Indigenous Knowledge in Disaster Risk Reduction and Climate Change Adaptation: Study of Housing pattern and Agricultural practices of Mishing community on Majuli Island, Assam

Sunanda Dey[1]

Abstract

Use of Indigenous knowledge in times of climate change needs an urgent reckoning. Indigenous and non-indigenous communities have been adapting for centuries to climatic trends and extremes. The Mishings of Majuli Island, Assam have their own traditional preparedness plans for the annual floods. The house structure, management of food storage and rescue boats is vital to Mishings. The case study of Mishing community of Majuli Island shows how eco-friendly development in the areas where indigenous people reside can be made by incorporating indigenous knowledge, disaster risk reduction and climate change adaptations. The assimilation of indigenous knowledge supports the disaster risk reduction plans made for local environment as they are evolved over period of time inculcating various aspects and needs of the ecology and ecosystems. Planners need to acknowledge the role of indigenous knowledge for better mitigation of disasters in future.

Keywords: *Indigenous knowledge, climate change, Majuli Island, Mishing Community*

Introduction

In the times when climate change has become a regular jargon being used in disaster mitigation policies the role of indigenous knowledge or the traditional knowledge becomes more imperative. Development professionals are talking about climate change adaptation and disaster risk reduction measures to cope with the impacts of disasters but lesser number of them are aware of the potential of indigenous knowledge; that too with the Midas touch of sustainable development. Indigenous (and non-indigenous) communities have been adapting for centuries to climatic trends and extremes (Brokensha et al., 1980; Campbell, 1990, 2006; Inglis, 1993; Nunn and Britton, 2001; Gaillard, 2007; Nunn et al., 2007, UK; Anchorage Declaration, 2009). Whilst some have experienced losses, other communities have adequately recovered through 'building back better' or 'building back safer'.

Broadly defined indigenous knowledge is the systemic information that remains in

1. Project Associate, National Institute of Disaster Management, New Delhi

the informal sector, usually unwritten and preserved in oral tradition rather than in texts. Indigenous knowledge helps in natural resource management which is really crucial for well being of the overall environment and sustainability. It is referred to as traditional environmental/ ecological knowledge or traditional knowledge in different places. Deborah McGregor (2004) in an, article says that Traditional Ecological Knowledge (TEK) as a construct of broader society is a relatively recent phenomenon, and the field that supports the acquisition of environmental knowledge from aboriginal people has rapidly grown over the last two decades. In part, TEK has emerged from the growing recognition that indigenous people all over the world developed sustainable environmental knowledge and practices that can be used to address problems that face global society. David Suzuki, scientist and environmentalist, writes, "My experience with Aboriginal people convinced me ... of the power and relevance of their knowledge and worldview in a time of imminent global ecocatastrophe." The international community has also recognised the important role Indigenous people and their knowledge can play in global society. In 1987 the Report of the World Commission on Environment and Development (or the Brundtland Report) recognised the important role of Indigenous people in sustainable development. Five years later, at the United Nations Conference on Environment and Development, the Convention on Biodiversity (CBD) was signed. The CBD reiterated the important role of Indigenous people and their knowledge for achieving sustainable environmental and resource management.

Case Study of Majuli Island

Mishing is a tribe settled mostly in the districts of Dibrugarh, Lakhimpur, Sibsagar, Jorhat, Darrang and Goalpara of Assam. Ethnically, the Mishings are mongoloid and belong to its Indo- Tibetan group (Figure 1). They belong to the tribal groups of Miyongs, Padams and Nishis of Arunachal Pradesh. It is said that the Mishings migrated from the hills of Arunachal to the plains of Assam about eight centuries ago and the process continued up to the first part of the 19th century. Although they identify themselves as Mishing and regard it to be correct name of their community, they have been identified by the term Miri by the people of Assam and as mentioned in list of scheduled castes and tribes of India.

