Climate Change and Gender Justice:

A Participatory Research Study on the Impact of Climate Change on Women in Three Selected Rural Communities in the Philippines

Research Team
Felina Mendres, Lead Researcher
Zenaida Soriano
Nora de la Vega
Cathy Estavillo
Tess Vistro, Consultant and Writer

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Pesticide Action Network Asia and the Pacific
PO Box 1170, 10850 Penang, Malaysia
Tel: (604) 657-0271 / 656-0381
Fax: (604) 658-3960
Email: panap@panap.net
Website: www.panap.net

Production Team
Compiled and edited by: ????
Project Coordinator: Gilbert Sape
Production Staff: Virgilio Tamayao Jr
Adviser: Sarojeni Rengam
Layout Artist: Dennis Longid (Red Leaf Designs)

Introduction

The Philippines is one country highly vulnerable to climate change. It is ranked highest in the world in terms of vulnerability to tropical cyclone disturbances with an average of 20 typhoons traversing the country every year.[1] It ranks sixth among countries considered as "extremely at risk" to disasters induced by disasters.

Climate-induced disasters such as drought during El Niño episodes and flooding during La Niña, further put climate sensitive sectors such as agriculture, water resources, forestry, fisheries, coastal and marine resources, health and infrastructure, at risk. Its extensive coastlines will be battered by sea level rise, putting further devastation to marine resources and ecosystems.

Roughly 70 per cent of the population are concentrated in rural agricultural communities and along coastlines, depending on these climate sensitive sectors for their livelihood and survival. Already reeling from the anthropogenic-induced devastation such as pollution, and over-exploitation of these resources, these vulnerable sectors stand to further

decline in terms of productivity, and to sustain livelihoods, will further slide way below poverty thresholds. Of the total 24 million Filipinos considered poor, 60 per cent can be found in the rural areas and half of these are women, engaging mostly in the unaccounted, unpaid informal economy.

In 2009, there were 12.04 million employed in the agricultural sector and about three fourths were male workers.[2]

On October 23, 2009, the Republic Act 9729 also known as the Climate Change Act of 2009[3] was passed into law. It was passed at the most opportune time. The country only a month before the passage, was hit by a strong typhoon, named *Ondoy*, which claimed more than a thousand lives, destroyed millions of properties, infrastructure, agricultural crops and livelihoods worth millions of pesos. Considered as the first in Asia, it is the country's first legal instrument to address the climate change crisis in the country. The law created a commission to 1) Coordinate and synchronize climate change programs of national government agencies; 2) Recommend key development investments in climate-sensitive sectors such as water resources, agriculture, forestry, coastal and marine resources, health and infrastructure to ensure the achievement of national sustainable development goals; 3) Create an enabling environment that shall promote broader multi-stakeholder participation and integrate climate change mitigation and adaptation; 4) Coordinate and establish a close partnership with the National Disaster Coordinating Council in order to increase efficiency and effectiveness in reducing the people's vulnerability to climate-related disasters; and, 5)Formulate the Framework Strategy and program on Climate Change, the National Climate Change Action Plan and facilitate local action plan.

Six months after the law was enacted, the National Framework Strategy on Climate Change was developed to serve as basis for climate change planning, research and development, monitor activities to protect vulnerable communities from the adverse impacts based on the country's climate change vulnerabilities, specific adaptation needs, mitigation potentials, and in accordance with the international agreements the country has entered into. The framework strategy acknowledged the particular strengths and vulnerabilities of the country in addressing the climate change crisis stating: "The Philippines is a country endowed with a plethora of species and ecosystems, making it one of the 18 mega-biodiversity countries in the world. However, there is currently an increasing

threat to the country's wealth of biodiversity because of the pressure brought upon by human induced threats which are further compounded by the adverse impacts of climate change on terrestrial and aquatic plant and animal communities as manifested in increasing temperature and extreme variability in rainfall."

The plan is envisioned to be reviewed every three (3) years. Among its mandates are: a) to set out national priorities; b) Impact, vulnerability and adaptation assessments; c) monitor compliance with international commitments; d) undertake research and development and database development and management; e) capability building and mainstreaming into academic programs; f) advocacy and information dissemination; and, g) gender mainstreaming.

One year after the formulation of the national framework strategy on climate change, a National Climate Change Action Plan[4] was formulated which included: a) assessment of the national impact of climate change; b) identification of the most vulnerable communities/areas, including ecosystems to the impacts of climate change, variability and extremes; c) the identification of differential impacts of climate change on men, women and children; d) assessment and management of risk and vulnerability; e) identification of GHG mitigation potentials; and, f) identification of options, prioritization of appropriate adaptation measures for joint projects of national and local governments.

Areas identified exposed to extremely warm temperatures are the provinces in Mindanao: Sulu, Basilan, Lanao del Sur, Lanao del Norte, Maguindanao, Davao del Sur, Zamboanga del Sur, Tawi-tawi and Misamis Occidental. Identified at risk due to heavy rains are the provinces of Albay, Pampanga, Ifugao, Rizal, Cavite, Sorsogon, Laguna, Biliran, Batangas, Pangasinan, Masbate, Metro Manila, Tarlac, Nueva Ecija, Northern Samar, Aklan, Capiz, La Union, Western Samar and Romblon. Super-typhoons are predicted in northern and southeastern Luzon and eastern Visayas while drought is seen in central and western Mindanao. Albay tops the list of 20 provinces which are vulnerable to disasters brought by climate change.

In the Philippine Development Plan (PDP)[5] for 2011 to 2016, the Aquino government identified the Integrity of the environment and climate change adaptation and mitigation (IECCAM) as one of its five priority areas. The rest are transparent, accountable and participatory governance,

poverty reduction and empowerment of the poor and vulnerable, rapid, inclusive and sustained economic growth, and just and lasting peace and the rule of law.

In the 2012 proposed budget[6], IECCAM as a priority program of the government is allocated P36.2 billion up of 18.2 per cent from its 2011 allocation. The component programs include:

Typhoons and other calamities preparedness. Automation program of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) to enhance the capability of PAGASA to provide timely and accurate weather forecasts, flood control projects, especially along major basins and principal rivers, rain water collection projects for irrigation and drinking water source, improving the environmental quality and sustainable management of Laguna Lake through institutional strengthening and community participation, rehabilitation of the Pasig river, solid waste and disposal management project of the Metro Manila.

For long term sustainability, the government defined the need to enhance the quality of our environment and make it more sustainable through empowered communities. Included in the targets for 2012 are:

The National Greening Program of the Department of Environment and Natural Resources (DENR) aims to plant 1.5 billion seedlings in 1.5 million hectares of public land nationwide for the period 2011 to 2016. Aside from increasing forest cover, this project also seeks to improve water quality in rivers and irrigation for farm lands, reduce the potential for flooding, reduce carbon dioxide, and lay the foundation for an expanded wood-products economy. The Forest Protection Program, an activity that intends to hire 600 extension workers and 3,113 *Bantay Gubat* (Forest Guards) volunteers to monitor and patrol the 4.1 million hectares of untenured forest lands.

Earlier on, two important pieces of legislations for climate change mitigation were also enacted: the Biofuels Act of 2006, and the Renewable Energy (RE) Act of 2008. Both aiming to reduce the country's dependence on fossil fuel, these likewise raised greater concerns. The biofuels agenda opened up the floodgates for thousands of hectares of agricultural lands devoted for food production, converted for biofuels cultivation, raising the warning of a spectre of the country's food insecurity.

But while the government has laid out its legal infrastructure for addressing climate change and its international commitments, there are several unsettling concerns on the operationalization of its plans. One is putting the public-private partnership scheme in the development of renewable energy resources and technology. The country which is a strong source of RE such as wind, solar, geothermal, and biofuel, further intends to get a share of the pie of global investments on renewable energy which reached Php 211 billion in 2010. This essentially puts the country's climate change mitigation and adaptation plan at the disposal of profit-driven private and foreign investments.

Accessing funds through various loan facilities of the World Bank (WB) and the Asian Development Bank (ADB) compromises benefits and long-term sustainability of climate change plans. Loans add more burden to indebted and already fragile economies like the Philippines. This violates a key principle and obligation enshrined in the UN Framework Convention Climate Change (UNFCCC), the principle of "common but differentiated responsibility," which mandates developed countries to pay for the effects and impact of climate change. Further, the donor-beneficiary relationship the CIF promotes erodes industrialized countries' obligations to emissions reduction. [7]

There is also disproportionate focus on mitigation especially on the promotion of renewable energy. This bias is further manifested in the preference for "hard" scientific and technology-based solutions over "soft" policies that address socio-economic needs and differences.[8]

Also as listed in the programs, most of the adaptation measures are physical infrastructure build-up such as flood barriers. So little went to investments and subsidy to support farmers as they adapt to the altered weather events.

