

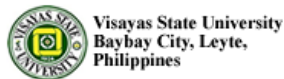
**HORT/2007/066-2**

**FARMERS PRACTICES, INITIAL FEEDBACK AND CONSTRAINTS TO ADOPTION  
OF VEGETABLE PRODUCTION UNDER PROTECTED STRUCTURES**

**Working Paper No. 4**



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*The Australian Centre for International Agricultural (ACIAR) project HORT/2007/066 “Enhanced profitability of selected vegetable value chains in the Southern Philippines” is concerned with increased income, and improved livelihoods for vegetable growers in the Southern Philippines. One component of the project relates to protected cropping. This component seeks to determine whether vegetables can be profitably grown under protected cropping (eg under plastic or netting) in the Southern Philippines. The focus is primarily Leyte, given the very difficult growing conditions that prevail there for certain times of the year.*

### **Summary**

This paper presents the results of focus group discussions (FGDs) conducted in Cabintan, Ormoc City, Leyte on January 27, 2009 and in Barangay Bogo, Maasin City Leyte on February 27, 2009 where on-farm trials of protected vegetable cropping systems are being implemented by two farmer-cooperators. The final outcomes of these trials will be presented in subsequent working papers in this series. The main findings from the focus group discussions regarding the structures themselves were:

1. The protected structure design does protect crops and facilitates husbandry activities;
2. There is impressive growth of vegetables compared to open field;
3. Potential irrigation problem due to lack of water in farmers’ fields; and
4. The overall viability and performance of vegetables in the longer term remains to be seen.

The ‘constraints to adoption’ of protected structures were seen to be:

1. Financial resources with regard to initial construction;
2. Access to construction materials (eg bamboo which is highly available in Maasin but not in Cabintan);
3. Lack of water for irrigation;
4. Uncertainty regarding the financial viability of growing vegetables under protected structure during the dry season.

### **Introduction**

The Australian Center for Agricultural Research (ACIAR) has provided support to the research project component entitled *Development of a cost-effective protected vegetable cropping system in the Philippines* based at the Visayas State University (VSU), Visca, Baybay City, Leyte, Philippines. The project is implemented to develop and test appropriate and effective protected annual crop production systems, to determine whether the production of vegetable crops using protected cropping systems is economically viable at both farm and market levels, and to promote adoption/modification of protected cropping systems. The project has set-up several protected vegetable production designs and experimental trials at VSU main campus. In coordination with the City Agricultural Services Office (CASO) and with the cooperation of two farmer-cooperators, two additional experimental trials were established at farmers’ fields. One trial is located in Cabintan Ormoc City while the other is in Bogo, Maasin City. With the near completion of the first set of vegetable cropping, the socio-economic team deemed it worthwhile to solicit farmers’ feedback on the production scheme to gather needed information that may serve as guidance for the technical, socio-economic, and other components leaders of the ACIAR funded program to take the appropriate actions in connection with the succeeding project related activities.

This paper presents the results of focus group discussions (FGDs) conducted in Cabintan, Ormoc City on January 27, 2009 and in Barangay Bogo, Maasin City on

February 27, 2009 where on-farm trials of protected vegetable cropping systems are being implemented by two farmer-cooperators. The production of vegetables under protected structures enabled neighboring farmers to personally observe the performance of vegetables grown with and without the protected structures. With farmers' exposure to the experimental trials, it is expected that they may be able to provide feedback and identify potential constraints to the adoption of the protected vegetable production scheme on their respective farms. Thus, the FGDs were conducted to gather the farmers' traditional vegetable production practices, initial feedback and potential constraints to adoption of the new production system. Having observed the farm trials, farmers are expected to articulate their observations or initial feedback on the structural design of the protected structure, cultural practices, growth performance of vegetables grown, and other concerns relative to the new vegetable production system.

#### **The FGD Participants**

In Cabintan, Ormoc City, eight vegetable growers and neighbors of Mr. Noel Morales, the farmer cooperator, attended the FGD. The average area cultivated by FGD participants for vegetables is 1.22 ha with six of them cultivating 1 ha each. The mean age of the FGD participants is 35.6 years old. All of them are members of the Cabintan Farmers' Association organized and supported by the Energy Development Corporation (formerly Philippine National Oil Company or PNOC). It was observed that all the participants are very much aware of what is going on in Mr. Morales' protected cropping and willing to share their observations.

