

Indigenous Knowledge And Biodiversity: Interconnectedness For Sustainable Development.

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Abstract: Indigenous knowledge is the local knowledge which is exclusive to a given culture or society. This indigenous knowledge is really important in conserving the biological resources existing in different altitudinal and climatic variations. Indigenous people are conserving the biodiversity in order to survive themselves, which eventually conserve the whole environment. However due to globalization, environmental threats, no transfer of knowledge to younger generations, this unique cultures and knowledge are gradually disappearing. Moreover, exclusionary practices, poverty as the capability deprivation and unequal policies are also responsible for making the indigenous knowledge more vulnerable, eventually affecting the diverse flora and fauna, causing them to extinction. Hence it is utmost important to conserve indigenous knowledge their skills and technologies in order to conserve biodiversities, which can be done by the effective implementation of the policies that are prepared for the conservation of indigenous people their knowledge and biodiversity. Unless and until we do not conserve indigenous knowledge, we cannot achieve sustainable development as indigenous and place-based knowledge always works to achieve sustainability.

Index Terms: Indigenous Knowledge, Biodiversity, Conservation, Sustainable Development

1 INTRODUCTION

Indigenous knowledge are always the matter of discussion and issues in debate. To exemplify, various traditional watermill being shut in some of the rural part of Nepal due to various reasons, such as, water sources dried up in recent years, younger generations didn't want to continue the profession, modernization effects, environmental changes and so forth. Hence we were interested to find out how this knowledge contributing for the conservation of diverse flora and fauna. Furthermore, it created interest in exploring why this knowledge is disappearing and how policies of the country are responding to these issues. Nepal is the country having diverse flora and fauna within 117 types of ecosystem, 75 vegetation types and 35 forest systems (Shrestha & Chhetri, 2010) divided ecologically into Terai, Hills and Mountains. Nearby this unique geography there are more than 59 indigenous tribe (CBS, 2001) inhabiting and directly dependent upon those ecosystems and biodiversities for survival. Moreover, Nepalese indigenous people are residing on different geographic belts with traditional life styles are closely attached with ecosystems, biodiversities, natural resources, and environment from millennia. Indigenous societies bear dynamic ancient epistemology, wisdom, knowledge, skills, technologies, endogenous or cosmological believes, folklore, customs, oral tradition associate with nature, earth, biodiversities, and natural resources (Sherpa, 2005). Nepal is rich in both ethnic and biological diversity.

On one hand, within the short increase of the altitude and change of climatic patterns are leading towards the existence of unique biological resources with varieties and on the other different ethnic diversities from one region of the country to another. Various ethnic groups of Nepal are equipped with different traditional knowledge which is known as indigenous knowledge. Those ethnic communities are utilizing indigenous traditional knowledge for their survival from time immemorial. Indigenous people are very near to the nature and use varieties of skills and ways to conserve the natural resources. Moreover, these techniques are environmentally sound, socially accepted and can produce sustainable conservation of biodiversity if it is well documented and utilized, when different scientific communities are in search for modern techniques to conserve the environment from devastating threats like climate change. Aligning with the similar statement, highlighting the importance of indigenous knowledge Brennan, (2011) says "Indigenous knowledge reflects the dynamic way in which the residents of an area have come to understand themselves in relationship to their natural environment and how they organize that folk knowledge of flora and fauna, cultural beliefs, and history to enhance their lives" (p.1). Thus, Indigenous Knowledge is the knowledge that exists in local form, different from scientific and modern knowledge, used by the people who are living very near to nature for their subsistence. While Indigenous Technology Knowledge is the art of using natural resources for the survival by the local people who are living very near to forests, river and is passed from one generation to another. Hence through this paper we would try to explore the relationship of indigenous knowledge (IK) with the biodiversity; moreover, the interlinkages between IK and Biodiversity in the context of Nepal. What will happen if they are not interlinked?