There is a mismatch of identified risks and climate vulnerabilities and the plan of action. Climate-sensitive sectors such as water resources, agriculture, forestry, coastal and marine resources and health and women and children are identified as climate vulnerable sectors, yet this is not matched by a clear plan of action and funding allocation by the government.

Part 1. The Research Study

In 2009, the Asia Pacific Forum on Women and Development (APWLD) identified climate change and its impact on rural women as one of the emerging issues it would focus on in one of its programs, the Breaking Out of Marginalization (BOOM) program. A plan to embark on a five countries participatory research project in Indonesia, Philippines (two sites), India, Sri Lanka and Pakistan, the program laid out the following research objectives:

A) To increase understanding of rural and indigenous women on the issues related to global warming and climate change;

B) To identify impacts of changes in climate on rural and indigenous women and the ways the impact exacerbates existing inequalities and gender relations;

C) To identify needs, potentials and obstacles of rural and indigenous women in addressing the impacts within the country specific policy context; and

D) To identify practices and initiatives in empowering women which serve as adaptation and mitigation measures (in the areas of agriculture, fisheries and natural resource management)

Developed further are the following scope and key questions to be addressed by the research studies:

A) What have been the characteristics of changing climate and major issues related to the changes in the rural sector in your country?

B) What are the impacts of those changes in the community (including children) and the resulting effects on women and men?

C) How has the existing inequalities between men and women, and based on other social factors, make women more vulnerable to those impacts and vice versa?

D) How women and men have been coping with those negative changes and impacts? What are the women's roles in the family and in the community in these practices?

E) What are the potentials and needs of women to respond to the situation? What are the obstacles?

F) What are the suggestions/demands the women make to improve their resilience? (suggestions more of the analytical and demand for rights claiming)

G) What are the women's strategies in addressing climate change and impact on their livelihood?

H) Major indicators for women's empowerment and disempowerment

I) Are there exceptional initiatives, coping mechanisms or tools that women in their communities have made to withstand climate change impacts? How useful have these been? Cite cases and describe how these have been developed.

1.A. The Philippine Research Study

This study was conducted by the AMIHAN, National Federation of Peasant Women, a mass organization of peasant women and other rural women, established in 1986, to respond to the need to organize rural women and develop their strength for collective action in addressing issues on marginalization and discrimination, poverty and landlessness.

AMIHAN has members and chapters in the three major islands of the country, and runs programs of educating and building organizations of rural women, launching campaigns for the government to recognize and respect rural women's rights to the land and other basic livelihood resources, against imperialist globalization particularly the unabated dumping of agricultural crops into the country, against continued use of hazardous chemicals in farming which pose health risks to women's reproductive health, against militarization of rural communities and the continued presence of US military troops in the countrysides.

It runs poverty alleviation and food security enhancement, maternal and family and environment and sustainable development programs, for the communities organized.

1.B. The Research Sites

The study was conducted in Barangays San Rafael, Mascap and Puray in the municipality of Rodriguez, province of Rizal. These are three of the 11 barangays of the municipality. Rodriguez is situated at the periphery of Metro Manila, bounded by Quezon City and Caloocan City on the west, by the province of Bulacan on the north, by the province of Quezon on the east and by San Mateo and Antipolo City on the south. It has a land area of 36, 308 hectares.[9]

Biophysical Characteristics[10]

Topography

Topography defines the detailed description of the surface features of a location or region. This includes the hills, valleys, streams, lakes, roads, tunnels, etc.

Rodriguez town of which barangays San Rafael, Mascap and Puray are a part of is situated on the southern slopes of the Sierra Madre Mountain Ranges. It is characterized as hilly to mountainous and the elevations are high. Approximately 83 per cent of its land area is composed of upland areas, hills and mountain ranges with steep slopes and rugged terrain. Only a small portion has low laying level terrain to moderately sloping and rolling lands.

Natural Drainage

Rodriguez is drained by a network of natural river systems which originate from the highlands of Sierra Madre: Maly river, Mangos river, Montalban river, Puray river, Tanag river, and Wawa river which joins a larger river system, the Marikina river which eventually drains out into the Manila Bay.

A number of springs and ponds are also present. Likewise, an underground water drainage system originates from Sierra Madre and seeps towards the valleys and lowlands providing essential water source for domestic, industrial and agricultural purposes.

Climate

The area is characterized by a Type 1 climate which has two pronounced seasons: dry from December to May, and wet from June to November.

Soil erosion potential

Soil erosion involves the dislodging, detachment and removal of fragmented surface material by action of the wind and/or run-off water. Severe erosion is present in the mountainous and strongly rolling hills areas (48.53 per cent). None to slightly eroded area is 32.1 per cent, while 9.27 per cent comprise the moderately eroded areas. The alluvial river valleys and lowlands experience no apparent erosion (7.41 per cent).

The occurrence of erosion is intensified by uncontrolled quarrying and land development in the municipality.

Land Uses

Lands in the town are classified as woodland/forests (51.5 per cent), savanna (43.3 per cent), riceland, (3.1 per cent) and built up (2.1 per cent) areas.

Socioeconomic, political context[11]

In a community profile study conducted at Barangay San Rafael in 2008, involving 1,003 household heads, representing 10 per cent of the total household population; 82 per cent were women; the women were the ones interviewed as most women were left at home, while their husbands were at work.

Relevant aspects related to women which can be culled from the study were the following:

- Income of respondents: fifty one (51 per cent) of the respondents were not gainfully employed; they do not have income. Most of them are housewives who are left at home to do household chores and take care of the children. The 41 per cent who have jobs have a monthly income of P3,000 and below. Using the "international poverty line of $1 per day per person (ADB, 2005), half (50.2 per cent) are living with less than $1 a day per person, and another 25 per cent have monthly income of P3,001 – P6,000 which is also below poverty line.

- Migration patterns: Most (87 per cent) of the respondents have stayed in the barangay for more than five years, and 39 per cent are original settlers.

- Existing organizations in the barangay: The respondents of the study identified at least 10 organizations in the barangay and the most mentioned organizations include women organization (37.9 per cent), homeowners association (17.5 per cent), non-government/people's organizations (13.4 per cent) and youth organization (12.5 per cent). Also according to the respondents, the categories of organizations which they are currently affiliated in are related to the following: 1) welfare of women; 2) livelihood and finance, and 3) peace and order.

- Community participation: the number of respondents participating in barangay activities (61 per cent) far exceeds those who do not (39 per cent). Their forms of participation include: attendance to meetings and actively participating in the projects of the barangay.

- The gender division of labor still follows the traditional Filipino household where the productive activities are dominated by men (66 per cent) and household activities are done by women (55 per cent). In terms of community activities, women participated more than the men. The reason identified is that women tend to be at home more often than the men. Thus they have more time for community activities compared to men.

- Ownership to properties. Properties identified were appliances, vehicles, machineries and land. Only five (5) out of the total respondents own land, and 10 own their houses.

- Majority of the respondents (84 per cent) have access to electricity; the area is not yet serviced by the national water system; most get their water from creek, river, spring; major sources of energy for cooking: liquefied gas, charcoal and firewood.

- Common occupations listed were construction work, business, employment, farming and poultry and livestock raising

- Available social services listed were health and nutrition, education, religion, market, capital and finance, recreation, communication and transportation.

- Problems and issues in the barangay: listed into categories, these were: peace and order (drunkenness, theft/robbery, brawl, gossips), health and nutrition (malnutrition, lack of free medicines, lung problems, inadequate food), environment and sanitation (quarrying and landslide as the major problem followed by garbage, mud and dust, illegal logging, polluted river/water, slash and burn agriculture, foul smell of piggery/poultry) economic and finance (lack of adequate jobs and opportunities, high prices of commodities and lack of livelihood programs), education

(high dropout rate/low educational attainment, low quality of education, lack of books, not enough teachers, high tuition fees) local governance and social problems (irresponsibility of local officials, implementing guidelines for land ownership are not in order, not reached by information about development projects, and improper use of government properties and resources).

