BIBLIOGRAPHY

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ABSTRACT

The study was conducted to document the awareness of the respondents on climate change. Thus, this study aimed to determine their perception about climate change based on their observation. A total of 50 respondents were taken randomly.

All of the respondents were aware on climate change and their perception were abrupt changes in temperature, occurrence of super typhoon, abrupt changes in weather condition, changes in season like prolong dry and wet season, La Nina and El Nino.

The weather data shows that from 2000 there is a gradual increase and decrease yearly in temperature. Pest and diseases occurs during wet and dry season that damaging crops in field is still being experienced now. Most farmers use chemicals to control pest and diseases. Strategies applied by farmers were they preferred to changed variety of crops, change of crops and plan production program and implement.

Farmers were aware of climate change which accordingly is being experienced now with a lot of changes in weather conditions. Farmers plan and implement production program to cope-up with climate change and weather changes.

Farmers engaged in eggplant production are encouraged to decrease the use of chemicals because this is contributory to the climate change. It is, therefore, recommended that farmers should reduce their application of chemical inputs to reduce effect on global warming and pollution to air and soil.

INTRODUCTION

Rationale

Climate change is a long-term change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. It may be a change in average weather conditions or the distribution of events around that average (e.g., more or fewer extreme weather events). The Philippines, as a developing country and biodiversity hotspot, is highly vulnerable to climate change impacts The Philippines has experienced temperature spikes brought about by climate change. It has observed that warming is experienced most in the Northern and Southern region of the country, while Metro Manila has warm less than most parts. The sector most affected by climate change, so far, is agriculture and food security. The sharpest fall in agricultural productions are experienced during strong El Nino events and after the occurrence of severe tropical cyclones. Decreases in agricultural productivity and aquaculture will ensue due to thermal and water stress, sea- level rise, floods and droughts, and tropical cyclones would diminish food security in many countries of Asia (Jabines and Inventor, 2007 and Zhai and Zhuang, 2007). The predicted changes in temperatures and rainfall patterns, as well as their associated impacts on water availability, pests, disease, and extreme weather events are all likely to affect substantially the potential of agricultural production (Zhai and Zhuang, 2007). These factors, individually and cumulatively, lead to reductions in agricultural production. Moreover, agricultural productivity will be depressed by increased climate variability and increased intensity and frequency of extreme events such a drought and floods. During the El Nino period crops become vulnerable to pest attacks and diseases. La Nina years bring heavy rain, causing massive runoff, severe erosion of

fertile soils, and inundation of agricultural areas and aquaculture farms (ADB, 2009). Farmers have always had to cope with the environment that surrounds them, gradually adapting to it. Most small-scale farmers have to deal with insufficient resources, and many are trying to grow crops in soils which the climate is changing and the resulting situations, weather temporary dry period or a hurricane, only adds to the list of challenges and to the sense of urgency.

Eggplant (*Solanum melongena L.*) is a popular vegetable crop grown in almost all backyards and school gardens throughout the country. It is used as a vegetable and is a basic ingredient in "pinakbet", a popular vegetable stew in the northern part of the country. It also goes well with meat and egg in preparation of eggplant omelets. Immature fruits are either roasted, fried, stuffed, boiled, pickled or processes while the young fruits are eaten raw. Among native varieties grown are Negros Purple, Pampanga Purple and Simeda. Two new eggplant varieties are also available, Dingras Long Purple and Dingras Multiple Purple. Foreign varieties include Black Beauty and Golden Gate. Eggplant grows in any kind of soil but thrives best in a fertile soil with sufficient moisture. Western Visayas farmers usually devote o.25 to 0.50 hectares to eggplant production. They usually allow eggplant seeds to germinate in a seedbox. Seedlings are transplanted in the field and in some cases in plots. Fertilizers and pesticides application is also practiced, whenever finances of farmers permit. Harvesting occurs as soon as eggplants attain marketable size and exhibit a bright, glossary appearance some farmers remove or harvest the fruits before they reach full maturity to attain the heavier crop. Harvesting is done by hand-picking the eggplants 3 months after planting. The general climate is long, warm growing season approximately 120 days. The temperature is 21°C to 29°C and the kind of

soil is deep sandy loam and clay loam. Satisfactory moisture supply, high fertility, and good drainage are needed. Eggplant is abundant from February to May, and dwindles from June to January. Thus, this study aims to identify the effect of climate change to eggplant production in Sto. Tomas, La Union.

