally. Attraction towards profession determined by many factors like awareness about profession, self interest/hobby, skills, family/societal encouragement/pressure towards professions, peer pressure from friends towards profession etc. Some are listed below

- Awareness and counseling about the profession or activities from different platform.
- Self interest/hobby sometimes generates avenues to attract towards the profession.
- Skills; many a times innate and training/educational degree led to attract the profession
- Family/societal encouragement/pressure towards something, consequently become attractive livelihood source
- Peer pressure from friends towards the profession led attraction.

Many a time, an individual initially attract towards the sector or jump to sector where he/she get opportunity just after enter into the labour market or just after completion of degree.

7.5. Factors to Retain in Livelihoods

Retain here means to continue the livelihood which he/she is performing. There are many factors which resulted to continue the livelihood or discontinue. They are lack of other opportunity, personal growth, expected respect, work environment, ladder to achieve goal, socially accepted or respected, self-realization of satisfaction on livelihood etc.

- Personal growth: if the livelihood is fulfilling the required need and desire.

- Avail expected respect/achievement: the respect which is eternal for the motivation towards work.
- Work environment: if friendly and encouraging environment access then livelihood retain.
- Ladder to achieve goal: if the pursued livelihood can or on process to fulfilled the desired goal.
- Socially accepted or respected: if the livelihood is socially accepted and society encouraged continuing the livelihood with respect then it will retain.
- Self realization/actualization of satisfaction: considering all above factors, if self-realization satisfies with the pursued livelihood then nothing can force to discontinue the livelihood.

In nutshell, anything to pursue continuously needs the self-determine factors to achieve something which is expected. Sometimes, social goals are more overpowered the personal goal for an individual, then in that situation self-actualization are more powerful.

7.6. Case Study from Sikkim to Attract and Retain Youth in Farming

a. Case Study: Social Acceptance Attract Youth towards Farming

Anant Bering Club (ABC) of Lower Bering, one of the village of East District of Sikkim, have taken community initiative to cultivate fallow land in collective manner. Approximately 25 acres of land started cultivating, by 20 households (here HHs means the entire family member covering three generation i.e. grandparents, parents, children etc) collectively. On weekend all the member of family allocate members from the family for the field. They made an executive body to manage the work and

every weekend attendance is maintained for proper execution. Committee appointed two young members from member family as an employee for overall care. On weekend all the member household used to come in field for performing the different kind of work like carrying manure, ploughing, weeding, and sowing. Youth used to perform hard work like carrying manure, ploughing and aged member perform to weeding, sowing etc.

In this manner, all the community members come together and work with full enjoyment and have lunch collectively in the field. This pattern of collaboration of three generations and sometimes four generations in same field boosted the encouragement among youth who formally working in nearby pharmaceutical company and other non-farm sector on casual basis and in weekend they just visit village for this collective farming. Prior to this initiative, these young people left the village and grab the available opportunity in factories. It resulted in conversion of cultivated land into fallow land due to scarcity of manpower for the field. After collective farming initiative, youths start visiting village on weekend just to work in the land with community members.

When visited during survey, I spent three weekend days on their field and participated in their farming practices, really it was amazing experience where people of three generation involved for same work. In process of cultivation, grandparents or parents used to share their past experiences of farming technique of sowing and making bed system with reasons of practicality to new generation. This gives hands on experience to the young generation with knowledge of conventional pattern of farming. This enhanced the motivation on young minds and led the support system to ageing farmers from young energy.



The study has found different level of members from same member households like one Assistant professor of Sikkim Govt. College, Govt. teacher, Engineer, Official workers, casual labour of company, farmers, school and college children etc. who started visiting village on weekend to support community farming.

When I interacted with the youths on that process, they passionately shared the view that if they get such kind of support from the society, then they are ready to leave the factory work and start farming to generate livelihood. Khom Nath Sharma, one of the youth member said ‘this togetherness boosted our motivation which was missing earlier and consequently many of us joined other non-farm sector for a livelihood and now if this kind of community support will continue then we will leave others’ work and make livelihood in farming’.

b. Case Study: Respect, Reward and Earning Retain Youth in Farming

Khem Kumar Bhattraï, 26 year old boy graduated from Industrial Training Institute (ITI) and initially worked in a company for a year, then after he started their parent's livelihood i.e. farming. He is from Kamaray Village of East Sikkim. Since 2016, he started farming in his agricultural land. Initially he started with vegetable farming, as their village is famous for vegetable production near to Rangpo market, border market of Sikkim. So it was his existing opportunity to market his product. In addition he started Bee-farming in unique manner. Due to Bee and its process of pollination helped yield in agriculture and in other side Bee gets flower from crop for honey creation. This innovative combination and new pattern of farming attracted people in his '*Kothay Bari*' farm (kitchen garden type).

This not only attracted people of surrounding but also different agencies like agricultural department, extension agent, ATMA, KVK etc. Steadily departmental exposure trip is hosted in his farm. ATMA recognized him as 'Resource Person' for the region and start organizing periodic training under his guidance. Many a time he was sent to national and international exhibition as a delegates and representative from the organic state of Sikkim. Now, national level team like national ministerial team, team from different state and from foreign national start visiting his place. In this process, he is charging some fees as an entry fees, training fees as farm tourism. Within three to four years of his farming life, he achieved many milestone and even state provide award to him.



Image: Receiving State level Award

Image: Hosting Farm Visit

So altogether, his motivation to continue this farm is boosted due to the recognition or rewards and support which he is fetching from society, govt. department etc. Now, in addition to this he started building small hut in his farm as a promotion of agro-tourism. At last, what he told in process interview for this study that ‘his livelihood through farming is becoming respectful and prosperous’.

7.7. Youths’ Interest in Agricultural Sub Sector

As study observed in above that youths are not interested in farming. So, just to know youth preferences within sub-sectors of agriculture where they want to join if they will not get any aspiring jobs on the basis of listed sub sectors (in Table 7.1). Agro-tourism is mostly preferred sub sector as 25.9 percent youths would like to consider this sub sector as last option for their livelihood. As Sikkim is famous for tourism destination, that could be the reason the term may attracted youths to choice this sub-sector. Similarly, 23.2 percent youths shown interest in agri-business and then, youths shown interest in dairy farm (18.1 percent) and vegetable cultivation (17.4 percent). Due to ban on outside vegetable, at the time of survey, vegetable get good market which leads to seen one of the prosperous sub-sector. As dairy and

vegetable is needful item in daily basis and has instant return of earning. Floriculture is another sub-sector of interested by 11.6 percent of youths. But only 3.9 percent youth are willing to be in staple food cultivation as a sub-sector for their livelihood among all agricultural sub-sectors.

