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Knowledge system of natural resource management in Andhikhola Gaunpalika, Syangja, District, Nepal

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Abstract

This paper attempts to analyze the local knowledge system of natural resource management in Andhikhola Gaunpalika Syangja district, western hill of Nepal. The knowledge system refers here is to institutional practices of forest resource management through community forest user groups. For this purpose, eight community forest user groups were purposively selected for detailed study. Data were collected from both primary and secondary sources. Primary data were collected through various methods and tools such as focus group discussion, key informant survey and Households survey. The application of locally produced knowledge system gives better solutions as well as governance system in forest management system in Nepal over decades. Nowadays, community forest user groups (CFUGs) have been playing dynamic role to develop institutional knowledge for profitable utilization of both timber and no timber forest products. Moreover, traditional knowledge system were more effective adopted practices. It is mainly due to traditional knowledge has been operated through institutional, structural and personal dimensions. However, these practices have been eroding due to the initiation of anticipated knowledge system. Thus, the paper argues that both local knowledge and modern knowledge system are equally important to manage community forest resource in the changing context. The traditional knowledge system which has different dimensions like institutional, structural and personal are not much in practice which ultimately erode the important indigenous knowledge that's why it is important to document the knowledge system.

Keywords: Natural resources, knowledge system, governance, community forestry, civil society

Introduction

Geographical interest in resource management and allocation issues has undoubtedly increased steadily since the mid-1970s. Resources of products of the physical system they are defined the human ability and need, not by nature. Resources are therefore dynamic cultural conception (Judith, 1989)^[14]. Resources is a concept of applied to denote sources of human satisfaction, wealth or strength which fulfill the human wants with the application knowledge and attitude. Labour entrepreneurial skills, investment funds, fixed capital assets, technology and the cultural and physical attributes of an area may all be referred to as resources of a nation or region and company or household (Johnston *et al.*, 1986)^[13]. Geographers are interested to the study of resources in the field of economic geography. They cover all types of resources such as biotic (forests) or abiotic (nutrients) renewable (water) or non-renewable (fossil fuel) tangible (land) or intangible (talent) or natural (national park) human made (community forestry) in resource geography (Zimmermann, 1951)^[25] rightly said that resources are not they become they are not static but expand and contract in response to human wants and human action. However, John *et al.*, (1986)^[13] include broader view in resources including both cultural and physical and physical attributes entrepreneurial skills, labour investment fund capital assets, technology of a household or a nation (Zimmermann, 1951)^[25] concludes that resource is not merely a tangible object but also a functional relationship that exist between people's want their capabilities and their attitudes towards the worth of environment (Zimmermann, 1951)^[25]. It requires both tangible (forest as a natural resources) and intangible (talent) as a local knowledge and indigenous knowledge) resources in the environment of the various types of natural resources, forest is considered as the major resources for the livelihoods of rural people. Perceived resources have changed and will continue to dramatically over time, not only in response to increase knowledge and technological innovation but also in line with economic, social and political developments (Judith,1989)^[14]. In the past, knowledge system was based

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on *Mela, Parma* system in forest resource management and farming as a traditional and local knowledge in different Nepalese community. Then, this system replaced *Talukdar, Mukhiya and Banpale* for resource management since the ancient time. Till 1950s, the forest bureaucrats have overly relied on the technical and colonial knowledge of forest management. The forest bureaucrats could not protect the forest from encroachment, deforestation, and resources depletion. In such situation, community-based forest management (CBFM) approach was primarily adopted as a deforestation control measure together with the need of the local community (FAO, 2016)^[8]. There are various types of forest management modality practiced in Nepal. In which, community forestry was introduced in the late 1970s in Nepal. Community forestry has existed in multidimensional forms and at different scales and intensities (Banjade 2003; Malla 1999;^[1, 15]). The conservation and management of forest resources by the people themselves have been effective in reserving the process of deforestation in many areas of Nepal (Gilmour & Fisher, 1992)^[9]. Community forest management witnesses' tremendous shifts in forest policies and procedures in Nepal (Giri, 2008)^[10]. Now, more than 35 percent of the population of Nepal is involved in community forest management programs.

