# ENDURING CLIMATE CHANGE AND FOOD INSECURITY THROUGH CHARCOAL PRODUCTION: A POVERTY COPING STRATEGY OF RELUCTANT INDIGENOUS WOMEN IN THE PHILIPPINES

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## Abstract

This case study looked into the Philippines' indigenous women's understanding of charcoal production and its connection to climate change. This specifically determined their level of knowledge of and attitude towards climate change and perception on the effects of climate change on health, livelihood, and environment. The study employed triangulation method consisting of household interview, field observation, and key informant interview. Twenty-four women belonging to Hanunuo and Ratagnon Mangyan tribes served as participants of the study. They were fairly young, married, lowly educated, and had bigger households. Their primary sources of income included slash-and-burn farming and charcoal making. Their monthly family income fell below the poverty threshold. The women were reluctant charcoal makers pushed to the limits due to lack of economic options. They had "very high" knowledge about climate change but had "neutral" attitude towards it. They agreed charcoal production contributes to climate change. They already felt the phenomenon's manifest effects on their health, livelihood, and environment. However, they needed to endure these while they cope with poverty and food insecurity. They lamented charcoal production is their only available option for their survival as upland farming is no longer viable. They hoped they can avail of livelihood options, which do not entail extraction of natural resources.

***Key words: Occidental Mindoro, Hanunuo, Ratagnon Mangyans, livelihood options***

## 1. Introduction

Climate change is one of pressing crises confronting the Philippines. The recent devastations brought by super typhoons made significant impacts to people's lives, livelihood, and ecosystem. The UN World Risk Report, in its World Risk Index put the Philippines number three of the 173 riskiest places in the world. The Report cited the country's lack of the capacity to cope with the threats posed by climate change (SEARCA, 2014).

The climate change effects exacerbate rural poverty and environmental degradation particularly in the uplands inhabited by the indigenous peoples (IPs), migrant landless lowlanders, and women who are considered poorest of the Philippines' poor (IFAD, ud).

Women and climate change have been a global discourse. Majority of the world's poor comprise women whose livelihood is dependent on natural resources. Securing food for the family is women's domain but its main sources are threatened by climate change. The UN Women Watch (2009) reported that climate change has serious effects in four dimensions of food security: food availability, food accessibility, food utilization, and food systems stability.

The IP women (Mangyans)in Magsaysay, Occidental Mindoro, Philippines are among the upland dwellers whose major sources of living are slash-and-burn farming or "kaingin" and charcoal making. While women are regarded as stewards of natural and household resources, it is observed that many of them are engaged in charcoal production. Furthermore, intense and widespread engagement in charcoal making is noted in the Mangyan communities. This scenario is quite alarming in the context of environmental sustainability and food security.

The Philippines' National Framework Strategy on Climate Change, 2010-2022 contends that addressing climate change requires more than just awareness but of knowledge, understanding and change in the way people think and act. It argues knowledge leads to action, that unless people understand the phenomenon they face, adaptation and mitigation measures would remain meaningless and ineffective (PCARRD-DOST, 2010).

Who are these Mangyan women in terms of socio-economic economic characteristics such as age, marital status, education, household size, and estimated monthly family income? Are they knowledgeable about climate change? What is their attitude towards this phenomenon? What is their perception with regards to effects of climate change on health, livelihood, and environment? The foregoing is what this study endeavored to realize.

This study will in a way contribute to the body of knowledge regarding climate change adaptation and mitigation especially for upland communities. The information provided by the Mangyans will be significant in helping them craft their own felt-need programs.For government and non-government organizations working for the welfare of marginalized groups, this study would help them create viable off-farm sources of income that could veer away the IPs and other migrant landless poor from engaging in destructive livelihood activities.

## 2. Method

*Research Site*

This study was conducted in three of the four Hanunuo Mangyan settlements such as Canabang, Emok, and Bantulaoin Barangay Paclolo, Magsaysay, Occidental Mindoro, Philippines. The fourth Hanunuo settlement is Basa. They are known as CEBB communities (acronym for Canabang, Emok, Bantulao, and Basa) that occupy the mountain part of Paclolo identified as ancestral domain. Figure 1 shows the ethnographic map of the Mangyans of Mindoro (www.google.com.ph).