- Impact of development projects: three development projects were identified: quarrying, tourism, and real estate development/ subdivision. There were mixed perceptions to these development projects; for quarrying, this is viewed negatively by most respondents, as the one causing landslides, destruction of environment, health hazards through the dust emissions; as to the real estate development and tourism development projects, cited as negative effects were decrease in agricultural lands due to land use conversion, additional garbage, demolition of houses, increase in population, the rich are the only ones benefited, land grabbing by developers. For all these projects acknowledged were that these can create jobs and will give additional revenues for the barangay.

1.B.a. History

Barangay San Rafael and Mascap[12]

These two barangays are contiguous. Settlers in the community started in the 50s. The place used to be thickly forested with an array of wild animals such as deers, wild boars, monkeys, snakes, wild cats, wild chickens, diverse species of insects such as beehives, butterflies, birds of various colors and tunes, such as parrots and eagles are widely seen in the area. Rivers teem with various species of fishes and shells. The land is fertile with all assortments of root crops, wild yams, ferns, different kinds of edible mushrooms. Rivers and streams are clean for drinking and for other household purposes. Rice and corn crops can easily be grown, with a single corn plant bearing as many as 5-6 corn ears, a clear indication of the fertility of the soil.

In the 60s, a strong typhoon destroyed many crops, houses, the foot bridge, and other properties; but this did not pose much difficulty as they have abundant reserved/stored food such as root crops, corn and rice. There

were no experiences of drought; they were able to plan their farming based on a regular and stable climatic condition and pattern.

In the 70s, there was increased migration into these two barangays, mostly the relatives of the first and second wave of settlers, who have started clearing forested areas and transformed into rice and corn farms. The slash-and-burn technique was massively employed. The slash is permitted to dry and then burned in the following dry season. The resulting ash fertilizes the soil and the burned field is then planted at the beginning of the rainy season with crops. Most of the tasks were done manually using machetes, axes, hoes and other such basic tools. The consequences of slash and burn techniques for ecosystems became destructive particularly as population densities increase and as a result, farming becomes more intensely practiced and as the demand for land increases, the fallow period, or resting period of the land by necessity declines. The principal vulnerability is the nutrient-rich soil. With large-scale clearing and cutting of trees, large-scale erosion ensued, since there were no roots or temporary water storage in nearby canopies to arrest the surface runoff. Thus, any small remaining amounts of nutrients are washed away.

By the 80s, with widespread slash-and-burn agriculture practice, the fertility of the soil was greatly diminished. There were attempts to plant trees, particularly fruit trees but these were done sporadically. Further deterioration of the biodiversity continued through the years and until the present time, making it difficult for farmers to farm.

Barangay San Rafael was established in the 1950s, and Mascap is only one of the sitios of the barangay. Mascap was established as a separate barangay from San Rafael in 1957 because of its increasing population. The entire barangay is a hacienda owned by a landlord named Doronilla and covers a land area of 1,644 hectares. In the 70s, the farmers organized themselves into Samahang Nayon (Village Association) for them to qualify as beneficiaries of the Presidential Decree 27, an agrarian reform law enacted during the time of President Ferdinand Marcos. A number of them were awarded lands and granted Emancipation Patents. With the ascendancy of President Corazon Aquino in 1986, a new agrarian reform law was enacted called the Comprehensive Agrarian Reform Program (CARP), which further distributed lands to beneficiaries. But the implementation of the law was contested by a claimant from a wealthy political clan, the Araneta-Roxas clan, claiming the lands are not qualified for CARP coverage, and that they

have acquired the land, so the lands cannot be distributed to the farmers. A series of court battles followed, and the case is now in the Supreme Court for final decision.

Mascap is 13 kilometers away from town proper and can be reached via cemented roads and bridges unlike Puray, which can be reached only by hiking. Government services are available: electricity, water system, elementary and secondary schools, and a health center. It is bounded in the north by barangay Puray, and on the west by barangay San Rafael.

In the Dumagat communities, the respondents claim to have been in those areas all their lives. These are ancestral lands which are occupied and cultivated by clans within the tribe. The clan, which was one of the key informants in the interview, claimed that the lands they are working on is estimated to be 300 hectares.

In the Dumagat community, there are no existing government services in the site; no schools for elementary and secondary schools. The children go to either Antipolo or Puray to attend school and stay with relatives on week days, and go home only on weekends. Existing is a literacy and numeracy program run by a religious group and attended not only by adults but also younger children, girls and boys. There is no electricity in the site, kerosene lamps are the common lighting fixtures used in the households.

There are no existing government health services. Traditional healing practices thrive well in the tribe, performed mostly by women but also some men, using herbal plants. Birthing babies is done by women *hilots* (traditional midwives).

They have their own cemetery called *sosonlan* – Dumagat term for cemetery.

Tribal regulations are followed in the community. There is a regulation that disallows the cutting of particular species of trees: *tibig*, *catmon*, *ayemik*, *awili* - species of trees that the tribe considers to have strong capacity to hold water and prevent soil erosion. There are tribal regulations on ways of keeping their rivers clean, such as strictly prohibiting disposal of dead animals in the rivers, as well as plastics and other pollutants. Sources of drinking water and for household use are springs and ponds.

There are no reported cases of rape. Girls are usually arranged for marriage by parents at an early age to bear more children and for the continuity of their tribe. There are reported cases though of wife battering. Divorce is allowed. The common properties are partitioned depending on who put up the cost of the purchase of the property. In a recent case of divorce decided upon by the clan, the wife was ordered to leave the house, as it was the husband's money that was used to build the house. The wife went back to her parents' house and brought along with her, all utensils she purchased from her own money. They have three children, but as the children are already in a position to choose who between the two parents they prefer to live with, they were given that choice.

1.C. Research Methodology

The study was conducted using mainly the methodologies of direct interviews, focused group discussions and key informant interviews and case studies. Direct observation was employed substantially. The primary data were gathered by trained organizers/researchers using an interview guide in English and was translated into Filipino. (see Appendix A)

A pre-test was conducted in November 2010, to test the research instrument/interview guide. Based on the results of the pretest (see Appendix B), the instrument was further revised.

The interviews were done from December 2010 to March 2011. In addition, non-structured interviews and personal observations were conducted to further enrich the data gathered through the structured instrument. Case Studies and focused group discussions were conducted to further validate the findings to selected community representatives.

Secondary data were gathered mainly coming from the municipal, barangay and national government data specifically Republic Act 9729, an Act Mainstreaming Climate Change into Government Policy Formulation, the Framework Strategy and Program on Climate Change.

Difficulties were encountered but proper adjustments were made.

First was the understandability of the research questionnaire. Based on the pretest, there were difficulties understanding concepts of climate change, ecosystems, and biodiversity. An intensive discussion of the concepts was

done with the researchers, and in the process this was combined with observations and related these concepts with what is happening in the farm, with the researchers' good grasp and knowledge of concepts and principles of sustainable agriculture and organic farming and the ability to explain these to the men and women respondents.

Due to the time limitations of the respondents, especially the women such that interviews were not done, the need for the researchers to stay longer in the communities arose. Establishing rapport was also essential especially on questions dealing with gender relations in the homes. Later integrating with the family, participating in house chores and work in the farm, made it easier for the interviews to proceed.

The language factor was dealt with by translating the questionnaire used. It was also beneficial that the researchers spoke the language/dialect of the people in the community. It was also important to explain clearly the objectives of the research and its importance to their lives, so that they can seriously involve themselves in the project.

Other obstacles and challenges faced by the researchers were the presence of military forces in the research sites. Even local authorities became suspicious of the activities of the researchers as they enter communities. To dispel the suspicions of local authorities, a research study permit was secured from the local government which was then presented to the local authorities. The researchers also had to accede to the requirements of signing in to logbooks and police blotters to get permission to enter the communities. In extremely difficult situations, the interviews were undertaken outside of the militarized communities. At some point, an ocular view of the sites was also undertaken.

The distance of the sites was another challenge. In the Dumagat communities, the researchers had to walk 12 hours to reach the community, hiking on steep mountain slopes and crossing at least four river systems.

1.D. The Respondents

The total number of respondents is 164. Table 1 shows the disaggregated number of respondents by gender and per barangay.