In Bogo, Maasin City, a group of about 40 vegetable farmers coming from different barangays of Maasin City visited the protected vegetable production scheme of Mr. Raymundo Ordiz, the farmer-cooperator, a few days prior to the conduct of the FGD. The on-site visit was agreed upon by the socio-economic team in coordination with the CASO. From the total number of farmers who visited the on-farm trial, 10 farmers were invited by the CASO to attend the FGD. However, early in the morning prior to the conduct of the FGD, there was heavy rain which lasted for hours. Perhaps farmers thought that the activity was canceled due to bad weather. Hence, the conduct of the FGD

was delayed with only four of the ten farmers invited came. Since everything was already set and ready, the project team decided to push through with the activity.

The participants were all vegetable growers and members of the farmers' associations from the different the barangays throughout the city. The mean size of vegetable farms of the FGD participants is 0.33 ha and their mean age is 49 years old. The farmer-participants are beneficiaries of Management Inputs for Agricultural Networking (MIAN) program spearheaded by the CASO.

### Vegetables Grown by FGD Participants

**Cabintan, Ormoc site.** The FGD participants in Cabintan, Ormoc City planted chinese cabbage, cabbage, bell pepper, snap beans, tomato, and cauliflower. Chinese cabbage and cabbage were planted throughout the year but in different areas or parts of their whole vegetable farm. A farmer only planted cabbage once a year due to heavy pest infestation. However, the cabbage crop was present the whole year as shown in the planting calendar because farmers plant the crop at different times of the year. Within a year, the majority of the farmers produce two to three vegetable croppings. A few farmers usually grow tomato in February to May followed by cabbage in July to October with cauliflower as the side crop. The farmers usually do not plant ampalaya although it was reported to have high price in the market because its fruit leaked or broke and was not smooth.

Planting Calendar of Vegetable Farmers in Cabintan, Ormoc City.

Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chinese cabbage	4 <sup>th</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	3 <sup>rd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	4 <sup>th</sup>
Cabbage	4 <sup>th</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	3 <sup>rd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	4 <sup>th</sup>
Bell pepper		2 <sup>nd</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>					2 <sup>nd</sup>
Snap beans	3 <sup>rd</sup>	3 <sup>rd</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	3 <sup>rd</sup>
Tomato		1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>		2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>		
Eggplant		1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>		2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>		
Cabbage with cauliflower							1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>		

1<sup>st</sup> cropping
  2<sup>nd</sup> cropping
  3<sup>rd</sup> cropping
  4<sup>th</sup> cropping

The month of February is the main planting season or the main crop for vegetables since everybody usually plant vegetables during this month to allow one or two croppings and harvesting of crops before the winds and rains come by October or November.

**Bogo, Maasin site.** In Bogo, Maasin City, the vegetables usually planted by farmers are sweet pepper, cucumber, eggplant, squash, bitter gourd, and tomato. Farmers usually adopt or follow a cropping pattern throughout the year. They however mentioned about planting of vegetables in succession in different plots or areas. One of the farmers, however, produce cucumber continuously all throughout the year but in different areas because according to him the crop is resistant to rain and suitable in sloping areas. Farmers mostly grew vegetables like sweet pepper and eggplant in two cropping during the months of March to June and October to December while bitter gourd (*Momordica charantia*) are also planted twice a year during February to April and September to December due to high demand of the crop and high market price. Meanwhile, farmers practiced intercropping squash with cucumber and bitter gourd with eggplant in different areas because the main crop takes longer time period before it can be harvested. Farmers usually plant sweet pepper with eggplant and cucumber with bitter gourd at the same time in just one area.