Table 7.1. Youths' Interest on Sub Sector of Agriculture

Sl. No.	Interest in agri. Sub Sector	Frequency	%
1	Staple Food Cultivation (Paddy, Maize, Millet, Buckwheat etc)	10	3.9
2	Dairy	47	18.1
3	Floriculture	30	11.6
4	Vegetable	45	17.4
5	Agri-business	60	23.2
6	Agro-tourism	67	25.9

Source: Field survey, 2018

Here there is an anticipation, in crisis of opportunities in other sector, youth's choice of sub-sector indicates that more attraction (nearly 49.1 percent) towards agricultural service sector i.e. agro-tourism and agri-business. Interest on this could be the reason of its 'term' and value it oriented in mind, as tourism and business is a prosperous sector. And in other hand, dairy and vegetable (35.5 percent of youth) are interested in this mainly it has instant return and have seen daily money flow in this product. For the dairy and vegetable youths has seen many chain development in terms of agribusiness.

In nutshell, the study infers that, youths are more interested in service oriented agricultural work due to many inherent features stuck in mind from society, parent, educational environment etc. Hence, it indicates that initially youths can be attracted in service oriented agriculture and allied activities (i.e. forward chain), but not directly to farming or field (i.e. backward chain). After entering into forward chain of agriculture, youths slowly understand the importance of backward chain or production to sustain forward chain, which would help to retain youths in agriculture and allied sector to maintain prosperous livelihood.

7.8. Experts Opinion to Improve in Agriculture Sector to Attract and Retain Youths

As per the understanding and observation from the experts on question 'suggestion for the improvement of agriculture sector to attract and retain youth' study prepared components for improvement. Accordingly, experts have mentioned many factors of improvement in terms to attract them and to derive their livelihood from this sector. As some factors can be observed in out of youth context but included because all such factors resulted farming as non-lucrative sector which set prejudice in the mind of youths. To understand the factors in better way, study clubbed similar kind of factors into various categories or component.

As per expert views, 25.5 percent experts cumulatively advocated to have compulsory subject of agriculture education from school level and provide awareness about its prospect. It will to get its technicalities and its scope which are necessity to attract youths in this sector.

Table No. 7.2: Improvement of Factors to Attract and Retain Youths in Agricultural Activities

Sl. No.	Component for Improvement	Factors of Improvement		Sub – Total
		Factors	Percentage	
1	Social Security Scheme for Farmers	Farmer security through salary, pension, insurance,	8.7	9.9
		Damage compensation	0.6	
		Provide Medical facilities	0.6	
2	Infrastructural development for agricultural support	Infrastructural development like cold storage, transport facilities, electricity facility	1.2	5.6
		Proper irrigation facility & manure	4.4	
3	Input Support	Improve technology, affordable & easy equipment to make livelihood easier	13.4	22.1
		Provide HYV & improved seeds in adequate amount	7.8	
		Provide Organic fertilizers	0.9	
4	Eradicate social stigma for farmers or to be farmers	Parents must allow and change social mentality to focus on govt. job	1.6	7.2
		Stop farming recognized as poor or work of uneducated	0.3	
		Govt./society should consider agriculture as prestigious having equal respect, awards for farmers as a recognition of respect	5.3	
5	To show continuous earning opportunity	Create market linkages, increase prices, for increase income	15.3	18.7

		If farming provide profit then other jobs,	0.3	
		Financial support, loans in low interest, subsidies,	3.1	
6	Farmers Friendly policy and schemes	Better govt. policies and agri. Schemes	3.1	4
		Continuous departmental support and extension	0.3	
		Institutional development for farmers	0.6	
7	Awareness cum Agri. Education to show its scope and technicality	Provide counseling and awareness about scope of agriculture	5.3	25.5
		Compulsory Agri. sub in educational institution with theoretical & practical	17.1	
		Job creation in agri. sector and more promotion of agriculture & allied activities	3.1	
8	Regional based support	Land Reform, land settlement development & land availability to land less or interested to do agri.	4.4	7
		Chase monkey, protection from wild animals	1	
		Complete banned outside food,	1.6	

Source: Expert Interview, June, 2019

Similarly, 22.1 percent experts responded to improve input support system in which feasible technological support, good varieties of seeds and access of adequate organic fertilizer. Third major component is to showcase continuous earning opportunity as like in other sector (18.7 percent) by developing supply chain and timely financial support and subsidies to generate good earning as similar to other

sectors. About 9.9 percent of experts proposed to improve in social security for farmers by providing salary, pension, insurance and compensation for damage or crop failure with medical facilities for farmers' family like in employees of other sectors to showcase security in this sector for upcoming youths.

Another major view from experts in terms of improvement or changes is to eradicate or eliminate social stigma (disgrace) on farmers and farming as a livelihood. As regards 7.2 percent said this social stigma generates because of parents and societies' expectation to get job after degree. So to improve the scenario for youths to show willingness, all stakeholders need to consider it (farming) as a respectful and prosperous livelihood. Government and society should consider agriculture as a central activities having equal respect with other sectorial profession, as it should be more than other because farmers provide 'fuel for human engine', wherever one work food as an essential fuel for human body or engine to run. In addition, provision for awards for farmers as recognition of respect and values of their work for the society and nation.

There is component of improvement which is based on region which pointed out by experts (about 7 percent) like land reform and provision of land for land less agricultural labourers and for those who are willing to do agricultural and allied activities as a livelihood. Similarly, need mechanism to support crop damages done by wild animal and complete banned on outside food to have good demand of local foods which sustain good earnings for farmers is of prime requirement.

Infrastructural development in support of agricultural activities is other component viewed out by 5.2 percent of experts like cold storage, transport chain and proper irrigational channel with provision of manure. And at last, 4 percent of experts

advocated farmers' friendly schemes and policies like better policy in congruence to all related department and autonomous govt. agency to help farmers and farming with adequate extension services and development of institution for farmers to increase their bargain power to compete market forces to fetch good return.

As many of the components of improvement are based on past experiences and present scenario which are main hurdles to make farmers or farming as a prosperous and lucrative livelihood. It ultimately affects the youth's perceived notion on agricultural activities. Hence, if all such components are managed adequately then life of farmers would also be equivalent to the life of others in terms of economically, socially, respectfully, that would give space to attract youths on this sector as like in other sector.

7.9. Need to Begin Agricultural Education from School Level

As study, observed from the beginning that, youths are formally unaware about pros and cons of agricultural activities. Even it is established fact that at present youths are not willing to attract and retain in this sector due to education which they are imbibing. From this, it will not be incorrect to say that present education curriculum not shown positive aspect of agriculture holistically and generates wrong impression about this sector among youths. Having said that, it could be another reason that lack of agricultural knowledge, youths are not showing positive attitude towards agriculture.

This means, the lack of knowledge about agriculture generates such prejudice. Even in *Bhagawat Gita* lord said that '*Tasmat Agyaan Sambhutam Hritstham*

*Gyaanasinatman, Chitwainam Sansayam Yogmaatisthothistha Bharat*¹⁶, which means reason for confusion on something or prejudice about things is because of lack of knowledge about it. So lack of knowledge on agriculture makes this difference. As a remedy to this problem on same *shastra* it says that ‘*Gyanagni Sarvakarmani Bhasmashat Kurutey Tatha*’ which means to overcome such prejudices only solution is to provide knowledge about things. Ultimately it infers that, if agricultural education is provided then such prejudice will destroy.