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1.1 Context

Indigenous traditional knowledge has contributed a lot in biodiversity conservation in the past, but at present context these kinds of knowledge are disappearing. Either those knowledge are not transformed to another generations or new generations do not want to accept and use those knowledge. Use of medicinal plants, shifting cultivations, farmer's managed irrigation systems, traditional water mills, use of biological

pesticides in agriculture, soil fertility management, improve local breeds, and so forth are some of the traditional knowledge (Sherpa, 2005) which indigenous people possessed and are still practicing in different corners of the country. Human survival is totally depended upon the biological resources derived from the nature for instances, foods, medicines, and industrial raw materials (Shrestha & Chettri, 2011). If these resources are lost or extinct from the world then it will ultimately affect the great human beings. Moreover, people living in rural parts of the country have subsistence relation with these biodiversity. Indigenous knowledge is part of cultures, and it is associated with language (L.D. Awasthi, Personal Communication, April 22, 2011) and biodiversity of particular society and culture. Thus when indigenous knowledge are lost, we will lose our languages, we will further lose the way of conserving diverse biological resources and the life of younger generations would be difficult if these unique knowledge are not transformed and conserved.

1.2 Critical Questions

1. Is it not important to conserve those important biological resources and the traditional knowledge that are contributing to conserve those important biodiversity?
2. How development practices existing in the country for influencing the indigenous knowledge?
3. Are the policies of the country responsible for the disappearance of that knowledge or the ignorance of the local people contributing for the loss?

2 LITERATURE REVIEW

2.1 What is Indigenous Knowledge?

Indigenous knowledge is traditional knowledge, which is existing in our local communities and societies from the time immemorial (Sharma, Bajracharya & Sitaula, 2009). Knowledge which is used by the people (we call them first settlers) who were living there for long time back and very close to nature (river, land and forest). On the other view, their lives depend upon proximity of nature and have very unique system of life i.e. self created or without burrowing from others can be said as Indigenous Knowledge. Indigenous knowledge is the local knowledge which is exclusive to a given cultures or societies. In other words, local knowledge held by indigenous people, or local knowledge unique to a given culture or society (Berkes 1999, as cited in ICIMOD, 2007). It is different from the knowledge generated by national and international research institute. It is the basis for local-level decision making in agricultures, health care, food preparations, education, natural-resource managements, and a host of other activities in rural communities (Warren 1991). Warren tried to highlight that indigenous people decide on their own how to use the resources that is derived from the nature for their survival without the help from others. Indigenous knowledge is the information that people in a given communities, based on experiences and adaptation to local cultures and environments have developed over time, and continued to improvise and develop (Shrestha, Shrestha, Rai, Sadha & Shrestha, 2008). Thus we can say indigenous knowledge has its base on unique sense of life or unique systems of articulation of the culture which is not burrowed from others.

