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BIOLOGICAL DIVERSITY AND COMMUNITY WELLBEINGOF HOOMI VILLAGE (UKHRUL) IN THE FACE OF CLIMATE CHANGE, MANIPUR

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ABSTRACT

As a part of socio-economic survey organized by the State Climate Change Cell, Directorate of Environment and Climate Change, Government of Manipur,the team examines the biological diversity, water supplies, resource management policies, economics and demographics of Hoomivillage. The team interview local organization, government workers, local council, private business and farmers on the vulnerability and adaptation responses to climate change. The village experiences various social and economic impacts as a result of climate change in the present trend and hence make good target for the study.

INTRODUCTION

Hoomivillage is known as the original dwelling place of Thoubal River, one of the key tributaries of Manipur River basin, which the local communities called as *Yangwuikong* is sacred to many indigenous communities. The *Yangwuikong* flows westwards towards Yaingangpokpi turning southwards and joins the Imphal River at Irong Ching. The word 'Hoomi' describe 'precious stone' in *Tangkhul* language. The *Tangkhul* community forms the majority of the village.The village is located about 130 kms away from the State capital, Imphal. The village is surrounded by Thiwa, Tuloi, Kanchai, Chingjui, Phungcham and Ngari villages. In accordance with the census report, 2011, the total population of the village is recorded as 1267 persons comprising of 652 males and 615 females with 277 households. The literacy rate and sex ratio of the village stands at 89 percent and 943 respectively. Traditionally, the village followed customary laws and regulations under the leadership of the village headman, known as *Ningthou* or so called as *King*. The king and most of the villagers faced their house eastwards. The king house is typical with bore engravings of realistic patterns of animal and human depicting the feasts held in the construction process as well as bygone culture of head hunting. Keeping of trophies of animal heads as decoration is also seen in many of the village houses. As a custom, the traditional burning of firewood at the king house is a symbol of village security, following the forefather's step.

Presently, the villagers complained of shifts in the intensity and distribution of rainfall patterns. The rains are so scattered that at times it rains in the village, but the fields remain dry. The rainfall pattern was not like these 10/15 years ago. Such suddenchangesaffect the production of agricultural yields in recent times. It also results in pest related problems, especially during the flowering season. The worst drought of 2005 frightened the whole village and is one example of climate related issues. The temperature rise also helps the villagers to walk long distances in search of fuel wood, fruit, fodder and other resources for their daily needs. The rising temperature in the last five years shows signs of mosquitoes and other new insects in the surrounding village.Interestingly, the village isgiving attention to the present climate change scenario. The change is responsible for the loss of natural resources which ultimately affects the socio-economic life and biological diversity. The signs of spring's water drying up resulting in the reduction of agricultural yields, forest resources, pisci culture and food demand is observed. The style of living is change with the change of climate, like, kuccha to pucca type with wide door and windows, wooden flooring, tin roof coveredand traditional way of kitchen with chimney or

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smoke free pipe in present day. The author shows changes of vegetation cover towards the upper side of the hill's expanse is directly seen as the loss of habitats from the natural environment. The erratic rainfall during the paddy season is adversely disturbing the agricultural production of the local communities. Likewise, landslides and mudslides during monsoon seasons is another environmental hazard disturbing the village. It occurs every year during the changeable rainfall destroying the village kaccha roadways. Sometimes, artificial landslides also occurred by manmade structures and practices like improper drainage systems, improper waste management and unscientific cultivation. Therefore, in order to tackle the challenges of climate change, it is the right time to find a solution which is sustainable, equitable and one which respects natural and ecological boundaries. The UNFCCC suggests that agricultural practices can achieve successful adaptation and mitigation responses within the ecologic, economic and social sustainability goals. The Fourth and Fifth Assessment Reports of the IPCC also reported sections on synergies and trade-offs between mitigation and adaptation,6,7 and the interest in the links between the two strategies (particularly evident in landscape management).The IPCC report of 2008 said that climate change over the next century will affect rainfall patterns, river flows and sea levels all over the world. It is found that agriculture yield is also severely affected over the next hundred years due to unprecedented rates of changes in the climate system **(Jarvis *et al*., 2010; Thornton *et al*., 2011).** The result of climate variability is threatening the natural resources of Hoomi villagebecause of high dependence by local communities.