In the last three decades, community forestry is considered the best practice for forest management in the hilly region of Nepal. Forest management activities subsistence activities and IG (Income generating) activities, ecological interdependence complexity and uncertainty are part of the hill community forestry. Within this context, various types of resources users, having different economic and social status perspectives knowledge system, values, understanding and objectives are involved in community forestry. Major forest products directly affecting the livelihood of rural people are fodder fuelwood, timber, litters, medicinal and aromatic plants and other non-timber forest products (NTFPs). The forest management issues in general and those of the community forestry in particular are viewed in a different way by different people with the perspectives of different knowledge and power dynamics (Edumunde and Wollenberg, 2001)^[6].

One of the major drivers for the implementation of community forestry program in Nepal were to reduce the effects of environmental degradation and to improve the condition of the forest and overall effects of the community forest program including the increase biodiversity from the result of rejuvenating and expanding the diversity species of trees and plants and wildlife. It is evident that the community's active participation on forest management had a positive contribution on increasing biodiversity and forest coverage on the once barren slope (Sheller, 2018 and Winder, 2004)^[21, 23]. Although, there are many studies community forest management system, comprehensive studies in changing knowledge system of community forestry are lacking. Different institutional knowledge and technical and managerial skills are developed in community

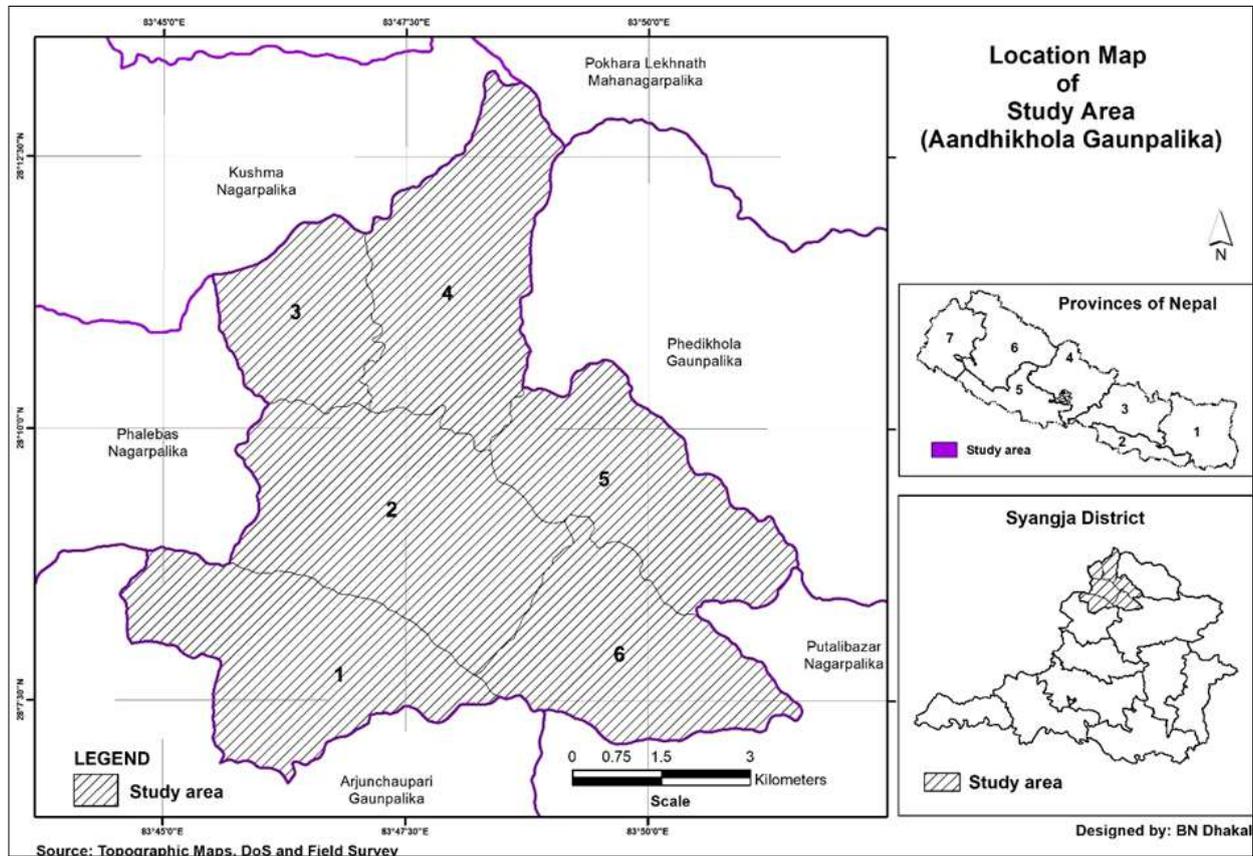
forestry, it is important to document whose knowledge and whose stake in the policies organizing the knowledge develop around. Bottom up making systems of documenting the knowledge of different stakeholders involved in both communities and the supporting institutions can provide some space for knowledge boundary.

