

**Second Day Inputs
and Discussions:
April 25, 2008**

Highlights of the First Day

- Changing and breeding patterns of animals and insects have been changed by climate change.
- In the Philippines, energy consumption is the number one cause of climate change and deforestation is the next while chemical farming is also a major contributor to greenhouse gas emissions.
- There are collected stories from farmers of changes in environments — i.e. black bug infestations.
- Coastal areas are highly vulnerable. About 50% of the population lives along the coastline. They will be affected by sea level rise.
- Global action today will impact greatly on the possible impacts of climate change. This would depend on intergovernmental action and the action of citizens; attitude cannot be business as usual.
- Countries who do not have resources to adapt to impacts of climate change will be most vulnerable.
- Extreme conditions like the coldest winter have already affected crops such as the one in Vietnam.
- Higher incidence of floods and extreme temperatures have affected crops and a surge in crop pests and diseases.
- Nitrous oxide is greatly contributing to climate change and chemical fertilizers are a major source.
- Climate change is about water and productivity is greatly affected by it and not necessarily by other inputs.
- Organic fertilizers will help mitigate climate change but should be used with caution in areas where drain system is a problem such as in Samar.
- Agriculture is determined also by weather and a crazy weather will result to crazy agriculture
- One percent increase in temperature will mean a 10% loss in rice production.

- Intellectual property rights is a barrier to technological transfer.
- Loss of soil nutrients as exemplified in the loss of nitrogen in the 50%, phosphorous in the 70s, potassium in the 80s and now zinc and potash.

International Agreements to Watch Out for Related to Climate Change

- United Nations Framework Convention on Climate Change (UNFCCC) - Non-Annex 1 countries (developing countries) are asked to provide each country's inventory of Greenhouse Gas Emissions as mandated by the UNFCCC. They don't have the same applications as developed countries.
- United Nations Convention to Combat Desertification and the Philippines has formulated the National Action Plan on Desertification.
- Climate Change Adaptation Fund to help developing countries adapt to the impacts of climate change. The fund comes from the levy coming from the Clean Development Mechanism activities.
- Kyoto Protocol pursuing reductions in Greenhouse Gas Emissions - focuses more on mitigation measures, spelling out the obligations of countries primarily contributing to GHG and help developing countries attain sustainable development.
- Bali Action Plan is still quite uncertain in its commitments.
- ASEAN does not negotiate as a group. It has the Center for Biological Diversity.
- CGIAR, ICRAF, IRRI, SEARCA

Challenges

- Develop indigenous technologies for adaptation.
- Mainstream the impact of climate change by integrating disaster preparedness, design of infrastructure, and other "climate proofing" measures in sustainable development plans from the national down to local.
- Climate risks mapping and seasonal climate forecasting that can be used in planning and should be disseminated to farmers through climate field schools such as the ones done in Indonesia and Iloilo in the Philippines.

- Mangrove reforestation, tsunami barriers
- Over-extraction of water resources, falling water tables and rising temperature result to food insecurity
- Change in production systems is necessary.
- Incipient desertification or loss of soil nutrients is affecting most of Asian countries and national action plans should be developed
- Organic farming is the way to go
- Make rice production attractive for farmers because of the losing generation of young farmers.
- Correct marketing flaws in rice
- Instil among the farmers the value of national responsibility to produce enough for the country not just for their own consumption
- Hybrid seeds promotion led to the farmers' loss of control over seeds and their adoptive ability
- Increase in chemical fertilizer prices becomes a disincentive for farmers to use chemicals. Putting back the rice straws and rice hull in the field can also reduce dependence on chemical inputs
- Based on experience, farmers have to buy everything that is needed to prevent pest attacks on hybrid while alternative sources are readily available to combat pests in inbred
- Rice fields are no longer productive with soil lacking in humus or the capacity of the soil to store its natural micro nutrients
- Organic farmers are getting high yield comparable with hybrid even if they use inbred seeds and the application of *Bokasi*, IMO, Korean Nature Farming methods. So why promote hybrid, when its prices are so high. There are various methods to increase resistance to pests, like the use of garlic or ginger mixed with gin, beer and brown sugar, etc.
- Hybrid is not suited for planting in the rainy season. Hybrid when planted during the rainy season turned to brown color. In China, rice is only good for livestock because it is chalky or powdery. Based on experience, SRI is also good system because it provided good tillers, very strong tillers, and rice plant stands upright.
- Dir. Concepcion, if there are good practices then it should be promoted. Ka Jimmy's results are not debatable. The problem is how to upscale it to promote it for wider adoption. There are no policies for upscaling, providing the resources to upscale. Farmers practice farming with dif-

ferent intensities, if we have farmers like Ka jimmy then we can achieve same results.. Technology should be location-specific. Governments should support promoting any technology that will surpass various yield increasing technologies.