Table 1 – Research respondents by gender and location/residence

Barangay/residence	Females	Males	Total	Percentage (%)	
				Women	Men
San Rafael	23	17	40	58	42
Mascap	36	15	51	71	29
Puray	37	37	74	50	50
Total	95	69	164	58	42

Selection of respondents is mainly purposive to meet the set requirement of not less than 100 and not more than 200 respondents, with 75 per cent of the respondents women and 25 per cent men from various sectoral groups. Despite this, the 75:25 per cent ratio was not met owing to the various limitations and difficulties encountered as earlier narrated.

The research focused on the following sectoral groups: peasants/ subsistence farmers/ indigenous peoples and other subsidiary occupational group. Of the total respondents, 144 are farmers, 12 are vegetable and fruit vendors, 3 barangay/community health workers, 1 bamboo stick maker, and 1 livestock raiser.

Of the 144 farmers, 77 are women and 67 are men; of the 12 fruits and vegetable vendors, 2 are men and 10 women; the bamboo stick maker and the livestock raiser are both women.

Of the total respondents, 56 belong to the Dumagat tribe of indigenous people; 26 of which are women and 30 men. All are subsistence farmers.

The average age of the women respondents is 47.51 while that of the men is 45.12, showing a relatively older respondent population. There are 117 parent respondents, and the average number of children is 4.2.

Most of the respondents have stayed in their communities for the past 30.9 – 33.12 years, and have relatively low level of schooling as shown in the table below.

Table 2 - Respondents' Educational Attainment			
Educational level	**Females**	**Males**	**Total**
Elementary	52	36	88
High school	28	14	42
College	4	2	6
Adult education classes	3	6	9
No schooling	8	11	19
Total	95	69	164

Of the 95 women respondents 63 are women farmers, and of the 69 male respondents, 56 are male farmers which are further classified as owner cultivators, caretakers, leasees, tenants, settlers and indigenous women farmers. Another sizable group of women are the fruit and vegetables vendors numbering 10 women.

Other sources of income of the other women respondents are scavenging, bamboo stick making, store owning, charcoal making, and serving as barangay/government health worker. Other sources of income listed are fruit and vegetable vending, charcoal making, store owning, tricycle driving.

Part 2. Research Results

The climate change phenomenon faced by the community was the long drought, characterized by long period of dry spell (9 months), no rainfall from November 2009 – June 2010 coupled with extremely warm temperature. The long drought happened after a devastating typhoon named Ondoy, which destroyed and washed out houses along the riverbanks, and caused landslides destroying agricultural crops and massive soil erosions in barangays San Rafael and Mascap. This was followed by months of heavy rains, unpredictable weather patterns and extreme warm weather.

The Dumagat communities in barangay Puray experienced drought, too much rain, extremely cold weather and typhoon. These had an impact in their farming. Their areas are still relatively forested, which account for the extreme cold temperatures. Soil erosion is minimal, making their soil still rich and fertile.

2.A. Impact on agriculture and livelihoods

No rain, loss of seeds

The farms in research sites are rain-fed and make use of non-chemical and traditional ways of farming. In March 2010, when little rain came, some women farmers cleaned their farm and sowed rice seeds, assuming/ hoping that the rains will continue to come as it used to in the past several years. But no rain came after that brief rain shower. As the seeds sowed did not germinate, the women farmers lost a portion of the seeds they keep in their possession.

Insect infestations, low yield

When the rains came after nine months of drought, the farmers planted rice but the problem of unusually high insect infestations on crops ensued resulting to lower yield. Insects identified by the farmers are: red large ants known locally as *hantik* or *damuki*, *suang kabayo*, *atanya*, *dogma*, aphids, *puti na uod*, *uwang*, tungro, *bunlod*, *ulalo*, *paniki* (bats), *anay* (termites), *bubuyog* (bees), *alingayo*. Rat and bird attacks were also reported.

The farmers testified that from years 1990-2000, for 2.5 kilos of rice seeds planted, one can harvest up to 500 kilos or 10 cavans of palay. From year 2000 up to the present, average harvest for every 2.5 kilos of rice seeds, is now from 50 – 150 kilos or 1-3 cavans of palay.

Diseased crops, low yield

The long drought affected the other crops, which the community depend on for food and cash needs. Bananas bore fruit but of lesser size, lesser number of fruits, and with some diseased portions, as shown by hardened parts of the fruit which therefore can not be eaten. According to a banana farmer, way back in 2000, she harvested about 3,000 pieces of bananas per month. During the interview in 2010, she was harvesting only 900 pieces of bananas per month.

According to the banana traders, in the late years of 90s until early 2000, the estimated pieces of bananas that they buy in barangay Mascap was more than 50,000 pieces per week. During the interview, it was down to a little over 20,000 pieces per week.

Other fruit trees (star apple, jackfruit, guavas, avocado, santol, guyabano, kalamansi, and pomelo) all bore fruit but with manifest signs of quality deterioration such as deformed shape, less juiciness, reduced sizes, and lesser number of fruits borne per tree. Guyabano, santol and pomelo tasted sourer than before.

Coconut trees are also not coping well with the extreme weather changes. The fruits fall from the tree at an early stage of maturity because of insect infestations. The fruits do not mature so the yield is reduced or there is nothing at all.

Survivor fruits, plants

The farmers account that a number of fruit trees and plants have survived the extreme weather changes. And these are *siniguelas*, pineapple, mangoes, a variety of banana called *lagkitan*, herbal plants such as lemon grass, oregano, *sambong*, and green leafy vegetables such as *saluyot*, *alugbati*, kamote tops, and various other traditional plants in the locality.

Massive soil erosion, hardened soil, decreased fertility, low yield

Root crops yielded less. According to a woman farmer in San Rafael, she used to harvest 15 kilos of cassava in three (3) seedlings of cassava planted, but now, it yielded only about three kilos of the tuber. In Mascap, in one seedling only 3 pieces were harvested, when before, she used to harvest 7-10 pieces per seedling.

Too much heat and rain lessened chances for domesticated animals to survive

The communities tend to domestic animals such as native chickens, ducks, goose and turkey for food and cash. There were accounts of chickens dead from heat stroke. Also during continuous rains, and cold weather, chickens are able to lay eggs, but only about 50 per cent of the eggs are hatched into chicks; and further, the chances of these chicks to survive have gotten less with the sudden weather changes. The chicks get colds with the changes in weather, and so lesser are the chances to survive. The same is true for the other domesticated animals.

Shifting to the use of hazardous chemicals

Some farmers claimed to have resorted to chemical farming, i.e., using chemical pesticides, to address their problem of unusually high insect infestations. The agricultural areas studied are rain-fed and employ traditional non-chemical farming.

2.B. Impact on Biodiversity

Biological diversity or "biodiversity" measures the "totality of genes, species, and ecosystems of a region". An ecosystem is a biological environment consisting of all the organisms living in a particular area, as well as all the nonliving (abiotic), physical components of the environment with which the organisms interact, such as air, soil, water and sunlight. Examples of ecosystems are agricultural, marine, forests.[13]

In the research sites, forest, river and agriculture ecosystems are found. Based on the history of the development of the communities, particularly barangays San Rafael and Mascap, there have been visible marks of loss of biodiversity.

According to the accounts of key informants, already lost are several species of edible shells, shrimps, crabs, fresh water fish, mainly due to flooding, which had washed away breeding sites and places along the river banks.

In the communities of Dumagat, their rivers still teem with fresh water fish, such as *bulig*, *biya*, *talangka*, and *suso*. A simple fish catching method, called *pangangatsa*, is done by women, and makes use of a rectangular shaped cloth called *katsa* laid over the chest, with the two ends tied over the back of the neck. The two other ends are then used to scoop fish and other edible species in the river and streams.

The forest ecosystem and the species therein have also undergone massive loss with excessive logging, massive soil erosion, and the destructive farming practices, such as slash-and-burn. The wild animals, accounted by the key informants and first wave of settlers in barangays San Rafael and Mascap, as abundant, are now nowhere to be found.

In the Dumagat communities however, the first growth forests and trees were already cut, but with continuous planting of trees coupled with

tribal regulations setting limits on cutting of trees, and prohibition in the cutting of particular species of trees, the communities relatively are able to maintain and conserve species in their forest ecosystem.

The agriculture ecosystems in San Rafael and Mascap have varying levels of destruction and conservation. The concrete manifestation of destruction is the decreased fertility of the soil, contributing to substantial decreases in the yields in all the crops.

There are several adaptation initiatives though as will be discussed in the succeeding paragraphs, aimed at preserving and restoring the richness of the ecosystems, and combating the destructive effects of climate change.