REVIEW OF LITERATURE

Climate Change

Climate change is defined by Asian Development Bank (2008) as the variation in the Earth's global climate or regional climates over times scales ranging from decades to millions of years. Changes may be driven by internal processes, external forces or, most recently, by human activities. Pulse Asian describes climate change as "any long-term significant change in the average weather that a given region experience." It can be caused by dynamic processes on earth, variations in sunlight intensity, and in the past hundreds of years by human activities such as clearing of forests, technology and industry (ABS-CBN, 2010).

Climate change may be limited to a specific region or may occur across the whole Earth. Climate change results from the interaction of the atmospheric and oceanic factors. It is the ultimate effect of global warming. The United Nations Framework Convention on Climate Change (UUNFCCC) put more emphasis on anthropogenic causes of climate change particularly fossil fuel burning (Tebtebba Foundation, 2009). While the Earth's climate has always varied naturally over *millennia*, there is a a scientific consensus that human activities are now changing global climate. Precipitation patterns characterizing land areas of the Northern Hemisphere have progressively changed. These changes include more rainfall in the mid to high latitudes, and on the contrary, less rainfall in the sub- tropics

These factors further contribute to the difficulties in estimating the impacts of climate change on agricultural productivity (Zhai and Zhuang, 2007). Sto. Tomas La Union is not spared with all these effects of climate change in agricultural productivity.

Thus, this study will look into the effect of climate change to agricultural production specifically on eggplant which is one of the major case crop in the area.

The Impacts of Climate Change on People and Food

Food security will depend on the inter-relationships between political and socio-economic stability, technological progress, agricultural policies and prices, growth of per capital and national incomes, poverty reduction, women's education, trade and climate variability.

Climate change, however, will affect food production because of shifts in temperature and rainfall, people's access to food by lowering their income from coastal fishing because of rising sea levels or lowering a country's foreign exchange earnings by the destruction of its export crops because of the rising frequency and intensity of tropical cyclones. Overall, climate changes including global warming and increased climate variability, could result in a variety of impacts on agriculture.

Some of the impacts of climate change on food production which are already visible and seem to be increasing are: Increased heat stress to crop and livestock, e.g. higher night temperatures which could adversely affect grain formation and other aspects of crop development, Increased evapo-transpiration rate are caused by higher temperatures and lower soil moisture levels, concentration of rainfall into a smaller number of rainy events with increases in the number of days with heavy rain, increasing erosion and flood risks. Furthermore, there are changes in seasonal distribution of rainfall with less falling in the main crop growing season, sea level rise leading to coastal degradation and salt water intrusion.

Food production and supply disruption through more frequent and severe extreme events; increase incidence of pests and diseases that will negatively affect crop production.

Climate Change and Agriculture

The sector most affected by climate change, so far, is agriculture and food security. The sharpest fall in agricultural productions are experienced during strong El Nino events and after the occurrence of severe tropical cyclones. Decreases in agricultural productivity and aquaculture will ensue due to thermal and water stress, sea-level rise, floods and droughts, and tropical cyclones would diminish food security in many countries of Asia

(Jabines and Inventor, 2007 and Zhai and Zhuang, 2007). The predicted changes in temperatures and rainfall patterns, as well as their associated impacts on water availability, pests, disease, and extreme weather events are all likely to affect substantially the potential of agricultural production (Zhai and Zhuang, 2007). These factors, individually and cumulatively, lead to reductions in agricultural production. Moreover, agricultural productivity will be depressed by increased climate variability and increased intensity and frequency of extreme events such a drought and floods. These factors further contribute to the difficulties in estimating the impacts of climate change on agricultural productivity (Zhai and Zhuang, 2007).

