

**“A STUDY ON EFFECT OF CLIMATE CHANGE ON
FARMERS OF SREENARAYANAPURAM VILLAGE”**

Dissertation

*Submitted to the University of Calicut in partial fulfillment of the
requirement for the award of the Degree of Master of Arts in Economics*

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DECLARATION

I **ASWANTH SANKAR** do hereby declare that the project entitled “**A STUDY ON EFFECT OF CLIMATE CHANGE ON FARMERS OF SREENARAYANAPURAM VILLAGE**” is an authentic record of work carried out under the guidance of **Dr HASEENA**, Head of Department of Economics. I further declare that this report has not previously formed the basis for the award of any degree, diploma, or similar title at any other university.

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Chapter 1

INTRODUCTION

1.1 INTRODUCTION

Agriculture is the art and science of cultivating the soil, growing crops, and raising livestock. The growth of society was founded based on fertile land. The growth of human needs has made agriculture an important part of society. Agriculture was the foundation of life as the increasing population made food an important commodity. From livestock raising to farming plant ancestors of human society paved the way by actively breeding animals and plants to find the perfectly consumable lifeforms.

Farmers are important workers in our world they produce food for human consumption. From where humans need to hunt animals and forage plants Farmers have started a revolution by themselves by actively farming and producing food. Without the farms human society would have been in shambles with a perfect place to settle as the dependable food might run out of overfishing and overgrazing. By selecting a good place to plant they become place for people to settle and then from there people started to live together in larger scale and then society has come into being.

Land had become a very important piece of asset from ancient times. Now they are decreasing every day and each day huge amount of plants are raised which have decreased the fertility of land. But human invention of fertilizers has paved way for high yield of plant and now fertilizers have become a crucial part of farming. From dry desert to cold Antarctic land was always abundant but fertile land like near river was never increasing.

Next important factor of agriculture is suitable climate. From luxurious grapes used in Champagne to Rice planted with large amount of water, each plant has its own requirement and this requirement is climate. Grapes used for wine and champagne need its apt climate with temperature and rainfall. And Rice needed enough rainfall to sustain its growth. Even though now dams have been built and reservoirs are storing water without enough rain fall water may not be available thus climate is a crucial part of farming and its cornerstone.

In each region climate is different this was usually mostly constant but now in this current times the climate is going haywire as pressure points formed in sea increasing temperature

and change in winds have all made what used to be constant to now ever changing climate and this change in climate from usual time is known as the climate change.

1.2 Climate change

Climate change refers to long-term shifts in temperatures and weather patterns, mainly caused by human activities, especially the burning of fossil fuels. The term “weather” refers to the temporary conditions of the atmosphere, the layer of air that surrounds the Earth. The change in temporary conditions of the atmosphere have led to what is climate change. The climate change has been effecting many things from the small scale effect of abnormal temperature to change in rainfall. The climate change has caused a big inconvenience in the sector of farming which was heavily depended on the uniformity of weather around the year.

Usually by predicting weather with their guts farmers used to mostly be able to farm and their guts usually worked out but now the climate are now within the predicting patterns. We used to say the clouds getting stuck on mountain to rain but now pressure point formation and the cyclone formation have overtaken the usual pattern of rain as the formation of respective cyclones and pressure points have led to raining. The increasing formation of cyclone in the Arabian ocean have been a huge part of the raining.

1.3 Climate Change on Farmers

A change in climate will lead farmers to change the way they plant crops. As the location will not have constant climate it will have fatal effect on plants from decreasing production to total loss of crops. The climate change may cause farmers in hilly region some big problems like landslide which may lead to destruction of complete asset. The climate change will effect quality of crops and this leads to poor harvest of crops.

This does not stop with only affect of crops but as a whole of economy as food is one of the most traded item around the world. The world runs on Food thus a change in food quatity will lead to change in its price. As it's a necessity it is unavoidable consumption thus One of the priority of a good country is its food security.

Poor depend on cheap food to make their life so if price of food increases due to climate activity they will quickly be affected. This effect does not stop with poor. But also Farmers who have invested a huge amount time and money into it. As suicide of farmers are getting more noticed these days that people have started to understand that climate change effect farmers.

1.4 Significance of the study

Food as a fuel of human beings is a necessity. Without food human can't live for long. So proper nutritious food is needed by the people. The food comes mostly from plant crops then from live stocks and everyday a hard work of farmer leads to what you have on the plate. As a fuel thus We can understand the significance of Food and the makers of these food are farmers. As Farmers are heavily depended on the weather of a region to grow certain crops and each weather are predicted by farmers before the sow their crops. But what would happen if they can't make accurate predictions which leads to crop loose. What would happen if usual climate starts to change? Thus if there is change in climate farmers will be effected and if farmers are effected food security will be effected and without food security human beings will have a hard life.

1.5 Operational Definitions

Climate

Climate is the average weather over a longer length of time in a particular place. A description of a climate includes details such as the typical temperature in each season, the amount of rainfall, and the amount of sunshine.

Climate Change

Climate change describes a change in the average conditions such as temperature and rainfall in a region over a long period of time. This can be noticed by regular examination of weather patterns.

Farmer

A person who does agricultural works such as working in farm cultivating land and raising livestock are known as a farmer. They are the most important part of a society as without farmers the food will not be generated.

1.6 Objectives of the study

- ❖ To examine the socio-Economic conditions of farmers
- ❖ To Evaluate The perception on climate change
- ❖ To Document adaptation strategies implemented by the farmers

1.7 Methodology

Research is systematic inquiry into and examination of materials and sources in order to uncover information and draw new findings. In this study both primary and secondary data are used. The data are collected from questionnaire from 50 respondents. The respondents of the study were the farmers in Sreenarayanapuram village in Thrissur district's Kodungallur. The secondary data have been collected from various journals, Books, newspaper and magazines.

Every study has variable they are independent and dependent variables. In the Present study, Climate change is the independent variable and farmer is the dependent variables

1.8 Limitations of the study

The study's limits are those aspects of its methodology or design that affected or influenced how the results of your research were interpreted. The current study has been restricted in the below aspect. The Study has been limited to Farmers. The study has been confined to only farmers of Sreenarayanapuram village. The study has been limited to one independent variable, climate change and only one dependent variable, farmers

Chapter 2

Review of literature

2.1 Introduction

The review of related literature was the main emphasis of this chapter. This is where I located the published content that is relevant to my research topic. It covered every empirical study conducted previously in the subject area. The studies on achievement that have been conducted recently are the most pertinent and helpful to the current investigation. Knowledge is required to conduct research or complete a project, and the researcher must be conversant with the library's resources.