The scenario of climate variability is equal for all forest types. Many low altitude trees and flowers species are seen in higher parts of the region due to rising temperature. Climate variability is slowly affecting the biota as well as abiota components, threatening the livelihood of the local people. As discussed, the result of climate is increasing the global averaged mean annual air temperature and variations in regional precipitation and these changes are expected to continue and intensify in the future **(Solomon *et al*., 2007).** The rapid land use changes and modifications of water quality is another cause of climate variability affecting the hydrological regime in Hoomi *khul* at present. Such sudden changes lead to the reduction of agricultural yields, forest resources, socio economic livelihoods and food demand. An extreme decline in crop yields causes food shortages and a manifold increase in food inflation. Soil erosion is another major problem during the dry areas or rainy season of the year leading to disturbance of ecological balance. It is believed that the rate of soil erosion depends upon the amount of seasonal distribution of rainfall, steepness of the slope and length, vegetation cover and nature of soil and the velocity of water. The impact of climate change on the quantity and quality of groundwater resources is of global importance because 1.5–3 billion people rely on groundwater as a drinking water source **(Kundzewicz and Do¨ ll, 2009).** As per the fourth IPCC assessment report the knowledge of groundwater recharge and of levels in both developed and developing countries is poor. There has been very little research on the impact of climate change on groundwater' **(Kundzewicz *et al*., 2007).** Changed pattern of rainfall due to climate change, human encroachment, over and unsystematic exploitation of natural resources, lack of knowledge-where and how to build safe shelters are the main reasons for such a massive loss of life, property and infrastructure in the natural calamities.

MATERIALS AND METHODS

1. Meeting the villagers with questionnaire
2. Surveying the village
3. Primary and Secondary data collection
4. Review literature
5. Oral interview on women, older and younger generation related to temperature and rainfall

RESULT AND DISCUSSION

Based on the questionnaire system and casual interactions with the village people,the socio-economic livelihoods of the village were discussed. Informal discussions and questions were also used to understand the vulnerability and adaptation responses of local communities to climate change in order to promote mechanisms for climate related planning. House to house interview was conducted to overcome the poor response rates of a normal questionnaire survey. Personal interviews involve adjustments in lifestyle, behaviors and socio-economic structures (i.e. livelihood security-based responses) as well as in land use and management of biodiversity and ecological processes (i.e. ecosystem-based responses). The questionnaire tested on local youth and leaders of the village community of varying ages, sexes and economic background to ensure clarity and effectiveness of the questions before use. Respondents were selected from different sex, age group, educational, social and economic classes.

An interview with an old woman describes the changing scenario of climate change in the last fifty years. According to her, the changes is mainly associated with the globalization, diversification of rural livelihoods, increased labour mobility and food insecurity, as well as other global trends, has brought both gains and challenges for both men and women in the village. In contrast to the men's folk, women's play a major work role in the socio-economic conditions of the village. They play a part in agricultural development and their vital contribution in the field of livestock farming and fodder collection from the forests. They are more responsible to all household maintenance. Likewise, from caring and brought up of children, they are also engaged in preparation of daily meals, preparation of home garden, and assisting in crop and animal production. They also involved in all aspects of agriculture operations, from crop selection to land preparation, to seed selection, planting, weeding, pest control, harvesting, crop storage, handling, marketing, and processing. The worst part is that, most of the agricultural fields are located on upper hill terraces and near the river bed; modern agricultural tools cannot be used. As a result, they considered agricultural work as a time-consuming method. Men prefer to do less time-consuming work which requires less labour, and generates more and quick money. They do not show much interest in routine agricultural work because it requires hard labour and is less productive. Therefore, instead of sharing the work with women, they prefer to migrate to urban areas. Those they can't migrate to other places; their basic necessities are met by using the surrounding natural resources. There are forests for source of fuel wood, fodder and leaf litter. Sometimes, in comparison to the rural men and urban women, the condition of rural women employed in the agriculture sector is worse. They

experience poverty, exclusion and the effects of climate change.