The inclusion of agricultural education is a global phenomenon. In US, Edible Schoolyard Projects calls for revolution in public education to infuse school curriculum with outdoor garden experiences, ecoliteracy and an “edible” education. It started from 1995 with the idea to transform children’s relationship with food by Alice Waters. Similarly, many such initiatives executed by international, regional, national organization and forums. The 2030 agenda for ‘Sustainable Development and United Nations Decade of Action on Nutrition’ scale up programs and policies for improved food security and nutrition recommended that effective nutrition education and coherent food policies in schools. For which formal education systems, such as pre-primary, primary and secondary schools are considered favorable settings for advancing nutrition and sustainable development education.

In Indian state level, Goa and Uttar Pradesh govt. has initiated kitchen garden project in school level. The main motive behind this is to boost the nutritive value of the midday meals and also encourage children to grow plants, vegetables and fruits and to achieve goal of learning as lifelong skills. This initiative evokes interest among young ones to look at agriculture as a fun activity.

¹⁶ 42 No. Sloka of Chapter 4 from Bhagawat Gita.

Similarly in individual level, like Good Harvest School, this is located in village of Paschim Gaon in the Unnao district of Uttar Pradesh. It is considered as India's first agriculture based primary school for girls founded by a couple Ashita and Anish Nath in 2016. Here, girls learn about farming practices through hands on experience in the space of 50,000 sq. ft. Many more such initiatives are implemented in different region.

In North East region of India, there are many organization and individual who are working in this line to give hands on technicalities of farming. As such, Farmer Samir Bordoloi, IARI Innovative Farmers awardee 2019, is giving training to school children on farm practice and have started SPREAD NE organization under which he provide training to youths on natural farming and trainees is given name as 'Green Commandos'.

In Sikkim, some of the schools do prepare flower garden under NSS, WWF as a fun activities, but not for consumable items to inculcate its importance. One of the primary school in North district of Sikkim took initiative to inculcate value of agriculture by cultivating different crops within premises. Mr. Mingma Sherpa, senior teacher, who won best teacher awards from state too, initiated the many unique things in Lum Govt. Primary school of Lower Dzongu. The vegetable grows in their premises is used in midday meals. As he said that 'such initiatives can help to learn the technique of farming within childhood level and this will generate understanding about the agriculture and its importance for life'.

Hence, it is imperative to start inculcating the agricultural education from school level to make mindset of youth, similar to other compulsory subject.

7.10. Action Plan to Attract and Retain Youth in Agriculture

So, as per observation from different organizations working in this line and of the views of 15 experts, this study tries to make action plan which may be the alternative way to attract and retain youth in agricultural activities for sustainable future. Initially to Attract the youth in agriculture sector we need to think in two level i.e. foundation level and general level.

For foundation level some action need to be taken, like

- First and foremost priority is to introduce Agricultural Education in connection with agripreneurship knowledge from school level. For that curriculum need to set on a way where children learn from Package of Practice (PoP) to value addition and supply chain management (both theory and practical). So that student inculcates this skill from childhood level itself. For this govt. should allocate land for farming near school to make model farm and appointment of agricultural graduates for school teaching. This will help to solve two way problem, one is employment generation for agricultural graduates and other is student will get to know the agricultural education as a life skill.
- In school level, student must get exposure trip to model farming area and like schools conduct summer camps or excursion trip, if that arranged in connection to farming then it would help to know more about agriculture and its additional opportunities.
- Just like, science & technology and environment exhibition, agricultural exhibition need to start for school level, so that student would generate avenues and techniques and its opportunity and prospects.

- Parents should encourage their children for agricultural activities.

For General Level

- Organized training which should cover from POP to supply chain. After completion of training provide some basic capital and technical input support as per training provided and allocate fallow land (if needed). Till initial production process proper monitoring and evaluation with adequate extension services should be given on his/her activities/project.
- Provide exposure trip to model farm developed by youth farmers to boost encouragement.
- Society should motivate youth who are lying idle towards farming and its avenues.
- State need to establish one window facilities in convergence of NABARD, PACS, respective departments and all other related agencies to allocate required supports to youth without any hurdles.
- In addition, govt. should have provision to do farm internship on selected model farm. For this all necessities need to be provided by government. To those who graduated with agricultural degree, provide them license on respective field like MBBS, Pharmacist get after degree, to act innovatively in their respective field. And in addition grant cultivable land on lease basis with other support.

Once they attracted towards farming, then sustainability of attraction is major question to answer. For that retention in their activities, we need to think wisely. Like

- Provide adequate extension support continuously from respective department and agencies especially till the first and second cycle of production after which if he/she gets return from production.
- Formation of Youth farmers Organization to support each other like FPO to support each other from backward chain to forward chain.
- Youth need to involve in policy making debates, so that they can suggest their need in policy level decision
- With agriculture activities, agro-tourism/farm-tourism need to develop as a service sector as an alternative earning source and diversification of work.
- Similarly youth should guide by team of innovators/entrepreneur corporate to do backward and forward chain development.
- Periodic, awards and recognition provision must be there to encourage innovation in farm level.
- As a socio-economic security, for initial period there should be monthly financial incentives, fixed provision for medical facilities for youth farmers and his/her dependencies and security as pension for old age. These three are major concern, so for that govt. can make mechanism of registering youth farmers and provide them guarantee by putting condition that they should continue farm, for that monitoring and evaluation team including village level worker (VLW) of agricultural department need to be set up.
- For continuous earning to maintain family basic quality needs in connection to production, formally farmers should allow to fix the price of their produce periodically region and crop wise and if that is not fetch from market then govt. should compensate the difference amount. In addition, due to monsoon failure, natural calamities, hailstone, wild animal damage then govt. should

trust farmers on its estimation of lost as per expected yield from quantity sown to provide compensation as per market rate of that particular time within a fortnight.

Altogether, by above action plan, the study tries to make framework on the basis of youths' need and their anticipation from any kind of livelihood. Instead, until and unless existing farmers will not have access to all such basic provision, new generation will not be enthusiastic to enter into a livelihood which has no security in terms of socio-economic. Hence, to accelerate encouragement in addition to above action plan, life of existing farmers should also be changed and farmers should willingly encourage their children and others to opt for this livelihood.

Attraction towards agricultural and allied activities is mainly determined on what perception and motivation youths have about it. In this context, study observed that there is an urgent need to provide a platform for youths to think about agriculture from school to societal level. Until and unless, as a general rule, one cannot get a taste of something they will not be attracted or habituated to it. So to have a taste about agriculture and its allied activities, there needs to be a platform for hands-on experience. For this, a better option is school, because school is only a formal source which built the mindset of children.