2.2 Review of Related Studies

Dibat and Nibal (2021) studied Climate Change Impacts, Farmers' Perception And Coping Mechanism By Small And Marginal Farmers they attempted to Ascertain the climate change trends using climatic data, Identify farmers' perception on climate change and qualifying factors of their perception, Examine the effects of climate change the livelihood of small and marginal farmers, Examine the important coping mechanisms of climate change induced problems at household and community levels, which are being practiced. They used bibliometric analysis on Scopus and web of science and found the literature to be reviewed. Secondary data on climate change has been done by using trend analysis, R² value, Mann-Kendal's test and Sen's slope estimator, analysing the climatic indicators during different period such as monthly, seasonal and annual period. Their secondary sources include data from government website and other previous literatures. For primary data Small and marginal farmers interview were taken as a sample. Their research has found that important climatic factors have been found to be changing over the last three decade. They also found that there is change in climatic parameters such as delay onset of monsoon, decline rainfall in agriculture period, reduction number of rainy days during agriculture period, increase temperature during Kharif, they found that farmers know about changes in the climate in their regions. they found that small and marginal farmers are the most vulnerable due to change in climate. They found that Climate change mitigation mechanisms have been understood as

actions to take advantage of opportunities to mitigate the impacts of climate change, creating a more resilient agricultural community. Their study is the one of its own kind to have classified the climate change effects on each phases of kharif agricultural practices and identified the key coping mechanisms adopted by farmers in each of these kharif agricultural phases

Manoj Kumar Das (2018) studied Impacts of Climate Change on Agricultural Productivity Vulnerability and Adaptation Strategies of Farmers A Case Study in Odisha through their study they tried, to understand the climate variation in the state of Odisha, To analyse climate variations in the study districts (Bolangir & Jagatsinghpur) and impacts of climate change on the productivity of selected crops, To assess the vulnerability of farmers to climate change in the study area, To explore the adaptation strategies to climate change used by the farmers and they found by using primary and secondary data in which primary data is collected from 397 farm households in a total of eight villages of Bolangir and Jagatsinghpur districts of Odisha with four villages from each district. They found that rainfall trend is decreasing, they also found that average temperature is increasing in alarming rate in Odisha, Climate shocks such as flood, cyclone and drought are regular phenomena in Odisha they found that there is either a decrease in area cultivated or decrease in yield rate. The yield rates of various crops have been highly erratic which may be due to bad weather, natural calamities or factors specific to the local area. Irrigation and fertilizers are found to be very instrumental 185 in increasing the yields of the crops there is a significant decreasing trend in monsoon and annual average rainfall are also found in both the districts

Badekhan and Almaszabeen (2022) studied Impact of Changing Climate on Agricultural Productivity and Farm Income in Northern Dry Zone of Karnataka and analysed spatial and temporal changes in climate in the Northern dry zone of Karnataka, measured the impact of dynamic factors of changing climate on cropping pattern and crop productivity in Northern dry zone of Karnataka, and found that there Is increase in average minimum temperature. Estimated the relationship between changing climate, cropping pattern, and farmers' income in the Northern dry zone of Karnataka. they assessed the perception and coping strategies of farmers to changes in the climate. They collected data of irrigation rainfall. Their data are

from Website of NASA, Agriculture ministry. They observed that there is a uneven distribution and irregular pattern of precipitation which according to them is influenced by deforestation. They found that there is shifting of precipitation from to other seasons which led to delaying in the sowing and decrease in harvest from season crops. They found that there is decreasing trend in rainfall. They found that land and

of crops is decreasing due to the diversification of crops. Intensity of cropping was found to be increased. There was a change in cropping pattern as the price of crops change. factors influencing the cropping pattern in the zone were development of new technology, availability of inputs and facilities, labour availability, improvement in technology, farm size and tenure, plant and water management government agrarian policies, social factors. They found that price of farm harvest is increasing over time. According to them age is a important factor with which social status is associated with. Perceptions that were common in sample farmers were decrease in rainy days, decreased crop yield, droughts, drying of water resources, loss of net income, late onset of monsoon, shift to non-agricultural activity, increase in pests and diseases, crop failures, floods, migration and decreased livestock yield they also found that The main variable cost was labour, but the main fixed cost was the land rental value. Other costs included in fixed costs included land revenue and taxes, depreciation on farm equipment and construction expenditures, and interest on working capital.

Mohapatra and Debasish (2022) studied Climate Change and Coping Mechanism of Small and Marginal Farmers an Empirical Study in Coastal Kendrapara District of Odisha India. They found the climate change trends using climatic data in east-southern coastal plain of Odisha's agriculture climatic zone, studied the climate change induced coastal livelihood vulnerability among small and marginal farmers of Kendrapara, Odisha, calculated who are the most vulnerable groups and what are the coping mechanisms of climate change induced problems at household and community levels, which are being practiced. They used livelihood vulnerability index to study. The factors such as Highest level of education in household, Land holding size, Number of income sources where important factors having impact on climate change. They found that farmers with agriculture as main source of income are more vulnerable than the farmers with other additional incomes. They used ANOVA and

T-test. They found that farmers with ability to loan from friends and relatives and with good social connections and can buy seeds using these after a disaster make them more resilient

Rajkumar R (2021) studied Livelihood Vulnerability of Rice Farmers of Tamil Nadu India to Climate Variability and Extremes. they studied the extent of variability and extremes in temperature and rainfall over the Tamil Nadu region, Identified the extent to which yield of rice is influenced by the variability and extremes in temperature as well as rainfall, and Identified the extent to which the rice farmers of Tamil Nadu adapts to the climate variability and extremes. They conducted a field survey among the rice cultivating farmers in the Cauvery Delta Region of Tamil Nadu. And surveyed 400 farmers. Also used secondary data from Agricultural ministry and meteorological department. They used stratified random sampling for selecting the farm households. They used Multiple linear regression models and used Livelihood vulnerability index to calculate the vulnerability. They found during survey that farmers perceive that there is change in temperature and rainfall. They found that farmers take cultivation decision based on the availability of water for irrigation. They found that farmers diversified their income and did not solely depend on farming. There are both supply and quality issue in drinking water and most families use vessels to store drinking water. Supply issue was also found to be an issue. Salt containing water is also a problem for them. They also found that about 20% of households did not have toilets. They have public health facilities near them which helps in better public health. They found that half of the farmers went o Self Help Groups and they recived loans from friend or relatives. Only 20% of farmers received insurance. Thanjavur districts was found to be most vulnerable which was caused by scarcity of water ,socio demographic profile and scarce social networks. Farmers cultivating in Samba season (**August through January**) are most vulnerable And those cultivating in Kuruvai (June – July) is least vulnerable, also having highest adaptive capacity. They found that Small farmers was most vulnerable

Jha and Chandan Kumar(2021) studied on Climate Change and Indian Agriculture Analyzing Adaptation Strategies for Improving Farm Productivity and Profitability in Bihar. They used questionnaire method and collected primary data from 700 farmers. They investigated the influence of farmers perception of climate change and found that most farmers perceive a change in temperature and precipitation level. Impact of frost and

temperature to extreme had highest impact upon them. They perceived changes in both Kharif and Rabi season . They also comprehended the way in which farm households' socioeconomic factors affect their access to agricultural extension services, financing availability, and the adoption of adaptation techniques. And found that income from farmers increase with increase in farm land. 92% farmers predict their weather using the actual climate and climate last year. The knowledge or information they get from television or radio or mobile phones are related to adaption strategies such as soil conservation, water conservation and buying of insurance. Those, who get information are more likely to predict the climate. They found that most farmers get extension from their farmer friends. They found that there is positive relationship between adaptation strategies and agriculture extensions. They found that 96%of farmers avail loans from Banks and 91% avail from cooperative society. 92% found delay in availing loan from banks leading them to take loans from informal sector. They also found the difference of net revenue of those who adapted and those who don't. Financial risk diversification is found to have important impact on farm revenue. Changing farm management for adaptation is found to be expensive. Limited access to credit is the next limitations for adaptation.