Bourdieu (1997)^[3] developed a theory of action around the concept of habitus, which referred to a considerable influence in the social sciences. This theory seeks to show that social agents develop strategies which are adopted to the need of the social world that they inhabit. 'Habitus constitutes a set of durable transposable dispositions' which regulates mental activity to the point where individuals are often unconsciously aware of their influence (Bourdieu, 1994 p.72)^[2]. Bourdieu (1997)^[3] has practiced the natural resource governance which are shaped by four categories. First, there is a large group of people commonly known as forest officials, foresters' agricultural scientists, engineers, overseers, technical specialist and so on who work in government, administrative and technical services. They all share a common technocratic habitus, which emphasises technical strategies of forest management at the expanse of creating accountable and deliberative institutions of resources governance and benefit sharing. In this connection, this study has focussed the forest resources management and knowledge system and which resources are to be found in intervention of human action in community forest management and utilization of Andhikhola Gaunpalika of Syangja district, Western Nepal.

Study area

Andhikhola Gaunpalika is located in the northern part of Syangja district. It lies between 28° 13' 47'' to 28° 06' 45'' latitude and 83° 50' 38'' to 83° 44' 37'' east longitude. It is about 2512 meters high from mean sea level and cover an area of 69.69 square kilometers. It is surrounded by Parvat district to the west, Putalibazar Municipality and Phedikhola Gaunpalika to the east and Kaski district to the north and Arjun Chaupari Gaunpalika and Putalibazar to the south. The famous river Andhikhola have been flowing from the central part of this Gaunpalika. According to Gaunpalika Records 2075 BS, the total population of this area is 25554 among which 13235 are male and 12319 are female and the total household is 4070

The agricultural land of this Gaunpalika occupies 56.98 percent of the total land. (GR, 2075) About 28.31 percent land is covered by forest area. There are different types of forest such as government protected forest, community forest and private forest. Forest resources is considered as major economic bases of this Gaunpalika. The Lekh of Panchase, the Lekh of Dahare and the Lekh of Pharsu are the famous forest resources area of this Gaunpalika. Natural resource specially the forest and water resources management and its proper utilization are the major bases of economic development for the habitants in the study area.



Methods and materials

The aim of this paper is to examine the current status of community forests user groups, analyse and document the how different knowledge system developed around Andhikhola Gaunpalika of Syangja district, Nepal. To explore the current status and changing knowledge system, eight community forest user group of the study area were selected for the study. Both primary data and secondary information were used to analyse the different knowledge system and its development. Review of widely published and unpublished documents, reports book along with the empirical field studies and knowledge based on practical ground have been used to bring this form.

There are 1052 members of community forest user groups in Andhikhola Gaunpalika of Syangja district and it was not possible to cover all those community forests user groups. So, attempt was made to select representative community forest for detailed study. For this, only thirty percent were selected for household’s survey of the total community forest user groups member of the study area. This was done through interviewing key informants and participating in informal focus group discussion. For this, ten groups of focus group discussion and six key persons were selected. The following Table 1 shows the average size of forest land, sample CFUGs with sample households and number of FGD and KII by sample CFUGs of the study area.

Table 1: Number of samples CFUGs selected for the study

Location of community forest	Area in Hectare	No of CFUGs members	No of Committee members	No of selected HHs	No of FGD	No of KII
Devisthan	9.91	91	9	27	1	1
Ranguwa	118.93	93	9	27	1	1
Dharakhola	11	70	7	21	1	1
Thulibarahe	55	45	12	14	1	
Baliyo	3.99	87	11	26	1	
Hadikhola	18.2	184	7	56	2	1
Bashyahari	16.0	380	11	114	3	1
Jugle	14.34	102	9	31	1	1
Total	247.37	1052	57	316	10	6
Size	247.37	131.62	7.13	39.5	1.25	0.75

Source: Field survey and CFUC Records, 2018

After selecting 316 the size of household interview was determined keeping in view the central limit theorem. According to rule of thumb, if the size of sample is 30 or more, the distribution becomes normal of statistical test can be performed (Daniel and Terrell, 1995) [5]. Following this concept was used for household survey.