Meanwhile, two farmers recalled their past experience in planting high-valued crops such as cauliflower and lettuce wherein they claimed of having good harvest. Unfortunately, the farmers were at that time not familiar about these crops and that they lack market price information and information about prospective buyers. According to the farmer, he ended up selling the vegetable at a low price. Other farmers also experienced planting carrots though it was rejected in the market and sold at cheaper price due to its non-marketable size. They argued that it takes a long period of time to harvest the crop which caused the delay of their planting calendar for the next crop. Consequently, farmers showed interests to again plant high-value vegetable crops such as lettuce, broccoli and cauliflower because of higher price in the market compared to other

vegetables. However they commented that there is no available seeds for them to buy in the locality.

It was observed that most of the farmers planted their vegetables during the month of March to enable them to plant crops in two or more croppings before the rains and flood would occur in November and December.

Planting Calendar of Vegetable Farmers in Maasin City

Crops planted	Months											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Sweet pepper			1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>				2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>
Eggplant			1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>				2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>
Cucumber	1 <sup>st</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	4 <sup>th</sup>	5 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	6 <sup>th</sup>
Squash		1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>							
Bitter gourd		1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>					2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>
Tomato			1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>						

■ 1<sup>st</sup> cropping  
 ■ 2<sup>nd</sup> cropping  
 ■ 3<sup>rd</sup> cropping  
 ■ 4<sup>th</sup> cropping  
 ■ 5<sup>th</sup> cropping  
 ■ 6<sup>th</sup> cropping

### Damage to Vegetable Crops

#### Ormoc Project Site

**Winds and rains.** The FGD participants in Cabintan, Ormoc City mentioned that rains and winds as the major cause of damage to their crops. Strong winds and rains occurred in October to January and destroyed their crops. In some cases, they could still harvest their crop but only in little volumes when harvested in November and December, but when January came, there was none left of the crops. Thus, January was considered the worst month. The crop most sensitive to rains and winds is Chinese cabbage followed by tomato. According to farmers, cabbage was more tolerant to rain.

To control the excessive water brought about by rains, some farmers usually make canals around or even within the plots, while some farmers do nothing at all. In fact, most of the farmers do not plant during this period to avoid losses. On the other hand, a few farmers who planted vegetable crops just hope for the possibility of less or no strong

winds and just left their planting to chance. According to them, it is really a gamble to grow vegetables during the last quarter of the year as the likelihood of damage was so high, but they had to do it because it was their only source of income. In fact, Mr. Ramil Morales related that he was one of the few farmers who planted during the period of strong winds and rains with the hope that his crops would survive. He planted chinese cabbage which has a potential yield of 5,000 kg. Unfortunately, it yielded only 500 kg owing to the harsh weather condition. Despite the poor yield, he continues to plant vegetables during the wet season since the vegetables produced at this time of the year command much higher prices in his view. Similarly, Mr. Alvin Morales expected a 4,000 kg yield of chinese cabbage but harvested only P1,500 kg. Nonetheless, he earned an equally high income from the harvest because the price increased to P30 per kg during the wet season compared to only P8-12 per kg during the dry season. According to him, this is the main reason some farmers still plant during the rainy season since the low yield is offset by the high price. The computation below compares the yield and income from Chinese cabbage during the two seasons.

Summary of Mr. Alvin Morales' gross income  
between dry and wet season

Dry Season			Wet Season		
Yield, kg	Price, P/kg	Income, P	Yield, kg	Price, P/kg	Income
4,000	8.00-12.00	32,000-48,000	1,500	30	45,000

The farmers stressed, though, that this was more an exception than the rule because only one of ten farmers could possibly gain from their crops when they plant during the wet season while the rest may not be able to earn any income at all or even incur losses from inputs they apply including their labor. Sometimes, money allocated for the family's food consumption was diverted to vegetable farming with a risk of having no income at all. When the worst scenario occurs, farmers resort to borrowing money from neighbors and friends. Interestingly, the farmers said that each time they took the risk of planting during the last quarter of the year they usually make prior agreements with someone to lend them money when their crops are damaged, a behavior indicating the uncertainty of vegetable production during the wet season.