- Farmers know the solutions but government is not listening to farmers.
- In the case of Cambodia, SRI has spread quickly because of the help of NGOs like CEDAC, eventually getting government to support it. From a few farmers adopting it, now Cambodia has around 80,000 farmers adopting SRI. And it has spread out to 24 provinces.
- If you want to upscale, we also have to understand the language of technocrats. But on the other hand, government should understand farmers.
- Malaysian farmers never heard of SRI. Chemical farming is the one promoted by government.
- With climate change, there is opportunity for organic agriculture. There can be opportunities for change in policies, etc. Current production systems (chemical production) are being challenged by climate change. But we should know how to deal, engage and lobby governments. We should not be combative in our style of engagements.

Input 4

Adaptation Strategies to Climate Change in Rice Cultivation: Literature Review & Case Documentation

Anni Mitin DBA, Ph.D.³

Introduction

Research Objective:

- To document cases and supporting data that describes the practices adopted by rice farmers in East Asia as means of adapting to climate change

Methodology:

- Compilation of secondary data from internet search and published materials.

Limitation:

- Time constraint
- Limited access
- Limited details on adaptation strategies specifically for rice.

This session is basically going to look at cases that we are familiar with. We wanted to use this to kick start our work on climate change. We did this compilation in a month. This study is basically the result mostly of internet research. We selected 10 cases by which we can reflect on.

Background

- Priority based on the different climate change indicators and the different strategies adopted.

3. Acting Executive Director, Southeast Asian Council for Food Security & Fair Trade (SEACON)

- Indication of different communities in different areas or provinces being confronted with different climatic factors and different ways of adapting within the same country.
- Areas covered by the research:
 - ▶ CHINA ▶ CAMBODIA ▶ INDONESIA
 - ▶ JAPAN ▶ MALAYSIA ▶ PHILIPPINES
 - ▶ THAILAND ▶ VIETNAM

Will look into:

- Autonomous adaptation, the reaction of farmers to address problem at farm level, based on the farmers' own initiatives and creativity to overcome a climatic related problem in their rice farming activities, whether they consciously or unconsciously able to relate the cause to climate change.
- Planned adaptation, a conscious policy option or response strategies that are commonly introduced to the farmers by authoritative figures, including government and research institutions

Indicators that we tried to look for in the different countries: Possible Strategies

- Change varieties
 - ▶ Change cultivation area
- Diversify
 - ▶ Crop rotation
- Systemize irrigation
 - ▶ Drainage
- Tillering
 - ▶ Aerobic cultivation
- Rice intensification (SRI)
- Farming techniques
 - ▶ Equipment
- Inputs (fertilizers, pesticides)
- Farm animals
 - ▶ Mechanization
- Alternate wet and dry system
- Change planting and harvesting dates (crop management)
- Tree planting (buffer zone, rooting)
- forest fire management, promotion of agro-forestry, adaptive management with suitable species and civil-cultural practices

- Climate Change Indicators
- enhanced CO₂
- higher temperature
- Water availability
- Climate variability (extremities) - intense drought, cyclones, typhoon, heat waves
- Soil fertility and erosion
- Pests and diseases
- Sea-level rise
- Soil or water salinity
- Socio-economic impacts
- decline in yields and production;
- reduced marginal GDP from agriculture;
- fluctuations in world market prices;
- changes in geographical distribution of trade regimes;
- increased number of people at risk of hunger and food insecurity
- (One strategy according to Dr. Tibig is to not plant at all)

VIETNAM:

Focus Areas - Tu Ky, Binh Giang, Hai Duong / Vietnam

(Nhan Dan Business, March 21, 2008)

Problem

- prolonged cold spell
- Socio-economic impact
- Lost of livelihood

Adaptation Strategies

- Farmers sow a new crop of rice seeds (P6 rice seeds, survive even the cold and have high productivity)
- district authority provided 35,000 tonnes of rice seeds to local farmers
- Agricultural engineers have also supplied farmers with techniques to protect the areas under newly-sow rice seeds

Areas: Long An, Can Tho, Dong Thap, An Giang / Vietnam

(Nguyen Thi Hien Thuan, Suppakorn Chinvanno, AIACC AS 2007)

Problem:

- floods/inundations
- Erratic rains

- droughts

Socio-economic impact

- Lost of livelihood
- Flood tolerant rice variety "Swarna Submergence" carrying sub1a gene to enable submerging up to 17 days
- Will be offered to farmers by 2009 (currently on field trial)

Source: Announced in Oct. 2007 in Hanoi, (Horizon Solutions, October 2007)

- In Vietnam, there was the case of floods. The seed companies may take this as an opportunity to make business. In Hanoi, the IRRI group had a meeting and has decided to release a particular variety that can withstand 17 days under water. There are two sides to this. For certain genes to work, the conditions must be there. Without it, what happens? Will the rice plant survive?? We don't know.
- In Long An Vietnam, they produce about about 1 Million tons a year and that is how much Malaysia imports. If this is gone, then I don't know our rice supply will be affected.
- There are a lot of interventions that are being proposed like machineries, embankment but the problem is how much resources are there to be able to cope?