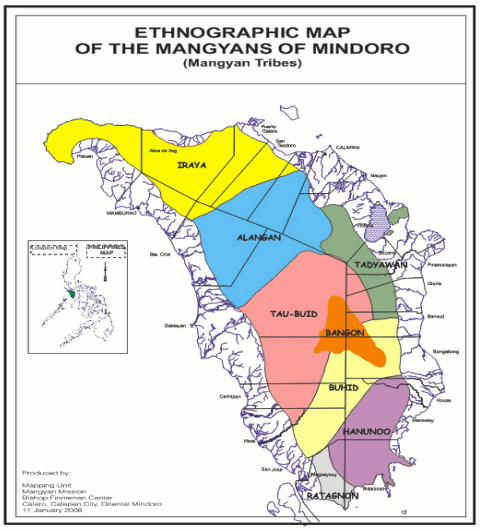


Fig. 1. Ethnographic map of the Mangyans of Mindoro, Philippines.

The other study site is Sitio Calachuchi in Barangay Alibog, Magsaysay, Occidental Mindoro. It is a Ratagnon Mangyan community inhabited by 73 households. The Ratagnons just like other Mangyans are engaged in "kaingin" (slash-and-burn farming) and charcoal making. The "kaingin" where they grow root crops, vegetables, and fruit trees is their primary source of food and income.

The sitio derived its name from the calachuchi flower which is abundant in the area.

*The Subjects of the Study*

Twenty four Hanunuo and Ratagnon Mangyan women who are actively involved in charcoal making participated in the case study. They were the women who expressed willingness to participate in the study. Table 1 presents the distribution of respondents by settlement.

Table 1.Distribution of IP women-charcoal makers by settlement (N=24).

| Settlement | Frequency | Percentage |
|---|---|---|
| Emok | 10 | 41.67 |
| Bantulao | 5 | 20.83 |
| Canabang | 6 | 25.00 |
| Calachuchi | 3 | 12.50 |
| Total | 24 | 100.00 |

*Research Design and Data Collection*

This utilized the descriptive research design. Triangulation method comprising of household interview, field observation, key informant interview, and secondary data was used. The tribe leaders as well as barangay officials' permit to conduct the study were sought. Hanunuo and Ratagnonagri culture students of the Occidental Mindoro State College facilitated the conduct of this study.

Descriptive statistics such as frequency distributions and means was used in the analysis of data from the household interview.

## 3. Result and Discussion

1. *The Indigenous women's' socio-economic profile*

The result shows that all women are married and more than half (58.33%) of them are young (39 years old and below). The IP women aged 60 years and older comprised 12.50% of the respondents. The youngest is 19 years old while the oldest is 60 years old. The mean age is 37.5.

Similarly, half of the IP women have attained low level of education (at least reached or finished the elementary level). Some 25.00% have not attended formal education. Less than 10% have reached the collegiate level. This implies that the Mangyan women are lowly educated. The result supports the report of Tacio (2010) that the upland people finish grade school or do not even attempt to enter school.

The IP women have big households with a mean of 6.4.The Philippine Commission on Women (PCW) reported an average Filipino household size of 4.8 in 2007. The PCW cited the result of the 2008 National Demographic and Household Survey (NDHS), where it portrayed women in poor households having the tendency to bear more children compared with those from more affluent households (PCW, 2014).

Table 2. Socio-economic profile of the indigenous women (N=24).

| Profile | Frequency | Percentage |
|---|---|---|
| Age | | |
| 39 and below | 14 | 58.33 |
| 4—59 | 7 | 29.17 |
| 60 and above | 3 | 12.50 |
| Mean age: 37.5 | | |
| Marital status | | |
| Married | 24 | 100.00 |
| Educational attainment | | |
| None | 6 | 25.00 |
| At least elementary | 14 | 50.00 |
| At least high school | 4 | 16.67 |
| At least college | 2 | 8.33 |
| Household size | | |
| ≤ 5 members | 7 | 29.17 |
| >5 members | 17 | 70.83 |
| Mean: 6:4 | | |
| Estimated monthly family income | 0 | 0.00 |
| Above poverty threshold | 24 | 100.00 |
| Below poverty threshold* | | |

*Poverty threshold for a family of 5=PhP 8,778.00 (PSA, 2014).

In terms of estimated monthly family income derived mainly from *kaingin* and charcoal making, the women earn a mean income of PhP 2,744.57 for an average family size of 6.4. This amount is below the poverty threshold of PhP8,778.00and food threshold of Php6,125 for a family fiveduring the first semester of 2014 (PSA, 2014).This infers that IP women are poor.

2. *Women's knowledge of climate change*

The IP women charcoal makers were given 10-item "true" or "false" statements about climate change causes, effects, adaptation, and mitigation. Items included questions regarding the existence of laws and programs relative to climate change implemented in their area or in the surrounding communities.