**Pests and diseases.** Like other vegetable farmers from Ormoc City, the Cabintan farmers were dependent on pesticides to control the damage caused by pests. Chinese cabbage and cabbage are usually infested with diamondback moth (DBM), beetles, and earthworms, while roots of bean plants are attacked by fine worms. To control these, they spray insecticides. Likewise, a fungal disease causing leaf spots on cabbage, which they locally called *dagabdab*, is controlled by spraying the affected plants with fungicide. As earlier mentioned, a farm was planted to cabbage only once a year because of heavy pest infestation. Meanwhile, tomato and eggplant are usually attacked by fruit and stemborers. The affected plant parts are removed manually or sprayed with insecticide in worse cases.

While pests and diseases infestation are higher during the wet season, farmers observed that it also occur at certain stages of the plant growth. At the seedling stage, plants are already attacked by pests but this could be controlled by spraying with chemicals, thereby attaining an 80 percent survival rate of the seedlings. For bell pepper and tomato, fruit flies are the ones that apparently attack the plants during fruiting stage regardless of the time of the year the crop is planted. The farmers mentioned that great losses occur on farms where no control or prevention is being done by the farmer.

### **Maasin City Site**

**Rain, flood and drought.** Heavy and continuous rain is considered as the most destructive cause of damage to vegetable crops as revealed by FGD participants. It normally occurred during the months of November to January and associated with floods during the months of November to December. During these months, farmers could still harvest in little volume and farmers normally incur losses. Thus, almost all crops are sensitive to rain especially in the month of January, which was considered as the worst month, but only cucumber resisted the rain since these are planted by farmers on sloping areas. It was noted that sweet pepper is the crop most sensitive to rain followed by tomato. Heavy rain is usually accompanied by floods and farmers had no means to control it because most of their farms were adjacent to the river banks. Though, some farmers avoid planting vegetables during this period because they are afraid to incur losses, still others try to take risks even if they only earn a little or having no income at

all. Good timing of harvesting activity with no rain ensures them better harvest or else they will select the area/season, if not, better plant later after the rainy season. Likewise, still other farmers would prefer to use plastic mulch in order to conserve moisture as well as minimize the incidence of pest. On the other hand, drought also may cause minor to heavy damage to their crops especially if the source of water is far from their farm thus may require more labor on the part of the farmer to provide water needed by the vegetable crop.

**Pest and diseases.** Farmers in Maasin City pointed out that during rainy season, pests and diseases occurrence is very high specifically during the flowering stage of the crop. They however stated that this may also occur during dry season. Their method of control for damage caused by pests is application of pesticides. However, some farmers use other control measures such as attractants, and plastic mulch. Normally, farmers don't apply pesticides to their crops if it already bears fruit. Sweet pepper was perceived to be generally susceptible to pests and diseases. One major cause of damage to this crop is caused by fruit flies, which is known as "blossom-end rot". This formed spots on fruits in which the pest attacks during its fruiting stage leaving the fruits to rot. Likewise, bitter gourd, tomato and eggplants are also attacked by fruit flies and their methods of control is by using attractants by spreading it on their farms while some others prefer wrapping the fruits like for instance, bitter gourd. Another damage cited is wilt which is caused by bacteria or damping-off of the crops. Hence, there is no control or prevention yet in this kind of infestation, but some farmers practiced crop rotation to reduce the population of pests. Mites, however, also cause damage to sweet pepper and causes curling of its leaves during the flowering stage and inhibiting its growth. To control this, they spray it with insecticides or else burn the leaves infested with mites. Another pest attacked was done by cricket "*timus*" which also cause damage to sweet pepper during its seedling stage through eating its apical shoots. Their method to control this is to wrap the body of seedlings with straw. Manual picking and burying of worms/fruit borer is also being practiced by farmers as their means of control but it shows no significant effect on pest population reduction. While other problem addressed by farmers growing cauliflower

was its seedling cannot stand in seedling trays or it may due lack of hardening as explained by the AT's.