PHILIPPINES

Current coping or adaptation strategies The Philippine island of Luzon in the Central Region, Cagayan Valley, and the Ilocos Region (Rice Today. Mar 2008. IRRI)

- Drought hit in July 2007

Impact

- forcing most rice farmers to plant maize, vegetables, and other dry-season crops instead of rice.
- Rice seedlings are short and small due to lack of water
- Planting delayed for 4 months

Adaptation Strategies

- Start planting maize in late August
- Aid from Department of Agriculture provided several means of assistance including"
- Cloud-seeding,

- shallow tube wells,
- seeds,
- water-impounding projects.

These areas cannot plant anymore because the land is too dry. They converted to corn. And if they had to plant they had to delay planting for 4 months.

The village of Sepaka, Island of Mindanao, Southern Philippines (Oxfam America 2007)

- extreme heat, droughts and flash flooding are now annual occurrences.
- regular pest infestations and unpredictable weather
- Since 1997 El Nino
- 2006 drought lasted for six months.
- 2007: the farmers face an added crisis: many of the rice fields have turned black and dried up because of an infestation of black rice bugs.

Adaptation Strategies

- A volunteer for Oxfam's operational project and received training in organic farming techniques
- mixing own pesticides and fertilizers instead of buying synthetic ones and capacity building

THAILAND

Thailand rice farming area of Isaan region (Khon Kaen province, Phra Yun District, Ban Daeng site)

Problem: High salinity level of rainfed rice fields.
(climate, rock salt deposits, saline groundwater)

Socio-economic impact

- Depletes annual crop yields.

Adaptation Strategies

- Pumping ground water for irrigation
- Water storage
- Water and solute transfer within 2-meter soil depth

In Thailand, they deal with high salinity. But there is very little literature on this.

CAMBODIA

Lovethom, Cambodia (Oxfam America 2007)

Problem

- unpredictable floods
- droughts
- soil erosion

Socio-economic impact

- has to send family members to work as laborers to sustain livelihood, causing a severe lack of manpower in the fields.

Adaptation Strategies

- shift planting date: did not plant immediately after the flood waters receded, started planting rice seedlings in November-the last month of the wet season,
 - diversifying jobs: pressing palm leaves to sell as thatch walls and roofs as well as selling porridge and banana leaves.
- integrated farming such as cattle raising and vegetable planting, improving irrigation systems

CHINA

Rice-growing provinces of Anhui, Hunan and Hubei, China
(The New Agriculturist, 2008)

In 2006, China suffered one of its worst droughts in half-a-century. Water levels in lakes, rivers and reservoirs dropped to historic lows.

Adaptation strategies

- Aerobic rice, bred to require significantly less water than ordinary lowland rice
- aerobic rice combines the positive traits of hardy upland rice with those of high-yielding lowland rice. (IRRI)

Although aerobic rice is still on experimental stage, they think its already the solution for them. The problem with this is that field experiments have shown that yields drop year to year, 50% by the 7th season and is susceptible to new diseases from soil, insects and bacteria. Wheat can grow nicely around them because its aerobic.

INDONESIA

Central Kalimantan /Indonesia (Hohan, 2007)

- CO₂ emission, smoke, haze
- poor management of peat lands (decomposing, burning)
- Mega Rice Project to convert 1,400,000 hectares of peat swamp to rice cultivation (1996)
- Thousands of kilometers of newly-excavated drainage and irrigation channels dried the peat.

Impact

- reduced farming livelihoods

Adaptation Strategies

Farmers

- Using fire as an essential low-cost tool for clearing land and releasing nutrients.

Government

- "No-burning Legislation" to reduce haze and emissions

Indonesia is the number 3 contributor to greenhouse gas, next to China and US. This is in Kalimantan. They have a peat swamp there. The government is so eager to convert these areas to rice. But when they tried to excavate the soil, they created a whole that drain all the water and dried up the lands. So, the question is how can communities cope. Farmers thought of using fire. But government came up with the no burning legislation. So adaptation strategies can be for or against the farmers.

BANGLADESH

Impact

- Farmers are detained and fined for setting fire to clear and restore nutrients to peat soil on which almost all depended on for livelihoods. Small Village of Munshiganj, Southwestern Bangladesh 90 km from the coast.
(The Independent UK. 2007)

Problems

- Despite being 90 kilometers away from the coast, there is still salt in ground water.
- Gradual increase in sea levels are forcing saltwater from Bay of Bengal into lowland.

Socio-economic impact

- Income adjustment, change in agricultural practices.
- Used to harvest rice and vegetables 2-3 times a year.
- Totally the community cannot plant any rice anymore and has adopted prawn farming instead. rice production declined and vegetable crop failed to grow in saline water.

The questions I leave you are:

What adaptation strategies will benefit farmers? Looking at agriculture as a whole, is it better to grow shrimp instead? What will happen to the farming sector? Would this contribute to the needs of the population economically? Do we save the rice culture? Or what ways can the strategies be good for the environment?