When the youths get a taste or hands-on experience about farming one or other way, then only they can think of the attraction towards agricultural sector for a livelihood option. And then, to retain in this livelihood, such an environment of support system needs to be managed from societal acceptance and encouragement to continue these novel activities. For this, one needs to have self-realization about the

importance of these activities to sustain human life. In between, all other support system to maintain livelihood need to arrange by one way or other.

So, it is well understood that youth (men and women) of today has a different mind-set and outlook. Unfortunately, there exists an 'aspiration-attainment gap'. Hence, their aspirations must be addressed on priority. They like to pursue intellectually satisfying, commercially viable and socially empowering activities. All these are critical for future growth and development of any nation and world. Therefore, need an enabling environment through policy, institutional, societal and family level. Study believes that engaging youth in agriculture sector more profoundly can deliver not only income but also work that is significant, prestigious and attractive for upcoming generation too.

Chapter 8

SUMMARY, CONCLUSION AND SUGGESTIONS

8.1. Summary

Agriculture is the most antediluvian activity of the human civilization. Amidst its declining share to the GDP of the economy, agriculture is still an important occupation of the most of the rural population. However, the present scenario of agriculture presents an interesting contradictory picture which sketches that majority of farming population are in the later stage of life and their replacement after retirement can be done through the participation of young generation people. However, the youths either are not interested or made disinterested towards agricultural farming. In this context the present work study focused on different issues of declining trend of farmers; to examine the perception of youth towards agricultural activities; to evaluate efficiency of the youth involved in agricultural activities and to explore the features which can attract and retain youth in agricultural and allied activities.

In this respect, primary data have been collected from the sample farm households, 150 samples for farmers' response, 259 samples on perception, 30 agripreneur for efficiency calculation and 15 experts of farming (model farmers, agricultural scientist, policy maker, official, youth agripreneur etc) have been collected. From total of 150 farm households and 259 youths have been personally interviewed to know the perception of youth o farming.

The farms household (150) have ben surveyed to evaluate on the factors or issues affecting the farming livelihood in this study area. Further, to understand the

perceptions of youth a questionnaire on perception towards agriculture have been framed. Each question has five likert scales (1 to 5) such as strongly disagree, agree, neutral, agreed & strongly agreed. In order to reduce all of the response variables into factors, principal component analysis has been applied. On the basis of obtained factors, structural equation modeling has been used and to evaluate the impact of the observed variable on the latent variable.

In the next step, the data from 30 agripreneur (as their number is very less in Sikkim) have been used to compute the relative efficiency of the agripreneur. Both Stochastic Frontline method and Data Envelopment Analysis (DEA) have been used to evaluate efficiency score, determinants of the level of output, their statistical significance, factors of inefficiency, and the projections of inputs to improve efficiency, peers of the inefficient DMU and the excess of inputs used. Lastly 15 experts have been consulted on the issues of how to attract and retain the youths in the agriculture or farm activities.

As per the analysis, the study found that agriculture sector is facing a declining trend of the farmers involvement due to various factors among which lack of helping hands from the family members, lack of adequate labour power for farming, employment oriented activities like MGNREGA in rural areas, changing attitude of the village people towards work in farming, provision of food to the people under food security Act are prominent. Further agriculture market imperfection leading to distress sale of the agricultural product, crop damage in the study are due to wild animals sudden entry into the human habitats, lack of irrigation and extension services, lack of social & economic security in farming are the factors that led to decline in farmers participation in farming.

The increase opportunities in the non-farm activities, importance of education for the children are the prominent incentives for the farmers not encouraging their children to continue agricultural activities through direct participation. The traditional age old joint family is replaced by nuclear family and village instead of becoming place of residence became a holiday destination. Secondly, the non-farm opportunity such as 'one family one job' program in Sikkim, 100 days employment scheme in MGNREGA adds to the declining trend of farmers' participation in farming activities. Thirdly, inadequate manure due to destruction of traditional *goath palnay chalan* (cattle grazing in forest), wild animal attack on of the crop dissuade farmers to go for farming activities.

PDS (Public distribution system) is another factor for declining farming as profoundly state by farmers. It has provision of Antodaya Yojana (free 35 kg rice per month per family) for poorest of the poor and for other same in subsidized rate i.e. @ 3/kg, otherwise same rice would cost @30/kg at market price i.e. 10 double of subsidized rate. This easy access of food at cheaper rate or free, made people feel that without or by less working also they can feed family, earlier for the same they had to work hard in agricultural field. Even by one day MGNREGA wage i.e. @177/day in Sikkim, enough to purchase 35 kg PDS (@3/kg) rice for a month. Access of this in association to work culture inculcates from MGNREGA, leads to seen agricultural activities as hard work to feed the family.

Another factor is farmers get less price of their produce due to lack of efficient supply chain, which hardly able to fulfill need of the family lead to work in non-farm sector to fulfill other needs of the family. Other reasons are inadequate irrigation facilities; extension service not in proper time like seed provided untimely,

no compensation for crop damage by monsoon and wild animal. Instead of having many central govt. schemes, rarely it is executed in Sikkim due to small land holdings. All these reasons cumulatively have impact on farming. As per sample observation within 20 years or prior to it and present 56.9 percent area of cultivation has declined and similar is the case with no of farmers, one of the major factors which can help to continue farming is availability of man power mainly youths.

But, as per findings youths don't seem to be interested to opt farming as a livelihood. Therefore, as a second objective of study, tries to access the perception of youth towards agricultural activities. As per analysis, livelihood preference of majority of youths for jobs and only 3.9 percent are for farming. Major reason to choose other than farming is to become successful, to have regular/good salary, to get facilities, as a respectful profession etc. In general, youths perceive that agriculture sector is full of hard and painful, tiring and it is the work done of uneducated people to earn livelihood. These two perceived thinking of youths towards agriculture and farmers indicate that it is not a livelihood for good/educated persons to become successful. In terms of interest on agricultural activities, majority of the farmers are not interested by citing the reason that it will not help to fulfill dreams and most importantly farming is not a profession for educated (considering themselves as educated even after class 10). Parents are also not encouraging (nearly 87.3 percent) their children for farming by saying that 'they are doing hard work in agriculture to make them educated for better jobs other than farming' as responded by youths. In other hand, farmers (85 percent) themselves also not supported educated to involve in farming. In terms of respect or prestige on farming livelihood, 68 percent said it is not respectful profession. Further, youths postulated (87 percent) that education or educational degree is a barrier to enter into farming.

The, perception of youths evaluated with the help of factor analysis and SEM model, by considering different items on Likert scale ranging 1-5 (strongly disagree to strongly agree). While analyzing the factors, study developed three latent variables i.e. economic perception, social perception and personal perception. As per the result, economic perception has negative relation among social and personal perception and social and personal perception has positive relation to determine the perception of youth to choose agricultural activities as a livelihood.