METHODOLOGY

Locale and Time of the Study

The study was conducted in 3 barangays of Sto. Tomas La Union, namely Patac, Casilagan and Bail. The study was conducted on October to November, 2011.

Respondents of the Study

The respondents were 50 eggplant farmers. The respondents were chosen at random.

Data Gathering Procedure

The study made use of primary and secondary data. Questionnaires were distributed to the respondents and personal interview with the respondents was done during the collection of questionnaires to validate data. Secondary data were taken at PAGASA (Region I).

Data Gathered

The data gathered were the climatological data, agro-ecological data of the area and socio-demographic data of the respondents, observation in changes in agro-physical feature of the area and production data.

Data Analysis

The data collected were tabulated and analyzed using frequency and descriptive analysis and other appropriate statistical tool.

RESULTS AND DISCUSSION

Profile of the Respondents

There were 50 respondents from 3 barangays of Santo Tomas, La Union. Profile of the respondents as to their age, gender, educational attainment, civil status and years of experience in eggplant production are presented in Table 1.

Gender. As shown in the table, most (90%) of the respondents were males and 10% were females. This implies that farming is a job for males in the study areas. .

Age. The age of the respondents ranged from twenty to seventy nine years old. The largest percentage of the respondents belonged to 40-59 years age bracket with 58%; 32% belonged to 20-39 years age bracket, and 10% belonged to 60-79 years old bracket.

Religion. All of the respondents are Roman Catholic. This shows that the area is predominantly Catholic.

Educational background. As shown in the table, most ((72%) of the respondents had reached high school level; 16% college level, 10% had reached elementary level while only 2% were college graduate. This implies that the respondents had attended formal education.

Civil status. Table shows that most (94%) of the respondents were married and 6% were separated.

Number of years engaged in eggplant production. As to experience in eggplant production, 30% of the respondents had 16-20 years of experience, 26% had 5-10 years of experience, 22% had 11 to 15 years and 22% had 21 years and more.

Table 1. Profile of the respondents

CHARACTERISTICS	BARANGAY			
	PATAC	BAIL	CASILAGAN	PERCENTAGE
Gender				
Male	25	15	5	90
Female	-	5	-	10
TOTAL	25	20	5	100
Age				
20-39	10	3	3	32
40-59	12	15	2	58
60-79	3	2	-	10
TOTAL	25	20	5	100
Religion				
Roman Catholic	25	20	5	100
TOTAL	25	20	5	100
Educational Background				
Elementary	2	3	-	10
High school	19	15	2	72
College level	4	2	2	16
College graduate	-	-	1	2
TOTAL	25	20	5	100

Table 1. Continued ….

CHARACTERISTICS	BARANGAYS			
	PATAC	BAIL	CASILAGAN	PERCENTAGE
Civil Status				
Married	25	18	4	94
Separated	-	2	1	6
TOTAL	25	20	5	100
Years of experience in eggplant production				
5-10 yrs.	9	4	-	26
11-15 yrs.	5	6	-	22
16-20 yrs.	5	8	2	30
21- above	6	2	3	22
TOTAL	25	20	5	100

Weather Data

Table 2 shows rainfall and temperature. It shows that in year 2003 and 2009, the area experienced heavy rainfall. In year 2010 temperature was highest temperature (23.4 ^{o}C to 32.7 ^{o}C). In year 2000 lowest temperature at 23.5^{o}C to 31.5^{o}C was experienced. The weather data shows that from 2000 there is a gradual increase and decrease yearly in temperature.