Input 5

**Participatory Plant Breeding:
an experience-based
climate change adaptation work**

Yoyo Arnejo

Short background on SEARICE

- SEARICE strengthens farmers' management of agricultural biodiversity (plant genetic resources)
- Empowers farmers specifically on the aspect of access and control over seeds or plant genetic resources
- Recognizes role of farmers in the conservation and development of plant genetic resources/seeds

Why Plant Genetic Resources (PGR) - the seeds?

- basic natural resource for farmers essential for production (other than water, land)
- Source of diversity: important for the evolution and adaptation of species
- Carries technology, knowledge, skills and culture of farmers

Strategies

- Technical work - promotion of community-based conservation, development and sustainable use of plant genetic resources:
- Farmer Field Schools or season-long trainings to facilitate experiential learning (empowering process)
- Participatory Plant Breeding (PPB)
- Participatory Varietal Selection (PVS)
- Household-based seed keeping and community seed banking

- Policy Work
- Lobbying and campaigns
- Networking (organizations, government institutions)
- Policy research and analysis
- SEARICE coordinates the *Community Biodiversity Development and Conservation - Biodiversity Use and Conservation in Asia Program* (CBDC-BUCAP) in Southeast Asia
- Works in partnership with groups and institutions in Vietnam, Lao PDR, Bhutan, Thailand, and directly implements the project in the Philippines

PPB's main concerns:

- Crops' narrowing genetic base, hence the need for broadening
- The limitations of institutional, commercial and farmers' systems of PGR management
- The important role of small farmers (Diverse needs, IKS, diverse environments and G X E)
- Assist efforts in reducing poverty

Political Context

- *Bhutan* - constitutional monarchy working towards decentralization at District level
- *Vietnam and Lao PDR* - centralized economic planning states, with initiatives towards decentralized governance (e.g. in Vietnam, rice production is governed at the provincial level)
- *Thailand and the Philippines* - emerged from long history of military and authoritarian rule, in the process of refining and defining their own style of democratized and decentralized governance
- Agro-ecological and Economic Context of Plant Genetic Resources Management

How Technical Work is Being Managed and Implemented:

- Community PGR management
- Farmers' Role and Contribution to Food Production and Agricultural Biodiversity Conservation

Concrete Contributions (Farmers' Rights In Action)

- Bhutan
 1. Developed 3 maize farmer varieties and 11 rice farmer varieties in 6 years in a country that used to receive stable lines from IRRI
 2. Rehabilitation of blast resistant rice variety (No.11) & local maize variety (Baipo Ashom)
 3. Corn varieties 'rehabilitated' in high altitude areas which increased yield by 30% & processed into tengma, providing additional cash to families
 4. Selection from maize population (Yangtsepa X Kanglung local)
 5. Selection of 1 introduced maize variety (ATZT Synt-3)
 6. Selection of 8 blast resistant rice varieties
 7. 4 rice selections from advanced lines

- Thailand
 1. Infusion of 26 TRVs back into the community for direct use (TRV commands higher price \$2/10 kg mark up) developed 71 varieties from farmers' own cross, and selection from early and late generation population
 2. PPB integrated in the curricula of 6 primary and secondary schools (1 science teacher and school got an award from this innovation) = 30% of curricula to contain local knowledge
 3. Royal Princess interest and challenge to authorities to work on PPB and inclusion in schools

- Lao PDR
 1. 36 communities in 4 provinces (720 farmers)
 2. developed 83 farmer varieties (mostly glutinous)
 3. 23 varieties from farmers' own cross, and selection from early and late generation population in Champassak
 4. 21 varieties/population from Luang Prabang
 5. 17 varieties/population from Savanakheth
 6. 22 varieties/ population from Vientiane
 7. 83 farmer varieties (7 years) compared to 13 inbred varieties by ARC (20 years)

8. 2 farmers produced 10.5 tons seeds sold to seed multiplication center of Lao PDR
 9. Communities in Luang Prabang (indigenous peoples) used to have 3 months of famine; with farmer varieties secured rice supply
 10. 100% adoption of farmer varieties where there was no rice breeding program (valleys)
 11. Lao PDR Policy Outcomes
 12. Direct involvement of ARC thru institutional partnership for BUCAP - mainstreamed PPB in national rice breeding program
 13. From 1 variety/2 years to an infusion of 89 stable lines, 108 segregating lines, 43 for seed multiplication in only 1 province of the 4 provinces with only 2 national rice plant breeders
 14. Deliberate crosses using Lao materials - utilization of collection from genebank
 15. PPB part of extension system in 4 provinces
 16. Involvement of DoA led to policy reviews
 17. Seed Rules and Regulations
 18. Exploring sui generis form of protection
 19. PPB as part of agriculture college curriculum
 20. Thesis/internship in farmers' fields
 21. Visits to FFS sites to learn about plant breeding and glimpse of extension methods
 22. Part of DoA activity: Provincial Farmer Conferences and Fair
 23. PPB gets media attention & public interest
- North and Central Vietnam
 - ▶ 185 communities (+ 37 new sites in 2007) with 135 communities receiving project funding with the rest supported by EU, PARK, Helvetas, SAM, SRD
 - ▶ 57 BUCAP-IPM clubs
 - ▶ Quang Nam province: 16 of the 18 communes are managed by BUCAP IPM Clubs with support from local authorities