To evaluate youth's perception, 12 items such as agricultural activities can fulfill needs, agriculture is part of life, agriculture cannot fulfill dream, like to do agricultural activities and others have been used to get the response of each youths on 5 Likert scale. After that through PCA the items have been reduced into three important variables (factors). Using Structural Equation Modelling (SEM) the causal relationship among the factor as well as between factors and observed variables have been estimated. The three factors are economic perception, social perception and personal perception. On the basis of factor loading economic perception is explained by fulfill no dream, part of life, like agriculture and many jobs available in agriculture and other 8 response items explain social and personal perception.

The correlation analysis shows that agriculture is part of life is correlated ($r = 0.6471$); need fulfill is correlated to like agriculture ($r = 0.6714$); part of life is correlated to like agriculture ($r = 0.5125$). Since, pairwise correlation is a prerequisite for factor analysis, hence correlation analysis is made. Then as per the smallest value of AIC criterion three factors have been considered to capture 100 percent of the variance. On the basis of factor loading need fulfill, part of life & like agriculture load jointly on 2nd factor.

Education is not to make agriculture as a profession, joining if no other opportunity; agriculture is hard work, family will not encourage; no interest on farming and no respect from society loads highly on 2nd factor, where as there are many jobs in agricultural sector, agricultural occupation is respectful is same as white collar. The factors, on the basis of loading points, have been named as *economic perception, personal perception & social perception*.

As per the SEM results economic perception is positively and significantly explained by items (agriculture activities is my part of daily life, I like to do agricultural activities, there are many jobs or livelihood in agriculture and allied sectors for you). The economic perception as a latent variable explains 0.89 unit and the error is 0.22 units. The value of coefficient of each item shows for example that higher economic perception among the youth explains that there is longer need fulfillment. Hence, agriculture is most needful activities only if it is economically beneficial. Agriculture will be part of life only if it is economically beneficial.

Similarly, the personal perception is explained positively and significantly by the items – I will not get respect from society if I derive my livelihood from agriculture. But agriculture occupation is respectful negatively explained by personal perception. Similarly, social perception explains joining agriculture if no other job is found. He four items are positive and statistically significant. Hence, youths personal perception is strongly against agriculture because lack of social prestige.

The covariance between economic perception and personal perception is negative implying higher economic benefit leads to low personal perception that it leads to less prestige etc. Despite all these the model is not a good fit. So make a good fit model the model is further modified.

So the last modification model suggested to have a covariance between likes agriculture and fulfils no dream. The fit statistics presented in the 3rd column (of Table 5.14) shows that LR value is $0.1022 > 0.05$, RMSEA is $0.32 (>0.05)$, CFI is 0.990 and coefficient of determination is 0.974 on this basis the path diagram of the best fit model shown in (Fig-5.9).Table-5.15, presents all the coefficients of the observed variable which are highly significant. That means all the latent variables explain these observed variable significantly.

As per SEM result, the most important part is to see the association among all these three latent variables. There is a negative association between economic & personal perception, economic & social perception. But there is positive association between social and personal perception (shown in Table-5.16). It infer that, if economic perception increase than social and personal perception decline, which means, if importance of economic factors increases then importance of social and personal factors put aside or its influencing power reduce. And in other hand, personal and social has positive relation means if personal factors increase then social factors also increase.

In short, economic factors more influenced the perception than other factors. As the analysis infers that economic perception has negative relation with social and personal perception and in other hand social and personal perception has positive relation. Hence, youth preference of agricultural livelihood determine by economic, social and personal perception. Among these perceptions, economic perception has negative relation between social and personal perception which means even if socially and personally agricultural livelihood is not preferred but economic opportunities/prospect is more on agricultural activities then youths would ready to

join. Similarly, even if economic opportunity or prospect is low youths would choose to be in agricultural activities if social and personal perception is high. Altogether, it infers that economic, social and personal perception has different degrees of influence on choice of agricultural activities as a livelihood by youth. Power of different perception to choose livelihood depend on one individual's priorities or values (may be economic, social and personal) attach to the livelihood.

Technical Efficiency of youths and its affecting factors analysis by SFA method as a next issue of analysis. Since there are few youth agripreneur in Sikkim, data from 30 agripreneurs have been collected (15 agripreneur from dairy farming and 15 farmers vegetable farming). The result suggests that the producing units are using more labour in proportion to other inputs. The result therefore shows a negative and significant impact on dairy production.

Further the LR test supports the justification for the use of SF function against the simple production function. The null hypothesis that the one sided inefficiency term follows a mixed Chi-Square distribution is accepted at 5 percent level of significance. The gamma value (γ) suggests that 98 percent of variation of the total variance is due to technical inefficiency.

In the inefficiency component education and experience (δ_2 & δ_3) are statistically significant and have negatively significant on inefficiency i.e. 1 percent increase in δ_2 (educational level) reduces inefficiency by 41 percent and 1 percent increase in δ_3 (experience) reduces inefficiency by 3 percent (in round figure). The economic implication is that educational level of the farmer (producer) is acting as a significant shifting parameter for production of dairy output. Similarly experience of the farmer is an important and significant factor reducing inefficiency.

In case of vegetable farming, the mean efficiency score is 0.982 more than efficiency score in dairy farming. In both cases education and experience reduces inefficiency significantly. In case of vegetable labour, bullock, seed costs and manures are statistically significant. In case of dairy labour has negative and significant impact on value of output. Medicine and feed as an inputs have positive and statistically significant.

For attracting and retaining youth in agriculture, first and foremost thing is to motivate them on this line. Motivation determined by human needs like physiological needs, safety needs, social needs, self-esteem needs, self-realization needs and psychological needs. Among these, degree of needs at the time of professional choice matter a lot. Another factor which motivate youths in choice of livelihood is expected value of outcome and its support to achieve individual's goal. Altogether, self-satisfaction is major motivation to opt for profession but for youths this self-satisfaction arises only through its value of outcome and its nature of work. Hence, to attract young generation on it, farming must be uphold as economically and intellectually attractive. For this, it is essential to create awareness that agriculture is not only equated to farming but also includes many opportunities for entrepreneurship, including production, processing, and value addition, branding and marketing. However it is essential to recognize that youth have diverse aspiration and the regional conditions need to be judiciously taken into account while developing any initiative to attract and retain young people into agriculture and allied activities.

Altogether, factors which help to attract towards livelihood are determined by awareness and counseling about the profession, self-interest, possession of skills, family and social encouragement/pressure. On other hand, determining factors to

retain in one livelihood are achievement of personal growth, work environment, socially respectful with rewards and recognition and self-realization of satisfaction. Even it is found in survey that majority of youth will select agri-tourism and agri-business in case of dearth in the opportunities in other sector. Interest on this could be the reason of its 'term' and value it oriented in mind, as tourism and business is a prosperous sector. This means, agriculture and farming as a term directly perceived as non-lucrative, hence, to attract and retain youth in farming its perceived notion in the mind of youth need to change and that is only possible if they get it in the form of education.

