Indigenous Knowledge on Disaster Management and Environmental Conservation of the Blaan Tribe in the Riparian Zone of the Calminda Watershed

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Abstract

The Blaan communities of Muling, Plinggang and Pongoleel in the riparian zone of the Calminda Watershed in Alabel, Sarangani Province are continually exposed to environmental hazards brought about by disasters in the forms of drought, land slide, soil erosion, flood and infestation of rats and swarm of locusts. This study describes the components and aspects of the indigenous knowledge or collective wisdom for disaster management and environmental conservation of the Blaan tribe. It also sought to discuss and analyze various environmental hazards including their seasonality and duration experienced by the communities. Moreover, it describes the state of human, social (networks), environmental, physical and financial capitals of the Blaan communities especially during periods of disasters using Sustainable Livelihoods Approach (SLA). This study employed alternative research methods using Participatory Rapid Field Appraisal (PRFA) strategies such as transect mapping, seasonal calendar method, Venn diagram and key informant interviews. Secondary sources of information like the Community Based Monitoring System of Sarangani and existing published research on disaster management and environmental conservation are also utilized to triangulate findings of the study. Finally, the results of the study are vital to help the community prepare for disasters throughout the year. Moreover, this research aims to generate policy notes and recommendations for the possible inclusion of indigenous knowledge in the disaster risk reduction management plans and environmental protection and conservation framework of the government, particularly local government units.

Introduction

The Philippines like most countries in Asia Pacific region is prone to many types of disasters. This is due to its location in the globe as part of the Pacific Ring of Fire. As an archipelagic country, the Philippines is vulnerable to natural hazards and climate change related disasters. Most Filipinos are engaging in farming and fishing which are economic activities that are heavily dependent on natural resources that made them doubly susceptible to harsh impacts of climate change. People in developing countries according to Clot (2009) are particularly vulnerable to disasters as they are more exposed, have lower coping capacities and are less prepared. They are also dependent on climate-sensitive primary industries such as agriculture, forestry and fishery. Therefore, disaster is a major restraining factor in the development process that can eradicate years of local development investments in few minutes of hours.

Disaster risk reduction is an integral part of the development efforts through equitable and inclusive mechanisms that are design to protect people from the harmful effects of disasters and build their resilience and capacities to confront daunting challenges brought about by natural hazards. The Philippine Disaster Risk Reduction and Management Act of 2010 gives primary to vulnerable and marginalized groups particularly women, children, differently-abled persons and ethnic minorities. Hence, the law provides the legal framework for the government to devise mechanisms that foster social protection to groups especially indigenous communities that are the vulnerable to effects of disasters. Moreover, the indigenous peoples in the Philippines play a major role in the protection and preservation of country’s rich and vast biodiverse areas since they live in or near these areas.

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There is an emergent call to pay paramount attention to indigenous voices in disaster risk reduction by governments, civil society organizations and other stakeholders around the world. The vulnerability of the Philippine archipelago and its local communities, particularly the poor and the IPs, is a compelling evidence to recognize and strengthen its wealth of indigenous knowledge for providing solutions to global problems of increasing disasters and climate change impacts. (Shaw et al, 2008)

The Blaan tribe is an ethnic group in the Southern portion of Mindanao. Majority of them are situated in the Provinces of Sarangani, South Cotabato and Sultan Kudarat. Like many traditional communities in the Asia Pacific Region, the Blaan community has developed since time immemorial indigenous knowledge that has been tested by time and proven effective in reducing disasters and managing unavoidable hazards. These knowledge assets are passed down from generations and are internalized by communities through process of socialization. This research highlights the potentials of indigenous knowledge for disaster risk reduction and environmental conservation of the Blaan Community in the riparian zone of the Calminda Watershed. This also intends to discuss how these community driven practices on indigenous knowledge can be integrated into the DRRM Framework of the government, especially the LGU.

Specifically, this study aims to answer the primary question, “What are the components and aspects of the indigenous knowledge or collective wisdom for disaster management and environmental conservation of the Blaan tribe in the riparian zone of the Calminda Watershed?” while seeking to do the following:

1. Discuss and analyze the various environmental hazards including their seasonality and duration experienced by the Blaan communities.
2. Describe the human, social (networks), environmental, physical and financial capitals of the Blaan communities.
3. Identify key lessons learned with respect to indigenous knowledge for disaster reduction from the case of the Blaan community in the riparian zone of Calminda Watershed.
4. Formulate action, policy and research recommendations that integrate indigenous knowledge in DRR in the local disaster management plans of local government units.

Methodology and Analytic Framework

This is a qualitative type of research that employed alternative research strategies that are originally developed and used by civil society organizations (CSO). These research approaches include Participatory Rapid Field Appraisal Strategies such as Transect Social Mapping, Seasonal Calendar, Venn Diagram and Key Informant Interview (KII). Fieldworks for this research were conducted from September 2012 to February 2014.