2.C. Impact on Women and their Families

Reduced working hours in the farms

One clear impact mentioned by the women is the unbearable heat of the sun during the long drought. For this, the number of working hours in the field was reduced, and the time schedule for farm work is changed. When before they can work for 11 hours per day (5am – 12 noon; 1pm – 6pm), now they only can work 5-6 hours (6am – 9am; 4-6pm). This reduced the work that can be done tending the fields and in a way this affected the harvest/yield.

Reduced Income from the low harvest

This affected the women's capacity to feed their children, with less food and cash that could be generated from the harvest. For the other sector of women (fruits and vegetable vendors) who depend on the harvest in agriculture, for their livelihood, this meant less crops to be sold and therefore also reduced income for them and their families. Children are forced to stop schooling for lack of resources.

Turning on to backbreaking, marginal jobs

With these changes, men and women turn to other livelihood sources, mostly off-farm, both within and outside the community to augment income. Among the jobs found in the community are collecting stones, scavenging garbage, collecting sand, collecting edible shells for food,

doing service work outside of the community, such as doing laundry, dishwashing or serving as waitresses in food establishments.

Sustaining ecologically sound food production

Home gardening is a common practice and clearly women's work. With the decreased yield and income from the farm, this practice became even more necessary and beneficial for the women and the families. These home gardens planted with nutrient-rich vegetable greens (*saluyot*, *alugbati*, sweet potato tops, *kangkong*, spinach) and herbal medicinal plants (lemon grass, ginger, turmeric, oregano, *damong marya*, *gumamela*, *mayana*, *cinco doctores*, aloe vera) are primarily for home consumption. But these also command a price and demand in the market and therefore, generate needed cash to buy other basic needs.

Increased burden with the drying up of sources of water

The sources of water for drinking, household, farm and animal use in Barangays Mascap and San Rafael are the numerous springs located in various locations in the communities. These are drained and connected to individual homes through water pipes and plastic hoses. During the long drought these sources dried up, forcing women and children to dig ponds on low-lying areas particularly along river banks. These became additional sources of work for women and children as they walk long distances to fetch water. The problem of potability of the water became a concern as the ponds are open to all kinds of contamination. The lack of accessible and clean water brought about various ailments for the women and their families, such as increased incidence of urinary tract infections, skin diseases, diarrhea, and other water-borne diseases.

Increased stresses and tension in families that resulted to incidence of domestic violence

The perennial lack of money for the needs of the family results to frequent altercations between couples, and oftentimes results to domestic violence such as battering of wives and children. These couples with the culture of machismo which prevails, condoning men drinking and gambling. In one cases shared by a respondent, even money for the food of the family is used to buy liquor by her husband.

Women as first line of defense of the community during natural disasters

The women are the ones left in the communities as the men, their husbands go out of the community for various jobs and especially during farm off seasons. When the community was devastated by typhoon Ondoy in 2009, it was mostly women and children who were left in the communities. During the post-Ondoy interviews, the women said that the reason they did not manage to save most of their belongings was because the men, their husbands were out of the communities working. With no one to provide help, the women brought their children to safer places first, then went back to attempt to save their belongings. By the time they went back for their belongings, their homes were already washed away by the raging flood from the inundated rivers and with it all their belongings.

Part 3. Adaptation and Mitigation Measures to combat effects of climate change

Adaptations[14] are adjustments in human and natural systems to respond to actual or expected climate impacts. People and ecological and social systems have a measure of in-built adaptation capacity (*autonomous adaptation*). But varying access to tools for adaptation affects the ability of people to cope and recover from climate-induced disasters. Further it is recognized that women and men experience the negative impacts differently and further their capacity to cope because of gender inequality.

Also the current rapid rate of climate changes will be expected to put pressure more on these autonomous adaptation capacities, and undermine the resilience of people and ecosystems from extreme weather events and natural hazards.

Mitigation[15] refers to a human intervention to reduce the "sources" of greenhouse gases or enhance the "sinks" to remove carbon dioxide from the atmosphere. Mitigation in agriculture includes measures that prevent greenhouse gas emissions such as reducing energy demand and using

biomass energy and other alternative energy sources. Other measures increase carbon storage by reducing land clearing, avoiding deforestation, afforestation, improving soil, and crop and grazing land management. Offset measures include planting trees to capture carbon dioxide.

3.A. Agriculture

Green manuring – this is a practice where the weeds and grasses that grow in their farms are left to rot on the soil serving to increase the fertility of the soil and developing the top soil which is supposed to be the most fertile. Other variation as practiced by the women is to allow dried leaves of fruit trees and other trees.

Changing the variety of bananas planted. This adaptation was innovated based on the actual experience of the farmers. The *saba* variety or the cooking banana is a cash crop and a staple food aside from rice and corn. For several years, the bananas in the area have been devastated by a banana disease, called locally as *kalamatyo*. According to the Department of Science and Technology (DOST), this disease is caused by the bacterium Pseudomonas solanacearum, and has affected other *saba*-producing provinces all over the country. The disease can affect the whole banana plant causing yellowing and wilting of leaves, brown discoloration of pseudo stem and fruit peduncle, reddish to black discoloration of fruit pulp, uneven ripening of fruits, and non-detachment of bracts and male flowers even if these were already dry. DOST claimed that such disease incidence can be controlled, but this information was not made available to the farmers prompting them to make adaptation based on their experience. And the adaptation done was to change the variety of bananas to *lagkitan* variety. According to the farmers, while this variety is cheaper, less marketable, less popular with consumers, it is a prolific bearer of fruit and not diseased so that in the end, it can approximate the sales that can be made from the *saba* variety.

Other farmers, planted other crops in place of the *saba* variety such as *kadyos*, (pigeon pea, scientific name: *Cajanus cajan*) cassava, and different varieties of yam.

Covering fruits of jackfruit at a certain stage of maturity of the fruit with sack to deter insect infestation.

Harvesting pineapple when mature, not ripe, has a deterrent effect on rat infestation. The farmers claim that the smell of the ripened pineapple attracts the rats. Another practice by the Dumagat community is planting of corn and root crops such as cassava, sweet potato around the rice farm. The idea is to offer alternative food so the rats will not feast on the rice plants. In the end, based from their experience, the rats cannot consume all the corn and root crops so there are still some left for the consumption of their families. The principle is offer food for all living organisms in the farm.

Multi-cropping as a form of pest management is also done by selected farmers. Crops such as ginger, pineapple, corn, and lemon grass are planted side by side. Flowering ornamental plants with certain smell that tend to drive away insects such as marigold, are planted in selected sites in the farm.

Planting of fruit trees, bamboo trees, and lemon grass along soil runoff are some of the traditional ways to prevent soil erosion. Accumulated dried leaves are also stacked along water ways to prevent soil erosion. The eroded soil from high-lying areas end up deposited along riverbanks and low-lying areas at the base of mountain slopes; these areas are then used by women farmers to plant crops for family consumption. Since these lands are fertile, they are able to grow and harvest various kinds of vegetables and root crops augmenting their sources of food for their families. Contouring is another practice to prevent soil erosion. And to get the maximum benefit, crops with good market demand are planted along the contour lines, which are spaces where the rich top soil eventually are deposited, when heavy rains and soil erosion occurs.

In many cases, they put the eroded soil in reusable containers and materials such as rubber tires, plastic containers, tin cans, wooden box, and are then used to plant vegetables and herbal plants. Even eroded soil trapped by huge boulders and large trees are used to plant vegetables and root crops.

Keeping seeds of rice, corn and various kinds of vegetables have since been the practice in the community. In the research areas, over a hundred varieties of traditional rice are in the farmers' possession to this day, and is a stable and rich heritage that is helping their communities to survive despite all the odds. For the Dumagat people, it is considered their most important possession. Accounts say that during the Second World War, all

they brought with them when they evacuated were the clothes on their bare backs, a few food, and their seeds kept in bamboo tubes. Some kept their seeds inside the bamboo posts of their houses, so that after the war when they went back to their communities, they immediately were able to start planting again. For the farmer migrants from the Visayas, when they came to settle in the communities, they brought with them seeds which up to this day is still used by their children and grandchildren.

The use and propagation of herbal plants and traditional ways of healing such as massage, hot compress, herbal plants for oral rehydration, keeping women's menstrual periods regular, as antiseptics for cuts and wounds, herbal formulations for skin diseases, and other common ailments.