Amanda J (2020) studied analysis of farmer resilience towards climate variability and extremes in the most vulnerable areas in lower vellar river sub basin India. They mainly comprehended the trends of temperature and precipitation of Lower Vellar River sub-basin of Tamil Nadu and found that there is increasing trend of extreme rainfall in the region. And there is a early coming of monsoon. They collected primary data by Participatory rural appraisal (RRA) from 50 farmers and secondary data was from previous literatures and govt websites.

Nagendiran, K (2020) studied Impact of climate change on agricultural sector with special reference to Vellore district in Tamil Nadu They studied the agricultural status of the Vellore district and tried to identify the problems effected by farmers in the region. They tried to to understand how the study areas' agriculture has been affected by climate change. Comprehended the phenomenon of climate change and its effects on Tamil Nadu and India.

they categorized the main causes of India's climate change. Learn about the issues that the research area's farmers and the sample respondents experienced. And made recommendations for acceptable policy actions to promote agricultural development in the research area. 450 agricultural farmers were interviewed. They also used secondary data from previous literatures and other govt official sources. The study found that climate change is the main reason for not using land and selling of land. There is a association between area owned and cultivation method. Found that climate change is the main reason for loss in agriculture. 73% is found to have no insurance. They suggested a reduction in green house gas emission and govt intervention in development of farming.

Felkner et al., (2009) examined the intricacy of climate change and its impacts on rice production. They looked at the extent to which farmers could mitigate the effects of climate change. They discovered that farmers could mitigate climate change's more moderate consequences but were helpless to do so when it became more severe.

Anupama Mahato (2014), the effects of global warming have a substantial impact on the agricultural commerce and output of developing countries, as well as a raised danger of starvation. Less than 800 million individuals experienced chronic hunger in 1996; more recently, that number has risen to nearly 1 billion. According to estimates and projections from the United Nations (UN 2009), the world's population will reach 9.1 billion by 2050, an increase of 32% from 2010. In the 40 years leading up to 2050, the world's population is projected to increase by 2.2 billion, and many of the new populations in these nations will struggle to feed themselves.

Sharmin Akter Sonia and Towhidul Islam (2019). This effect affects human settlement, reducing the potential for participation in various income sources while also impeding current access to income sources. Additionally, this raises household expenses. Similar to Bangladesh, many other nations began to experience the adverse effects of climate change and the intensity of natural calamities including tropical cyclones, landslides, river erosion, and floods. Due to their insufficient financial resources, those who live in poverty will find it difficult to adapt to the changing climate.

Deresá (2007) used the Ricardian method to analyze the effects of climate change on Ethiopian agriculture and how farmers made adjustments to various environmental conditions. For the study, data from 11 of the country's 18 agroecological zones were

analyzed. covering more than 74% of the country with a survey of 1,000 farmers from 50 different regions. The regression study demonstrated that the variables related to soil, household, and climate had a significant impact. impact on the average net income per acre for farmers. Overall, the findings indicated that Ethiopians experience the negative effects of both rising temperatures and decreasing precipitation.

Uvirkaa Akumaga et al. (2018) findings of various research, grain yields in West Africa are predicted to decrease by 10% by 2050 as a result of climate change, Other research indicates that some areas would also see a shortening of the growing season, which might exacerbate West Africa's already long history of agricultural underperformance. The population of the area is projected to double by 2050, necessitating a five-fold increase in food production merely to stay up. Despite these predictions, research looking into local mitigation and adaptation options frequently came to surprisingly upbeat outcomes.

Pattanaik and Rajeevan(2010) examined changes in India's monsoon season extreme rainfall events from 1951 to 2005. A considerable upward trend in the average frequency of intense rainfall events over India was discovered by the study.monsoon time. Additionally, the study discovered a declining pattern in low rainfall occurrences that maintain the region's seasonal average rainfall in balance.

Sahu and Khare(2015) examined the variations in monthly, seasonal, and yearly rainfall for 30 districts in Odisha from 1901 to 2010. In the districts of Bolangir, Jharsuguda, Deogarh, Nuapada, and Sundargarh, there is a marked decline in yearly rainfall. Similar to this, Deogarh, Jharsuguda, and Sundargarh districts have seen a noticeable decline in monsoon rainfall. The eastern districts of Odisha, however, showed a considerable positive trend in yearly rainfall, according to the study.

Saravanakumar (2015) Using panel data from 13 districts in Tamil nadu for the years 1971 to 2009, calculated the effects of climate change on agricultural productivity and discovered a quadratic link between climate factors and rice and sorghum yield. The findings show that rice and sorghum are sensitive to variations in rainfall and temperature, and that these climate factors have a favorable impact on yields up to a certain threshold. However, as the temperature and rainfall rise above the threshold level, the yield is significantly impacted.

Ray and Goel (2021) For five different climatic zones of India, calculated dependencies, spatiotemporal trends, change points, and stationarity in rainfall and rainy day series from 1901 to 2013. A long-term dependence on an annual and seasonal basis is only present in one-fourth of the station rainfall and rainy day datasets. Nearly all of India's climatic areas showed a strong presence of lag-one serial correlation. Most sites in semi-arid and humid sub-tropical regions showed a considerable downward trend. For the majority of the study area, the annual and monsoon seasons saw a 10% reduction in rainfall volume.

Ram et al. (2018) In Texas, from 2008 to 2016, assessed the effects of drought on crop productivity and cropping area across 10 climate zones. According to the findings, the yield of winter wheat and corn was more negatively impacted by drought than that of cotton and sorghum. Additionally, the findings suggested that drought-tolerant crops like sorghum and increased irrigation during dry spells could lessen the impact of drought on crop productivity.

Patel et al. (2020) undertook a community-level research of the effects and resilience to natural disasters in Odisha, India. According to their research, marginal and small household farmers were the ones who were most affected by natural disasters, and they turned to distribution networks, early warning systems, multipurpose cyclone rehabilitation facilities, and seasonal residential care facilities as coping mechanisms. Awas Yojana, Indira

1.3 Research gap

the research gap existing in the studies are that in the study the sample taken from farmers of Sreenarayanapuram village may be extended to district level and state level. The study can be conducted among people other than farmers In the study only climate change is independent variable. In the study only farmers are dependent variable

Chapter 3

Theoretical Framework

3.1 Introduction

Climate change effects farmers in different ways and it may be different type of change in different regions and thus different farmers experience and perceive different changes.