- ▶ Hue: 12 out of 19 communes
 - ▶ 2001-2006: 17 farmer varieties in Hoa Binh with MD25 covering at one stage 10,000 hectares of land
 - ▶ 8 farmer developed varieties undergoing tests for seed certification ; 3 varieties - tested for PVP
 - ▶ these prove that the national government and even the scientific community are starting to recognize the varieties developed by farmers
 - ▶ SRI - seed & water mgt - started with BUCAP processes with PPD + Oxfam America covers 8,000 hectares under SRI system (climate change mitigation)
- South Vietnam
 - ▶ 3 universities, 7 seed centers, 6 extension centers, DCP South Vietnam
 - ▶ 13 provinces (whole Mekong Delta)- 4 M hectares of rice area
 - ▶ 335 seed clubs - supplying 12% of total seed requirement in the whole Delta (source of 50% of Vietnam's exported rice), in contrast, formal system supply only 3% - at least 1 ton increase per hectare
 - ▶ Farmer developed variety covered a total of 150,000 hectares in 2007 (35,000 tons of rice seeds sold)
 - ▶ 10 varieties under national testing for varietal registration
 - ▶ 21 varieties undergoing multilocation trials
 - ▶ developed 1 BPH resistant farmer-variety (HD1) - covering 20,000 ha
- Philippines
 1. 60 communities, 19 municipalities, 5 provinces (Bohol, Misamis Oriental, North Cotabato, Bukidnon, Sultan Kudarat); Most of these communities were directly organized by the project as early as 1997
 2. Partner communities in the expansion areas usually organized in collaboration with other institutions like the academe, local government units and civil society organizations, which took part in the mainstreaming activities of the project
 3. 22 People's Organizations (with a total of 833 farmers implementing PGRCDU)

4. 4 Inter-municipal organizations - 1 in Bohol (Farmers' Consultative Council), 3 in Mindanao (SEEDS in Pres. Roxas, MABUHAY in Bukidnon, ASEPLAFA in Lambayong, SK)
5. Local government engagements (opened spaces thru provincial program)
6. Based on solid field work + engagements in policy advocacy (Bohol Prov'l program on PGRCDU, GM free zone, community registry -protection mechanism)
7. Policy outcomes

NATIONAL level

8. Round table discussions with different stakeholders, meetings, fora, workshops
9. legislative lobby (senate and congress) - e.g. hybrid rice engagement and budget hearing, senate and congressional investigation; ratification of international treaties (Cartagena, ITPGRFA)
10. Work with NGO and farmers networks - across political spectrum (e.g. Farmers Rights)
11. Media advocacy - print, radio, television; press conferences, press briefing, interviews, radio spots, press releases
12. Direct Action - hunger strike against Bt corn commercialisation
13. Legal Action - LLRice 62 case against DA, BPI and Bayer
14. PPB on a national scale
15. CBDC-BUCAP experiences clearly show the comparative advantages of PPB in prime irrigated areas, as well as in marginal areas in terms of cost, faster delivery & use
16. farmers were able to develop varieties that are adapted to specific ecological conditions such as drought tolerant varieties like Neo Wan 1 from Thailand and VCC1 from Philippines and varieties that can be grown under flooded condition such as A11 in Laos. In Philippines many farmer varieties are adapted to alkaline and acidic soils
17. Involvement of different actors, not just plant breeders necessary to affect policy and practice and hasten the paradigm shift

18. PPB is a learning platform not just for farmer-plant breeders but for the entire Ministry, schools etc
19. Creating new ways of working and communicating among stakeholders
20. Need for institutions to have strong ownership of the PPB program
21. Work on the ground - actual field experiences necessary

OPEN FORUM:

Dr. Suryo: Regarding the peat swamp mega rice project, with the change in government, the project has been stopped. You mentioned the Kalimantan people still burning shrubs. We have to distinguish between Java Island and Kalimantan. In Java Island, soil is fertile while in Kalimantan, soil is already degraded. The second thing is that we have to formulate and know the main impacts per area so we can do the appropriate action.

Q: I know SEARICE has been doing PPB for a long time but I am just wondering the specific relation of PPB to climate change?

Yoyo: Farmers develop the seed varieties appropriate to their specific conditions, whether long dry spell or a lot of rainfall. They keep on producing seeds that are adaptable to the present conditions.

Mr. Phuc: Vietnam - local varieties are important to help farmers adapt to extreme climate conditions; Adaptation is a long period. So it's step by step. I appreciate what SEARICE and BUCAP have been doing because in Vietnam we have diverse conditions and adaptive varieties are important. Vietnam government is actually promoting 1 to 2 varieties and that is the problem. Question for Yoyo: You said that role of NGOs in Vietnam is not so strong as in Cambodia and Laos, because NGOs now in Vietnam are more accepted by government than in the past. The challenge for NGOs in Vietnam is that some do not have legal papers. The Ministry of Internal Affairs have prepared 10 drafts for the registration of NGOs but has not improved yet. Now there is more open policy for NGOs doing poverty reduction

Yoyo: Before, farmers have noticed that IRRI varieties are no longer adapted to the soil conditions so farmers developed new adapted

varieties as the yield decreases.