Another practice is to bury harvested root crops such as a kind of gabi (yam) and ginger under the ground to prevent the crops from drying up. These are kept buried until such time that they need, use or consume these crops.

In the case of the Dumagat communities, the practice of leaving the farm to fallow for a certain period of time allows the farm and soil to rest and restore its lost fertility. A clear plan is in place, that for a certain period, the different portions of their lands are used on a rotation basis. And on the farm's edges are an assortment of fruits, and edible crops and vines are planted, so that when they go back to the land, there are still other sources of food to live on as they start planting new crops.

The age old practice of keeping their rivers and streams clean; taking care of the forest as a source of all their needs: food, fuel, fodder and medicines, is still intact. The culture of harvesting food and other needs from the land, forest and rivers, based on what is needed and can be consumed, ensures that the food they eat are all freshly picked, and also to ensure that everyone in the community can eat, and leave food for others who are also in need. They harvest crops and catch fish enough only for one meal. If they can catch wild animals, this is partitioned to all members of the community.

In the Dumagat communities, the slash-and-burn, shifting cultivation are good practices that help the biodiversity of the agriculture ecosystem maintain its richness. This is coupled with a culture of planting in any place deemed suitable for planting, not so much for personal or family

consumption, but for the community as well. Their knowledge of edible wild plants that grow abundantly in their ecosystem, and their consciousness to propagate these, contribute to continuing maintenance and preservation of these species of plants.

3.B. On Disaster Preparedness

Among the women in San Rafael and Mascap, having access to communication facilities such as radio, television, serve the purpose of early warning to an upcoming typhoon. Families with no access to these get news through neighbors or information relayed to the barangays through word of mouth. In the Philippines, the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) is a national institution dedicated to provide flood and typhoon warnings, public weather forecasts and advisories.

The Dumagat communities do not have access to electricity, so radio and TV as a means of getting news about an impending storm or typhoon is not available. Some families may have radios powered by batteries but this is very rare. But the Dumagat people have indigenous ways of predicting the coming of a weather disturbance. According to them, one sign that portends the coming of a storm, is when a bird species called *langay-langayan* are seen flying in droves. They further validate this when crabs and edible shellfishes are seen coming out of rivers and streams. The wind and clouds are also indicators of a coming storm.

When these signs are seen, the women then would start storing drinking water, food and dried wood for fuel. The domestic animals are placed in a dry and safe place; the clothes for cold weather especially for the children are taken out of storage bins, harvest whatever crops are available and can be stored for food; the men start patching up leaking roofs, strengthening the foundation of their houses which are usually made of light materials so as not to be blown away by strong winds. Breakable kitchen utensils such as glasses and plates are placed outside of the house so as not to be broken when the house gets blown away or toppled down. They also do pruning of trees or cutting down of large branches of trees; banana trees especially if already bearing fruits, are tied down to a tree to prevent it from collapsing or a support structure is placed beside it, also to prevent it from collapsing with the strong winds.

If the storm gets to be extremely disastrous, the community already has identified a place for evacuation, which are usually places known to be not prone to landslides and far from huge trees.

After the storm, the works at hand are cleaning the house, fixing whatever parts of the house were destroyed, and going to the farm and scrimping on crops which can still be salvaged and consumed; domestic animals that had fallen ill because of the extreme weather are butchered and distributed for consumption for the whole clan. If all indications point to the passing of the storm, the kitchen utensils and cooking equipment are then brought back to the house.

Part 4. Potentials and Obstacles in Building Women's Adaptive Capacity to Climate Change

Women and men experience climate change differently, and gender inequalities worsen women's coping capacity. It has also been acknowledged that women are important actors of change and holders of significant knowledge and skills related to mitigation, adaptation, and the reduction of risks in the face of climate change, making them crucial agents in this area.

Based on this framework, gender roles in the selected research sites were studied. Particularly in San Rafael and Mascap, gender roles still conform to traditional roles: work in the farm is performed by men and the household chores, and caring of children are performed by women. As shown in an earlier study, the gender division of labor still follows the traditional Filipino household where the productive activities are dominated by men (66 per cent) and household activities are done by women (55 per cent). But in terms of community activities, women participated more than the men. The reason identified is that women tend to be at home more often than the men. Thus, they have more time for community activities compared to men.

Among the respondents are 12 widows who directly cultivate and manage their farms. Also when the men had to go out of the communities to seek additional sources of income, the women are left to tend to the farms.
In a barangay profile study undertaken in 2008, earlier cited in this paper, using a random sampling method of selecting the respondents based on households, it turned out to be 82 per cent women respondents, attesting to the reality that most women were left at home, while their husbands were at work.

But even while the men work in the farm and go outside of the communities to seek other jobs, these are not enough to sustain the needs of their families. Within the communities, women do back-breaking work to earn additional income. Quantifying these work that the women do shows how much they are contributing for the upkeep of their families.

The multiple tasks that women perform put a limit in their participation in the community affairs. Although most of the respondents are members of various barangay-level organizations and non-government organizations (NGOs), there is much to be desired in terms of how empowering the programs these organizations do for the women. But the experience of being and having been a part of an organization, in a sense is a potential factor for building the adaptive capacity of the women to cope with climate change.

While these gender roles pose limitations to the women, this situation also presents potentials and opportunities for them. The reality that they remain longer in the communities put them in the better position than men, who rarely stay in the communities, to undertake community resilience programs which strengthen the adaptive capacity of the communities to address climate change.

Gender relations and gender roles tend to be more flexible among the Dumagat indigenous peoples. Except for the reproductive role of bearing and giving birth to children, which is the exclusive domain of women, all the rest of roles and work - household chores and farm work - can be both performed by men and women. Women are allowed to clear a farm of their own and are respected and recognized for their particular skill in tending their own farms. Men likewise perform all kinds of household chores. Even hunting of wild boars which is a clan tradition, women have a role, and

that is they are the ones who drive the boars towards the trap prepared or where the men are stationed to catch the wild boar.

The existing traditions on management of their lands, river systems and forests are huge pluses for the continuing resilience of their communities to the destructive impacts of climate change.

The access and control of the women and men of the land have proven to be the most important adaptation tool. Their land tenure though need to be secured and strengthened, to ensure that the innovative strategies and initiatives undertaken are sustained, strengthened and expanded. The threats thereof must be resolved. For most of the farmers in San Rafael and Mascap, the land claim must immediately be dismissed by the High Court, and the immediate distribution of land titles must be undertaken.

The threats to the ancestral lands must likewise be addressed. Claimants to their ancestral lands must be stopped.

Community and farmers' mobilizations to claim these rights must be strengthened to press for a fast resolution of their land cases in court. And since women are the fixtures in the communities, they are in the best position to perform these actions.

Women's farming knowledge especially for production of food for home consumption and preservation, skills in marketing, skills in keeping the seeds, which have been in their possession for the past several decades, are likewise important tools of adaptation.

Part 5. Analysis, Conclusions and Recommendations

Climate change resulted in visible damage to the livelihood resources of the women and their families in the communities studied: land, water, forest and fresh water resources. This has undermined the livelihood of these subsistence and landless farmers and indigenous peoples. It is increasingly making it difficult to raise their own food and cash which they need for other basic needs including schooling of their children and health needs.

But the women with all limitations and meager resources at their command continue to cope and adapt to these environmental changes. Almost without any government support, they are continuously evolving and innovating ways to respond to the changing climatic patterns and its deleterious effects.

Women performed significant roles in the upkeep of their communities and in keeping and conserving their livelihood resources. Though mainly at individual homes and family farms through family-based food production schemes and keeping seeds and medicinal plants, these are significant skills that helped the families to survive.

Women and men have developed farm- and home-based strategies that can be considered autonomous adaptation. But with the fast rate of the deterioration of ecosystems and the increasingly hazardous impact of extreme weather events, there is an urgent need for an outside intervention, particularly the government.

Their insecure land tenure poses a threat and risk to these potentials for sustaining, strengthening and expanding these adaptation strategies. There is the urgent need to secure these, and for the government's action and intervention.

Based on this analysis and conclusions and based on the focused group discussions undertaken, the following recommendations are set forth:

1. Build more awareness on the impacts of climate change at the community level;

2. Strengthen and expand good practices of adaptation initiatives and strategies; document these and use as starting point for the development of studies and training modules for adaptation including soil fertility restoration, soil erosion prevention, biodiversity based ecological agriculture; seeds preservation and protection and, food preservation.