Table 3 shows their level of knowledge about climate change. Majority (95.83%) have "very high" knowledge. This is relative to the findings of Lumbo (2010) when she studied the Hanunuo women's perspectives of environmental protection and upland farming systems in SitioEmoc, Paclolo, Magsaysay, Occidental Mindoro. Lumbo found the Hanunuo women had high knowledge on environment-friendly farming practices.

In a similar context, the findings of the Integrated Development Program for the Indigenous People in Southern Tagalog (IDPIP-ST) on the experiences of the HanunuoMangyans's climate change adaptation and mitigation practices in Oriental Mindoro showed the Mangyans are knowledgeable of the phenomenon. The DPIP-ST Report revealed that the Hanunuo did not have the local or indigenous term for "climate change," but their understanding did not differ from the scientific definition. Their experiences and observations helped them grasp what climate change is (IDPIP-ST, 2011).

The women recognized charcoal making contributes to climate change. They explained charcoal making has severely injured not only the environment but also the upland farming. They reiterated biodiversity is affected because of the balding forests. Annual and perennial crops become stunted as they are exposed to extreme weather condition.

Table 3. The indigenous women's level of knowledge about climate change.

| Level of knowledge about climate change | Frequency | Percentage |
|---|---|---|
| Very high | 23 | 95.83 |
| High | 1 | 4.17 |
| Average | 0 | 0 |
| Low | 0 | 0 |
| Very low | 0 | 0 |

Charcoal production in the study sites has become extensive and lucrative that some IPs are no longer keen on farming. They explained it is easier to make money in charcoal making than in farming. Apparently, charcoal making has also destroyed the Mangyan's culture particularly in food production. They used to grow food crops through their *kaingin*. On lean months, they search the forest for indigenous food like wild yam *(Dioscoreavillosa)*. Nowadays, they go to charcoal buyers or middle-men for cash advance to buy food payable upon the next charcoal production and delivery. Hence, this makes them loan dependent and consequently, drives them to extract more from already damaged and scarce upland resources.

3. *Women's attitude towards climate change*

Attitude refers to the favorable and favorable reaction of the IP towards information, policies, and practices the promote climate change adaptation and mitigation. Six attitudinal statements, three each for positive and negative statements were developed. Using a 5-point scale, statements were answered "strongly agree," "agree," "uncertain," "strongly disagree," and" disagree." The positive statements were scored 5, 4, 3, 2, and 1 for "strongly agree" to "strongly disagree, respectively and vice versa for negative statements. The highest possible score is 30 while the lowest is 6. The scores were interpreted as follows: 26-30 (highly positive); 21-25 (positive); 16-20 (neutral); 11-15 (negative); and 6-10 (highly negative).

The women's attitude towards climate change is presented in Table 4. More than half (54.17%) of them have "neutral" attitude with regards to issues relative to climate change. While it is true that they have very high knowledge about climate change, it is also a fact that they are also contributory to environmental degradation due to charcoal making. This is probably the reason why they have "neutral" attitude.

Table 4. The indigenous women's attitude towards climate change.

| Attitude towards climate change | Frequency | Percentage |
|---|---|---|
| Highly positive | 4 | 16.67 |
| Positive | 7 | 29.17 |
| Neutral | 13 | 54.17 |
| Negative | 0 | 0 |
| Highly negative | 0 | 0 |

The women expressed sadness on how their economic activities injure the environment. But they have no choice as farming is no longer viable. What they generate from their *kaingin* could no longer suffice the urgent needs of the family especially food. They listed their most crucial needs as follows: food, household essentials (kerosene and detergents), medicine, education for children, and farm inputs.

4. *Women's perception on the effects of climate change on health, livelihood, and environment*

The women were asked on their perception as to the effects of climate change on their health, livelihood, and environment. The fact that women are highly knowledgeable about climate change, they easily identified its effects on various areas.

In term of effects of climate change on health, they enumerated the following illnesses: cough, colds, heat stroke, asthma, skin diseases, boil, fever, and hypertension as a consequence of changing climate (Table 5). They elaborated that members of the household easily get sick because of extreme weather condition. Children often contract asthma, colds, coughs, fever, and skin disease. Older members suffer from rheumatism and hypertension and threatened by heat stroke. The women attribute scorching heat of the sun to their husbands' indolence. The women revealed their husbands contribute little to farm and housework.