In similar version with the old woman, a middle-aged woman also shares her view on the environmental conditions of the village. In comparison to the last decade, the climate change changes from colder to semi colder ones. A worse drought (2005) frightened the whole village is an example of the changing climate change scenario. Most villagers complained of shift in the intensity and distribution of rainfall. The rains are so scattered that at times it rains in the village, but the fields remain dry. The rainfall pattern was not like these 10-15 years ago. Such changing pattern affects the production of agricultural yields in recent times. It also increased in pest-related problems, especially during the flowering season. Many, like her, are facing similar problems: erratic rainfall pattern affecting yield, pests and related diseases on the rise; and losses staring them in the face. Women are still considered as the backbone of agriculture. They also contribute a major share to household activities like cooking, washing, clothing and other small works. They are sometime work as agricultural labor, sometime work as paid wage labor in other agricultural farm to generate the family income. In addition, they carry out vital reproductive functions in caring for children, older persons and the sick. They also walk long distance in such of local food, vegetables and other fodder. Such gathering of resource through the forests take time resulting to spent less time with their family, children and their education, which ultimately affects the family and social life. In short, women face the brunt of risks associated with climate change since they are primary managers of energy, water, food and essential services.

Young people play an important part in solving problem and finding the solution of village livelihoods: they are the key part in helping communities' subsistence needs, and improving local people's long-term security and village development. And if engaged they will improve many of the structural development challenges that we face today, including enhancing the cohesiveness of families and communities, reducing health risks and advancing livelihood opportunities. They are the bridge between effective development policy and valuable practical action on the ground. The role of the Youth is to help build and harness young people as assets. It has been developed through an innovative process led by young people, which itself has reinforced their capacity to participate and lead. Rural Development schemes like NREGS have been implemented for the overall development of the Hoomivillage. The village youth contribute in organizational development like planning and implementation of orchid farm to make a new standard way of life in the village. Plantation programme like ginseng, horticultural crops or even timber crops (Gmelina arborea) is a dream come true programme for the local youth.

An interaction programme with the executives of Hoomi Leaders Union (HLU) wasorganized to discuss and analyse the changing scenario of village habit in the last decade. HLU is a conglomerate of members of Board of Deacons, Christian Youth Society, Women Society, Village Authority, Shanao Long, Katamnao Long, Mahila Group and Government Employees. A field visit to the original catchment area of Thoubalturel and village preserve forest *Wang* (*Gmelina arborea*) cultivation was also made during the discussion programme. Thoubalturel originate from the Hoomi hills and flows westwards towards Yaingangpokpi turning southwards and join the Imphal River at Irong Ching. Moreover, the *Wang* site was demarcated for ecological park and being maintained by the Hoomikatamnao. The majority of the population has limited diversification and mostly depends on agriculture for their livelihoods. Pumpkin, chayote, potato, Maize, Turmeric and Colocasia are the main agriculture products in the villages. Their agricultural works mainly depends on the forest products like collecting leaf litter as manure, support for the leguminous crop and fencing for crops. Housing and construction works is also dependent on the resources available in the nearby forests. Traditionally, Forests are the major source of fuel wood, fodder, and food for the local communities. Due to adverse environmental conditions, the dependence for firewood has been a part of life of the local people and fodder forms a large part of the overall dependence. Wood from the forest is the main source for cooking and heating. Now a day, the villagers conserve and protect three different kinds of forest – Pine (*Pinus wallichiana*), Wang (*Gmelina arborea*) and mixed type for their local benefits. These natural resources form the base for the sustainability of village society. Forests also play a major source of freshwater stream for the Hoomi communities. Slash and burn cultivation is already ban in the village decade ago. Livestock production is always dependent on the availability and accessibility of the fodder species in forest and grazing area. At many places a reduction was observed in livestock holding due to degradation and inaccessibility of fodder (Piggery, Cow and Goat).