Comment: The thing is personally, traditional seeds have proven themselves for thousands of years. They have managed to withstand weather for thousands of years, and with the development of new varieties, there are a lot of uncertainties. For me, it is best to use the traditional seeds because they have proven themselves.

Vietnam: With prolonged cold weather, traditional varieties can survive extreme weather conditions contrary to hybrid varieties - under 15 degrees - difficult to transplant and can not survive. I think with the development of new varieties, they are more prone to die or to problems.

Q: We are aware of the efforts of our ancestors but currently there are threats to our breeding efforts. We know the WTO imposed IPR regime so farmers' efforts can be overrun by seeds corporations probably through genetic engineering in time. What are ancestors farmers did in a long time maybe surpassed by these corporations. WTO is a global policy that can put sanctions. Even if we breed good varieties but if corporations own the IPR then we would have to pay royalties. Question about the shrimp farming in Bangladesh, is it an adaptation measure? This is happening in the Philippines and has led to other problems.

Anni: Bangladesh farmers are shifting to prawn farming from rice farming due to rising sea level.

Dr. Tibig: There's no use of talking about science if you don't talk of applications. We do research in order to help applications for the good of everyone. About climate change, there is no single strategy to adapt to climate change. No single strategy to adapt to climate change. What you have shown are examples of adaptation strategies. I grouped them into non technological and technological but come to think of it, you all have them:

- Farmer participation in drawing up plans/recommendations. They know their farms better because they know better the changes in the farm environment better than the scientists and institutions.
- On Using different seed varieties and genetics. IRRI is even recognizing that rice production is going to decline unless of course there will be improvement in varieties, meaning a problem of genetics..
- I also heard someone mentioning diversification not only hori-

zontally but vertical. Vertical means the use of by-products to increase farmers' income.

- Policy review (need to push for indigenous technology, review of country's involvement in global trade agreements-that is why I am pushing for indigenous technology.., Policy review in terms of land use and/or CARP to help subsistence farmers) and implementation,
- Shift in farmers' livelihood (need to discuss further (ie. Rice to shrimp) in the light of SIBAT's insights of this shift leading to other problems)
- Use indigenous knowledge. There is a big store of indigenous knowledge. UNFCCC recognizes that. In fact they are making a compendium of adaptation of strategies.
- We have to be very careful dealing with carbon credits, because it might bounce back on us. The Americans say that by tilling the land, you are contributing to climate change so we have to wait since it is still a very hot issue in the negotiations.

Dr. Concepcion's comments:

- First, in order to make all these discussions viable, any effort that we do should be mainstreamed.
- Rice farming should be made as a major land use. Take irrigated rice agriculture as a major land use. If that happens, then enabling policies will come.
- Finding the balance on the economic viability, food security, for example and needs of the environment. Sustainable agriculture will not be adopted 100%, at once. Promote successful sustainable agriculture practices according to a particular area/location's specific conditions. There is no way that organic agriculture will increase production but it will improve biological activities. A technology's adoption (50% adoption) according to that area's specific condition is the ultimate success indicator of the technology.
- On varietal breeding, too many varieties can be dangerous from the point of view of the farmer and the environment. Every variety is an individual and every individual has its ecological landscape. If you don't put them together, then nothing is sustainable. Imagine with 273 varieties, there is no such space that will accommodate all of these. Maybe you can go into core vari-

eties and develop alternate varieties as a safety net. Move the effort a little to consider the market requirements and outside of the farm. Imagine if you have many varieties, then it goes to the mill, one is broken and one is not because they have different milling requirements. Practical thing to do is to select varieties that are suited for each environment. That is why I am pushing that irrigated rice lands being a major land use is foremost. Do not use technology to develop for example a saline tolerant variety for a saline farm because you will only accelerate salinity being taken up to the soil because rice is a very strong pump and can increasing and putting that landscape to irreversible salinity.

- Changing variety is pushing productivity beyond the limit of natural resources. That is the same mistake that we are complaining on hybrid rice; I would like to change the approach-push the approach beyond the farm, test it against the market, against the environment and the final sustainability to sustain their effort is the market-whether they are earning or not. Do not satisfy the environment alone. Farmers' family is increasing. These are the practical considerations
- Water economy - farmers in irrigated rice lands are submerging their plants their water not because the plant needs it but to prevent weeds from growing. Irrigated agriculture should be change in terms of use of water. Implement alternating wet and dry irrigation system. But there is a better way, if you plant rice at filled capacity then rice will grow and yield. There is also the rotary weeder that is the partner of irrigation. Flooding is use because of weeds but if you use weeder then there is less water.
- Farming is a social responsibility. Finding the balance of ensuring household surplus that can sustain the national rice stock for public consumption. The quarrel between sustainable agriculture and the national programs is that how much of the surplus can protect the environment and satisfy the market. That kind of balance seems to be the cause of the problem.
- With so many practitioners that you have, i would like to recommend if you have formed some kind of federation or network of organic practitioners and you upscale sustainable agriculture. You have to harmonize your efforts and message. The reason that you are having difficulty communicating is that ad-