**Soil problem.** The FGD participants also mentioned about their problem on their soil. They claimed that wilting of crops was probably causes by the bacteria present in the soil but it was not proven to be cause by bacterial wilt. The farmers applied Furadan to treat the infected soil. It was likewise pointed out that by farmers that no soil analysis have been conducted on their farms. In reaction, one Agricultural Technician (AT) present during the FGD helped to advise this problem by thorough plowing and constructing canal on the furrows of the land infested with bacterial wilt due to waterlogged soils in order to expose it to sunlight. However, they were advised to have their soil analyzed in VSU which will be coordinated under the department of Dr. AB Tulin.

## **Marketing of Vegetable Products**

### **Vegetable Marketing in Cabintan**

Most farmers in Cabintan project site market their produce right at their farms since a number of buyers usually come to buy their products. The FGD participants did not consider marketing of their vegetables a problem. Farmers, however, stressed the very low buying price of buyers as the common problem they usually encounter during peak production due to the abundance and oversupply of vegetables. During such periods, buyers normally just dictate their buying price and farmers are seemingly helpless and they just beg for them to increase the price a little bit. On the other hand, vegetables harvested during off-season commanded higher prices and buyers are the ones who bid with one another as to who can offer the highest price to the farmer.

Some farmers, particularly those with transportation facilities such as motorcycles and mobile phones already learned to canvass prices by visiting the Ormoc City market or through texting contacts in Ormoc and even in Cebu so that when buyers come to their farms, they already know the prevailing prices and they are in good bargaining positions

and buyers could not take advantage of their lack of price information. The farmers recognize the importance of a cellular phone in their marketing operation. At times, after canvassing the prices, farmers hired an individual to bring their products to contracted buyers in the Ormoc City or Tacloban City market.

### **Vegetable Marketing in Maasin thru MIAN**

In the Maasin project site, marketing of vegetable products by FGD participants is mainly handled thru the MIAN. Hence, marketing of their vegetable produce was likewise not a problem because they are members of the MIAN scheme that cater to market their products. However, farmers usually encounter problems on the market price of their vegetables especially when there is oversupply. Prices of vegetables during this period are very low and buyers usually are the ones who dictate on their buying price.

### **Farmers' Feedback on Protected Cropping Technology**

#### **Design of Protected Structure**

**Farmers' observations in Cabintan, Ormoc site.** With their knowledge on the total damage of the vegetable crop of Mr. Noel Morales under the open field vis a vis those under the protected structure, FGD participants in Cabintan, Ormoc City were totally convinced of the technical effectiveness of the structure most especially during rainy season. According to them, harvest is assured because the crop is protected from strong winds and heavy rain. They likewise agree that the designed of the structure is appropriate in their area since it is sturdy and strong to withstand the very strong winds and heavy rain in their area. However according to farmers, the performance of the crop during the main season crop still remains to be seen since the dry spell might be favorable to vegetable crop under the open field vis-à-vis those crop under the protected structure. Moreover, the lack of water on their farms may pose a problem for those who plan to adopt the production of vegetables under protected structure since it would entail additional labor and production costs. They also cited the absence of bamboo in their area

and therefore there is need for them to purchase this materials from the nearest available source.

**Farmers feedback in Bogo, Maasin.** After their actual observation of the growth performance of the tomato crop under protected structure vis-à-vis those under the open field, the FGD-farmer participants in Maasin were likewise convinced about the positive effect of the protected structures. They were delighted to observe that if indeed this will be proven to be financially viable, the scheme will be great help to farmers in the area since bamboos used to produce the structure are highly available in their area. All farmers positively shared their insights on the advantage and disadvantage of the protected structure of Mr. Raymundo Ordiz. According to them, the structure gave dual effect to the farmer and the crops because not only the crops were benefited but also the farmer for he can facilitate all his farming activities inside the structure especially during rainy seasons. Farmers added that during dry season, the protected structure was not favorable to them because it's hot to work inside due to smaller ventilation. Hence, watering of plants inside the structure is important during dry season because the land preparation was not good and there was no irrigation installed on it. On the other hand, they have observed that fertilization of crops inside the structure was not delayed because it was not destructed by rain and also crops were taller compared to crops exposed outside. They further commented that the design of the structure was good only for heavy rains and it will probably last longer compared to lumber.

