DOCUMENTATION OF CLIMATE CHANGE IMPACTS, COMMUNITY PERCEPTIONS AND ADAPTATION PRACTICES OF RICE FARMERS IN THE PHILIPPINES

AMIHAN, National Federation of Peasant Women set out to study the impacts of climate change in Anda, Pangasinan in 2011. The said area is a rice producing coastal municipality located in the north-central portion of the island of Luzon in the Philippines. The objectives of the study were to identify and document the 1) impacts of climate change on rice farmers; 2) community perceptions on climate change; and 3) existing adaptation practices

The Study Site

The documentation project was undertaken in barangays Poblacion, Cabungan, Namagbagan and Tondol. Namagbagan is an inland barangay, while Poblacion, Tondol and Cabungan are coastal barangays. The terrain of the town is generally rolling, hilly on the west and patches of plain in the east. The town elevation ranges from 3.3 – 10 meters above sea level. Average rainfall is 170.30 mm and Average temperature: 25-30 degrees Centigrade (January - February, 2011 data).

Land use is 63.25% agriculture. The town is a third class municipality by income classification. Total population is 34,398, and total households at 6,811. Agriculture is the main source of livelihood. Of the total number of hectares devoted to agriculture,71% is devoted to palay production, with an average yield of 4 metric ton per hectare. Aquaculture is also a major source of livelihood.

Methodology

Four data gathering methods were employed in the study: direct interviews and case studies, involving 29 farmer respondents; a focus group discussion; key informants and gathering data from secondary sources (government data, internet research).

There were a total of 29 respondents (12 females, 17 males). In Namagbagan, 11 (6 females, 5 males); Tondol, 10 (4 females, 6 males); Poblacion, 6 (3 males, 3 females); Cabungan, 2 males; In Tondol, three couples were also interviewed. The average age of the 29 respondents was 57.56 years. For female respondents, the average age was 50.

For male respondents, the average age was 57.92 years. Twenty one were married, one was a widow and another was a widower. The interviews started in December 2010.

Two climate phenomena were identified and studied: sea level rises and temperature increases resulting in drought and long dry spells. Sea level rises have brought salt water intrusion into the rice farms.

Corn and squash harvestd by women form backyard gardens

Sea Level Rise and Saline Intrusion

An account of a woman respondent said:"In the 1960s, respondents claim there were no salt intrusions into the rice fields; the area was an ideal place for rice production. In the 1990s, the local government began constructing roads cutting across the rice fields towards the center of Barangay Tondol, with four sewage pipes put in place. This was originally designed as a passage way to the sea for rain water to minimize flooding of the rice fields, during typhoons, heavy rains."

In succeeding years, with climate change and with the expansion of water from the sea and the corresponding sea level rise, these culverts became the passage way for salt water to drain into the rice fields.

Also in the 1970s, a law called Fish pond Leasehold Agreements (FLA) encouraged farmers to develop fish ponds as a source of livelihood. Some farmers converted their rice lands into fish ponds and constructed water ways for sea water to flow through the rice fields/fish ponds. These ventures did not become profitable and were abandoned. The abandoned fish ponds have become passage ways for salt water intrusion into farm lands.

For the farmers interviewed, there have been varying levels of impact, specifically reduction in rice harvests, but these have been attributed to other equally valid factors: the decreasing fertility of the soil, which when not applied with sufficient amounts of chemical fertilizers can no longer produce; the erratic rain patterns, and typhoons that come for example when rice is ready to be harvested, inundating the fields and reducing harvests.

One farmer tenant stopped cultivating rice after a series of harvest failures. Before the salt intrusion, he was harvesting 70 sacks in the 11/2 hectares, but in 2009, the harvest dropped to 35 sacks, and in 2010, he surrendered the land to the land owner. In effect, he also surrendered his tenancy rights which could be the basis for his claim to the land through the agrarian reform program of the government.

crack on earth 2-3 feet deep

Another farmer said that in 2007, 2008, 2009, he had harvest failure. In 2010, he decided to plant two weeks earlier than the regular planting season; his rice plants and grains had already matured when the salt water entered the rice fields. Thus, for the first time in three years, he was able to bring back his usual harvest of 70 sacks in his 7,000 square meters rice land. However, this is still below what he had been harvesting years before which could reach up to 100 sacks.