Table 2. Data on annual rainfall relative humidity and temperature from 1990-2010 (Dagupan PAGASA Station)

YEARS	AVERAGEANNUAL RAINFALL(mm)	RELATIVE HUMIDITY	TEMPERATURE (ºC)	
			Minimum	Maximum
2000	337.2	83.3	23.5	31.5
2001	2071	81.8	23.7	31.9
2002	2730	83.4	22.9	31.9
2003	3500	83.8	22	31.6
2004	2814	84.3	21.9	31.8
2005	1622.1	82.7	23.8	32.4
2006	2304	82.1	23.0	32.3
2007	1942	81.1	22.8	32.2
2008	2157	82.0	22.8	32.1
2009	3306.1	82.4	22.6	31.9
2010	2187.6	81.5	23.4	32.7

Awareness on Climate Change.

Table 3 showed that all the respondents in all area were aware about climate change. As to their perception about climate change, all the respondents mentioned that climate is abrupt changes in temperature, most (96%) mentioned the occurrence of super typhoon, most (90%) also mentioned abrupt changes in weather condition, 78% said that changes in season like prolong dry and wet season, 30% experience El Nino and 20% experience La Nina. In terms of their cropping per year on eggplant production, there is no change because their cropping period is only once and it is being practiced until now. This implies that the

farmers were aware of climate change which according to them is the one being experienced now with a lot of changes in weather conditions

Table 3. Perception of respondents on climate change

PARTICULAR	FREQUENCY	PERCENTAGE
Abrupt changes in temperature	50	100
Occurrence of super typhoon	48	96
Abrupt changes in weather condition	45	90
Changes in season like prolong dry and wet season	39	78
La Nina	42	84
El Nino	25	50

Table 4. Crops grown

CROPS GROWN	1990-2000		2001-2010	
	F	%	F	%
Eggplant	50	100	50	100
Rice	43	86	39	78
Tobacco	35	70	40	80
Corn	21	42	15	30
String Beans	19	38	16	32
Bitter Gourd	10	20	15	3

Agro- Ecological Profile.

Table 5 shows the landscape of farm of the respondents. It shows the observe changes in agro-ecological profile in the farm and the causes of changes. There were 42 flat terrain and 8 of the respondents have terraced unirrigated.

Changes in agro-ecological profile in the farm. Table 5 presents the changes in demographic profile in the farm from 1990 to present. Most (94%) observed decreased supply of water and farm get easily flooded. Causes of changes in demographic profile were weather conditions (100%), soil erosion (80%), supply of water become scarce because the source dried-up (62%), La Nina (84%) and El Nino (50%).

Table 5. Changes in agro-ecological profile

PARTICULAR	FREQUENCY	PERCENTAGE
Farm landscapes		
Terraced unrrigated	8	16
Flat terrain	42	84
TOTAL	50	100
Observe changes in demographic profile in the farm		
Farm are easily get flooded	39	78
Decrease supply of water	47	94
Causes of changes in ecological Profile		
Weather conditions	50	100
Soil erosion	40	80
Supply of water became scarce because the source dried-up	31	62
La Nina	42	84
El Nino	25	50

Source of Irrigation

Table 6 shows that most (90%) of the respondents were using water pump in irrigating the farm. Majority (62%) of the respondents mentioned that there are changes on the source of irrigation and 38% had no changes on source of irrigation. Causes of changes in the source of irrigation low water supply in river as mentioned by all the respondents; 65% mentioned irrigation canal dried-up so farm became rain fed and spring dried-up during summer season.