vocates are sending a variety of message to the government. Communicate well to the government. Talk about the effect of organic farming in different ways at different locations and conditions. Ask the government to support your technology because the market will support it. Don't say that it will replace the existing program of the government. Present successful sustainable agriculture methods considering the economy-of-scale in one language. If you talk to the national government, you have to be one as a network. You develop a common language/message but differentiated approach. Don't ever go in a discussion saying that you will change/replace the system. A good product will always be supported by the market. They will change if they see it. Our farmers in Asia never copy.

- Organic agriculture will correct the problem but not totally solve it. Mainstream all your efforts.
- On the WTO issue-IPR issue, its good that you promote in situ protection of genetic resources.

Clarification: Did you say that too much of biodiversity is bad-genetic pollution?

Dr. Concepcion: No. I didn't say that. I'm very sure that the right term for what you are doing is seed selection. When you talk to the government, there are scientist-breeders there and we have to be careful of terms because they are very sensitive to terminologies. When you say that you are developing varieties for a short period, I'm very sure that you will be questioned there because they follow a process because breeding is a long process.

Yoyo: We know that it takes four years to develop a variety. Farmers know that. It depends on the selection method they use-if they use the single panicle method, it's shorter. This is why sometimes they can easily achieve uniformity after 3.5 years.

Dr. Concepcion: I'm not contesting you but I'm talking as a technocrat because they will have the same questions.

WORKSHOP RESULTS

ISSUES AND PROBLEMS	POLICY RECOMMENDATIONS	STRATEGIES
Corporate control of fertilizers and farm inputs	Reduction of chemical use in rice farming	Lobby and engage regional bodies, multilateral research agencies such as CGIAR, SEARCA and national governments and national agriculture research institutions MARDITECH (Malaysia), PHILRICE (Philippines), CARDI (Cambodia), Plant Protection Department/Vietnam Food Crop Research Institute, Rice Research Development Center (Indonesia)
Mainstreaming sustainable agriculture technologies (not just in rice but also other crops and livestock)	<p>Fund for organic/Government /even other institutions support to help upscale farmer experiences on Sus Ag</p> <p>National and regional (i.e. ASEAN) road maps for sustainable rice production,</p> <p>Consolidation of best practices/indigenous knowledge</p> <p>Support successful practitioners to showcase successes that could lead to better adoption</p> <p>On seeds-production of quality seeds</p> <p>Promoting farmer's innovative techniques in sustainable/organic agriculture/ promotion of SRI and other technologies as a climate change mitigating measure</p>	<p>Lobbying/ Budget/fund intervention - inclusion of SA support for SA and CC mitigating measures</p> <p>Look into the opportunities within ASEAN and see how we can intervene as far as the issue of road map for sustainable rice production (not just the trade issue, but basically under the framework of food security for the region)</p> <p>Research</p> <p>Information dissemination Campaign (media campaign, lobbying)</p>

ISSUES AND PROBLEMS	POLICY RECOMMENDATIONS	STRATEGIES
Water and Land Use	<p>Participatory water and land use planning</p> <p>Water conservation campaign: effective utilization, upgrading of irrigations systems and participatory irrigation management</p> <p>Protecting land from degradation</p>	<p>Advocating national governments for a land use policy; Urge governments to include farmers, NGOs, other sectors in the crafting of land use policy</p> <p>With countries having a land use policy in place, this has not prevented the ricelands' conversion; still needs to do some lobbying so that irrigated/potentially irrigable rice lands are not converted for food security</p> <p>Monitoring land use conversions</p> <p>Push for the "Rice Protected Zones"</p>
Impacts of Climate Change and CC Adaptation	<p>National governments are made aware of the impact of CC on agriculture and benefits of sus ag</p> <p>Integrating climate change adaptation and mitigation in country/national plans down to grassroots</p> <p>Multi stakeholders collaboration on climate change mitigation and adaptation</p> <p>Capacity building for Climate change adaptation</p> <p>Reflecting and Gathering the impacts of climate change for dissemination</p> <p>Ensure that impact on women's are looked into</p>	<p>National Action Planning; making sure that these plans are monitored and enforced</p> <p>PO-NGO-LGU -Academe collaboration</p> <p>Trainings, workshops on impact of cc and adaptation techniques</p> <p>Information dissemination (Information, exchange and communication)</p> <p>Involvement of women in the gathering of effects, formulation of plans and programs</p> <p>Lobbying governments for action plans to cope with climate change, support for sus ag</p> <p>Looking into the role of CANSEA and the national bodies (i.e. PNCC for the Philippines)</p>