2.2 Importance of Indigenous knowledge

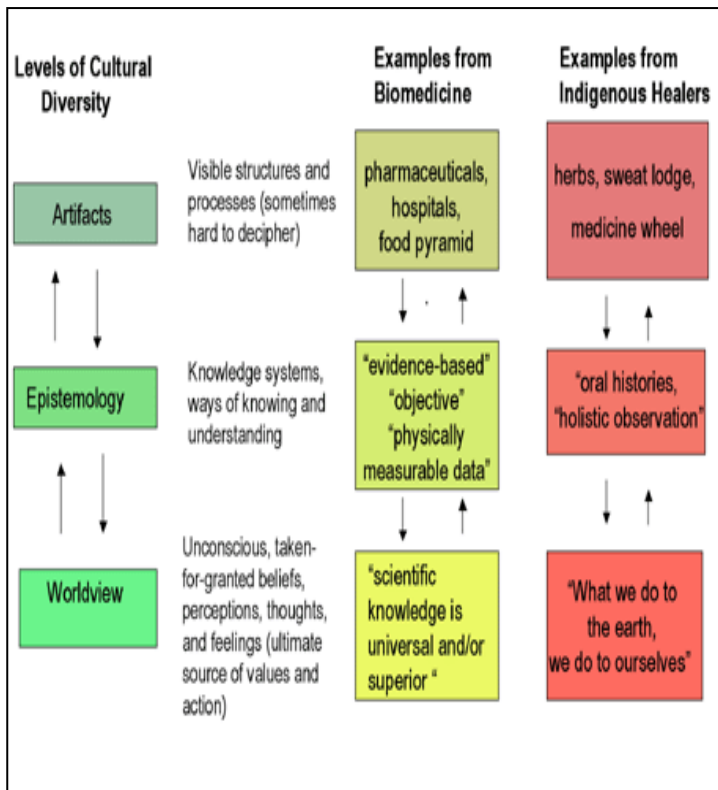
Indigenous knowledge has been used by the local rural people in various sectors of their life. From maintaining the soil fertility in the agricultural fields by using mulching method to use of water for grinding and milling food grains through watermills or using ash in agriculture to get rid of pest to selective burning method in forest to foster nutrition are many methods used by the indigenous people for their survival. IK are farmer's friendly, economic and environmental friendly, socially accepted and suited to specific local and environmental conditions (Sharma, Bajracharya & Sitaula, 2009). It includes practices and technologies, such as seed treatments, storage methods and tools used for planting and harvesting (Shrestha et. al, 2008). Though there may have been different weakness with the IK system but rural people developed skills to fight in the very harsh conditions brought about by the nature. At present, we are crying to mitigate and minimize the effect brought by the climate change in agriculture and different other sectors, thus those knowledge used by the indigenous people in the past to cope with extreme climatic events can be important knowledge base to use for minimizing the devastating effect brought by climate change and many other environmental problems. Highlighting the importance of Indigenous Knowledge, Limbu (2008) says, "Limbu people one of the indigenous tribe of Nepal and were found to carry out subsistence farming (based on integration of livestock and agriculture activities) in a very sustainable manner (conservation tillage, mini dike construction, crop rotation, relay cropping, farmyard- and green manuring, and integrated pest management". Furthermore "Limbu people of the study sites cope with natural calamities (landslides and flashflood, fire, etc.) by traditional methods; they also use prophylactic measures utilizing local resources and indigenous ideas. They do not know much about the link between environment and biodiversity but are contributing their bit to it in their own ways (e.g., by establishing 'devithan', and 'raniban' to protect segments of forests) (Limbu, 2008, p.1).

2.3 Linkages of Biodiversity with Indigenous Knowledge

Indigenous people are living in close proximity with the nature and always dependent upon the natural resources and biodiversities. Biodiversity and IK have mutual relationship with each other. IK helps in the conservation of biodiversity and biodiversity in turn is helping the survival of Indigenous people living nearby these biological resources. Thus they can always in line with the conservation of those resources for their survival. If they are conserved they can utilize it, if not they will be in problem and may affect their livelihood. Indigenous people and their socio-cultural relationships with biological systems have largely been contributing to sustainable conservation of biodiversity, especially in in-situ conservation (conservation of the resources in their natural state or natural habitat) (Shrestha et.al, 2008). Indigenous people can be used to describe any ethnic group who have historically belonged to a particular region or country, and may have different—cultural, linguistic, traditional, and other characteristics to those of the dominant culture of that region. The Indigenous people interact with the available natural resources and maintain them in pristine condition (ibid.). People who have unique culture within the society have to depend upon the resources brought from the nature hence they do not only think for themselves but also conserve the

natural habitats and individual species for their future generations. Indigenous Limbu people have been using hundreds of plants for the treatment of diseases (Subba, 2006, as cited in Limbu, 2008), ranging anything from diarrhea, constipation, to fracture. Socio-cultural practices in a particular area can help for protect local biodiversities; a good example is the local religious belief in Dolpa of not allowing the killing of leopards, which is the sole contributor for the protection of snow leopards in the region (ibid.). This strongly shows that, indigenous people are always thriving to achieve sustainable development i.e. indigenous and place-based knowledge always works for sustainable development (Irwin 1995, as cited in, Semali, Grim & Maretzki, 2006).