3.2 Global Scenario

In Global context, studies have proven that climate change exist. Its effect farmers negatively. They way farmers are effected are different in different regions. In Some region rain precipitation level is lower than the usual which in turn effect farmers by having them depend heavily on ground water. In some regions temperature is lower than what it used to be which forms ice particles on crops thus damaging the crop. These effect farmers are a large aspect. Area or region which was never effected by flood are starting to see flooding. This has caused huge loss in crops grown. The places which was never in drought have started to experience drought which have led to farmers being effected.

Globally farmers are experiencing a huge loss due to climate change as unexpected variable like climate change have caused many investments of time and money to not bear fruit which in turn causes farmers to go bankrupt. There is increase in suicide rate among farmers as due to high media attention more farmers are being given high amount of attention.

According to a paper in Elsevier's Earth Science Reviews published last year, the sea surface temperatures over the Arabian Sea increased by 1.2°C to 1.4°C in recent decades.

According to a research paper published in the Nature magazine in 2021, there is a noticeable upward trend in the severity, frequency, and duration of cyclonic storms (CS), have been seen over the Arabian Sea from 1982 to 2019.

3.3 Indian Scenario

In India The farmers are socially and economically being effected by climate change. The unexpected increase in precipitation have caused many regions of India to face unexpected flood which led to increased destruction of crops. The increase in cyclone in Bay of Bengal

and Arabian sea have led to increase in crops being effected by cyclone or high wind which destroys crops.

Increase in temperature in India have caused decrease in production of crops. This has effected farmers economically. Due to effect of flood in north Indian states there have been shortage of crops in the market which have led to increase in prices of vegetables. New crop insurance scheme in India have increased farmer's confidence in farming. Increased monsoon rain have caused 100 death in north Indian states. The India Meteorological Department (IMD), the Aridity Anomaly Outlook Index revealed that about 78 per cent of India's districts are experiencing drought-like conditions.

3.4 Kerala Scenario

According to a recent study that was published in the international journal Environmental Science and Pollution Research, the average temperature has risen by 0.54 degrees Celsius during the last 39 years. The study also noted an increase in daily average temperature of 0.013 degrees Celsius in Kerala.

The average annual mean land surface air temperature (1971-2020) increased by 0.45 degrees Celsius last year over the southern state, according to the "Statement on Climate for the State of Kerala-2022" published by the Institute of Climate Change Studies (ICCS), government of Kerala. The mild winter season, when the average mean temperature increased by 1.02 degrees Celsius, was the biggest contributor to Kerala's warmer-than-normal annual mean temperatures.

There has been increased loss of crops due to unexpected flood in Kerala. A study by agricultural meteorologists at Kerala Agriculture University (KAU) shows that minor changes in temperature have not affected the first paddy crop (Virippu) season, which runs from April-May to Sep-Oct. A dispersed and unsettling pattern of rainfall has been noted to have an impact on the agriculture calendar.

Crops on around 40,960 hectares (ha) of agricultural land were lost to calamities in the state in just three-and-half years from June 2019 to December 2022, as per data from the agriculture department

From these we can see that climate change is effecting farmers in kerala.

3.5 Adaptation strategies

Farmers make adaptation to their planting by using mixed cropping and using more fertilizers and change the crops. But some farmers like coconut farmers can't change anything other than fertilizer and plants as these kind of crops are hard to adapt to climate. They are usually a very long term investment without any possibility to change

Chapter 4

Data Analysis and Interpretation

4.1 Introduction

Data analysis is the methodical application of logical and/or statistical approaches to describe and demonstrate, summarize and assess, and assess data. The data collected are used to interpret new information this will be used to increase the knowledge and help in studying and research better.

4.2 Profile of the study area

Sreenarayanapuram village is a place situated Thrissur districts Kodungallur region. It situated in Mathilakam block.

This study is conducted among the farmers in Sreenarayanapuram village. Through questionnaire method 50 samples were randomly collected

4.3 Data analysis

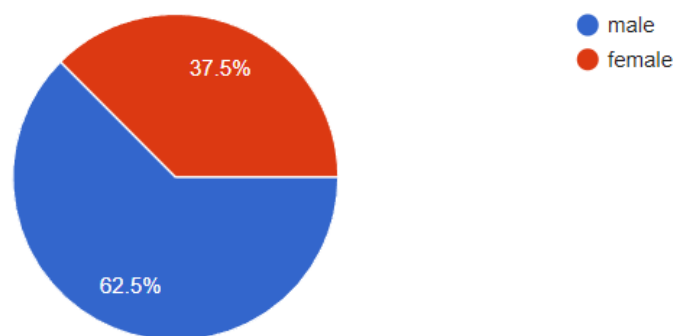


Fig 4.3.1

The fig 4.3.1 shows the respondents of the questionnaire and their gender .Of the respondents 62.5% are male and 37.5% are females. The random sampling method was used to collect data.

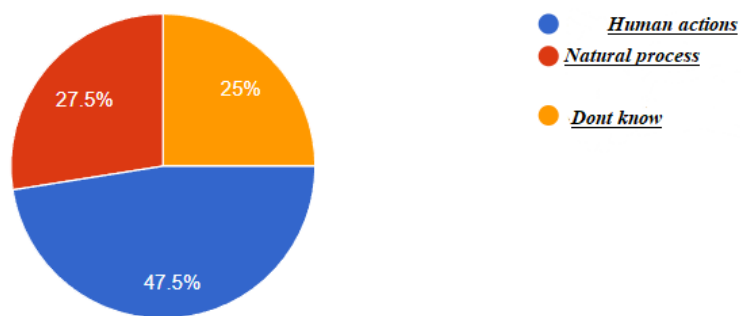


Fig 4.3.2

Fig 4.3.2 shows the the respondents reply about the reason for climate change and the reply are collected by random sampling method and all of the respondents have responded to the question. In which 47.5% think that it is human action and 27.5 % think that its natural process. And 25% doesn't know about the reason.