CONCLUSION

Mountain ecosystems are particularly sensitive to the impacts of climate variability. They are affected at a faster rate than other terrestrial habitats. Therefore, it is important to adopt a well-articulated strategy that or the one hand pursues a clearly stated vision and on the other offers practical suggestion to move forward. Changing the situation of economic and social backwardness in the hill districts are the key challenges of climate change at present. The positive features of the Hoomi*khul* are that they have enormous potential for tourism sector, other suitable solution for climate resilience and high value agriculture like SRI (System of Rice Intensification) system can be apply. In Hoomi, both genders are prioritized the strategy of household income diversification like wage labour in or nearby the village, petty trade, as a means of guaranteeing livelihood security. Forest plays a major role towards increasing the global carbon sequestration if the world's forest could be managed properly with due importance to afforestation and reforestation. Kyoto protocol (1997) specifically mentioned afforestation and reforestation as tools that can be used to reduce level of carbon dioxide from the atmosphere. Most of the cultivated crops are organic in nature i.e. no use of synthetic pesticides or fertilizers. Organic agriculture enhances natural nutrient cycling and builds soil organic matter, which can also support resilience to climate change and sequester carbon in soils. It is the need of the hour to check the impact of climate change on the present Thoubalturel and take measurable action without any delay. For the long term, conservation of Thoubalturel is to fulfill the required demand of irrigated agriculture and domestic needs of Hoomi people Nevertheless, belief in climate change is not necessary to elicit the lived experiences of farming communities confronting the impacts of climate change.

Ecological disturbance tends to harm rural people more directly

than the urban people. Most of the Hoomi people are directly dependent on biological resources for their livelihood. In the past, forest was the only source of fuel and fruit bearing trees. With the introduction of government schemes, the plantation of growing pine and other coniferous species, which are non-native, is started in the village. The wood of the pine does not burn well in *chulhas* (traditional earthen stoves), nor are its needles edible for the cattle and cannot be used as manure in the fields. Sometimes, the people use LPG from the markets for additional purpose. The forest that once provided the villages with sources of life is now a strange entity. While the links with the forests have weakened, urban aspirations have also increased among the communities. Local people, especially the women-folk used to weave beautiful traditional cloths and carpentry works. But the market for such locally made products has declined, because of the wide availability of the cheaper made substitutes. Trees are efficient in carbon sequestration and hence they reduce the negative effects of climate change by increasing the absorption of carbon emissions. It is necessary for the local people to give awareness on the various benefits of conserving trees. Local people play a key role in restoring and improving the health of the community forests. Other preventive measures taken up by the Hoomi*khul*to protect the surrounding environment are:

Tree plantation programmes have been taken up in many locations. One significant development on this regard is seen in the adjoining areas where the Ngayikong originates. The HoomiKatamnao Long, the students Union of the village is taking leading initiative in maintaining this development. The students' body has been assigned the responsibility of regulating and developing conservative measures at a certain portion of the forest area near the Ngayikong. Keeping this in view, the student's union has taken up plantation of fruit trees in and around the region. Moreover, developing an ecological park is one of the activities to be taken up by the Students Union.

Banning of forest fire: Forest fire was said to be very frequent in the forest lands of the village 5 years back and before. One reason for this is mainly due to the traditional perception that burning of forest is beneficial for the re-growth of the plants and provides better prospects for cattle grazing. However, burning of forest has been strictly prohibited in the present days and it has not occurred during the last 3-4 years

Use of chemicals and electrical equipment for fishing banned: There has also been an illegal use of electrical equipment for fishing in the river. Regulations have made been in this regard too.