The researcher used a combination of approaches to analyze data generated from the informants of the study, outputs of the workshops and secondary sources of information from published materials and from the Provincial Government of Sarangani. Specifically, the frameworks for analysis of the data are the Framework Analysis (FA) and Sustainable Livelihoods Approach (SLA).

The Framework Analysis is “a qualitative method that is aptly suited for applied policy research.” This framework suggests the sifting, charting and sorting of data in accordance with key issues and themes”. (Srivastava and Thompson, 2009). Moreover, it enables the researcher to understand and interpret data and move from descriptive accounts to a conceptual explanation.
based on the data at hand. (Furber, 2010). The five steps involved in framework analysis are: familiarization; indentifying a thematic framework; indexing; charting and mapping and interpretation. In this study, data gathered thru KII, community workshops and document review are classified according to identified aspects of the indigenous knowledge or collective wisdom of the Blaan tribe on disaster management and environmental conservation.

To analyze a community’s vulnerability and adaptive capacities, the research used the Sustainable Livelihoods Approach by describing five types of assets, namely,

- Human capital which includes health, nutrition, education, knowledge and skills;
- Social Capital that comprises networks and connections, relationships of trust and mutual support, formal and informal groups, common rules and sanctions, collective representation, mechanisms for participation in decision making, and leadership.
- Environmental Capital which encompass access to land and produce, wild foods and fibres, water and aquatic resources, biodiversity, trees and forest products, environmental services and wildlife.
- Physical Capital which consists of infrastructure, technologies and tools.
- Financial Capital that covers savings, credit, remittances, pension and wages. (ICIMOD, No Date)

Results and Discussions

Through the conduct of series of community visits, interviews and participatory workshops, the researcher obtained data and information from the Blaan communities of Pongoleel, Plinggang and Muling in Barangay Alegria, Sarangani Province. The vast amount of data are sifted, charted and sorted according to issues and themes. The researcher also analyzed the findings of the study using conceptual and theoretical inferences from studies conducted by other researchers on indigenous knowledge in disaster management and environmental conservation here in the Philippines and abroad.

**Current state of health of the Calminda Watershed and survival of the community**

The Calminda Watershed is a major water resource in the hinterlands of Alabel, Sarangani Province. The watershed is important for the Blaan people in the highland communities of Pongoleel and Muling as it is where they get water for household consumption and its river banks serve as sacred gumlok (hunting grounds). The watershed is also home to a variety of fresh water fishes such as *ki’le’* (eel), *kulong* (big shrimp) *agong* (small shrimp), *kulo* (crab), *paitan* (bangus), and *ngi’lag* (catfish). Wild animals are also abundant in the area. These wild animals like *lablab* (wild pig), *slarong* (deer), *unggoy* (monkeys), *anuk takayo* (wild birds) and *anuk* (wild chicken) normally flock into the banks of the watershed to drink water. However, the community reported that the health of the Calminda watershed is no longer the same as it was before. The volume of the water flowing in the watershed has significantly reduced over the years. At present, major tributaries of the Calminda watershed are already dry and no water is flowing except during heavy rains. The lives of the Blaans in the mountain community is deeply attached to their land and therefore including the Calminda watershed. In times of hardships such as during *domligo* (El Niño) and *simog* (La Niña) that caused the death of crops and resulted into food insecurity, the community relies on the watershed for food through inland

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2 In Blaan language Calmida refers to the flat surface or plain between two hills or mountains
fishing and hunting of wild animals. The deteriorating state of health of the Calminda watershed is an alarming threat to the survival of the Blaan community. Without the watershed, the community may certainly encounter difficulties when a disaster strikes and therefore contributes to the vulnerabilities of the members of the community to natural disasters.

Observance of climate change

The community observed that the pattern of climatic conditions have changed over time. The Blaans are knowledgeable of the best time to plant corn and other crops by observing some natural phenomena like the size and position of the moon in the sky, behavior of trees and animals and direction of the wind. Nonetheless, according to them they can no longer predict the weather pattern. The climate at present has changed drastically which affect traditional farming system of the tribe. Traditional knowledge of predicting the weather which is an accumulated knowledge asset of the tribe from their ancestors may no longer reliable due to climate change.

Plant-based pharmacopoeia and Indigenous bio-pesticide

To cure illnesses of animals particularly beasts of burden which are useful in the farm, the Blaans have learned to use a certain weed locally known as slot which is boiled and the concoction is given to horses, carabaos and cows with bloated stomach which they called bungition. The Blaans claims that there are plants with medicinal properties and proven effective in curing illnesses. One of which is the leaves of the alkik plant, used as wrapper of the rice and given to a sick person. Another is the seed of the bia-o, locally known as lumbang and its English name is Candlenut. The Blaan extract the oil from the seed through burning and apply to the forehead of a person with high fever. The bia-o is also used in a traditional healing practice that is called tu-ob, a common method of surrounding the sick person with heat and smoke, usually done with incense, which is believed helpful in curing diseases. In addition, the community also identified the maliango tree as an effective cure for malaria and snake bite. The bark of the tree is used for tu-ob and is boiled in water and the concoction is given to a person stricken with malaria. For snake bites, the bark of the maliango is applied directly to the wounds.