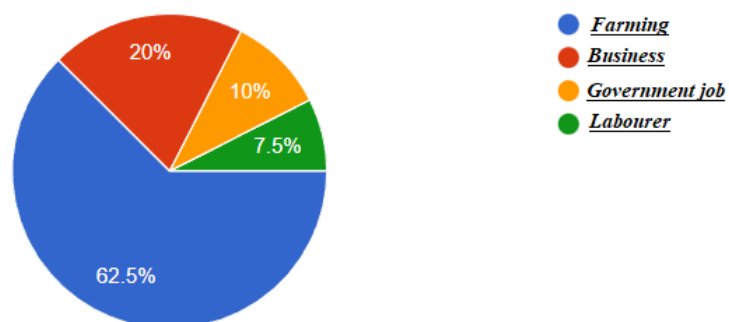


Fig 4.3.3

The fig 4.3.3 shows the primary source of income of farmers They are farming, business, government jobs, labourer. The 62.5% of respondents have farming as their primary source of income. 20% have business as their source of income. 10% have government job as their source of income. 7.5% have labourer as their source of income

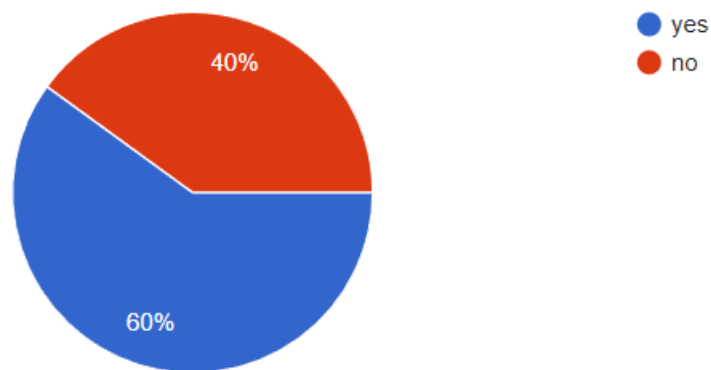


Fig 4.3.4

The fig 4.3.4 shows whether the respondents have health insurance or not. In which 60% have reported that they have insurance and 40% have reported that they don't.

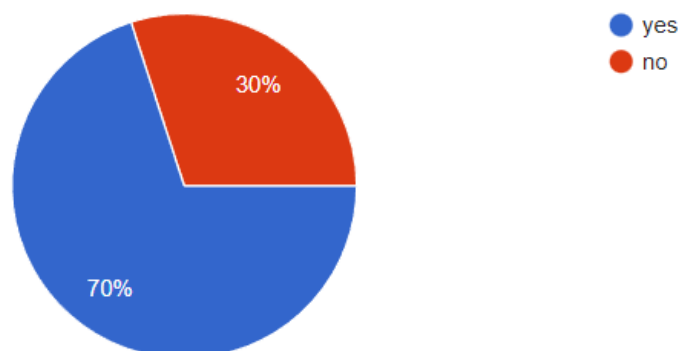


Fig4.3.5

Fig 4.3.5 Shows whether the respondents receive early warning of climate change and weather .in which 70% responded that they receive climate change information and 30% responded that they don't

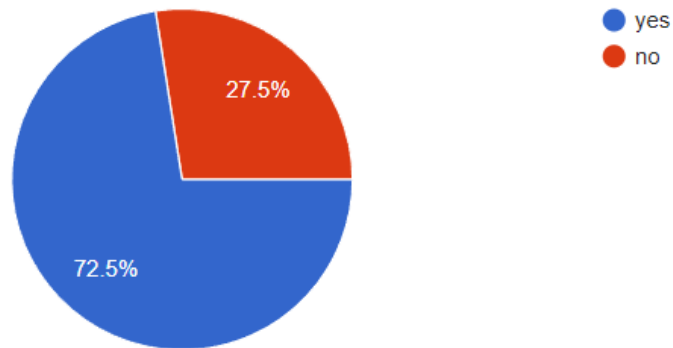


Fig 4.3.6

Fig 4.3.6 shows whether the respondents have lost their crop due to climate change And 72.5 % have reported that they have lost their crops due to climate change. And 27.5% don't.

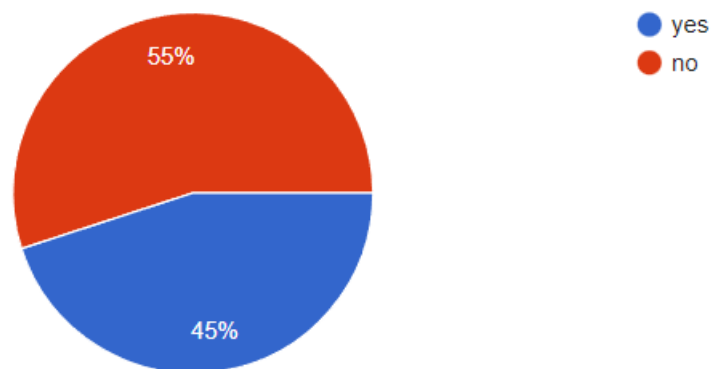


Fig 4.3.7

Fig 4.3.7 shows whether the female house hold member have any economic activity. In which 45% have responded that they have and 55% shows that they don't have any economic activity

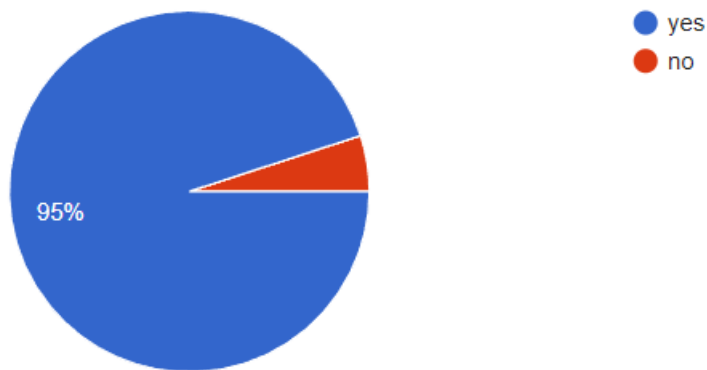


Fig 4.3.8

Fig 4.3.8 shows whether the respondents have their own cultivatable land and the 95% of the people have land and 5% does not

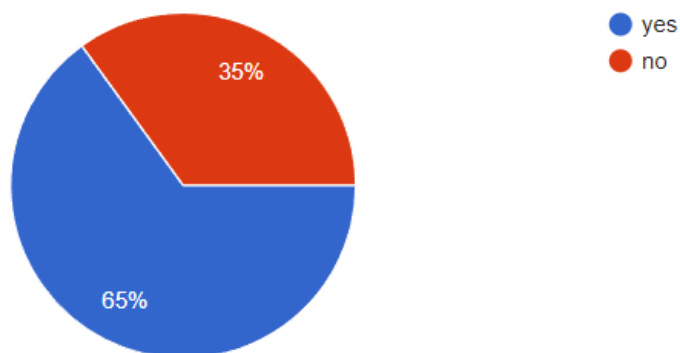


Fig 4.3.9

Fig 4.3.9 Shows whether the respondents are depended on rain but the 65% of respondent reported that they depend on rain and 35% have reported that they don't.

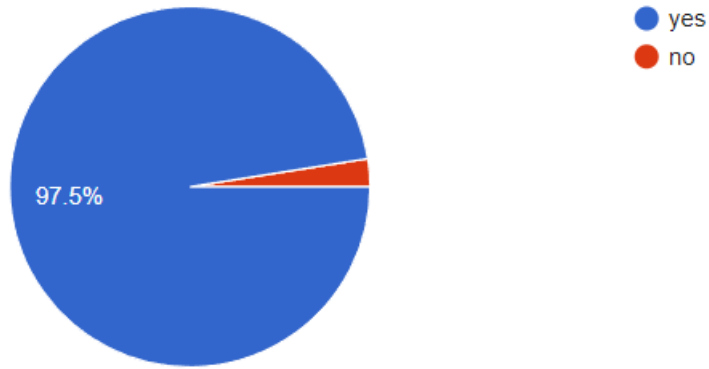


Fig 4.3.10

The Fig 4.3.10 shows whether there is any change in production of crops due to climate change and 97.5 % have replied that there is change in production and 2.5% have reported that there is no change.