Agriculture: is the main occupation of the people. When asked about other possible alternatives of livelihood, villagers suggested horticultural prospects, but due to limited technical and scientific knowledge, villagers are yet to be in a position to benefit from it. Moreover, commercialization of horticultural crops has not been a practice in the village. Some households have shown interests in production of horticultural fruits such as lemon and orange, though the exercise is still limited to a small scale. Some of the hindrances pointed out by the villagers to promote horticultural products are: firstly, long gestation period: Many people have less interest in planting lemon trees as they have to wait minimum 7 to 8 years to harvest the fruit. Secondly, invasion of unknown insects to the lemon trees in the recent past years has discouraged the planters to grow more of it. This could be due to the climate variability and change impact. Traditional remedies like applying kerosene, diesel and intoxicants items are carried out which seem to be effective for short period. But gradually it did not help in the long run. This is one reason which hinders in upholding this activity into commercial purposes. This is where the villagers feel professional intervention is required as traditional knowledge is inadequate to avert these insects from affecting the fruit tree.

Piggery and fishery: People are also interested in training programmes for fishery and piggery. They are of the opinion that piggery will have more negative impact on climate change as it requires a lot firewood to cook pig food. The pressure of felling of trees is believed to remain the same. In the present scenario, fish is reared only for domestic use and not for commercial purpose. Villagers are disappointed with the way fish grow as they find fishes not harvestable even after rearing for a year. But if proper training of fishery is availed to those interested persons, they are of the view that it may be a beneficial source of income. However, the constraints of spending a huge amount of money on fish feed may remain a challenge for the community.

Rivers: There are 7 main rivers in the villages. They are Ngayikong, Hover kong, Ngachamkong, Khalviirkong, Fakphankong, Katingkong and Tekong. Ngayikong occupies a significant place in the geography of Manipur as this river is the originating dwelling place of the catchment area of the Thoubal river, one of the main rivers in Manipur. Despite this significance, other than supplying water to 6 or 7 ponds, the river is not used for other reasons in the village. Among the seven rivers, hoverkong provides water for most of the agricultural lands of the village. Other than Ngayikong, the other five rivers are tributaries of Hover kong. Hover kong is the sole source of water for agricultural lands where paddy cultivation is done as these lands are situated in the adjoining area of that river. Though all the rivers flow throughout the year, the villagers observe that the volume of water flowing in these rivers have reduced to a considerable extent during the last one decade.

Forest Lands: More than 95 percent of the forest land of the village is community land. Administration and regulation of this community land lies with the village Authority (VA). The village Authority is headed by the King of the village and the members of the VA are representatives of the different clans and sub-clans of the village. There are two locations of reserved forests. Hunting, felling of trees and forest fire are prohibited in these reserved areas. These reserved forests comprised mainly of pine trees and oak trees among others. Fines are penalized to those who violate the rules laid down. Apart from these reserved areas, there is no restriction on the amount of collection of firewood in other forest lands. All households of the village depend on the forest for fuel throughout the year. This is the main reason contributing to massive felling of trees each year. Every household is said to consume firewood of not less than one truckload in a year. The extent of the activity gets worsened with more well-off households consuming 2 to three truckloads of firewood. Sale of firewood outside the village which was practiced years ago has however, now,

been prohibited. This is one preventive measure taken up in the recent past to limit felling of trees from community lands for commercial purposes. Offenders are penalized from time to time depending on the severity of the crime. But the village Authority has no hand on the forest lands owned by private individuals. In rare cases, this leads to collecting of fuels for their domestic use from the public land and for commercial purpose from their private lands. Felling of trees for fuel use is more concentrated in the regions where roads are accessible for vehicles. Due to the advantage of this accessibility, the rotation period of harvesting trees in this region has been notably shortened during the last few decades. The minimum rotation period for harvesting matured tree products takes around 20 years. This duration has been reduced to a mere gap of 5 to 6 years.