3. Secure the land tenure of the farmers as it was shown in the study that land is one important tool for adaptation;

4. Strengthen and expand the leadership roles of the women at the community level, as they are the fixtures in the communities; work to install the women not only in sectoral non government organizations, but also work for their election at the barangay level local government unit;

5. Strengthen and expand the key roles of women as gatekeepers of seeds, herbalists, food producers, food preservers and protectors and conservators of the ecosystem;

6. Investments to protect existing sources of livelihood and income – through market support, farm and animal tools, production and post harvest facilities;

7. Direct investments and compensation from UN Climate financing schemes to the communities undertaking protection of the forest and other ecosystems;

8. Direct funding to communities in partnership with NGOs for the research and development of renewable energy sources;

9. Make language in the climate negotiations accessible and understandable to the local communities; realize engagement and participation of local communities in the climate change negotiations/ talks;

9. Develop community level disaster preparedness plan with women as lead as they are the ones left in the community;

10. Nutrition education, diet diversification programs using locally available crops; strengthening local self reliance on food;

11. Health education programs, using as starting points local practices using medicinal plants;

12. Develop an advocacy position for gender-responsive approach towards climate change policy making and programming; and

13. Replicate these studies in more rural communities and sectors, to document and establish baseline data on impacts as well as common and good practices.

Annexes

Annex A – Interview Guide (Tagalog)

Gabay sa Pag-Interbyu

A. Layunin ng Pananaliksik/pag-aaral

a) Makita ang epekto ng pagbabago ng klima (climate change) sa mga kababaihan sa kanayunan, kabilang na ang mga katutubong kababaihan, at kung paanong ang pagbabago sa klima ay lalong nagpapalala sa di pantay na karapatan/karanasan ng kababaihan.

b) Matukoy ang mga hadlang at mga particular na pangangailangan ng mga kababaihan sa kanayunan, upang makaangkop sa papalalang sitwasyon dulot ng pagbabago ng klima.

c) Matukoy ang mga magagandang karanasan at mga inisyatiba ng mga kababaihan sa sustenable at maka kalikasan na paraan ng pagsasaka at pangangalaga ng likas na yaman ng komunidad.

d) Makapagrekomenda ng mga pamamaraan/estratehiya ng (pag angkop) adaptasyon at mitigasyon (paano mapababa ang epekto/ mapababa/mapigilan ang higit na pag init ng mundo) sa mga komunidad.

Klima at epekto sa pagbubukid:

a.1 Ano ang mga namamayaning di pantay na relasyon ng babae at lalaki sa komunidad?

I-Check	Ipaliwanag
	Nakakapagmay-ari ng lupa ang mga lalaki at ang babae ay hindi
	Mas nakakapag-aral ang lalaki kaysa babae
	Mas nakakalahok ang mga lalaki sa mga pagdedesisyon sa mga usaping pangkomunidad.
	Mas maraming oportunidad sa trabaho/kabuhayan ang mga lalaki kaysa kababaihan.
	Matindi ang kawalan ng serbisyong pangkalusugan sa komunidad kabilang na ang mga serbisyo sa pagkontrol ng pagbubuntis at panganganak.
	Mas kalalakihan ang nakakadalo sa mga pagsasanay para mapaunlad ang pagsasaka, nakakautang, mga pasilidad sa pagbebenta ng produkta, teknolohiya at iba pang suportang serbisyo, at programa sa panlipunang seguridad, kaysa kababaihan.
	Mas may akses ang mga kalalakihan sa pagkain kaysa mga kababaihan.
	Ang mga babae ang gumagampan ng trabaho sa pag-aalaga at pagpapalaki ng mga anak, gawaing bahay, pag-iigib ng tubig inumin at panggamit sa bahay.
	Mas malaki ang tsansa sa mga lalaki na makalabas ng komunidad upang makahanap ng opportunidad na pagkakakitaan.
	Mas maraming pagbabawal sa mga babae kaysa sa mga lalaki, dahil sa kultura. Anu-ano ang mga pagbabawal na yun?
	Mas ang kalalakihan ang nagdedesisyon sa kung saan pupunta ang kita sa bukid o kung ano mang pinagkakakitaan ng mag-asawa at mga anak. Saan napupunta?

a.2 Sa nakaraang limang taon, anong mga kalamidad ang dumaan sa inyong komunidad na nakaapekto sa inyong pagsasaka at sa kabuang buhay at kabuhayan ng inyong komunidad?

	Kalamidad	**Ipaliwanag**
	Bagyo	
	Ipu-ipo	
	Baha at sobrang malakas na ulan	
	Landslides	
	Pagtaas ng tubig sa ilog	
	Pagbabago sa pagdating ng ulan (dumarating dati ang ulan sa mayo at hunyo, pero ngayon ay sa nobyembre na dumarating ang ulan)	
	Drought/el nino	
	Sobrang lamig ng klima at sobrang init sa kabilang banda.	
	Pagtaas ng init ng dagat	
	Peste ng daga, anong tanim ang naapektuhan	
	Peste ng insekto , anong mga tanim ang naaapektuhan	
	Iba pa	

a.3 Paano naapektuhan ang pagsasaka/komunidad

	Halimbawa	Ipaliwanag Paano
	Natangay ng baha ang mga bahay ng mga tao	
	Nasira ang mga pananim	
	Nasira ang mga kalsada at tulay	
	May mga nalunod na tao	
	Natigil ang mga pangekonomiyang gawain tulad ng pagbebenta ng produkto/pagbababa mula sa bundok.	
	Pagkamatay mula sa sobrang init at sobrang lamig	
	Natitigil ang pinagmumulan ng tubig inumin at tubig gamit sa bahay.	
	Nawawala/nauubos ang mga panggatong at iba pang pinagmumulan ng enerhiya.	
	Pagtaas ng presyo ng mga pagkain at iba pang batayang pangangailangan.	
	Natitigil ang pagpasok sa eskuela ng mga anak	
	Natigil din ang pagpasok sa trabaho	

a.4 Ano ang ginawa (response) ng komunidad?

	Halimbawa	Ipaliwanag
	Lumikas ang mga pamilya sa mas ligtas at mataas na lugar, evacuation centers	
	Lumilipat ang mga pamilya sa mga lugar na di naapektuhan ng kalamidad	
	Nagsagawa ang komunidad ng tulungan at sama samang pagkilos para ibangon ang komunidad tulad ng pagkumpuni ng nasirang tulay, kalsada, pag clear ng landslides, pagkumpuni ng mga nasirang bahay	
	Pagtatayo ng komon na kusina at komon na alagaan ng mga bata	
	Nagsagawa ang komunidad ng tulungan at sama samang pagkilos para ibalik ang supply ng tubig, koryente, atbp.	

a.5 Paanong ang mga pangyayaring ito ay nagkaroon ng magkaibang epekto sa babae at lalaki sa antas ng pamilya at bahay at sa antas ng komunidad? PAANO NABABAGO ANG MGA GANITO, PAG MAY KALAMIDAD O SA PAG INIT NG KLIMA

	Halimbawa	**Ipaliwanag bakit**
	Babae	
	Mas natatali ang babae sa gawaing bahay at pag-aalaga ng mga anak	
	Mas bumigat ang pasanin ng mga kababaihan, sa pag aalaga ng mga maysakit na anak at iba pang miyembro ng pamilya, dagdag sa gawaing bahay	
	Mas limitadong paglahok sa pangkomunidad na aktibidad	
	Paglala ng karahasan sa kababaihan sa iba't-ibang porma	
	Hindi natutugunan ang particular na pangangailangan ng kababaihan sa relief at rehab operations	
	Iba pa	

b.1 Anong mga hakbang ang naisagawa upang umangkop sa mga pagbabago sa klima at pagbabago ng panahon, ng komunidad at organisasyon ng kababaihan?

	Halimbawa	**Ipaliwanag**
	Pagtatayo ng kanilang bahay sa mas ligtas na lugar	
	Pagtatanim ng mga mga matibay at tradisyunal na pananim na nabubuhay kahit sa panahon ng drought,	
	pagtatayo ng seedbanks/ bahaginan/preserbasyon ng mga binhi	
	RIP RAPPING ng ilog, bilang proteksyon sa baha mula sa ilog	
	Pag engganyo ng tulong at partisipasyon ng iba't-ibang sector sa labas ng komunidad.	
	Mas tumibay na pagkakaisa ng mga tao/kababaihan sa komunidad, at pagtatayo ng mga organisasyon o muling pagbuhay ng mga dating di aktibong organisasyon.	
	Pagkilos laban sa pinag-mumulan ng kalamidad at pagbabago ng klima tulad ng protesta laban sa malaganap na quarrying,	
	Pagbabalon at paghahanap ng tubig bukal para sa inumin at tubig gamit sa bahay	
	Kilos protesta sa DENR	
	Pagtatanim ng mga punong kahoy, punong prutas at saging	

b.2 Ano ang bahagi/partisipasyon ng mga kababaihan sa mga hakbang na nabanggit sa komunidad?