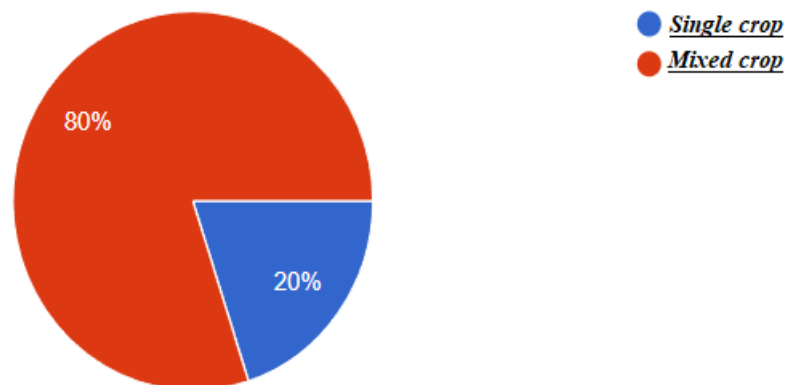


Fig 4.3.11

Fig 4.3.11 shows whether the the respondents use mixed cropping or single crop cultivation. 80% of respondents responded that they do mixed cropping and 20 %do single crop farming

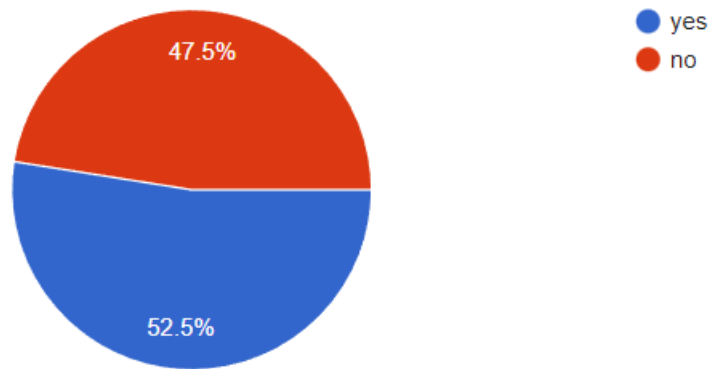


Fig 4.3.12

Fig 4.3.12 Shows whether the respondent receive expected price for their crops and 52.5% replied that they do receive expected price and 47.5 % expect that they don't

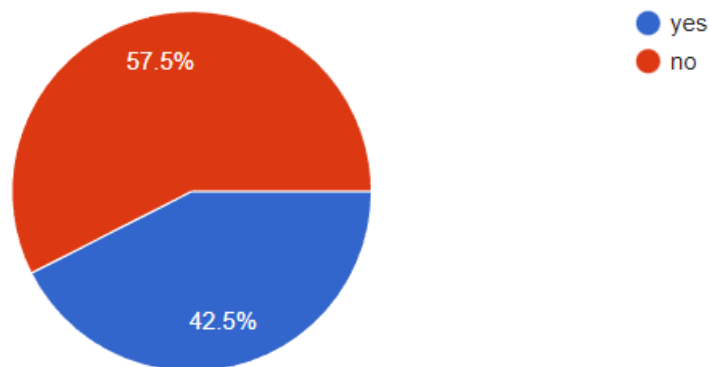


Fig 4.3.13

Fig 4.3.13 Shows whether the respondents received help from government due to problems of climate change. And 42.5% received help from government and 57.5% have not received any help from government.

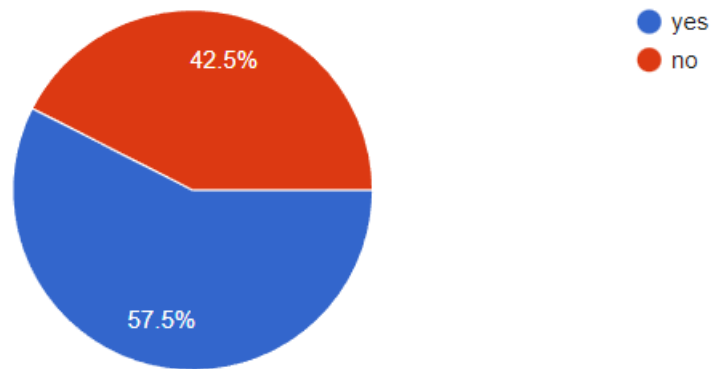


Fig 4.3.14

The Fig 4.3.14 shows whether the respondents perceive that there is unexpected rain patterns and 57.5 % Perceives that there is unusual rain pattern and 42.5% perceives that there is no unusual rain pattern.

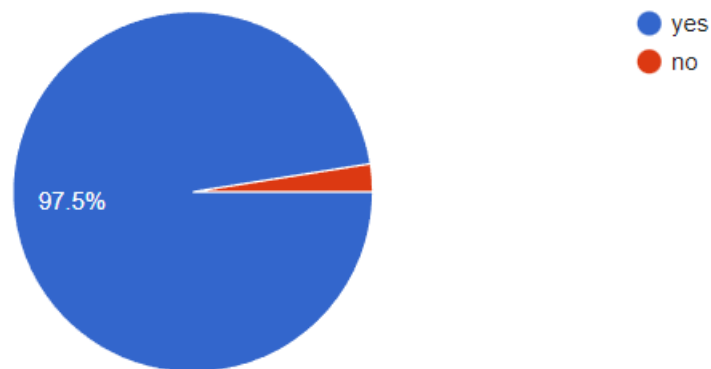


Fig 4.3.15

Fig 4.3.15 shows whether they perceive increase in atmospheric temperature.

97.5% perceive a increase in temperature and 2.5% does not.

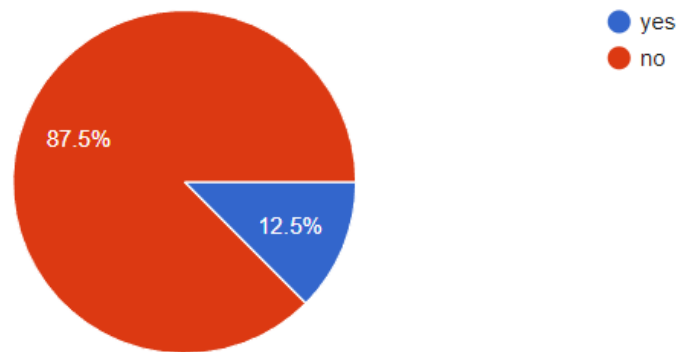


Fig 4.3.16

Fig 4.3.16 show whether the respondents have any insurance and 87.5% responded that they don't have insurance on crops and 12.5% responded that there is crop insurance.