A number of suggestions from farmers came about to possibly modify the protected structure. One suggestion was to install a net and bamboo clips on the roof instead of plastic in order to reduce the effects of strong winds but they confided that these may not be good for heavy rains. Likewise, they suggested installing net sidings to reduce the occurrence of pest and also the use of pesticides. Furthermore, they also tossed the idea of possibly installing drip irrigation to minimize cost of labor for watering. They also added that the bamboo posts must be coated with coal tar in order to prolong its life span.

## **Crop Performance**

FGD participants from Ormoc were impressed by the growth performance of the cauliflower crop in which those under the protected structure had apparently healthy curds while plants in the open field barely reached the curding stage because of rotting brought about by excessive water. It was observed, however, that under the protected structure, curding was delayed, and when the curds came, they were small. Mr. Noel Morales, the farmer-cooperator, guessed that the intense heat of the sun was reflected on the plastic cover of the structure which consequently caused plant stress and burnt leaves. In effect, curding was delayed. Notwithstanding the delay, the plants recovered and the curds grew healthily until harvest time.

The farmers also observed that less pesticide is required as pests which attacked the plants when they held excess water from the rain would not anymore come since the moisture condition was not favorable to these pests. In addition, pesticide application is effective because the rain cannot wash away the pesticide. As to fertilizer application, it is also more effective because leaching of the fertilizer is less as there is not much water in the soil, thereby enabling it to consume much of the nutrients for plant growth.

## **Initial Farmers' Feedback on Constraints to Adoption**

### **Ormoc Site**

The farmers had apprehensions on their financial capability to construct a protected structure in their farm especially that the materials like plastic have to be purchased at a high cost and bamboo was not locally available. They recalled that bamboo used in the structure constructed in Mr. Noel Morales' farm was transported from VSU by the project staff.

Being members of the EDC-organized Cabintan Farmers' Association, they mentioned that PNOG has extended to them financial assistance for the construction of tunnel-shaped protected structures for vegetables. They were able to construct two structures which cost P7,000 each. They have agreed to rotate the use of the structures among the association members who are vegetable growers. The cost of construction would be paid back to the EDC when they are able to earn adequate income from their vegetables. When asked if they would be willing to adopt the protected structure technology if EDC provided loans for this purpose, they replied in the positive provided that the terms and conditions of the loan are reasonable. For instance, there is no interest on the loan and they will not be obliged to pay the loan or part of it during a failed cropping. Additionally, they stressed that the technology should be proven feasible, that is, vegetable production is indeed better under the protected structure.

It is worth noting that the farmers wondered about the vegetable yield under protected cropping during favorable weather. If the structures are very useful during the wet season, will they be as useful during favorable weather? They added that when the weather is favorable, the plants under the protected structure need to be watered while those outside rely on rain. This would then entail higher cost of labor. Dr. Armenia replied that the field trials are going on and their questions will be considered since another set of vegetable crop will still be produced within and outside the structure during the main season cropping.

### **Maasin Site**

The FGD participants in Maasin City were primarily constrained financially in adopting the protected structure in their area due to high cost of materials like plastic roof and labor. In fact, they were informed on the cost of plastic roof which will depreciate 3 to 5 years. However, few of them stated that they even cannot afford to buy plastic mulch which was cheaper compared to the cost of plastic roof. Luckily, they had no problems on the supply of bamboo because it was highly available in the locality or even adjacent to their farms. Meanwhile, some farmers stressed that the structure might not be suitable on

their area due to strong winds because their area was sloping. But they were informed that their farms and in Cabintan, Ormoc City have almost the same topography and that the design of protected structure was successfully constructed which exhibited good harvest but modified only with durable materials to control strong winds. Likewise, they added problems like the location of the structure if it's near to fruit trees because there is a tendency that for instance, sweet peppers grown under the structure will be easily infested by fruit flies. Absence of net sidings will encourage more pest infestations inside the structure. And other problem mentioned was the source of water especially during dry season because this would entail additional cost of installing water pump or irrigation and even labor.

When asked if they were interested to adopt the protected structure technology in order to increase their income and standard of living. If for instance, the CASO will help to provide them loans, they answered positively. But they all have to make sure the market for their products to assure positive profit and the AT in Maasin City encourage them to plant high-value vegetable crops on off-season so that it will command high prices.