To protect crops from the infestation of insects, the Blaan people are using indigenous organic pesticides and insecticides. One of these is salvan which is a variety of bamboo planted by the Blaans on the ground in their farms to protect crops from pestilence and even from bad curse (barang). Another organic insecticide used by the community is called abtok. Twigs of that bush plant are planted all over the rice field to prevent black bugs (tia-ngaw) from coming because of its foul smell. The Blaans also used sol which is a concoction from a flower and sprayed to vegetables to manage pestilence in plants. Sol is also used by the community as organic poison in catching fishes and shrimps in the watershed. This traditional knowledge among the Blaans in dealing with pestilence is useful in the production of chemical free crops and grains and therefore, a practice that is promoting green agriculture.

Food storage and Seed banking systems

The indigenous cultural community in Pongoleel, Muling and Plinggang has learned from their ancestors how to effectively store foods. Rice and corn for consumption of the family are usually stored in lehub which is a drum-like storage tank made of bark of the lob and dlung trees. The Blaan also dried poisonous wild yam which they called kubong. Dried kubong according to them can last even for years that can be utilized by the community when food is scarce. In addition, dried kubong is usually mixed with rice and can be used for most Blaan delicacies. Accordingly,
poison in wild yam can be taken away by soaking it in salt. A bamboo canister called *tiral* is used by the community members as storage for variety of seeds of corn, rice, and beans. The Blaans save seeds of these crops to ensure the continuity and survival of their varieties. Long period of droughts might wipe out the entire variety of crops especially native corn, upland rice, and beans. Another interesting way of storing corn seeds is known as *blal*. Corns with husk in up-side-down position are hanged in a row even in an open field that can be used in the next planting season. For a community in the mountain and prone to many types of natural calamities, a knowledge on food storage and seed banking is highly valuable. This is an effective adaptive coping mechanism of the tribe to mitigate hunger during season of food scarcity. Seed banking is important to ensure the continuity of the different variety of crops and grains which may be destroyed and lost due to drought and other natural disasters.

*Forest management and social ownership of natural resources*

The Blaans have practiced common ownership of the *lasang* (forest) and the *bolol* (mountain). Every member of the community owns the forest and all the natural resources found therein. Parts of the social activities of the Blaan are *mangaya* or hunting of wild birds and animals and gathering of fruits of *uway* (rattan) and *blubo*. Blaans have innate generosity, foreigners are allowed to enter the *lasang* and gather resources there provided they have asked permission from the traditional leader, traditionally called *fulong*. This kind of practice of the Blaan in protecting the forest is similar to the *muyong* of the Ifugaos in Mountain Province (Butic and Ngildo, 2003 in Indigenous Peoples, Forest and REDD Plus: State of the Forests, Policy Environment and Ways Forward, 2010). However, the Blaans are considerably more generous and accommodating as they allow foreigners to enter and gather resources in the *lasang* provided they asked permission from the *fulong*. In the case of the Ifugaos, non-members of the tribe are prohibited to go inside the *muyong* especially to gather foods and hunt inside the forest. Severe punishments from members of the community are reserved for the intruders.

*Indigenous homestead and rituals in building houses*

The Blaans usually build their traditional houses in the hill side and not in the plain. Blaan traditional house is made of indigenous materials that are abundant in the place such as wood, bamboo and cogon for roofing. They do not use nails in building houses rather, the Blaan used *klay* and *nito* in knitting wood barks into the bamboo poles that served as posts of the house. The Blaans also put bamboo braces to fortify the foundation of their houses in order to withstand the fury of strong winds during rainy season. The architectural design of Blaan houses is unique from other ethno-linguistic groups like the Tboli although most of building materials are the same. Its functionality to withstand different types of disasters is a result of age-long experience of the tribe to confront natural calamities.

The Blaans believed that they should be careful in choosing a place where to build a house. They have to make sure that the place is not within the path wherein bad spirits are traversing otherwise, the family that settles therein might experience bad luck like diseases and calamities. In order to determine that a particular area in the community is suitable for housing a ritual called *himbisan* should be done to be executed by the *blu-os* who is a soothsayer, priest, augur and traditional healer of the community. However, the elders of the community are amenable that such traditional belief is no longer practice by the tribe since no one in the community has the skill and knowledge to execute the ritual.
Ability to predict drought and rainy season