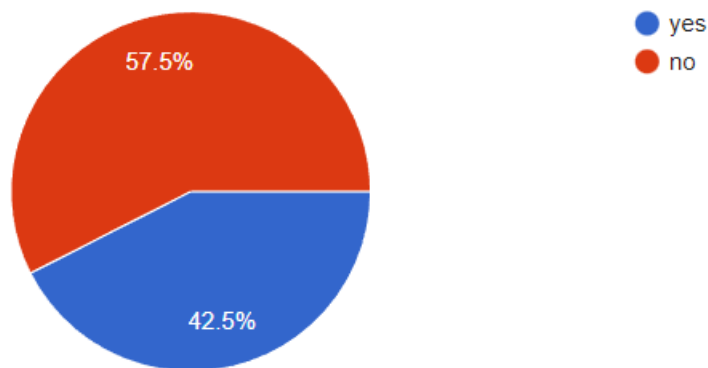


Fig 4.3.17

Fig 4.3.17 Shows whether they own agricultural machineries and 57.5 % say that they don't own machineries and 42 .5 says they own machineries.

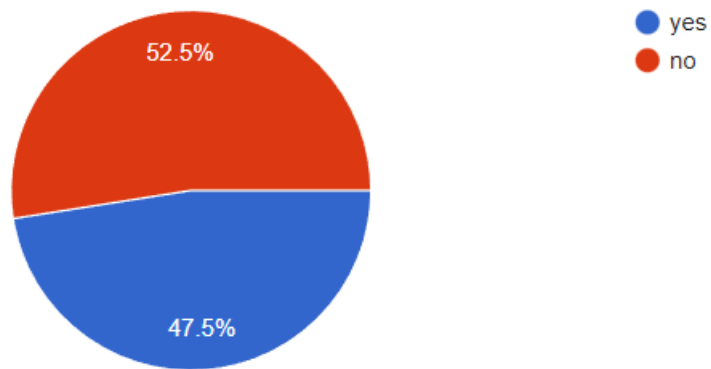


Fig 4.3.18

Fig 4.3.18 shows whether the respondent own live stock and 47.5 % responded that they own live stock and 52.5 % responded that the don't own live stock.

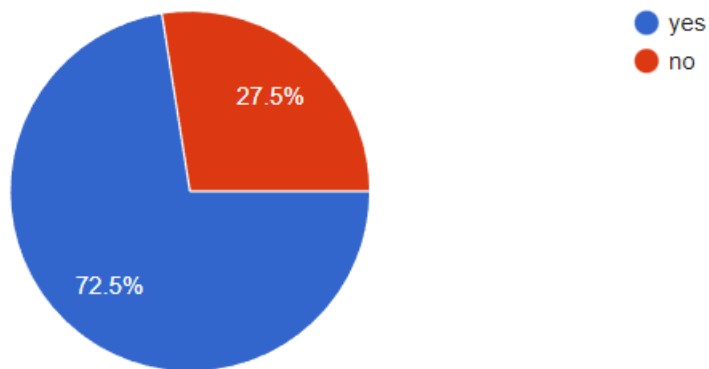


Fig 4.3.19

Fig 4.3.19 shows whether they perceive that the amount of irrigation frequency is higher than the past. And 72.5 % perceive that their irrigation is more frequent than past times and 27.5% perceive that it's not.

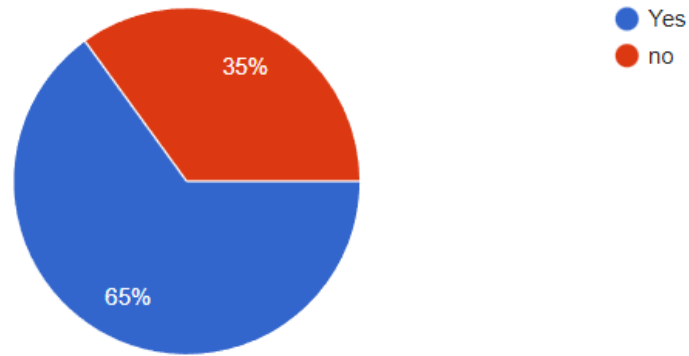


Fig 4.3.20

Fig 4.3.20 Shows whether they use higher amount of chemical fertilizers than the past and 65% use higher amount of chemical fertilizers than past and 35% does not.

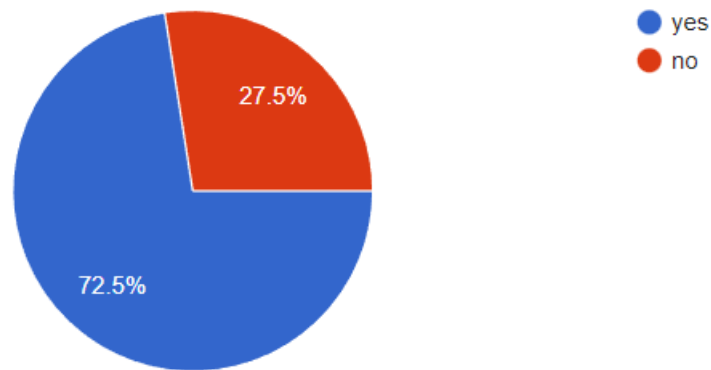


Fig 4.3.21

Fig 4.3.21, It shows whether there is a increase in use of pesticide than compared to past. And 27.5 % responded that they don't use more pesticide and 72.5 % says that they use more pesticide.

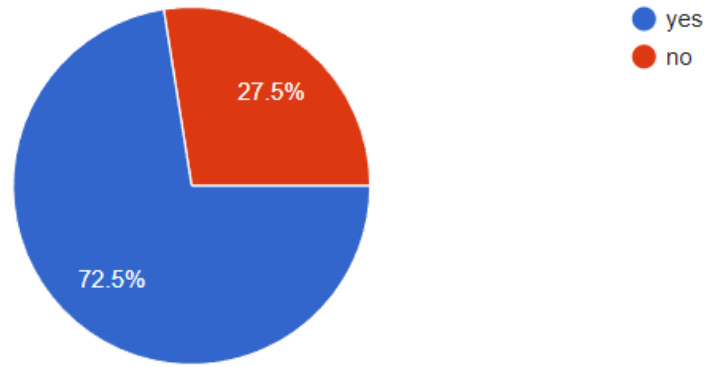


Fig 4.3.22

Fig 4.3.22 Shows whether they have used adaptation strategies for climate change effect. And 72.5% responded that they use adaptation strategies and 27.5% does not.