The Mishing people speak Mishing dialect. Their language belongs to the northern Assam branch of the Tibeto- Burman languages. There are almost 500,000 speakers of the language. It is also known as Plains Miri or Takam. The speakers of the language inhabit mostly Lakhimpur, Sonitpur, Dhemaji, Dibrugarh, Sibsagar, Jorhat, Golaghat, Tinsukia districts of Assam. Assamese language is as popular among them as their own dialect though pronunciation and expression in Assamese is not sound. The Mishings came into contact with the Ahom in the early part of the 16th century. Most probably they know Assamese language since then. In the later period

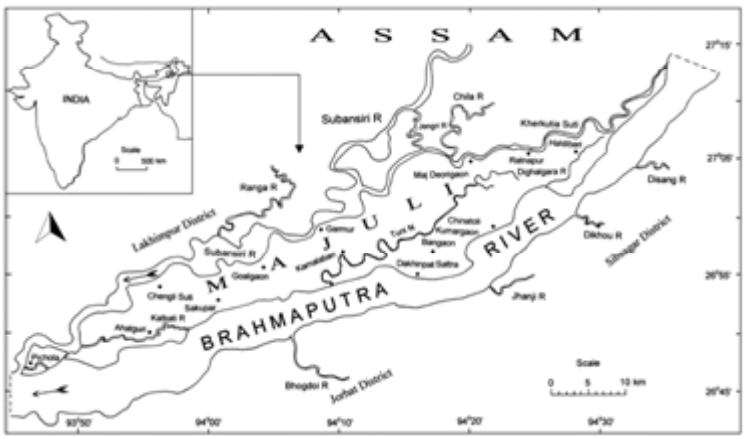

Figure 1: Study Area Map

Assamese language was the medium of the Gosains and Brahmins who converted them into Hinduism. Assamese is the official language of working in Assam so in Majuli Island. The villagers can also understand Hindi to some extent and Bengali also. But the proportion of the villagers is comparatively less. The Mishing script is roman-based. The premier literary body of Mishing language is known as 'Mising Agom Kébang'.

Majuli's economy is predominantly an agrarian rural economy with more than 75 % of its population earning their livelihood from agriculture and allied activities like fishery and animal husbandry.

a) Agriculture: Out of the total arable land of 30,556 hectares, the net area sown is 28,452 hectares, with a cropping intensity of 175.70 %. The principal crops grown are paddy of three varieties viz. summer paddy, winter paddy and autumn paddy, rape and mustard, wheat, pulses, potato, garlic and sugarcane. Among the pulses grown in the island are black gram, green gram and peas. Sugarcane and arum are grown in the char areas of the island.

b) Animal Husbandry: It is not only subsidiary income to about 80 % of the families but also generates employment for thousands of people. A large number of cattle and goat farms are there in the islets or char areas. Piggery and pottery are two important sources of income for the tribal families, particularly the women folk.

c) Fishery: About 20% of the total geographical area of the island is covered by water throughout the year. With 152 natural registered fisheries and more than

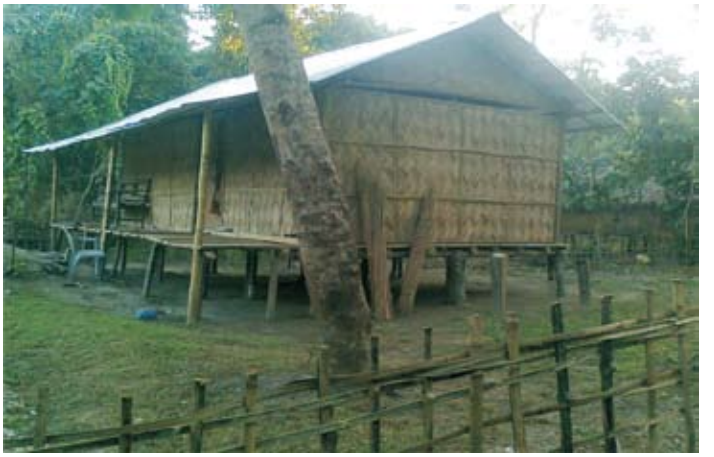

Figure 2: A Traditional Mishing Ghar

200 cultured fisheries, about 10% of the population of Majuli earns their livelihood through fishery. Climate change and disasters impact the agricultural productivity of the farmers which crucially affects sustaining capacity of the inhabitants.

Disaster Preparedness by Mishings of Majuli Island

The Mishings have their own preparedness plans for the annual floods. The house structure, management of food storage and rescue boats is vital to Mishings. The traditional *Chang ghars* are built by them where the impacts of flood are least observed, as it saves their belongings during high floods. The bamboo used houses on slits are their cultural identity and is an indigenous method of protection and adaptation to the local environment.

Non-governmental organisations help them in reconstruction of their houses if any damaged during floods, and also provide economic relief through national schemes like Indira Awas Yojna to build their houses. The newly formed *chang ghar*s are modified in the building material used, keeping the original design intact. Though some educated Mishings have started to build Assamese style house in some part of Majuli Island-Jengraimukh. They are now more oriented towards modern living, though their number is very less now.