The members of the Blaan community have the ability to predict the coming of dry and even rainy seasons by observing the behavior of a certain tree locally known as *tlato*. Accordingly, the community can predict drought if that tree sheds off its leaves and proceed to flowering and bearing of fruits afterwards. However, if that tree started to produce new leaves and will not bear fruit then rainy season is coming. The used of plants or tree in indigenous early warning indicators of rainfall and drought is not exclusive to the Blaan tribe in the hinterlands of Sarangani. The indigenous people in the Makueni District in Swaziland, used the Baobab tree to predict drought and rainy season. At the end of long rains during March to April, the Baobab sheds all its leaves and remains leafless for the entire duration of the dry season in the month of June to September. Near the onset of short rains in October to November, tender new leaves starts to appear on the tree. The fruiting pattern of the tree is also useful for the community to determine the performance of the season, especially rainfall failure and drought. Prolific fruiting seems to indicate a likely poor season ahead. (UNEP, 2008)

Environmental Conservation

Some aspects of the collective wisdom of the Blaan tribe are related to environmental protection and conservation which are significantly intertwined to the culture and tradition of this indigenous group of people. This set of knowledge stresses the importance to some plants and animals and gives primacy to traditional farming practices of the tribe.

Sacred plants and animals and Indigenous farming system

Some beliefs of the Blaans are beneficial for environmental conservation. There are plants and animals considered by the members of the community as sacred, thus, the community has protected these plants and animals over time. The *alimukon* or white-earred brown dove is hailed to be sacred because its sound serves as warning of impending danger. For instance, if a group of hunters go inside the forest to hunt for wild animals and they hear the sound of the *alimukon*, they should abort their hunting activities otherwise something wrong will happen to them inside the forest. Other sacred animals are horse because of its usefulness in the farm; dog which serve as guardian; chicken and crabs which are use in curing illnesses. Plants which are considered sacred include *pali* (rice), *tubo* (sugarcane), *gabi* (taro), *kasila* (camote), *ube* (yam) *bukay agol* (white corn) *agol milkat* (glutinous corn) and *kasila-kayo* (cassava). These plants are useful during drought and when food is scarce. These are also important ingredients in the preparation of medicinal concoction to treat diseases of people and animals.

The Blaans are farming communities since time immemorial and the farming practices of their ancestors have been transmitted to the current generation. Traditionally, the Blaans plant vegetables and fruit bearing trees based on the position of the moon in the sky. According to these upland dwellers the best time to plant early maturing crops like camote, cassava and other vegetables is during *alyawan* (around 8:00 to 9:00 in the morning and the moon is the visible in the sky). Banana, mango and other fruit bearing trees are best planted during *tasot-ibulan* (around 1:00 to 2:00 in the afternoon while the moon is in the eastern sky). The best time to plant coconut, taro and corn is during *dsal-ibulan* when the moon in its fullest is nestling on the top of the mountain. Seeds of important crops are also saved by the community, which are to be planted during the right season.
Coping mechanisms to mitigate hunger and food insecurity

Despite numerous natural disasters that constantly confronted the upland communities, the Blaans have learned various survival mechanisms and most of which are taught by their ancestors. During times of food scarcity brought about by drought, community members have reduced to eating *klot* or poisonous wild yam to stave off hunger. According to the community, they are aware that wild yam contains poison but they are also knowledgeable of the appropriate way to make the *klot* edible. A certain plant called *baldangi* is used by the Blaan as antidote in case of food poisoning. Inquirer Mindanao reported on April 8, 2010 that 70 *lumads* had been confined to the hospital due to food poisoning after eating the wild yam\(^3\). Thus, eating wild yam is common among different indigenous cultural communities in Mindanao. Moreover, during times in which rice and corn for family consumption are scarce, these upland dwellers are gathering young leaves of plants locally known as *fufew* for food. This plant is abundantly growing on the side of the cliffs and hills near the watershed. Other plants thriving near the watershed such as *silol, labi, mlaga, fugan and tlehe*\(^4\) serve as sources of food for the community in times of hunger. Moreover, community members are also gathering the fruits of *blubo and uway* in the forest to provide food for the entire family. The infestation of locust is detrimental to food production of the Blaan community. In order to mitigate hunger, community members are eating grasshoppers. Another notable coping mechanism of the tribe during food crises is hunting of wild animals and birds in the forest and in the riverbanks of the watershed. Blaans usually build a makeshift structure called *lat* made of palm leaves. Hunters hide inside the *lat* and wait for the coming of wild animals and birds visiting the watershed to drink water. Inside the *lat*, hunters can conveniently hit their targets using bow and arrow without getting noticed by the animals. Moreover, the Blaan folks are also growing drought resistant and early maturing crops like cassava, taro, beans and legumes.