Results and discussion

Knowledge systems in community forestry

The knowledge system developed by different agents of the society. Natural resources management has been contributing to enhance the overall livelihoods of the people. Although, there are various types of natural

resources management practice in the study area. This study concentrated only on document the developed knowledge system on various stages of community forest resource management. Knowledge system is the changing and dynamic concept of resources management, which are developed in more effective manner at local level and contributed in changing policies of the government.

According to the local forest users, there were two types of forest management system in the past. The first one was based on *Ban Lauro parnali* (Forest stick system). This system was used in each house turn by turn for patrolling the forest to see whether forest are products are stolen from the forest area. A 'stick' called as 'Ban Lauro' was used to transfer form one household to another for inspection and patrolling the forest for one day. Turn system was developed based on the number of beneficiaries of the particular forest patches.

And the second system was *Jhara system* (a volunteer or free services) for the resource management by the community member of the village. At least, one person from a household should be presented according to their rules. These rules and regulations had been made by the local community. All the community member had to accept customary rules and regulations, otherwise the violators has to be punished. During initial phases, before formation of CFUGs, this is the way of forest management system developed by locals. Indirectly it was an institution, but there was not any committee. At that time, automatically the institution was run for protection of the forests. The operation rules for forest management in the past were based on the 'oral tradition'. The local users would not follow this rule, he would be punished by local institutions which are not in formally active. This type of institutions was in existence in the past in the study area. Most of the local people would follow this rule. Later on, community forest user group was formed, registered and handed over the particular patches of forest land with use rights of forest products, formally. It is considered one of the best ideas for sustainable forest management in hilly regions of Nepal. Thus, forest management system has changed into formal knowledge system. Again, the situation became change. Labour migration is increasing in rural area and it creates new knowledge for the livelihood. Migrants are not depending on forest. There is no active manpower to well manage the forest. Now, in the rural area, two types of problems are created in community forest; first one is scarcity of young generation and the second is invasive plants is spreading all over the forest in the rural area.

Present status of community forest

Community forest user groups have been playing crucial role for the conservation and utilization of forest in the past, even though, it has not been in more practices now. Traditionally forest was considered as important for using fire wood, fodder, leaf litter, bedding materials for the livelihood of rural area. Now, more than 28 percent area is covered by forest in this Gaunpalika. Government forest, protected forest, community forest and private forest are existence in the Gaunpalika. *Chilaune*, *Katush*, *Uttish*, *Sallo*, *Sal*, *Bakle* etc. are the major species of forest. Wild boar, leopard, tiger, monkey, bear, deer, *Dumsi* are the major wild animals available in this area. Now a days, forest area is extended in previous agricultural lands which ultimately has increases problem of destroying the limited

agriculture products.

The average size of the community forest remains 30.92 hectare. The average household of the study has 132 and average size of community forest user group committee's member remains 7.13 in the study area. Devasthan Batashe CF, Handikhola CF, Basyahari CF, Baliyo Khoriya CF are located in upper part of Gaunpalika and Thulibarahe CF, Jugle CF, Dharkhola CF and Ranguwa Tarebhir CF are located in lower part of Gaunpalika. The lower part CF lies in the river side of Andhikhola. Economically, forest of lower part is more valuable in compare to the forests of upper part due to the forest species and plants available and nature of forest. *Sal* is the major hard wood forest in the lower part of forest whereas *Chilaune*, *Bakle Sallo* etc. are the major wood in the upper part of forest in the study area.

Conceptual frameworks

Community forest user groups, society (social organization) and local government are interconnected to each other in the development of forest resource management. Indigenous and local knowledge system, organizational knowledge system and Local government are the major component of forest resource management. These components have played a major role for development of knowledge system in different way. They have different role and responsibility in the management of forest resources. Uphoff (1984)^[24] provides basic definitions, stating organizations are structures of recognized accepted roles, that may operate on a formal or informal basis. There are different types of organizations, which support to manage forest by using different types of knowledge system.