Nowadays due to more of NGOs penetration into the lives of Mishing, they are prepared well to face the wrath of floods. There are posters in Assamese language through which they are taught about cleanliness and hygiene to be maintained during flood times and otherwise. Mishing people are provided sanitation kits, soaps and foladies-sanitary pads to be used in general life and specially during disasters.

Figure 3: A Traditional granary with modern implants (front one- in preparation stage, back one- ready)

They are told by posters about rescue operation methods, in times of emergency evacuation, personal hygiene to be maintained during floods and in case some one falls ill, the symptoms to detect the disease.

For the protection of the food items during flood times the NGOs help inhabitants of a village or a group of villages in constructing granaries. These granaries are built on strong foundation instead of bamboo slits which are their traditional types. The granary's base pillars are covered by steel sheets so that it gets protected from rodents and other small animals attack. The construction is traditional in design but the parts constituting it are modern, so that the sentiments of the villagers are intact and also the purpose of building strong, protective granary is attained. For this often NGOs sponsor and sometimes villagers contribute according to their capacity.

Ham radio sets are provided to locals before the onset of floods to communicate. Boats are also provided which are used to rescue people during floods. Otherwise bamboo constructed temporary boat kind planks are provided. Besides, every villager knows swimming. They also sow deep water rice which is their specialty. This kind of rice can withstand floods and after the floods, can be harvested without worrying about the result. These are sown in low lying areas of the island. In high line areas they grow, *saali* paddy, which is another kind of rice.

Early Warning Systems for Flood

There are some signals from nature which it provides before any major event that is about to happen. The people living in consonance with nature are able to detect

and identify them and are able to protect themselves in advance. Tribal people are masters in this. Mishing community has their own set of early warning signs which help them to prepare and know about the upcoming natural event. Related to floods, they have some signs and symptoms. The nearest river to Mishing people in Majuli is Brahmaputra and its tributary Luit. When they observe the soil sediments coming downstream, they can get an idea of how heavy the rains would be. If soil sediments are flowing in the river before the onset of monsoon, it signals that flood will come and the rain would be heavy leading to floods. Another warning system that works is observing the rain pattern. If during the beginning of the rainy season, it rains heavily for first week or more than 10 days continuously, it predicts heavy flooding. During these times Mishing community and other community people are evacuated to higher grounds. Another one is when wild animals start to retract to higher grounds, which shows that floods are approaching.

Besides this, the local information system is quite active during flood season or the rainy season. Regular updates are circulated by radio and ham radios to the villagers about the approaching floods or any unpleasant natural event. Some localised radio stations are opened up or local body operation centre is set up which updates them on hourly basis or as the situation demands. Nowadays television has penetrated into the lives of Mishing community, so live updates help people to assess the situation properly and act accordingly.

Indigenous Methods of Mishings

Patterns of House - the Mishing villages are situated on the banks of the river or a stream. A typical Mishing village usually consists of a population of less then one thousand living in about hundred households. The houses in the village always face running water. They are generally constructed close to one another without much thought for planning of the village. Unlike an Assamese village, the Mishing villages present a bleak landscape because the Mishing houses are seldom surrounded by kitchen gardens or fruit trees, although lately they have started planting some trees near their houses.

A Mishing village is distinguished by typical long dwelling houses (*Chang ghar*) which are built on a bamboo platform raised about six feet above ground on wooden poles. The width of the house is about 20 feet and its length depends on the size of the domestic family that occupies it. Nowadays the trend of nuclear families has shrunken the size of the houses. A Mishing house is not partitioned into small rooms but the entire domestic group lives in one single large barrack like hall. Each house

has extended verandah in the front. There are only two doors in the house, one in front and the other in the rear. There are no windows in the house. The architectural pattern of the Mishing house has no variation in any form in the entire community though recently the more economically sound families have constructed brick pillars instead of wood pillar for their house foundation or have renovated their traditional house with contemporary building material. The traditional thatched roof is replaced with tin sheets in some dwellings.

A Mishing house built on a platform is highly adapted to the frequent floods that visit most parts of upper Assam and specially the riverine tracts. During normal floods, a Mishing village looks like a vast canvas with their houses quite above the water level. Unless the flood rises as high as seven feet, the Mishing house is quite safe. During the floods, the daily life of the people is modified but is not disrupted. The cattle are of course taken to a higher ground, but the poultry and pigs which every household possesses are housed on the raised pigsties and platforms. Each household also owns a few large boats and dugout canoes and instead of walking from one house to another, during the flood season they just row their canoes to visit others in the village. Thus the social life of the people is not greatly disrupted.