The study found the women perform most of the work both in the farm and home. This finding is consistent with the report of the UN Women Watch (2009) that a greater percentage of women comprise the farm labor force in developing countries. In addition, when parents' participation is sought by the schools where the children are enrolled, it is always the women who would attend. They also participate in community affairs, which used to be men's domain.

With regards to effects of climate change on their livelihood, the women noted the following: crop losses (100%), low productivity (100%), low income (50.00%), poverty (33.33%), and lack of jobs (4.17%). These manifestations are interrelated. Crop loss comes with low productivity and income and lack of job opportunity. The end result is poverty. As the UN Women Watch (2009) puts it, *"In the context of climate change, women face loss of income as well as harvest—often their sole sources of food and income."*

Table 5.Women's perception of the effects of climate change on health, livelihood, and environment.

| Perceived effect of climate change | Frequency *multiple response | Percentage |
|---|---|---|
| On health | | |
| Illnesses (cough, colds, heat stroke, asthma, skin diseases, boil, fever, hypertension, rheumatism, heat stroke) | 24 | 100.00 |
| Poor health | 8 | 33.33 |
| On livelihood | | |
| Crop losses | 24 | 100.00 |
| Low productivity | 24 | 100.00 |
| Low income | 12 | 50.00 |
| Poverty | 8 | 33.33 |
| Lack of job | 1 | 4.17 |
| On environment | | |
| Drought | 18 | 75.00 |
| Drying up of rivers | 18 | 75.00 |
| Crop pests | 17 | 70.83 |
| Forest destruction | 15 | 62.50 |
| Scarcity of water | 14 | 58.33 |
| Soil erosion | 9 | 37.50 |
| Flooding | 8 | 33.33 |

In terms of effects of climate change on the environment, the women identified drought (75.00%), drying of rivers (75.00%), crop pests (70.83%), forest destruction (62.50%), and scarcity of water (58.33%) (Table5). Others mentioned soil erosion and flooding especially in low lying communities. The

women revealed that the Caguray River traversing the CEBB communities dries up during summer. They attributed this to environmental destruction especially the indiscriminate cutting of trees in the uplands.

The women opined thatal though they are part of the problem and solution as to causes and effects of climate change, the mainstream people take most of the fault. First and foremost, charcoal production was not part of their culture. They only knew of slash-and-burn farming but they observed fallowing when lands were still abundant and the *Damuong* (non-Mangyan) have not yet successfully encroached their ancestral lands. In the 1970s, a geothermal power plant was constructed within CEBB. They were taught how to produce charcoal for the plant's fuel. The Mangyans were amazed how the geothermal power plant fed from charcoal. They cut more trees and produced more charcoal realizing how easier it was to generate cash. Later, they realized the long term effects of the existence of the geothermal power plant. The CEBB leaders petitioned for its closure. They got what they wanted but charcoal making remained completely ingrained in their system. Nowadays even the Mangyan children are engaged in charcoal production.

When asked to what conditions charcoal production could be stopped in their communities, the women and their elders proposed three things. First, full management of their resources should be entrusted to them. Outsiders should return to them what is legally and culturally theirs. The upland areas have been intruded by other migrant landless people particularly from the Visayas, who threaten them with *talibong* (fighting swords) during confrontations.

Second, the government should completely prohibit charcoal production system-from production to distribution and utilization. The Mangyans believed it is unfair to confiscate their charcoal when buying and utilizing it are legal.

Third, they should have access to viable livelihood options that do not require extraction of natural resources.

## 4. Conclusion

The indigenous women featured in the case study reflect a picture of poverty in the uplands as seen in their profile and limited economic opportunity. The young women are reluctant charcoal makers pressed to the edges because of insufficiency. They are literally poor in terms of education, income, and livelihood options.

The women despite their low education are very eloquent with regards to climate change causes and manifest effects on health, livelihood, and environment. They admit climate change and charcoal production have strong association. They feel sorry for being both incidental agent of environmental destruction and recipient of the subsequent effects. Charcoal making is their only viable option to cope with food insecurity at the present time.

It is important for the government and concerned stakeholders to pay attention to what the Mangyans say as to how charcoal production can be stopped in their areas to prevent further damage to the remaining upland resources. The Mangyans are full of wisdom and they know very well what is happening in their surroundings. It is high time for the development workers initiating programs in the Mangyan communities to refrain from planning and deciding what they think is good for them. They should assist only in ensuring that the development programs the Mangyans themselves have crafted can be implemented by providing the required resources.

## 5. Acknowledgment

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## Biography

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