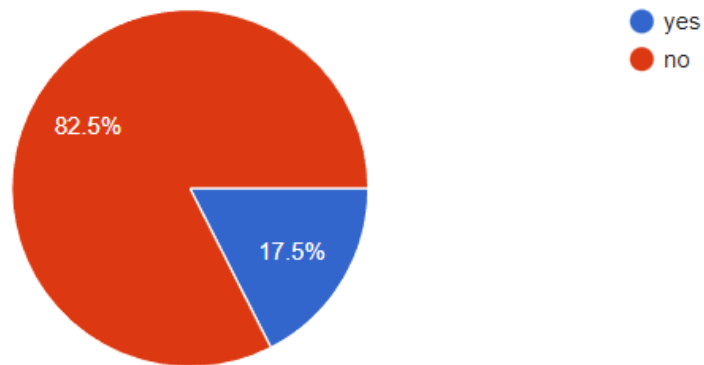


Fig 4.3.23

The Figure 4.3.23 shows whether there is any need for them to migrate to other regions for other jobs. And 17.5% migrate to other regions for job and 82.5% don't.

CHAPTER 5

FINDINGS, SUGGESTIONS AND CONCLUSION

5.1 Findings

- There are 50 responses and 62.5% of them is male and 37.5% is female
- 95% of the respondents have cultivatable land and only 5% don't have them.
- 62.5% of respondents are primarily depended on farming and 20 % are depended on business and 10% have government jobs and 7.5% are labourers.
- 57.5% of people have 1 source of income and 25% have 2 source of income and 17.5 % have 3 source of income.
- 47.5% of respondents believe that human actions are the reasons for the climate change and 27.5% believe that it's a natural process and 25% don't know the reason for climate change.
- 60% of the respondents have health insurance and 40% don't have health insurance.
- 70% receive early warning about climate change and 30% doesn't receive any warnings.
- 72.5% of the respondents have lost crops due to climate change. And 27.5% have not.
- 55% of the respondent's female household does not have economic activity and 45% of the respondent's female household have economic activity.
- 65% of the respondents depend on rain and 35% does not depend on rain.
- 97.5% believe that there is change in production of crops due to climate change
- 80% of the respondents are cultivating mixed crops and 20% are cultivating single crop.
- 52.5% of the respondents believe that they get expected price for the crops and 47.5% does not believe that they get expected price.
- 57.5% have not received any government help due to climate change and 42.5% have received help from government
- 57.5 % perceive unusual rain patterns and 42.5% don't perceive it.
- 97.5% perceive that the temperature of atmosphere is increasing and 2.5% does not.
- 87.5% does not have insurance on crops and 12.5% have insurance on crops.
- 57.5% have farming machineries and 42.5% does not have farming machineries
- 52.5% does not have any livestock but 47.5% have live stock in their land

- 72.5% perceive that they have increased irrigation compared to past. 27.5% does not.
- 65% use more chemical fertilizers than the past. But 35% does not use more than the past.
- 72.5% perceive that there is increase in use of pesticides than the past but 27.5% perceive that there is no change in use of pesticide.
- 72.5% have used adaptation strategies for farming and 27.5% does not.
- 17.5% had to migrate to other regions for jobs where as 82.5% doesn't.

5.2 Suggestions

Most of respondents feel climate change in a way. And thus climate change strategies should be more used to combat the climate change. Most of the farmers don't have insurance on crops this could lead to a lot of unwanted risk as there are more government oriented insurance on crops now with insurance they can protect their crops and peacefully farm. There are unusual rains so the farmers should always be up-to-date with information about weather and they should try to increase knowledge of climate change and their effect on them.

5.3 Conclusion

Farmers are effected by climate change and farmers don't take insurance on their crops. They perceive a increase in atmospheric temperature and most of them own their own land. Majority of the farmers does not have livestock which could be a huge investment to compact climate change.

Most of them have only one source of income so diversification of income should be a priority to farmers. Most of them own machineries. And there is a increase in irrigation use this may lead to consumption of ground water leading to its depletion.

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QUESTIONNAIRE

1. NAME

2. AGE

3. GENDER

- MALE
- FEMALE

4. DO YOU OWN CULTIVATABLE LAND?

- OWN CULTIVATABLE LAND
- DON'T OWN CULTIVATABLE LAND

5. NUMBER OF PRIMARY SOURCE OF INCOME

- 1
- 2
- 3

6. WHAT IS THE REASON FOR CLIMATE CHANGE?

- HUMAN ACTIONS
- NATURAL PROCESS
- DON'T KNOW

7. THE PRIMARY SOURCE OF INCOME

- CULTIVATION
- BUSINESS
- GOVERNMENT JOB
- LABORER

8. DO YOU HAVE HEALTH INSURANCE?

- YES I OWN A HEALTH INUSRANCE
- I DON'T OWN A HEALTH INSURANCE

9. DO YOU RECEIVE EARLY WARNING ABOUT CLIMATE CHANGE?

- I RECEIVE EARLY WARNINGS
- I DON'T RECEIVE EARLY WARNINGS

10. HAVE YOU LOST CROP DUE TO CLIMATE CHANGE?

- I HAVE LOST CROPS DUE TO CLIMATE CHANGE
- NO

11. FEMALE HOUSEHOLD HAVE ANY ECONOMIC ACTIVITY?

- YES
- NO

12. DO YOU DEPEND ON RAIN FOR IRRIGATION?

- I DEPEND ON RAIN
- I DON'T DEPEND ON RAIN

13. IS THERE ANY CHANGE IN CROP PRODUCTION DUE TO CLIMATE CHANGE?

- YES, THERE IS A CHANGE
- NO, THERE IS NO CHANGE

14. DO YOU CULTIVATE SINGLE CROP?

- YES I CULTIVATE SINGLE CROP
- NO I CULTIVATE MIXED CROP

15. DO YOU GET EXPECTED PRICE FOR THE HARVEST?

- YES
- NO

16. DID YOU RECEIVED ANY HELP FROM GOVERNMENT FOR FLOOD OR DROUGHT?

- YES
- NO

17. DO YOU PERCIEVE ANY UNUSUAL RAIN?

- I PERCEIVE AN UNSUSAL RAIN
- NO I DON'T PERCIEVE

18. DO YOU PERCEIVE AN INCREASE IN ATMOSPHERIC TEMPERATURE?

- I PERCEIVE AN INCREASE IN ATMOSPHERIC TEMPERATURE
- I DON'T PERCEIVE AN INCREASE IN TEMPERATURE

19. DO YOU HAVE INSURANCE ON CROPS?

- YES, I OWN INSUANCE
- NO I DON'T

20. DO YOU OWN FARMING MACHINERIES?

- YES I OWN MACHINERIES
- NO I DON'T OWN

21. DO YOU OWN LIVESTOCKS?

- YES, I OWN LIVESTOCK
- NO I DON'T OWN LIVE STOCK

22. DO YOU THINK USE OF CHEMICAL FERTILIZERS INCREASED AS COMPARED TO PAST?

- YES
- NO

23. DO YOU THINK THE USE OF PESTICIDE HAVE INCREASED AS COMPARED TO PAST?

- YES
- NO

24. DO USE ADAPTATION STRATEGIES IN FARMING FOR CLIMATE CHANGE?

- YES I USE ADAPTATION STRATEGIES
- NO I DON'T USE ADAPTATION STARTEGIES

25. DO YOU HAVE TO MIGRATE TO OTHER PLACES FOR JOBS?

- YES
- NO