Table 6. Source of irrigation

PARTICULARS	FREQUENCY	PERCENTAGE
Source of irrigation		
Rain fed	21	42
River	20	40
Irrigation canal	13	26
Spring	8	16
Others (water pump)	45	90
Are there changes in the source of irrigation		
There are changes	31	62
No changes	19	38
TOTAL	50	100
Changes in source of irrigation		
Irrigation canal dried-up so farm become rainfed	20	65
Low water supply in river	31	100
Spring dried-up during summer season	20	65

Changes in the variety of crops grown. As shown in the table, most (74%) of the respondents, mentioned that they had changed the variety of their crops; 26% had not changed the variety of crops grown. All the respondents mentioned that they changed the variety of crops grown because of higher yield obtained, adopted to weather and climate change. Other reasons include easy to manage and resistant to pest and diseases (78%). This implies that farmers were taking measures or finding ways to cope up with climate change.

Table 7. Changes in variety of crops grown

PARTICULAR	FREQUENCY	PERCENTAGE
Changes in the variety of crops		
There are changes	37	74
No changes	13	26
TOTAL	50	100
Reasons for changing crops		
Higher yield	37	100
Easy to manage	30	81
Resistance to pest and diseases	29	78
Adopted to weather changes	37	100
Adopted to climate change	37	100

Reasons for changing crops grown. All the respondents had changed the kind of crops grown. The changes encountered were better demand in the market, provide higher income and better yield and (20%) mentioned that the crop is more adapted to abrupt

changes in weather or temperature. Result implies that farmers changed crops grown because of economic reasons such as provide better yield thus higher income and more preferred in the market.

Table 8. Reasons for changing the kind of crops grown

REASON	FREQUENCY	PERCENTAGE
Better demand in the market	50	100
Provide higher income	50	100
More adopted to abrupt changes in weather or temperature	10	20
Better yield	50	100

*multiple response

Changes in production /cultural management practices. The production activities were weeding, spraying, irrigation, fertilizer application, harvesting practices and packaging. These are presented in Table 9.

Weeding. Weeding practices was done twice to thrice for the whole cropping period. In year 1990-2000, majority (60%) of the respondents weeded thrice, 40% weeded twice. In 2001-2010, most (80%) of the respondents weeded thrice for the whole cropping period. This shows that there was reduction on the number of farmers weeding their eggplant farm twice and there was an increase in the number of farmers weeding thrice. Thus, frequency of weeding farm increased.

Spraying. Spraying activities was done once to two times a week for the whole cropping period. Majority (70%) of the respondents sprayed 2x a week for the whole

cropping period while 30% sprayed once. This implies that farmers preferred to spray twice to reduce damage and control pest and diseases.

Irrigation. The respondents irrigated their crops 2x to 3x a day. This implies that majority of the farmers irrigated their crops 3x a day. Result shows that more farmers had increased frequency of irrigation. This could be explain with their observation that the water holding capacity of the soil was poor and also the soil texture and structure had changed from porous to compact.

Fertilizer application. Fertilizer applications was done by the respondents only once for basal in year 1990-2000 and majority (74%) of the respondents applied side dressing after 1 week and 26% after 2weeks. In 2001-2010, all the respondents applied fertilizer for basal only once and 74% applied side dressing after 2 weeks. This implies that more farmers were applying fertilizer after 2 weeks of transplanting.

Harvesting practices. The respondents harvested their crops either 2x to 3x a month. In 1990-2000, 64% of the respondents harvested their crops 3x a month and 36% harvested their crops 2x a month. In 2001-2010, majority (72%) of the respondents harvested their crops 3x a month and 28% harvest 2x a month. The result implies were harvesting 3x a month was practiced because higher production.

Packaging. In year 1990 – 2000, farmers used sacks or bamboo crates as packaging material and in 2001 to 2010, farmers and traders use cellophane bags or plastic bag and still being practiced now. Cellophane is more convenient to use.