Therefore, study advocated the need of agricultural education as compulsory subject from school level (more focus on hand on experience) and in addition exposure to children in model farm and periodic agricultural exhibition as like science and technology and environment exhibition to showcase its prospect and innovation ideas. In general level, for present day's youths who are lying idle provision of training from POP to supply chain followed by internship in model farm. After completion of internship allocate land and basic inputs, for this proper monitoring team need to establish to evaluate and to provide extension services until and unless he/she start fetching return from its produce. The study believes that, when return or earning started from farm produce it will automatically motivate youths to scale up their activities but till that time, proper execution mechanism needs to be established by government level. Until and unless it is not taken in mission mode, sustainability of agriculture will become question mark and lead to food insecurity and led to uncertainty for existence of life. Hence, everyone needs to understand the fact that sustainability of agriculture sector and human existence has indispensable relation and act accordingly.

8.2. Suggestion

In Sikkim, as per official undisclosed sources 60,000 farmers are cultivating land, but study presumes actual number of farmers is less than this number. In this small state, government has schemes called OFOJ, in which government tried to provide one job (initially in casual form) per family in govt. sector to those who are domicile of state. Due to special provision in Indian constitution under article 371f, land is owned by domicile holders. So, there is gap in number between state population in census and domicile holder. The study want to suggests that under OFOJ provision appoint one member (especially young) from farming family to perform own farm duty instead of appointing for any other department just by paying some incentives. This will help to secure family income, given employment and mainly it will add the manpower to farming. The government should monitor their activity of cultivation through VLW and its production evaluation. Altogether, it will boost agricultural production and fallow land used productively.

Redistribution of fallow land among the land less people and new farmers (especially youths) who want to start new venture in agriculture for this Land Bank provision needs to be established in which land owner can deposit his/her fallow land to the Gram Panchayat mentioning the some limited locked in period and Gram Panchayat will allocate fallow land to those who want to cultivate. This mechanism must be similar to the actual monetary bank function, in which people deposit their surplus money to bank under different saving schemes and later same money credited to needy in form of loan or otherway round.

Livestock rearing and farming are complementary activity to each other. Ban on grazing may have positive impact on forest and greenery of state but it obstructs

the farming structure. So, lifting ban on grazing (*Goath Palan*) and promoting it in existing *gaucharan* area and identify new pasture land for grazing is suggested. To prevent or minimize crop loss by wild animals, one of the best mechanisms is to plant wild fruits trees in forest or to create edible forest to fulfill food requirement of wild animal as a long term plan.

Similarly, natural calamities and monsoon failure with periodic hailstone also damages the crop. So for all kinds of crop damages, respective department should have scheme to compensate crop damage within fortnight. For that, evaluation of damage need to be exercise in each farm field with the help field level staff in a manner that expected yield (considering amount of seed sown) in area as per past year trends of production need to be finalize. After estimation of expected yield of crop and its present value of market, that amount needs to compensate by respective authority as a moral support to continue its cultivation activities.

In context of PDS, need of reclassification of beneficiary as per availability of land for paddy cultivation and its family requirement of food monthly/annual (considering cultural, festival requirement) is highly warranted. But before, this all other suggestion should be implemented. With respect to public work schemes local level authority need to monitor the activities as per norms. To sustain agricultural activities out of monetary trap PARMA, age-old social capital of sharing labour for agricultural activities, need to preserve and should be promoted.

For supply chain, strong farm produce collection network needs to be set up with micro cold storage for surplus produce with in village. The way Dairy chain is sustained (through Milk Union Cooperative) similarly other (especially daily need

items like vegetable and other chain) also can sustain. Increase the availability of seeds and inputs in local level.

Farmers should be provided complete autonomy in deciding the price of their produce. To accelerate the power of autonomy the Cooperative and FPO must be strengthened. Along with organic farming, more natural farming practices need to be adopted for sustainability by preserving and promoting indigenous seeds and technique. In context of Sikkim, small farm size is more productive than large, as study infers, and Sikkim's natural physiology also as such where small farm is possible. So for volume of production, collective farming can be alternative solution, as observed in the study area. Efficient functioning of FPO and Cluster projects can help farmers for both backward and forward linkages for farm production. But for this, convergence of all the farmers' scheme from different agencies must be kept under one umbrella for effective outcome.

Parents and Society do generally not supportive to encourage new generation to step up for farming; by pointing farming is not a profession for educated. Hence, society and parents should inculcate the value of education not only for jobs but to make meaningful and productive life. In addition, education system needs to create the equal value for every sphere of work and to make life meaningful but not successful. Compulsory agricultural education subject should introduce from school level. In addition, allocate farming land for each school for its practical purposes. For this appoints agricultural graduates, who will help to solve some unemployment problem in short term and in long term it will generate manpower for farming. In addition, organizing agricultural exhibition for student and youths for circulation of new and innovative ideas just like science & technology, environment exhibition at

school level should be promoted. And periodic exposure visit to model farm near to school region.

Linkage of banks, credit and marketing agencies help the farmers to have quick and effective access. Further farmers and youths must be having role at policy making level. Periodic rewards and recognition for youth farmers and agripreneur has to be scheduled. As a socio-economic security, for initial period there should be monthly financial incentives, fixed provision for medical facilities for youth farmers and his/her dependencies and security as pension for old age. These three are major concern, so for that govt. can make mechanism of registering youth farmers and provide them guarantee by putting condition that they should continue farming, for that monitoring and evaluation team including village level worker (VLW) of agricultural department need to be set up.

To, conclude youths are backbone to the economy and society. Their immense skill can have lot of contribution in agriculture which is in jeopardy. They can bring all kinds miraculous changes not only in agriculture but in the economy provided they are properly recognized and are assigned prominent role as per their skills. Their participation will bring a sea change when agriculture will be intellectually and economically accepted.

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Appendix A

Questionnaire for Farmer

Date:.....

(This survey is part of research work on title “**Determinants of Youth Involvement in Agriculture & Allied Activities in Sikkim**” under Department of Economics, Sikkim University. The information collected through this survey will be kept confidential and only used for academic purpose.)

A. Name of the Respondent:

District :	Block:
GPU:	Village/Ward:

B. Demography Details								
Sl.No	Name	& Female 2)	Age	Qualification	Educational	Occupation ¹⁷	Monthly Income Earn (in Rs.)	solely depend on

¹⁷ Occupation- Farmer-1, Govt. Employee-2, Pvt. Employee-3, Self Employee-4, Combination of Farming & wage labour-5, Business-6, Others-7

C. Households Details			
1. Farmer Name		5. Main Source of Family Income ¹⁸	
2. Community ¹⁹		6. Years of Farming Experience (in years)	
3. Religion ²⁰		7. Family Structure (1- Joint, 2- Nuclear)	
4. Respondent		8. a. 10 years ago how much land you cultivate	
Mob.No.		b. And how much at present?	