	Halimbawa	**Ipaliwanag**
	Gawain ng mga kababaihan ay pangunahin sa mga gawaing bahay, at iba pa na pangsuporta sa gawain ng mga lalaki/asawa	
	Kababaihan ay nangunguna sa pagdedesisyon sa komunidad, sila ang nagsasalita at representatibo ng sa mga events sa labas ng komunidad.	
	Paglakas ng kakayahan ng mga kababaihan na makip-agnegosasyon at maggiit sa gobyerno para sa kanilang kahilingan; paglakas ng pag-kilala ng gobyerno sa kakaya-han ng mga kababaihan.	
	Paglaki ng bilang ng mga kababaihan na nagsasalita sa mga pagtitipon sa komunidad	
	Paglaki ng partisipasyon at pamumuno ng kababaihan sa muling pagbangon ng kanilang komunidad at sa pagdedesisyon at pamamahala ng kanilang komunidad.	
	Paglakas ng tulungan ng ma-gasawa sa gawaing bahay	
	Paglaki ng bilang ng mga organisasyon na naitayo o muling binuhay sa komunidad.	

b.3 Ano ang mga hakbang na isinagawa ng komunidad at organisasyon at grupo ng kababaihan upang itaguyod o hadlangan ang paglakas ng kakayahan ng mga kababaihan (empowerment) Ano ang mga hadlang/ hamon at pangangailangan ng kababaihan upang maipatupad ang mga ito?

	Halimbawa	**Ipaliwanag**
	Hinahadlangan ng asawa at mga biyenan.	
	Pag aatubili sa bahagi ng kababaihan na gampanan ang tungkulin sa pamumuno	
	Kawalan ng akses sa pange-konomiya/pangkabuhayang rekurso.	
	Kawalan ng kakayahan sa pagdedesisyon	
	Kawalan ng impormasyon, kakayahan sa teknolohiya, at pangkalusugang serbisyo.	
	Hadlang sa pangangailangang alagaan ang mga maliliit na mga anak, kailangang dalhin sa eskuela, pagluluto ng kanilang pag-kain.	
	Hadlang sa pangangailangang maghanap ng pera at mapagkakakitaan para sa pangangailangan ng pamilya.	

c.1 Anu-ano ang mga ginagawa ninyo pamamaraan na sa tingin ninyo ay upang masustine at mapangalagaan ang inyong sakahan at kapaligiran at upang matuloy tuloy na magsisilbi ang mga ito sa pangangailangan at kapakinabangan natin at komunidad, pati ang susunod na henerasyon?

	Halimbawa	**Ipaliwanag/Paano ginagawa**
	Pagtatanim ng puno	
	Pagsasagawa ng organikong pagsasaka/pagbawas sa paggamit ng kemikal na abono at pestisidyo.	
	Pagbawas sa konsumo ng koryente at mas paggamit ng solar power	
	Pagbawas sa paggamit ng gasoline (fossil fuel)	
	Nag re recycle	
	Paggamit ng alternatibang enerhiya	
	Kampanya laban sa pamumutol ng puno sa kabundukan	
	Komun na pangangalaga sa mga likas na yaman ng komunidad: lupa, tubig at kabundukan.	
	Painagsisikapan ng komunidad na kamtin ang kasapatan sa pagkain	

c.2 Ano ang papel na ginagampanan ng mga kababaihan sa ganitong mga hakbang?

	Halimbawa	**Ipaliwanag paano**
	Sa antas ng pamilya, naisasagawa ng mga kababaihan ang pagre recycle	
	Nagsasagawa ang mga organisasyon ng kababaihan ng proyekto sa pagtatanim ng puno	
	Sa pamamagitan ng komunal farm ng mga kababaihan, nakakatulong sila sa pagkakamit ng kasapatan ng pagkain sa komunidad.	
	Iba pa	

c.3 Paanong ang mga hakbanging ito ng mga kababaihan ay nagtataguyod o humahadlang sa pagpapalakas ng kakayahan ng mga kababaihan. Ano ang mga pangangailangan/hamon/hadlang para sa mga kababaihan upang ipatupad ang mga ito?

	Halimbawa	**Ipaliwanag paano**
	Kawalan ng impormasyon at kaalaman sa teknolohiya	
	Paggamit ng sarili nilang kaalaman (indigenous) na naipasa sa kanila ng kanilang mga ninuno.	
	Nangunguna ang mga kababaihan sa pagpapatigil ng pamumutol ng puno sa kabundukan.	
	Ang mga kababaihan at kanilang pamilya ay nagpuputol ng puno upang gawing uling at ito ang kanilang kabuhayan	
	Kahirapan ang humahadlang sa kababaihan upang lumahok, mas prayoridad na nila na magtrabaho kaysa makilahok.	
	Pagbabawal ng komunidad dahil sa mga pagtingin at kagawian sa lipunan kaugnay sa kung ano ang dapat na papel ng kababaihan.	
	Gawaing bahay at mga anak	

c.4 paanong ang mga nabanggit na ginagawa/hakbang ng mga kababaihan at komunidad ay nakakatulong sa kakayahan ng mga kababaihan?

	Halimbawa	**Ipaliwanag paano**
	Nakapagbigay ng oportunidad sa mga kababaihan upang isagawa/ isapraktika/maranasan ang paggigiit ng kanilang pamumuno.	
	Mas lalong nawalan ng boses ang mga kababaihan at di nakalahok ang mga kababaihan sa mga usapin sa pagdedesisyon sa komunidad.	

Mahuhusay na Karanasan: I-nota ang mga lalabas na magagandang karanasan at idokumento at gawing case study.

	Ipaliwanag/Isalarawan (isama ang ano, sino, kailan, saan at paano)(Ipaliwanag paano nakaambag sa pagpapalakas ng kakayahan ng mga kababaihan)
Case 1	
Case 2	

Endnotes

1 Philippine National Framework Strategy on Climate Change, 2010
2 Bureau of Agricultural Statistics, 2009
3 Republic Act 9729
4 National Climate Change Action Plan
5 Philippine Development Plan, 2011-2016
6 Message of His Excellency Benigno S. Aquino III, President of the Philippines to The Fifteenth Congress of the Philippines on the National Budget for 2012, [July 26, 2011]
7 Rural and Indigenous Women's Statement on Climate Change, A submission to the parties to the UNFCCC, November 11, 2009
8 Athena Peralta, "Gender and Climate Change Finance, A Case Study from the Philippines," 2008
9 Rodriguez Tourism Office data
10 Data from the municipal planning office, Rodriguez, Rizal
11 Barangay profile of San Rafael and Mascap, and key informant interviews
12 From key informant interviews
13 Wikipedia
14 Director Silvino Q. Tejada, A discussion paper on Climate Change Adaptation and Mitigation Measures of the Department of Agriculture, Bureau of Soils and Water Management.
15 Ibid

ABOUT PAN AP

Pesticide Action Network Asia and the Pacific (PAN AP) is one of the five regional centres of PAN, a global network dedicated to eliminating the harm caused to humans and the environment by pesticides and promoting biodiversity-based ecological agriculture.

PAN AP's vision is a society that is truly democratic, equal, just, and culturally diverse; based on the principles of food sovereignty, gender justice and environmental sustainability. It has developed strong partnerships with peasants, agricultural workers and rural women movements in the Asia Pacific region and guided by the strong leadership of these grassroots groups, has grown into a reputable advocacy network with a firm Asian perspective.

PAN AP's mission lies in strengthening people's movements to advance and assert food sovereignty, biodiversity-based ecological agriculture, and the empowerment of rural women; protect people and the environment from highly hazardous pesticides; defend the rice heritage of Asia; and resist the threats of corporate agriculture and neo-liberal globalization.

Currently, PAN AP comprises 108 network partner organizations in the Asia Pacific region and links with about 400 other CSOs and grassroots organizations regionally and globally.