Table 9. Changes in production/cultural management practices

ACTIVITIES	1990-2000		2001-2010	
	F	(%)	F	(%)
Weeding				
Twice	20	40	10	20
Thrice	30	60	40	80
TOTAL	50	100	50	100
Spraying				
Once	15	30	20	40
Twice	35	70	30	60
TOTAL	50	100	50	100
Irrigation				
Twice a week	15	30	9	18
Thrice a week	35	70	41	82
TOTAL	50	100	50	100
Fertilizer application				
Basal				
Once	50	100	50	100
Side dressing				
After 1 week	37	74	13	26
After 2 weeks	13	26	37	74
TOTAL	50	100	50	100

Table 9. Continued…

ACTIVITIES	1990-2000		2001-2010	
	F	(%)	F	(%)
Harvesting practices				
Twice	18	36	14	28
Thrice	32	64	36	72
Packaging				
Sack	50	100	-	-
Plastic/cellophane bag	-	-	50	100

Changes in application of fertilizer. Table 10 shows that most of the respondents (60%) had no changes in the application of fertilizers, while 40% had changes on the application of fertilizers. In terms of quantity, before farmers used 2 sacks of T14 in 1990-2000, now at present years (2001-2010) they used 3 ½ sacks of T14 in farm; in 1990-2000 farmers used of 1 ½ sacks of urea and at present years (2001-2010) they used 2 sacks volume of urea; and for ammonium they used 1 ½ sacks volume in 1990-2000 and at present years (2001-2010) farmers increased used of ammonium to 2 ½ sacks.

Table 10a. Changes in fertilizer application

PARTICULAR	FREQUENCY	PERCENTAGE
There are changes	20	40
No changes	30	60
TOTAL	50	100

Table 10a. Continued…

PARTICULAR	FREQUENCY	PERCENTAGE
Nature on changes on the application of fertilizer Increase of application	20	40

Table 10b. Fertilizer applied

Fertilizer applied	1990-2000		2001-2010	
	F	QUANTITY	F	QUANTITY
Triple 14	20	2 sack	20	3 ½ sacks
Urea	20	1 ½ sacks	20	2 sacks
Ammonium	20	1 ½ sacks	20	2 ½ sacks

Observations on the incidence of pest and diseases. Table 11 presents the observations on the incidence of pest and diseases. Fruit borer were low during wet season and moderate during dry season since 1990-2010. In 1990-2000, army worm were low during wet season and high during dry season. In 2001-2010 army worm were moderate during wet and dry season. Aphids were low during wet season and moderate during dry season since 1990-2000. In 2001-2010, aphids were moderate during wet and dry season. Leaf miner was observed to be moderate during wet and dry season since 1990-2000. In 2001-2010, leaf miner was low during wet season and moderate during dry season. In 1990-2000, stem borer was observed to be low during wet and dry season. In 2001-2010, stem borer was observed with low rating during wet season and moderate during dry season.

In 1990-2000, bacterial wilt, downy mildew, fruit and root rotting were moderate during wet season. In dry season downy mildew is moderate and others are still low. In 2000-2010, bacterial wilt, downy mildew and fruit rotting were low during wet season while root rotting was moderate. In dry season, downy mildew was low while bacterial wilt, fruit and root rotting were moderate. The result implies that pest and diseases occurs during wet and dry season that damaging crops in field is still being experienced now.

Table 11. Observations on incidence of pest and diseases

NAME OF PEST AND DISEASES	1990-2000		2000-2010	
	WET	DRY	WET	DRY
Pest				
Fruit borer	2.96	3.58	2.96	3.55
Army worms	2.83	4	3.17	3.56
Aphids	2.94	3.65	3.08	3.79
Leaf miner	3	3.55	2.77	3.87
Stem borer	2.58	2.92	2.29	3
Diseases				
Bacterial wilt	3.08	2.95	2.62	3.38
Downy mildew	3.09	3	2.67	2.94
Fruit rotting	3	2.84	2.44	3.19
Root rotting	3	2.89	3	3.12

Legend: 0 - 1 None
1.1 - 2 Low
2.1 - 3 Moderate
3.1 - 4 High

Application of pesticides. Table 12 shows that most of the respondents did not changed their application of insecticide and pesticide. In 1990-2000, lanate, brudan, malathione, sagro, tamaron and ascend were applied low during wet season. While, karate was applied moderately during wet season. In dry season, sagro applied moderately, while lanate, brudan, malathione, karate and ascend are still applied low. In 2000-2010, malathione and tamaron applied moderately during wet season while lanate, brudan, sagro, karate and ascend are applied low during wet season. Malathione were applied moderately during dry season. Lanate, brudan, sagro and ascend were applied low during dry season. This results implies that most farmers use chemicals to control pest and diseases.