Another direct benefit of the forest for the villagers is providing materials for house construction. In case of any households wishing to construct a house, it can acquire all the necessary materials from pillars to big trees for sawing plank wood. This is possible with the permission from the VA. Above all these, there is a strong community bond prevalent in the village. For instance, the household constructing the house is given a free helping hand from all villagers to complete the construction on time. There are merits and demerits of having a common community forest land. In one hand, it narrows the gap between the haves and the have-nots as they have the equal privilege of sharing the common resources. Moreover, this helps in wiping out the sharp economic inequality among the households. But, on the other hand, this in many ways leads to the exploitation of the resources more terribly. Public resources are not taken care of the way private individuals do with their private resources. People become more ruthless and careless in utilizing these resources. This could lead to degradation of the resources in a much faster rate.

Another commercial resource found in the forest is medicinal plants. Ginseng, a well-known high-value medicinal plant is said to be available in plenty a decade ago. But due to the excessive and exploitative nature of the commercial activity carried out by the villagers, ginseng has started to disappear and has become a rare item to be spotted in the forest lands. One of the villagers stated; "Just for a meagre amount of 17 rupees per kilo, a huge quantity of ginseng has been collected and sold off; now, it's hardly available when the price of it has been raised to 4500 rupees or 5000 rupees". Such statement is indicative of the limited awareness among the community resulting in the destruction of those invaluable natural resources.

One of the main reasons of losing biodiversity in the village is related to the social and cultural practices. Hunting of wild birds and animals is still practiced by the villagers and the neighboring villagers. Meat of wild animals is still considered one of the best local cuisines. Wild animals like deer, wild boar and porcupine were once found abundantly in the forests. The number of these animals however has been reduced substantially during the last 20 years. Next to poaching is habitat destruction due to construction of roads and deforestation that has led to the loss of this biodiversity.

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(*Tangkhul* = a tribe of Manipur, *Ningthou* = King, *Wang* =Manipuri name of *Gmelina arborea, Turel* = river, *Kong* = river in Tangkhul dialect, *Yangwuikong* = another name of Thoubal river in Hoomi*khul,* Yaingangpokpi = name of a place, *Imphal River* = name of a major river, *Irong Ching* = name of a Hill, UNFCCC = United Nation Federation on Climate Change Conference, IPCC = Intergovernmental Panel on Climate Change)

References

1. The state's vision is to include both human and economic development (Dewan and Bahadur, 2005), and economic development should be supported with environmental conservation.
2. Dewan, M.L. and JagdishBhadur (Eds.) (2005). Uttaranchal: Vision and Action Programme. Concept Publishing Company, New Delhi.
3. Climate change and water (IPCC Technical paper VI)
4. Options for support to agriculture and food security under climate change, Jarvis et al., 2010; Thornton et al., 2011
5. Census, 2011, Socio Economic and Caste Census
6. The Fourth and Fifth Assessment Reports of the IPCC
7. Carbon dioxide, climate and society; WMO, 2013
8. Solomon et al., 2007, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change
9. Kundzewicz and Do¨ ll, 2009, The implications of projected climate change for freshwater resources and their management
10. Kundzewicz et al., 2007, Climate Change 2007: Working Group II: Impacts, Adaptation and Vulnerability
11. Shiva and Bhatt 2009; IPCC 2013, Conservation Agriculture: a approach to combat climate change in Indian Himalaya
12. Biological diversity in freshwater environments, Bisht et al. 2006; Nautiyal et al. 2008,
13. Comprehensive carbon stock and flow accounting: A national framework to support climate change mitigation policy, Nellemann et al. 2011
14. Kyoto protocol 1997, UN Treaty Database. Retrieved 27 November2014.
15. Ecosystem based adaptation to climate change: concept, scability and a role for conservation science, Smit et al. 2000; Ojea 2015; Vignola et al. 2015.

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