His conclusion was that when salt water seeps through his rice fields at a time when the rice plants are flowering there will be no harvest at all; but if the salt water seeps in when the rice plants have started maturing, they can still claim harvest more or less 70 sacks.

He recounted that rice stalks in the early stage of maturation, when saturated with saline water, start at first to turn black and look burnt, and then eventually die.

Adaptation for Saline Intrusion

An adaptation method was the building of rice paddy dikes, made of mud, one meter wide, and one meter in height. To some extent, this method stalled the intrusion of salt water into the rice fields, but when the sea level rise is strong, salt water spills over the dikes unable to prevent the further entry of salt water into the farms.

Adaptation measures used by the farmers are far from satisfactory. For saline intrusion, the most common measure is building rice paddy dikes but this is a limited measure due to its permeability. Another problem with these paddy dikes is that they can be destroyed by a species of crab, locally called caramacam, which create holes where salt water passes through. The farmers claim that they can still plant rice in the rice fields when there are continuous rains, as the rains can neutralize the salt content of the soil.

Another adaptation measure is close monitoring of the low and high tide levels as indicated in calendars. During high tide levels indicated in the calendar, the farmer organizes all members of his family to secure and keep salt water from entering the rice field, even guarding the rice fields round the clock. As they know the days of high tides, they are able to prepare,

and strengthen the rice paddy dikes to keep the salt water out.

Based on the interviews, adaptation measures included building rice paddy dikes, and closely monitoring sea water surges (high tide, low tide) based on the 2010 calendar and forecasts and advisories from the government's weather station, PAGASA. Indicated in these calendars are readings of sea water surges (high tide and low tide) for the rice cropping months, June to October, which the farmers claim are good months when sea level rise is manageable, especially in the first three months or the vegetative (germination, seeding, tilling and stem elongation) and reproductive stage (flowering, heading or panicle exertion, panicle initiation to booting), the crucial months for rice to mature and ripen. When saline water inundates the rice fields during these months, the rice plant progressively turns brown until it looked burnt and eventually dies. Some grain can still be harvested if salt intrusion occurs during the ripening phase.

Drought

Sustained temperature increases and drought has resulted in the drying up of farm lands, including sources of water for irrigation. Small water reservoirs which serve as rain collectors constructed by the government in selected barangays also dry up during periods of drought. Over time, there has been continuous erosion of soil with the cutting of trees around the village reservoir; the soil is continuously deposited into the reservoir making it shallower and reducing its capacity to hold water and collect rain water during the rainy season. Some trees were also felled during typhoons and flooding. Dredging of the reservoir is seen as a solution by the farmers, so a strong recommendation was to bring such to the attention of municipal government for consideration and action.

There are, however, small deep wells that never run dry and provide water for drinking, household uses, and water needs for vegetable gardens.

There is a reduction in harvest during drought, with many rice stalks with empty grains, but the more destructive are typhoons or continuous rains or flooding in the rice fields at any phase of rice production.

A woman participant said: "I am already 74 years old and only these past years that I experienced very strong storms. We still have not recovered from the devastation of these storms on our houses and crops."

From the year 2000, there were changes in the climate. Farmers started experiencing long dry spells along with sudden storms and erratic rainfall resulting in a progressive fall in their harvest. During these dry seasons, cracks on the earth could extend more than one foot deep in the ground. In 2008, they experienced an all-time low of only 30 sacks per hectare. One farmer was forced to sell his farming tools in order to pay his debts to the landlord. He also experienced unexpected storm and flood that washed away his harvested palay. Insects, pests and birds destroying the crops are problems that the farmers continue to face.

gateway to paddy dikes

Adaptation for Drought

One key informant on drought was able to cope because of the availability of capital to build his own reservoir, and also because of his ownership of the land. Only a portion of his land was devoted to rice farming, the rest is planted with other cash crops such as mangoes and vegetables. In this way, he has a back-up source of income if his rice production fails. With capital to build a reservoir for irrigation, planting earlier had beneficial gains, since rice had already been harvested before the heavy rains and typhoons came.

In one barangay, there are two deep wells which do not run out of water even during drought or long dry spells. These become the source of drinking water, household, live-

Some estimates say that the water from these all-year wells can provide for the irrigation needs of a second cropping of rice, but many are against the idea of tapping it for irrigation purposes, as this may affect the water needs of human beings, farm animals and households.