from millennia. Similarly, UN indigenous people draft declaration 1993 has clearly emphasized on indigenous issues are in human right to maintain and strengthen their distinctive spiritual and material relationships with lands, territories, waters, coastal seas, flora and fauna and other resources have traditionally owned or occupied or used (Sherpa, 2005). ILO 196 respects the collective aspects of land, territories, biodiversities and natural resources, cultures, customary relationship of indigenous peoples (ibid.). In contrast, National Park and Wildlife Conservation Act 1973 declared more than 20% of the land as protected areas, dislocated the indigenous people from their original place, and made them more marginalized in newer kind of environment. After the Protected Area delineation, their (indigenous) livelihoods become harsher due to the strict or selective access to the resources, which they were dependent since time immemorial. First they are compelled to leave the place after Protected Area declaration and secondly they are forced to live in very fragile and vulnerable zones which make their life more miserable (Parajuli, 2009). Furthermore Awasthi (2011, April 1st, Personal Communication) says "policies perpetuate inequalities and made for those who are in power and their existence", even after the declaration of Buffer Zone (zone where selective harvesting of forest resources are allowed for community people) elite and powerful groups of the society took advantages from the buffer zone; making indigenous and disadvantaged groups further marginalized and compelled to displaced to the forest fringes and along the flood prone river banks where there is always the threat of flood and wild life encroachment. Similarly, Forest Act 1993, Wetland Policy 2002 (2059 B.S.) and 10th Forest Action Plan (2002-2007) of Nepal have not included the issues and rights of indigenous people over biological resources and are silent in the case of indigenous peoples. Moreover, Government of Nepal prepared a draft national legislation 2002 (2059 B.S.) regarding biodiversity and traditional knowledge (access to genetic resources, right and benefit sharing) without recognized and participation of indigenous nationalities. However, The Interim Constitution, 2007 includes more far-reaching provisions regarding the rights of indigenous peoples. Apart from proportional inclusion in the state structure, constitution has made provision of social justice, policy to uplift the economically and socially backward indigenous nationalities by making provisions for reservations in education, health, housing, food security and employment (Sherpa, 2005). But still no exact and appropriate policies were formulated for the protection of indigenous rights over biological resources in order to preserve the unique traditional knowledge.



<http://www.ioe.org/joe/2005december/images/a1-fig1.gif>

The above chart shows how the indigenous knowledge system supports the biomedicines and hospitals through the creation of different important medicines and that knowledge are transferring through oral history and observation.

3 DISCUSSIONS AND INTERPRETATIONS

3.1 Policies: Indigenous people and Biodiversity

Having distinct languages, religions, customs, folklore, cultures, knowledge and ancient territories, 59 ethnic groups of Nepal have now received the legal recognition as 'indigenous people' (otherwise identified as 'janajatis' or nationalities) (Limbu, 2008). These groups have been consolidated through Nepal Federation of Indigenous Nationalities (NEFIN), a national level organization constituted by the government, as the umbrella organization (Sherpa, 2005). Nepal has already ratified Convention on Biological Diversity (CBD 1992, held in Rio De Jenerio, Brazil). CBD article 8(j) states on indigenous peoples' rights over biodiversity and contribution of indigenous peoples for conservation, restoration and sustainable uses

3.2 Sustainability

The concept of sustainability is embodied in indigenous and traditional livelihood systems (Posey & Dutfield, 1997). Furthermore, that knowledge include the expertise, understanding and insight of people, applied to continue or improve their livelihood, which can be used in various sectors to achieve the goal of sustainable development in the country. However, deforestation, habitat encroachment, modernization, urbanization, no transfer of IK from parents to the younger generations, unequal state policies, and various environmental threats like climate change is posing the threat to the extinction of the biodiversity along with IK. As stated earlier, Nepal comprises with more than 59 indigenous people who speak their own mother tongue, own culture and unique way

of conserving biodiversity. Losses of Indigenous languages are also a threat on IK since the traditional knowledge of the communities is passed down orally. IK are not dispersed all over the space like other types of knowledge, as it is confined within few individuals. If these people or individuals are lost from the area then there is strong chance of disappearance of the precious knowledge they have and if these groups are extinct from this world then we will lose the important language systems, which are directly related with the biotic. Furthermore, "with the gradual loss of some languages, we will lose at the same time priceless knowledge of other ways of inhabiting nature and of resources for sustainable development" (L.D. Awasthi, 1st April, 2011, Personal Communication). That means culture, language and biotic are inextricably linked with each other. If we lose the diverse flora and fauna that are nearer to indigenous people, they in turn will be perishing from this world due to lack of foods and resources for their survival. People who have unique culture within the society have to depend upon the resources brought from the nature hence they do not only think for themselves but also conserve the natural habitats and individual species for their future generations. Socio-cultural practices in a particular area can help protect local biodiversity for instance not allowing the killing of leopards. This strongly shows that, indigenous people they are always thriving to achieve sustainable development i.e. indigenous and place-based knowledge always work for sustainable development (Irwin 1995, as cited in, Semali, Grim & Marezki, 2006). Thus we can say we must conserve biodiversity to conserve indigenous people or vice versa in order to achieve the sustainable development.