D. Farm Details							
1.Land Ownership	Total Area (in Hal ²¹)	Net Sown Area (in Hal)	Gross Cropped Area (in Hal)	2. Crop Details	Major Crops	Area under cultivation (in Hal)	Purpose (Self Consumption-1, Commercial-2)
Personal				Main Crop			
Lease in				Seasonal			
Lease Out							
Andhya/Kut				Off Seasonal			
3.Livestock Details	Goat	Cattle (Cow and Ox)	Pig	Poultry	Other (specify...)	Total average Monthly earning from livestock	

¹⁸ Source of Income- Farmer-1, Govt. Employee-2, Pvt. Employee-3, Self Employee-4, Combination of Farming & wage labour-5, Business-6, Others-7

¹⁹ Community: General-1, ST-2, SC-3, OBC-4

²⁰ Religion- Hindu-1, Budhist-2, Christian-3, Muslim-4, Others-5

²¹ 2.5 hal is equal to 1 Acre

						product
No.						

E. Understanding Factors affecting Farmers and Farming	Yes	No
1. Do you think farming is economically (profit-loss) viable livelihood? (Yes-1/No-2)		
2. Agri. & Allied income is sufficient for your basic family needs? (Yes-1/No-2)		
3. Do you want to leave this occupation? (Yes-1/No-2)		
4. If Q.3 is yes, at what level of monthly income you will leave the farming? (in Rs. Amount)		
5. Where do you want to live your remaining life? Urban-1 , Rural-2		
6. Do you think you have encouraged your successors to continue in agriculture? (Yes-1/No-2)		
7. Do you think that educated children should engaged in agriculture? (Yes-1/No-2)		
8. Do you think, your children have enough knowledge/technique to pursue farming as livelihood? (Yes-1/No-2)		
9. Do you realize the farming as a livelihood is declining in your village? (Yes-1/No-2)		
10. Do you heard about Minimum Support Price (MSP)? (Yes-1/No-2)		
11. Do you think increase in road facilities and other opportunity like MGNREGA, availability of food subsidy in village led to decline in farming activity? (Yes-1/No-2)		
D.1 Impact of Food Subsidy		
12. Do you avail Food Subsidy/PDS? (Yes-1/No-2)		
13. Are you a beneficiary of AAY/BPL/APL? (AAY-1, BPL-2, APL-3)		
14. Do you think people have to work hard to feed his/her family? (Yes-1/No-2)		

15. Did PDS lessen the burden to feed your family? (Yes-1/No-2)		
16. Do you feel that availability of PDS/Food make you refrain to work less on farming? (Yes-1/No-2)		
17. If Yes above Q. 16, will lessen the farming activity will secure the food security of future generation? (Yes-1/No-2)		
18. How many months, your own produce is enough to feed the family? (in months)		
19. Per month how much Rice and Vegetable do you purchase from market? (in Kg)		
D.2. Market and Credit Reach		
20. Do you have easy to access the market for your produce? (Yes-1/No-2)		
21. Do you sell directly in the market or to the intermediaries? (Direct-1/Intermediaries- 2)		
22. Do you get price as per your expectation ? (Yes-1/No-2)		
23. Is there any supply chain provision from govt. side? (Yes-1/No-2)		
24. Is there any financial/credit support system for farming? (Yes-1/No-2)		
D.3. Impact of Rural Employment Scheme		
25. Are you a job card holder of MGNREGA? (Yes-1/No-2)		
26. In last year, how many days you got job ? (in days)		
27. How much did you earn from MGNREGA last year? (in amount)		
28. Is MGNREGA helpful for farming? (Yes-1/No-2)		
29. What do you prefer, if farming and MGNREGA work is in your option? (1-farming, 2-MGNREGA)		
30. Do you realize that due to MGNREGA people refrain from hard work? (Yes-1/No-2)		
31. Do you experience that decline in farming activity due to MGNREGA programme? (Yes-1/No-2)		
32. Do you think there is enough labour supply for farm activity? (Yes-1/No-2)		
D.4. Organic Initiative		
33. Is organic initiative become beneficial (economically) for you? (Yes-1/No-2)		

34. Did you get training on organic practices? (Yes-1/No-2)		
35. For how many days you attended training, till date? (in days)		
36. As per your cultivation experience, is organic practice retain the production level? (Yes-1/No-2)		
37. Are you getting higher prices to your produce as compare to outside product? (Yes-1/No-2)		
D.5. Other Factors		
38. Is lack of irrigation is problem for farming? (Yes-1/No-2)		
39. Is wild animal attack on produce discourage for farming? (Yes-1/No-2)		
40. Is organic, boosting the encouragement of farmer for farming? (Yes-1/No-2)		
41. Do you want to use new technology? (Yes-1/No-2)		
42. Is your age an obstacle to work on field? (Yes-1/No-2)		
43. Due to lack of any other option, you are practicing farming as occupation? (Yes-1/No-2)		

Prospect & Suggestion

1. Do you get support from Government? Yes/No (What, how.....)
2. Do you want to use new technology? Yes/ No (Why.....)
3. What are the obstacles in this occupation?
4. What are the factors which impacting to decline in farming activity? Tick as per your realization...

Factors	Highly	Moderately	Low
a. No body to support you on farming			
b. Your Ageing			
c. MGNREGA			
d. PDS (Subsidies food)			
e. Lack of irrigation facility			

f. Lack of youth interest (from family member)			
g. Lack of support from govt. timely			
h. Lack of assured market chain for your produce			
i. Unavailability of labour			
j. Small land holding			

5. For the improvement of production and marketing what can be done and how?
6. Is MGNREGA is helpful to farming? Yes/No (How.....)
7. Do you have fallow land? Yes/No (if yes, what is the reason)
8. Details of land cultivation and the then family structure....

Time	Area (In Hals)	Family Structure (Joint-1, Nuclear-2)
10 years Ago		
At Present		

9. Do you want to continue farming activities? Yes/ No (Why.....)
10. If you had done training on organic cultivation, what you have learned from training? (mention some technique which you have understand)
11. What difference you experienced on organic and conventional farming practice other than not using chemical?
12. Tick as per your realization, in context of your understanding about organic farming

Issues	Strongly Agree	Agree	Disagree	Strongly Disagree	Neutral
a. Economically Beneficial					
b. Ecological/sustainable farming pattern					

c. Prefer for quality food (healthy)					
d. Availability of govt. supports (inputs and others)					
e. Easy to practice					
f. Less Costing as compare to other farming pattern					

13. Whether your children take interest on your occupation? Yes/ No (how?)

14. Do you want to encourage to your children to carry on this occupation? Yes/
No (Why?..)

15. Do you think this occupation is giving you respect or in future you will get respect if you continue? Yes/No (Why and How)

Appendix B

Questionnaire for Youth

Date:.....