ISSUES AND PROBLEMS	POLICY RECOMMENDATIONS	STRATEGIES
<p>Role of International Treaties/Conventions and Role of Multilateral Organizations (ADB and other donor agencies)</p>	<p>Country review and action on International Treaties that impedes on climate change litigation and Adaptation</p> <p>Provide funding to support sustainable agriculture/cc adaptation measures</p> <p>ON IRRI</p>	<p>Research/ review of literature</p> <p>Join groups advocating for change in policies of these multilateral organizations</p> <p>Involve international donors in advocacy forum/ send them to see the benefits of these practices</p> <p>Send proposals as a group to promote sustainable rice farming</p>

Annex 1: List of Participants

NAME	ORGANIZATION	COUNTRY	EMAIL/CONTACT NUMBERS
Hazel Tanchuling	EARWG Secretariat	Philippines	hazel_tanchuling@yahoo.com
Jocytita Sierra	Rice Watch	Philippines	joyce.sierra@gmail.com
Said Abdullah	KRKP	Indonesia	krkp@indo.net.id
Phuc Van Nguyen	Sustainable Rural Development	Vietnam	phuc@srd.org.vn
Joyce Palacol	CBCP-NASSA	Philippines	j_palacol@yahoo.com
Samuel Contreras	Bureau of Soils and Water Management	Philippines	sammycontreras@yahoo.com
Cheng Dara	Rachana	Cambodia	rachana_treang@yahoo.com
Sang Siem	Farmer	Cambodia	055-9280326
Aizel Joyce Catipay	Businessworld newspaper	Philippines	aizeljoyce@yahoo.com/ 09208348459
Minh Nguyen Nguyet	Oxfam Quebec	Vietnam	nguyenm@oxfam.gc.ca
Rawwna Crisostomo	GMA 7		9188236861
Lando San Jose			
Winston Lucas			
Sr. Aida Velasquez OSB	LTK/PNCC	Philippines	564-65-38; 5257627
Jowen Berber	Centrosaka	Philippines	centrosaka@yahoo.com
Eugene Quirante	NFA	Philippines	liga_agrikultura@yahoo.com/ 09157981176
Randy Nobleza	Malaya	Philippines	
Floyd Padilla	AHN	Philippines	floridapadilla@yahoo.com
Mike Llanes	Oxfam GB	Philippines	mdllannes@gmail.com
Para Ribete	Haribon	Philippines	
William Alamin	R1	Philippines	
Alice Raymundo	IRDF/APNFS	Philippines	aliceraymundo@yahoo.com

NAME	ORGANIZATION	COUNTRY	EMAIL/CONTACT NUMBERS
Dr. Suryo Wiyono	Bogor Agricultural university	Indonesia	swiyono@yahoo.de; suryow@hotmail.com
Edwin C. Plaza	Davao Provinces Rural Devt Institute	Philippines	edwin_plaza@yahoo.com
Lourdes Tibig	Philippine Atmospheric Geophysical Sciences Administration	Philippines	lvtibig@yahoo.com
Aurelio Z. Dela Cruz	SIBAT	Philippines	teng_dela_cruz@yahoo.com
Sok Kao	Cambodian Center for Study of Agriculture	Cambodia	sokkao@online.com.kh
Gani Serrano	PRRM	Philippines	iserrano@prrm.org
Anni Mitin	SEACON	Malaysia	annie@seacouncil.org
Luy Pisey Rith	OXFAM America	Cambodia	pluy@oxfamamerica.org
Ma. Flora Umali	Sarilaya	Philippines	
Lia Esquillo	IDIS	Philippines	ianna_simone@yahoo.com
Jessica Cantos	Rice Watch	Philippines	jeckcantos@gmail.com
Tessie galleta	Daluyong-farmer	Philippines	9212202513
Senena Taller	Daluyong-farmer	Philippines	9216521173
Rebecca Miranda	Daluyong-farmer	Philippines	9198051940
Jun Garde	SRI	Philippines	
Charlie Razo	Sri Pilipinas		
Shalimar Vitan	Oxfam GB	Philippines	svitan@oxfam.org.uk
Nestor Diego	TFFS-PKMP	Philippines	rasheed_nestordiego@yahoo.com
Jayson Cainglet	Agribusiness Accountability Initiative	Philippines	jaycainglet@yahoo.com
Gina de la Cruz	Rural Urban Peoples Linkages	Philippines	gina_dlc@yahoo.com
Che de Jesus	Searice	Philippines	searice@searice.org.ph
Arman Catolico	Searice	Philippines	

NAME	ORGANIZATION	COUNTRY	EMAIL/CONTACT NUMBERS
Jason Torres	ABC 5		
Faith Bacon	PLCPD	Philippines	
Aurora Regalado	MODE	Philippines	
Pamela Ordoveza	PCIJ	Philippines	pamela.ordoveza@gmail.com
Yoyo Arnejo	SEARICE		boholpgn@globelines.com.ph
Lee Aruelo	TWN	Philippines	lmaruelo@yahoo.com
Ka Jimmy Tadeo	Paragos-Pilipinas	Philippines	
Karol Ilagan	PCIJ		karol@pcij.org
Roslin	Philippine Network on Climate Change		