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\(^4\) These plants belong to the palm family
Types of Disasters and their Seasonality, Effects and Impact to the Indigenous Community

Table 1 Seasonal Calendar

<table>
<thead>
<tr>
<th>Calamity</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>Effects</th>
<th>Impact</th>
<th>Available Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Food insecurity</td>
<td>Everyone's affected including farm animals</td>
<td>Wild Yam</td>
</tr>
<tr>
<td>Strong Wind</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Destruction of farm crops</td>
<td>Insufficient food supply</td>
<td>Decrease the quantity of harvest</td>
</tr>
<tr>
<td>Heavy Rain</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Land slide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rat Infestation</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Crops like coconut, rice, sweet potato, cassava eaten by rodents</td>
<td>Insufficient food supply</td>
<td></td>
</tr>
<tr>
<td>Locust Infestation</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Crops such as corn, rice, coconut, and banana eaten by swarm of locust including bamboo and grass</td>
<td>Insufficient food supply</td>
<td>Even farm animals are affected as forage are consumed by locust</td>
</tr>
</tbody>
</table>

As shown in the seasonal calendar, the Blaan tribe in Pongoleel, Muling and Plinggang identified drought as the primary hazard which they have confronted over the years. According to them, the drought season usually starts in March to middle of April. During drought, crops like corn, coconut, banana and sweet potato died and resulted to food insecurity among members of the community in the mountain ecosystem. The impact of drought is not only felt by people but also by farm animals like cows, goats and carabaos as grasses for forage also wither during this season. To cope with the effects and impacts of drought, the Blaans gathered poisonous wild yam and julew in the forest for food. They also hunt wild birds and animals in the forest and in the riverbanks of the watershed. Every June and July, the Blaans observed the presence of strong wind accompanied by heavy rains that cause destruction of crops and often resulted to landslide in the area. Consequently, strong wind and heavy rain lead to the insufficiency of food supplies for members of the community and decrease the quantity of harvest. During this season, the Blaans eat mlaga, fugan, akil and basag, plants that belong to the palm family which are abundantly growing near the creek and the watershed. The community also experienced rat infestation which usually happened from August to September. Rodents eat farm crops like coconut, rice, sweet potato and cassava that resulted to insufficient supply of food for the community. During rat infestation, foods from the forest like yam, taro, biga, poisonous wild yam, and soft parts of palm trees are available for the consumption of the
Finally, the Blaan community has not been spared from locust infestation. From March to May, members of the community have to deal with the swarm of grasshoppers that are destructive to crops like corn, rice, coconut and banana including grasses and bamboos. As a result, people suffered from inadequate food supply and even farm animals are affected since grasses are also eaten by the locust. Since grasshoppers are abundant during this season, Blaans eat them to deal with hunger. There were times in the past that rat and locust infestation lasted for two years which greatly devastated the livelihoods of Blaan people.

**State of Human, Social, Environmental, Physical and Financial Capitals**

In order to increase understanding on the vulnerabilities and capacities of the Blaan communities to climate change related disasters, the researcher employed the Sustainable Livelihood Approach (SLA) to describe the state of human, social, environmental, physical and financial capitals using CBMS Sarangani (2010) data. CBMS is a monitoring survey tool developed by the Angelo King Institute of De La Salle University (DLSU) that include fourteen (14) indicators to gauge poverty incidence at the community level. These indicators are child mortality rate, malnutrition among 0-5 children, number of children not attending elementary, number of children not attending high school, number of families below food threshold, number of families that experienced food shortage, number of families with makeshift housing, access to sanitary toilet, access to potable water, income threshold, maternal mortality rate, number of squatters, unemployment rate, and criminality rate. CBMS data are supplemented using information generated through social mapping, Venn Diagram and key informant interviews.

State of Human Capital

Table 2 Health, Education and Experience of Hunger

<table>
<thead>
<tr>
<th>Community</th>
<th>CBMS Indicators</th>
<th>Child mortality rate</th>
<th>Maternal Mortality Rate</th>
<th>Incidence of Malnutrition</th>
<th>Children 6-12 not attending elementary</th>
<th>Children 13-16 not attending high school</th>
<th>Families that experienced food shortage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>M</td>
<td>N</td>
<td>M</td>
<td>N</td>
<td>M</td>
</tr>
<tr>
<td>Muling</td>
<td></td>
<td>44</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>44</td>
<td>0</td>
</tr>
<tr>
<td>Plinggang</td>
<td></td>
<td>38</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>Pongoleel</td>
<td></td>
<td>33</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>33</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>115</td>
<td>0</td>
<td>13</td>
<td>0</td>
<td>115</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: CBMS Sarangani, 2010

Legend: N - Population  M – Magnitude

Table 2 shows the state of human capital of the three Blaan communities. In terms of health, no children within the age of 0 to 5 years old died and no mother died because of pregnancy. In terms of malnutrition among children, only 1 child in Plinggang is diagnosed as malnourished. This indicates the health status of the communities is generally good even health facilities of the barangay are not easily available to the people due to distance. Barangay Health Workers (BHW) assigned in the area are the only source of health services for members of the community. In the area of education, 23 out of 143 children with the age of 6 to 12 years old are no longer attending elementary school and 30 out of 68 children within the age range of 13 to 16 are not attending secondary education. Elementary school is available in the community; however, secondary school is located in the barangay center of Alegria. In terms of food supply, no family has experienced hunger or food shortage. This is attributed to the coping strategy of
the tribe of gathering wild plants in the riverbanks of the watershed and hunting wild animals in the forest during food crises.