Table 12. Application of insecticide and pesticide

PESTICIDE AND INSECTICIDE	1990-2000		2001-2010	
	WET	DRY	WET	DRY
Lanate	2.40	2.64	2.56	2.70
Brudan	2.71	2.57	2.54	2.43
Malathione	2.56	2.67	3	3
Sagro	2	3	2	2.64
Tamaron	2	0	3	0
Karate	3	2.28	2	2
Ascend	2.76	2.33	2.31	2.41

Legend: 0 – 1 None
1.1 - 2 Low
2.1 - 3 Moderate
3.1 - 4 High

Control measures. It shows to Table 13, all of the respondents use chemicals to control pest; 60% used manual picking but this is only applicable when the farmers has a small area planted with eggplant or when incidence is low. There were 10% of the respondents who use biological or organic control.

Table 13. Control measures

CONTROL MEASURES	FREQUENCY	PERCENTAGE
Use of chemicals	50	100
Biological control	5	10
Manual picking	30	60
Use of organic control	5	10

*Multiple response

Changes in yield. Majority of the respondents had an area of 2500m^2 that their average marketable yield from 1990-2000 is 377.27 kilos while in 2001-2010 is 485.45 kilos. Their non-average marketable from 1990-2000 is 47.27 while in 2001-2010 is 70.81. This implies that there are changes in yield during 2001-2010 and had higher marketable.

Table 14. Changes yield per year of a 2500m^2 farm

PARTICULARS	1990-2000	2001-2010
Marketable	377.27	485.45
Non-marketable	47.27	70.81

Coping mechanism. Table 15 shows that all respondents cope-up with climate change by changing the crops, or change variety of crop (74%), change or adjust cropping period (40%) and plan and implement production program.

This implies that farmers employing some strategies to cope-up with climate and weather changes.

Table 15. Strategies/coping mechanism employed by farmers

PARTICULARS	FREQUENCY	PERCENTAGE
Change of crops	50	100
Change variety of crops	37	74
Change/adjust cropping period	20	40
Plan production program and implement	20	40

*Multiple response

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study was conducted to document the awareness of the respondents on climate change. Thus, this study aimed to determine the perception about climate change based on their observation. The study was conducted from October to November 2011. The study was conducted in 3 barangays in Sto. Tomas, La Union namely Patac, Bail and Casilagan using survey questionnaire. A total of 50 respondents were taken randomly.

All of the respondents were aware on climate change and their perception were abrupt changes in temperature, occurrence of super typhoon, abrupt changes in weather condition, changes in season like prolong dry and wet season, La Nina and El Nino. Secondary data was taken from PAGASA at Dagupan City, Pangasinan. The weather data shows that from 2000 there is a gradual increase and decrease yearly in temperature. Pest and diseases occurs during wet and dry season that damaging crops in field is still being experienced now. And most farmers use chemicals to control pest and diseases. Strategies applied by farmers are they preferred to changed variety of crops, change of crops and plan production program and implement.

Conclusions

Farmers were aware of climate change which according to them is the one being experienced now with a lot of changes in weather conditions. Farmers employed several strategies and coping mechanism to mitigate climate change however, they apply more chemicals.

Recommendations

Respondents who are engaged in farming are encouraged to decreased utilization of chemicals because this is one of the reasons contributing to the climate change. It is recommended that farmers should revisit traditional production practices to reduce effect of global warming and pollution to air and soil.

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