(This survey is part of research work on title “**Determinants of Youth Involvement in Agriculture & Allied Activities in Sikkim**” under Department of Economics, Sikkim University. The information collected through this survey will be kept confidential and only used for academic purpose.)

1. Name :	2. Gender:
3. Community/Caste:	4. Qualification:
5. Age:	6. Mob. No.:
7. No. of family member:	8. Farm Size (in Hal):
9. Parent occupation:	10. Land status: Own/Adhya or Kut/both

6. What do you prefer to do after completion of degree/education²²?
- a. Govt. Job b. Private Job c. Business d. Farming
- e. any other (specify)..... With reason
7. To your understanding what is Agricultural Activity/Farming?
8. What comes in your mind when you think of a “Farmer”?

²² 1 for Govt. Service, 2 for Private Service, 3 for Self Employment (including Business) & 4 for Agri. & Allied Activities

9. Understanding Perception on Agriculture : Statement	Strongly Agree	Agree	Disagree	Strongly Disagree	Neutral
a. Agri. Activities can fulfill my needs					
b. Agriculture is part of my daily life					
c. Agri. & allied activities cannot fulfilled my dream					
d. I like to do agricultural activities					
e. I will not get respect from society, if I derive my livelihood from agri. & allied activities					
f. There are many jobs or option in agriculture and allied sector for youth					
g. Agricultural occupation is respectful as same as white collar job					
h. I am studying or become educated not to make agriculture as a profession					
i. If I will not get any job then only I will think for this sector					
j. Agriculture activities is dirty and hard work as compare to other					
k. My family will not encourage you to do agriculture activities.					
l. Personally, I don't have interest on farming					
m. Do you think, involvement of youth like you can change the fame of agriculture?					
n. Organic farming, is showing new opportunity to youth					

10. Do you ever work in agriculture field? Yes / No

Why?

11. Do you have interest to work on agriculture field? Yes /

No

Why?

12. Do you know how agriculture product (any) produce? Yes / No

Mention specifically the product name

13. Do you think farming (or to be a Farmer) is a prestigious one? Yes /

No

Why?

14. Do you get encouragement from your parents/family to make your profession as farming? (Yes/No).... Why?

15. Please Tick Yes or No to Know your perception	
a). Under economic profitability;	
i. Is it remunerative? Yes/No	
ii. Do you think agricultural earning can fulfill daily requirement of your family? Yes/NO	
iii. Do you think that income instability occur in agricultural activity? Yes/No	
b). On working environment;	
i. Does it involve hard manual work? Yes/No	
ii. Is it not a attractive profession? Yes/ No	

iii. Do you find any charm on working environment of agricultural activity? Yes/NO	
c). On Social infrastructure and status;	
i. Is it a prosperous/glamorous livelihood/profession? Yes/No	
ii. Is this profession have enjoyment/entertainment? Yes/No	
iii. Can it be taken as profession?	
iv. Do you think any future scope in terms of profession/livelihood? Yes/No	
v. Does your parent support you taking farming as a profession/livelihood? Yes/No	
d). On Government policy;	
i. Is there any economic security for farmers? Yes/No	

16. Do you want to engaged in farming after degree/education? Yes / No

17. Do you prefer to have your own agriculture field? Yes / No

Why?

18. After joining (any) service, do you still want to be engaged in farming activity?

Yes / No

19. If agriculture/farming disappeared today, would it matter to you personally?

Yes / No

How?

20. Do you prefer urban life? (Yes/No)

Why?

21. Do you think education level is a barrier for entry into farming activity?

⇒ Yes or No. Share your feelings.....

22. If you feel to go for agriculture activity, then which among the following branch of agri. Sector would you like to take up?

⇒ Traditional Agri. Activity like Paddy cultivation etc

⇒ Dairy

⇒ Horticulture

⇒ Floriculture

⇒ Agri- Business

⇒ Agri-Tourism

23. Any suggestion for the improvement of agriculture sector to attract youth..... !

Appendix C

Schedule for Youth Agripreneur

Date:

(This survey is part of research work on title “**Determinants of Youth Involvement in Agriculture & Allied Activities in Sikkim**” under Department of Economics, Sikkim University. The information collected through this survey will be kept confidential and only used for academic purpose.)

1. District		2. Block	
3. GPU		4. Village/Ward	
5. Name of Agripreneur		6. Gender	
7. Age		8. Qualification	
9. Past Experience		10. Presently working on (any formal institution)	
11. Agri. & Allied Activity		12. Started from (in which year)	

13. Demography Details							
Sl.No	Name	Sex (Male 1 & Female 2)	Age	Educational Qualification	Occupation ²³	Monthly Income Earn (in Rs.)	Farming solely depend on

²³ Occupation- Farmer-1, Govt. Employee-2, Pvt. Employee-3, Self Employee-4, Combination of Farming & wage labour-5, Business-6, Others-7

14. Perception and Constraint of Youth involvement in this sector

Factors	Yes	No	Don't Know
a. Agri. & allied income is sufficient for your basic family needs?			
b. Do you think agri. & allied activities are beneficial occupation?			
c. Educated farming youth run behind the subsidies & loan, do you agree?			
d. There is no adequate credit facility in this sector			
e. This is sector is consider as poor return on investment			
f. Lack of basic knowledge of this sector refraining youth participation			
g. Lack of ready market for agri. & allied produce			
h. Youth lagging interest on agri. & allied activities due to discouragement by society/community			
i. Farming and related activities are not respectful profession			
j. Insufficient land resources to start any agri. & allied related venture			

15. What are others constraint you realized in this sector? (Mention few.....)

16. What attract you on this sector or on what objective or aim? (mention few elements...)

17. Do you think is there any option to sustain agri. & allied activities other then youth involvement or taking responsibility to feed the world? (Yes/No..... & why)

18. Presently youth unemployment is high, other sector is not able to absorb the new labour force, can agri. & allied sector has opportunity to grab additional labour force? (Yes/No)..... How?

19. Is increased in fallow land is opportunity for youth self employment?

(Yes/No)How?

Production& CostPer Acre (1 Acre= 100 Decimal)

1. Production	Quantity	2. Cost (per acre)			
Produce Item					
Area under Cultivation					
Labour					
Rent/Lease					
Fixed Cost					
Machinery					
Bullock					
Variable Cost					
Seeds					
manure					
Organic medicine					

3. In Last production period, how much you produced? _____ (in value.).

4. Any post-harvest technology used or processed product prior to supply? Yes/NO (Explain briefly).

5. Total income earn from farming: Rs.

Additional Produces or Revenue Generation Source

Sl. No.	Item	Revenue Monthly
1.	Milk/Milk Product	
2.	Sale of Cow Dung/Vermicompost	
3.	Livestock	
4.	Any other Specify	

6. Any suggestion, that how youth can attract and retain in agri. & allied activities....?