State of Social Capital

Norms of reciprocity and network of civic engagement which are sources of mutual trust among members of the community are vital to assess their capacities to confront impending disasters.

Venn Diagram

The Venn Diagram shows a very simple social network of the Blaan Community of Pongoleel, Muling and Plinggang. According to the participants of the social workshop, the purok leader who is also the community tribal leader is the primary source of support in the community when a disaster strikes. They also identified the Assembly of God, the most popular religious denomination in the locality, as support organization during times of difficulties. Support provided by the school teachers of Pongoleel Elementary School is also valued by the community.

Moreover, the community also identified non-government organizations, religious institutions, Barangay Health Workers (BHW), Barangay Nutrition Scholars (BNS) and local government units as infrequent sources of supports during times of disasters. Noticeably, the community does not identify the Barangay Captain of Alegria as a primary agent to whom they can rely on especially during disasters due to the relative isolation and distance of the community from the barangay center. The Blaans have a notable culture of self-help that is called alayon. During harvest of rice and corn, every member of the community is enjoined to attend a feast to give thanks to the Almighty for the gift of abundant harvest. Hunting is a social activity among male members of the community and usually done during feast to offer food for the entire community.
State of Environmental Capital

The social map that is produced by members of the community through a participatory method is reflective of their state of environmental capital.

The social map shows the communities of Pongoleel, Muling and Plinggang as well the nearby sitios Malaya and Pagang in the mountain ecosystem in Alegria, Alabel, Sarangani Province. It can be noticed that these communities are built on top of the hill bounded by the Snilong Creek on the North and the Calminda Watershed on the South. The hillsides are utilized by the community folks to grow corn, banana and coconut. The riparian zones of the Calminda Watershed are dominated by forest trees and some patches of bamboo plants. According to the members of the community, their community is a former site of logging activities which resulted to the disappearance of forest including all the wild animals residing therein. At present, these forest patches are results of National Greening Program (NGP) of the Department of the Environment and Natural Resources (DENR) which tapped Blaan folks as stewards of the forest and primary agents in reforestation initiative. On the other hand, red triangles on the map are the areas of the Snilong Creek and Calminda Watershed where in landslides and soil erosions are typically observed by the community.

State of Physical Capital

The researcher utilized CBMS data in describing the physical capital of the Blaan communities. The discussion on the presence of social infrastructures like school, water system and health facilities are based on the community map. As shown in the map, only 1 elementary school is available in the community. For young Blaans to attend secondary education, they have to enroll in high school that is located in the barangay center in Alegria. This means, they have to travel using single motorcycles or walk on foot every time they report to school due to distance of their community to the center of the barangay. It is also noticeable that no health facility is available in the community. Barangay health center and lying-in clinic are all located in the barangay center.

Table 3 Homestead and access to toilet and water
As can be seen in Table 3, 7 out of 137 households in the three Blaan communities are living in makeshift housing. Their houses are made of light materials such as bamboo and cogon grass. Almost every household, 136 out 137 have no access to sanitary toilet and 134 families have no access to potable water. This indicates that members of the communities have poor sanitary practices. Access to clean and potable water is a major problem for the Blaan folks of the three communities. Blaan folks are having difficulties of getting water from a spring down the hill since no water system is available near the community center. Moreover, the quality of water from this source is not also certain as to the presence of any bacteriological contamination since water from the spring has not been subjected to laboratory examination.

State of Financial Capital

The resilience of the Blaan communities to confront various types of disasters and reduce their vulnerabilities can be best understood by assessing their financial capacities such as income and employment.

Table 4 Employment, Food Threshold and Income Threshold

As shown in Table 4, the three communities have considerably low unemployment rate with only 1 person who is unemployed out 151. However, this low unemployment rate does not signify a high level of economic status among members of the communities. Most of them rely on agriculture by planting corn, rice and other crops in their farm and some are wage earners in the farms of other people in nearby communities. High poverty incidence in the three communities is glaring since 81 out of 137 households have income below the food threshold. This means that their income is not sufficient to buy foods that can meet the recommended amount of nutrition for members of the family. According to the National Statistical Coordination Board (NSCB)\(^5\), food thresholds “refers to the annual per capita cost of basic food requirements which meet 100% adequacy of the recommended dietary allowance (RDA) for protein and energy.

\(^{5}\) See http://www.nscb.gov.ph/ru8/Poverty/povertyprod.htm
(2,000 calories) and 80% adequacy of the nutrients.” In 2009, food threshold in the Philippines
is P11, 868 while in Region XII, the food threshold is P10,448. In terms of poverty
threshold, 103 out of 137 families are below the poverty line. Poverty threshold based on NSCB
“is equal to the annual per capital food threshold plus the cost of other basic non-food
requirements”. In 2009, the national poverty line in the Philippines was P16, 841, however;
the current poverty line in Region XII is relatively lower which is pegged at P14,967.006. This
only shows that the income earned by majority of households in three communities is
inadequate for them to get out from the poverty line.