For drought situations, building an additional reservoir allowed a farmer to begin planting earlier than farmers who have no access to capital to build a reservoir. Another adaptation is the adjustment of rice cropping months.

Respondents' Perceptions of Climate Patterns

- In January and February 2000, there were heavy rains; In August-October 2010 comparatively more rains came. Weather patterns became irregular; months that are supposed to be the dry season became the wet season, and months which were supposed to be the wet season became the dry season.
- Farmers experienced heavy fog during January – February, especially in the evening and early morning.
- Sea level rises are now up to 10-15 meters towards the inland, while before this didn't happen. Depending on the strength of the water flow coming inland, soil erosion and uprooted trees can result.
- The movements of the waves are erratic; it can be very calm in a day, then it can go higher than the height of an individual. A direct effect of this, according to the residents, is the reduction of arosep (sea grapes), a kind of valuable edible seaweed, and a decrease in the fish catch. There is now a common saying that before a fisher folk could catch 10 fish, but now a single fish has to be caught by 10 fisher folks, because of the growing fish scarcity.

Conclusions and Recommendations

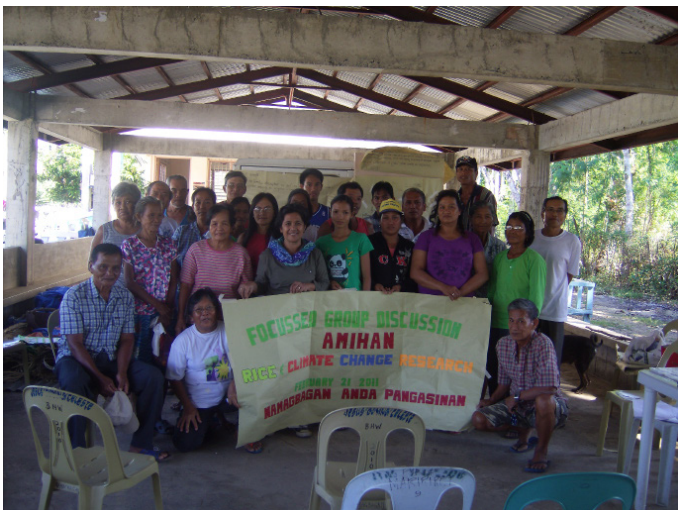
Ownership of land and capital are important adaptation tools for the farmers. Most of the farmers who left their salt inundated lands were tied to various tenancy relations and sharing schemes. With salt intrusion and ensuing harvest failure, their ability to cope was destroyed for lack of resources. Farmers who continue to work in the saline fields most frequently own the land and have resources to develop necessary adaptation measures. This is also true in the case of the farmers affected by drought.

In one case, aside from capital to build a reservoir and capital for rice production inputs, an additional piece of land is planted with fruit trees and vegetables that serves as a back-up source of income if rice production fails. The liberal use of chemical fertilizers and pesticides and the burning of wood for charcoal aggravate the vulnerability of communities to climate change impacts.

An organization of farmers could be a powerful adaptation tool support for farmers but is absent in this area. The researchers observed that farmers could be helped to address common problems through simple cooperation schemes.

Respondents reported that there have been efforts by the government to set up organizations and cooperatives of farmers, but these were designed as credit facilities and eventually stopped
operating.

Knowledge and awareness about the impact of climate change is an important factor in assisting communities to confront climate change-induced problems. Awareness of the problem is the first step in developing adaptive measures. Unfortunately, in the study area this awareness is lacking



focused group discussion with the farmers

Specific Recommendations

- On the problem of salt intrusion in the estimated 30 hectares of rice lands. Put gate valves on the culverts to prevent the free flow of salt water into the rice lands; consult with experts.
- On the problem of water scarcity. Construction of more reservoir/rain collectors; Dredging of existing reservoir/rain collectors; Repair existing wells in the three barangay and explore other sources of water such as spring wells in the barangays.
- Plant fruit trees, hardwood trees, especially around reservoirs.
- Implement massive education campaigns on climate change and the impact on lives and livelihoods; develop skills trainings based on the expressed needs of the communities.
- Develop training on organic farming – composting, basket gardening
- Build empowering organizations of farmers and women farmers.
- Bring climate change issues to all levels of government, from municipal to Congress.

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