3.3 Poverty as Capability Deprivation and Exclusion

Indigenous people who are living very near to nature are said to be poor and excluded from different social relations and knowledge they have is said to be unscientific. But IK which are considered as unscientific and government policies do not include it for the conservation, as it is unexplained but all the things which are not explained and not unscientific (Sharma, Bajracharya & Sitaula, 2009). Indigenous people are capable to fight with the extreme environmental conditions and poorer conditions of their health due to diseases with the help of IK since long time back. Different modern medicines have its base on the IK derived from ethno medicine (Limbu, 2008). Not only poverty, along with exclusion due to policies they are in the phase of extinction, but their capabilities are ignored and not documented and preserved. Sen (2000) associates idea of social exclusion to capability perspective on poverty (p.4). He further argues, "Development requires the removal of major sources of unfreedom: poverty as well as oppression, poor economic opportunities as well as systematic social deprivation, neglect of public facilities as well as intolerance or over activity or repressive states" (Sen 1999, p. 3). This view of Amartya Sen can be linked with the issue of indigenous people, it is not due to poverty that indigenous knowledge are disappearing but the capability deprivation and the exclusionary policies imposed on them cause them to further marginalized and are in the verge of extinction. Social exclusion can be constitutively a part of capability deprivation as well as instrumentally a cause of diverse capability failures. The case for seeing social exclusion as an approach to poverty is easy enough to establish within the general perspective of poverty as capability failure (Sen, 2000, p.5).

Exclusion of indigenous people from the different social structures and facilities such as education, lead indigenous knowledge to more vulnerable and fragile. In the context of Nepal, indigenous people are excluded from the education sector especially from schools. Problems of the lack of equitable access to the education is rooted to the historical reality that the state had implemented the policy to discriminate the citizens based on ethnicity (Chitrakar, 2007). Because of the caste hierarchical system in the country that create the exclusionary practice in the education as well. Exclusion in education means disrespecting, and not responding or recognizing the educational needs, and values of all children with gender, ethnic groups, children with different abilities and disabilities and so forth. It means the values, rights and ability of those groups of children are undermined may be by law or through implementation or during practice. However, there is another school of thought by Bourdieu's cultural reproduction theory; he argues that the schools reproduce the cultures and values of the dominant group in the society, which would later on works as a form of violence, which is called as "symbolic violence". Furthermore he argues that a school reproduces such beliefs of the dominant groups which later on transfer to human, through social structure, influences the school reproduction. In the case of indigenous children in school as well, they have been dominating on the ground of caste status since long which is the cultural parts in Nepalese context. Consequently, it has been reproducing educational exclusion through the social structures (Bourdieu, 1977). Thus the exclusion of indigenous people from education means they are further marginalized and far from mainstreaming of the state policies. This further loosens the interconnections between indigenous knowledge and biodiversities.

5 CONCLUSION

Indigenous knowledge and biodiversity are inextricably linked. If one is affected other may disappear. Or in other way if biodiversities are lost than the survival of indigenous people are questioned and if we lose indigenous knowledge, we will lose cultures and languages which are very closely linked with biotic. The diverse indigenous knowledge existing in our country is in the verge of extinction due to different reasons such as globalization, poverty as capability deprivation, exclusion of those groups from education and other facilities, recent environmental threats like climate change. Hence there is real urgency to preserve this unique indigenous knowledge because all the scientific discoveries are rooted in this knowledge and if we lose it, then it may affect the livelihood of the great humans. Thus it is utmost important that state should not only make policies in order to conserve both indigenous knowledge and biodiversities but also needs to ensure the effective implementation of the policies. We can use the help of modern technologies and skills in order to increase the efficiency of the indigenous technologies and to gain economic development, which may help in preservation of indigenous knowledge and biodiversities. For instance, traditional watermill can be improved by changing its wooden part by iron, which increases the efficiency for economic gain and conserve it to achieve sustainable development.

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