Erosion of Indigenous Knowledge

In studying the traditional knowledge on flood preparedness of rural communities in Pakistan
and Nepal, Dekens (2008) noted that this local knowledge is getting eroded due to rapid change
in environmental and socio-economic context which highlights the utility of external and
scientific knowledge. This assertion is also true in the case of the Blaan tribe in the hinterlands
of Alabel, Sarangani Province. Community members especially the elders admitted that their
collective knowledge on disaster management and environmental conservation is gradually
eroding due to the influence of modern technology and mass media. The present generations of
Blaans are no longer aware of these knowledge assets of their tribe. Most families are not
knowledgeable of these traditional ways of dealing with disasters and therefore these practices
are no longer, transmitted to younger members of the family. According to one senior member
of the community Tiala Yambo, he is sharing these knowledge and practices to his children and
grandchildren. However, he is also amenable of the diminishing interest among younger
generations of Blaan in their community to learn about indigenous knowledge especially in
disaster management and environmental conservation. He noted that only few people in the
community have the skill to do the kubong which is the process of preparing poisonous wild yam
for food during drought season. He added that some of the community members are no longer
relying on farming as source of living, instead they engaged in the cutting of trees for the
production of charcoal which are sold in Poblacion, Alabel and in General Santos City. This kind
of activity is detrimental to the health of the environment especially the Calminda watershed.
Most Blaan houses, if not all, in Pongoleel, Muling and Plinggang are no longer built using the
original architectural design since they believed that concrete houses are more durable to
withstand the devastation of natural disasters. In addition, most Blaan farmers are no longer
using indigenous pesticides like salvan, abtok and sol as they are using chemical based
pesticides for their agricultural crops.

Concluding Remarks and Lessons Learned

The following are the conclusions and lessons learned of the study:

1. The Blaan tribe in Muling, Pongoleel and Plinggang, Alegria, Sarangani Province have
   immense amount of indigenous knowledge systems and practices on disaster
   management and environmental conservation.

2. On disaster management, the Blaans have the ability to predict drought and rainy
   season by observing the behaviour of the tlaeto’ trees which are usually growing in the
   riverbanks of the Calminda watershed. They have also impressive plant-based
   pharmacopeia for human and animal health and they are knowledgeable in using

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6 Information on the food and poverty thresholds in Region XII is provided by the Provincial Planning and
Development Office (PPDO) Sarangani
organic pesticides to manage pestilence in agricultural crops. Moreover, the Blaans have an indigenous technology of food storage and seed banking which are vital to mitigate hunger during times of disasters.

3. On environmental conservation, the Blaans give stressed on the social or collective ownership of the forest and all the natural resources found therein. They also believed to the sacredness of some animals and plants and therefore they believed that they are bound to protect these plants and animals. This belief is significantly contributing to the promotion of biodiversity. In addition, the Blaans are still practicing the farming techniques they inherited from their ancestors based on the behaviour of nature such as the position of the moon in the sky.

4. The Blaans identified drought, heavy rain accompanied by strong wind, rat and locust infestations as the major natural calamities that they experienced over the years. The primary impact of these natural disasters to the members of the community is food insecurity and hunger.

5. In order to mitigate the effects and impacts of disasters, the Blaans have coping mechanisms of addressing food insufficiency and hunger by gathering wild fruits and vegetables in the forest and in the riverbanks of the watershed. They also propagate early maturing and drought resistant crops to ensure the availability of foods even during disasters. Hunting as a social activity is done by male members of the community to mitigate hunger brought by natural calamities.

6. The Blaans are also eating poisonous wild yam especially during drought season. Accordingly, they are knowledgeable on how to properly prepare the food to remove the poison in the root crop. They also identified the baldangi plant as antidote of the poison of the said crop.

7. In terms of human capital, the health status of the members of the communities is considerably high as manifested by zero child mortality rate, zero maternal mortality rate, and low incidence of malnutrition among children. However, in the area of education, a significant number of children are no longer attending elementary and secondary education. When it comes to social capital, the Blaans stressed the importance of alayon, a culture of helping each other especially in times of crises. Members of the communities rely primarily on the tribal leader during disasters since the Barangay Local Government of Alegria is far from the three communities. The Blaans have considerably poor environmental capital since trees in the forest were toppled down because of massive logging activities and some few remaining forest patches in the area. The health of the Calminda watershed which is an abundant source of fresh water fishes for the members of the communities is in danger of further deterioration due to deforestation. Some tributaries of the watershed are already dry and no water is flowing except during heavy rain. In terms of physical capital, some families are living in makeshift housings which are vulnerable to destruction during typhoons. Almost every household has no access to potable water and sanitary toilet. Finally, the state of financial capital of the Blaans is considerably low though most members of the tribe have income because of farming. The low financial capital of the tribe is manifested by the high incidence of families with income below the food threshold and poverty thresholds. Thus, most of them are living below the poverty line.