Farmers still wonder if indeed the vegetable yield inside the protected structure is greater than outside the structure. Yet, some of them were interested to observe and compare the performance of the crops inside and outside the structure specifically in terms of its size and yield. They also added if how long the crops will bear fruits until to its last harvesting between inside and outside the structure. Furthermore, they suggested the monitoring of pest incidence if it has effect on the vegetable production inside and outside the structure. To this queries, Dr. Armenia explained that this field trial is still going on and their questions will be answered later and he added that there was is also field trial in Cabintan site that exhibit good growth and yield performance of the crop inside the structure whereas those outside were totally damaged.

**APPENDIX A**

**ATTENDANCE SHEET  
FOCUS GROUP DISCUSSION ON PROTECTED VEGETABLE  
CROPPING SYSTEM**

January 27, 2009  
Cabintan, Ormoc City

<b>Name</b>	<b>Age</b>	<b>Civil Status</b>	<b>No. of Years in Vegetable Farming</b>	<b>Size of Vegetable Farm (Ha)</b>
1. Jimmy Calfoforo	43	Single	10	0.75
2. Alvin F. Morales	32	Married	8	1.00
3. Emerald E. Quimpano	35	Married	8	1.00
4. Pedy A. Panchacala	44	Married	9	1.00
5. Noel Morales	37	Single	12	3.00
6. Ramil Morales	34	Married	10	1.00
7. Carmelito Aguinaldo	34	Married	10	1.00
8. Florame Morales	22	Married		
9. Virgilio Morales	64	Married		
10. Rodel Morales	26	Single	10	1.00
11. Rosa Matugas	23	Married		
12. Corazon Morales	60	Married		

## APPENDIX B

### ATTENDANCE SHEET FOCUS GROUP DISCUSSION ON PROTECTED VEGETABLE CROPPING SYSTEM

February 27, 2009 (Friday)  
Sitio Gutusan, Bogo, Maasin City, So. Leyte

Name	Age	Address	Size of Vegetable farm (hectare)
1. Virginia M. Dueñas	49	Hantag	.30
2. Fernando C. Dueñas	50	Hantag	-
3. Francisco M. Petagra	43	Hinapu Daku	.30
4. Nestor Cerro	50	Hinapu Daku	.25
5. Rayco Ordiz	24	Bogo	-
6. Nissan Ordiz	26	Bogo	-
7. Raymundo P. Ordiz	54	Bogo (Farmer-cooperator)	.75
8. Conrada Ordiz	58	Bogo	-
9. Rustica Ordiz	55	Bogo (Chairman, Brgy. Committee on Agriculture)	-
Eleno A. Macaldo	33	Bogo (Brgy. Captain)	-
11. Aniceto C. Villar	47	Dongon (Agricultural Technician)	-
12. Rodrigo S. Jualo	40	Lonoy (Agricultural Technician)	-
13. Nida G. Tagana	57	Asuncion (Agricultural Technician)	-
14. Ana Gracia D. Cagabhion	44	Manhilo (Agricultural Technician)	-
15. Virgilia M. Barrientos	49	Mantahan (Agricultural Technician)	-
16. Manuel Gabisay	56	San Roque, Macrohon (Agricultural Technician)	-

## APPENDIX C

### PHOTO DOCUMENTATION OF THE FGDs CONDUCTED AT CABINTAN, ORMOC AND BOGO, MAASIN



FGD participants' visit to the farm of Mr. Noel Morales, Cabintan, Ormoc City, January 27, 2009



Harvesting of cauliflower at Mr. Noel Morales' farm,  
Cabintan, Ormoc City  
January 27, 2009



FGD on Farmers' Initial Feedback and Constraints to Adoption  
of Vegetable Production Under Protected Structures  
January 27, 2009



Preparing for the FGD in Barangay Bogo, Maasin City, February 27, 2009



FGD Proper in Barangay Bogo, Maasin City



Visit to the farm of Mr. Raymundo Ordiz after the FGD