Every Mishing - man, woman and child- knows swimming and rowing and they are well adapted to the environmental conditions. The floods usually occur in late May and continue up to mid-July. If floods are not serious, they are in a way beneficial for the people. First, it's like annual cleaning of the underneath their houses and secondly, the flood waters also deposit rich silt on their fields and enrich its fertility. The last major flood came in July 2008 in recent history and the latest being the 2012 floods when three waves of floods happened and ravaged the island badly.

Farming Methods: Mishings are exclusively settled agriculturists. In their original home in the hill, they practiced shifting cultivation and after migrating to the plains, they did not totally abandon this practice. They could practice shifting cultivation initially in the plain because there were vast tracts of grasslands and forests in the alluvial plains of upper Assam. With the availability of fresh land the Mishing seldom stayed at one place permanently. They moved to a new site after a few years soon after the fertility of the soil was exhausted. The Mishings in Majuli Island grow *Saali* paddy in high line areas and deep water rice in low line areas. This is so because they don't waste their agricultural produce because of floods which come every year. The deep water rice is not affected by flood waters and can be harvested after the floods recede. The main problems for farmers are soil erosion and sand deposition in their fields when the water level recedes. Large chunk of lands are lost to the river Brahmaputra. When flood water enters the land, it brings sand along with it which remains afterwards affecting the fertility of the land.

Early Warning Symptoms: Mishing community people have developed some expertise on the forthcoming floods indicators which help them to forecast a flood and normal rains. The older generation people are expertise because of the experience they have over the years. One of the warning signs is observing the river system flowing near them. If there are soil sediments coming through river flows before the onset of monsoon, it indicates flooding for the year. Another indicator is rain at the beginning of the season. If the situation is such that it rains continuously for one week at the beginning of the rainy season, it indicates heavy floods.

The Mishing community when affected with disaster has its own ways and means to cope with annual flood events; still external assistance whatever received if not in their desired form is of no use to them. This is depicted in the above description of external help which they get from non-governmental organisations during preparedness phase and during disaster times. Indigenous people are really sensitive towards their cultural norms and practices and thus when have to adjust to some thing totally alien they succumb to extinction in extreme cases. This issue was a concern when NGO people were there on Majuli Island to help build resilient Mishing community and Majuli Island on the whole. In the present case of Mishing community, indigenous disaster risk reduction measures, which are existing in the form of their cultural native practices and rituals, with incorporation of climate change adaptation, were introduced in the development policy of the local government. In process the community benefits by becoming better equipped to future's impending disasters and sustain the aggravated impacts due to climate change.

Conclusion

In today's times when development practices are followed rampantly without putting mind over it, the significance of indigenous knowledge is getting forgotten. In time of disaster when relief and rehabilitation works are going on, the basic needs of the affected community are not met as according to their needs, the form in which they require it. There have been incidences of communities being offered tinned food (in Africa) during relief food material but it has not helped the aggrieved people as they didn't know how to use it. The culture and social norms which are followed by the indigenous people of a place need to be kept in mind when they are being helped in the aftermath of a disaster. The unique practices which they follow for specific purposes need a space in crisis times or they lose spatial correlations and it can endanger their identity. This shall be a huge impediment for them.

Today's rate of change may be reducing the viability of indigenous knowledge, it should still be considered a valuable knowledge base, from which it may be pertinent to draw on for devising new technologies or techniques for climate change adaptations

(Shea, 2003; Campbell, 2006; Gaillard, 2007; Anchorage Declaration, 2009) or disaster risk reduction measures. The integration of indigenous and scientific knowledge may strengthen the ability of indigenous communities to cope with climate change, whilst retaining their traditional practices (Kelman et al., 2009; Mercer et al., 2008, 2009, 2010).

The case study of Mishing community of Majuli Island shows how eco-friendly development in the areas where indigenous people reside can be made by incorporating indigenous knowledge, disaster risk reduction and climate change adaptations. The assimilation of indigenous knowledge supports the disaster risk reduction plans made for local environment as they are evolved over period of time inculcating various aspects and needs of the ecology and ecosystems. The native measures used for disaster mitigation are in sync with the local environment and needs and thus adapt smoothly without disturbing the flora or fauna much as compared to some totally unfamiliar activity which can be exploitive or endangering the local biodiversity of the place.

Note : The case study presented in the text was conducted in the month of November, 2010 as part of M. Phil. dissertation.

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