8. The immense indigenous knowledge systems and practices of the Blaan communities are gradually eroding since the younger generations are longer interested to learn the collective wisdom on disaster management and environmental conservation of their tribe.
Recommendations

Based on the findings of the study, the researcher sets forth the following recommendations:

Action Recommendations

1. Collective wisdom and practices on disaster management and environmental conservation should be taught to the younger generations to address the threat of erosion of indigenous knowledge. This can be done by integrating the findings of this research into the curricula of basic education in the elementary in communities where majority of the school children are Blaan.

2. Community elders especially those who are knowledgeable of these traditional practices on disaster management and environmental conservation are encouraged to tell stories to their children and other younger members of the community to ensure continuity and survival of these knowledge assets of the Blaan tribe.

3. The Department of the Environment and Natural Resources (DENR) and LGU Sarangani should establish and strengthen their relationships with the Blaan community especially peoples’ organizations in the implementation of agriculture and environmental protection programs such the National Greening Program (NGP). The protection of the existing forest patches in the riparian zones of the Calminda Watershed and the need to increase vegetation in the area through massive planting of trees are imperatives to save the health of the watershed from further damage and deterioration. Moreover, fostering collective ownership among members of the community reinforces the sustainability of programs and initiatives.

4. The DENR and LGU Sarangani should also promote the planting of forest trees which are endemic in the area like Molave and Breadfruit and stop on introducing foreign species like Gmelina and Mahogany. Breadfruit locally known as kulo, can be a good source of food for the community during economic difficulties especially during drought season.

5. Plants which are identified by members of the community to have pharmacological properties should be subjected to intensive and scientific investigations through careful laboratory testing of samples to determine their efficacy to treat diseases as well as the presence of chemical elements which may be harmful to human and animal health. This can be done by both academic institutions like the Mindanao State University, General Santos City and the Environmental Conservation and Protection Center (ECPC) of PLGU Sarangani which have the capacities and facilities to do necessary processes and procedures.

6. Subject to laboratory investigations the chemical properties of bio-pesticides like salvan, abtok and sol used by the Blaan people in managing pestilence on agricultural crops. This is important to determine the effectiveness and potency of these bio-pesticides that can be used in producing chemical-free agricultural crops and grains. Moreover, these bio-pesticides may be used to reduce farm inputs

Policy Recommendations

1. The government especially the Provincial Government of Sarangani and the Municipal Local Government of Alabel should adopt a more holistic approach to disaster risk reduction by integrating indigenous knowledge in the disaster risk reduction and management framework of the LGU especially practices that are tested and proven over time. However, indigenous knowledge should have a balanced mix with modern
technologies to effectively safeguard people and communities from the harmful effects of natural hazard induced disasters.

2. Traditional practices that are useful to the protection and preservation of natural resources and foster contribution to biodiversity should be considered and taken into account in the environment and natural resource management framework of the government to promote cultural sensitivity and inclusiveness.

Research Recommendations

1. The findings of this research can be further enriched through the conduct of Vulnerabilities and Capacities Assessment (VCA) in the Blaan community wherein this study was conducted.

2. Research institutions, civil society organizations and universities are encouraged to conduct studies on indigenous knowledge for disaster management and environmental conservation in different indigenous cultural communities to come up with the collection of knowledge assets of different tribes in the Philippines especially in Mindanao.

3. Community members are eating poisonous wild yam or klot during times of drought. Thus, there is an urgent need to conduct massive scientific study on the chemical contents of such crop and its effects on humans. The baldangi plant which is claimed by the Blaans as antidote of the poison of wild yam should also be subjected to laboratory investigation.

4. Considering the complexities and richness of indigenous knowledge on DRRM and environmental conservation of the tribal communities in the Philippines, the conduct of comparative studies is also needed to increase understanding on the utility of these knowledge assets especially among researchers and development workers.

5. Indigenous cultural communities in Mindanao are not only confronted with destructive effects of climatic change related disasters but also the effects of protracted conflict between the Armed Forces of the Philippines and insurgent groups. To this end, it is also interesting to study indigenous knowledge of communities that are not only prone to natural disasters but also to arm conflict particularly their coping mechanisms and adaptive strategies.

References Cited


Community Based Monitoring System, Sarangani (2010)


International Centre for Integrated Mountain Development (No Date), Sustainable Livelihood Approach

and Pakistan, Good Practices and Lessons Learned from Experiences in the Asia Pacific Region, International Strategy for Disaster Reduction, Kyoto University and the European Union, Bangkok, Thailand

National Statistical Coordination Board (2009)


Republic Act No. 10121 (2010) An Act Strengthening the Philippine Disaster Risk Reduction and Management System, Providing for the National Disaster Risk Reduction and Management Framework and Institutionalizing the National Disaster Risk Reduction and Management Plan, Appropriating Funds Therefore and for other Purposes