Ostrom (1996)^[17] is of the opinion that appropriation, provision, monitoring, enforcement, conflict resolution and governance activities in common are organised in multiple layers of nested enterprises' forest user group can be organized at three levels. In fact, the organizational structure of the forest user groups of the study area is three layered viz. local community forest user groups, civil Society (INGOs and NGOs) and local government entity, which are interrelated to each other in the development of local knowledge system. They have been working jointly or separately in forest management issues in the study area. All these organizations produce different knowledge system by practicing different activities in forest management. The following Figure 1 shows different knowledge system of forest resources management practices by conceptual frameworks for understanding the different knowledge system.

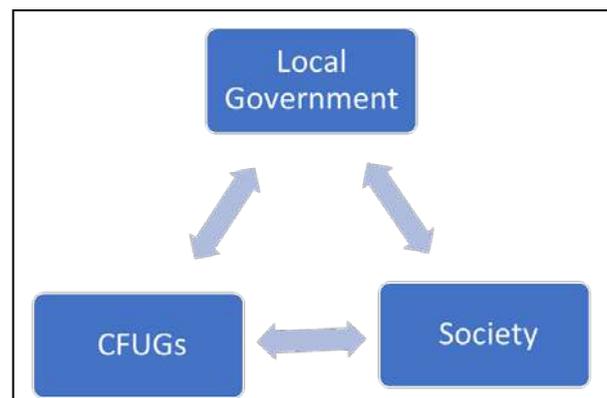


Fig 1: Conceptual frameworks for understanding the knowledge system

CFUGs and Indigenous and local knowledge system

Indigenous knowledge-based forest management practices are developed in remote and rural parts of the country from the long past. Which was based on ideas and skill developed by local community for forest management. Local forest management has been mediated by the traditional institutions, which have enabled the management forests for generation. Local people understand and respond to the ecological issues. Human perceptions, knowledge and actions linked with resource attribute (Ojha, 2002)^[16]. Role of external knowledge is also evident in the context where local knowledge and information are valued less by the local people against external ones who hold power and transfer knowledge of group governance and forest management (Banjade, 2003)^[11]. Indigenous knowledge of rural people knowledge includes beliefs rituals and perceptions way of learning, local technology stock of knowledge and practices of acquiring and transmitting it (Chamber, 1991 p.83)^[4]. Indigenous knowledge (IK) is an integral part of the poor's strategies for survival. Rist and Dahdouh- Guebas (2006)^[19] wrote different view on scientific knowledge and local knowledge. They identified the range of scenarios through which science and local knowledge can come interface: science simply ignores a practice based on local knowledge that can be scientifically understood. Generally, traditional knowledge and local knowledge are taken from local people and research institutions.

Fisher (1991)^[7] argues that the concept of indigenous management system is a heuristic device and does not mean a local community living in a vacuum but rather something which is largely community based to be distinguished from something which is deliberately introduced by a government or other agency beyond the community. Indigenous knowledge system (IKS) in emerging economics in general and rural Nepal in particular have historically been considered one of the most valuable assets people own and social capital but also the least mobilized for developing rural communities.

Traditionally, the local people would use from the leaf, bud, branch, shoot and vine of the different plant as medicine. All types of plant were not use as medicine. The old people, who had indigenous knowledge of different plant, especially non timber forest products would be used as medicine. Now new generations have not serious how to protect and manage that types of plant or vegetation for the future. Indigenous knowledge is in crisis in the young local.

According to octogenarians two local people of the study area, *we did not use any medicine in our long life, sometime we used Jadibuti (medicinal herbs) as a medicine and we worshiped the jungle as a Bandevi or Banjhakri for conservation of tree and sources of water. Now the young people negligence our view and idea. They don't have such type of knowledge about the Judibuti.*

From the above saying it is clear that the young generation are not interested to the any activities of forest management. This is the major problem in the management of forest. It indicates that for conserving the forest it is essential to new innovative idea to manage the forest and economically benefitted widely local people by the forest resources.

Social organizational knowledge system

Social and institutional development, awareness and learning, skill development and forest management practices are the major indicators of institutional knowledge system.

The natural resource management practices are mediated by at least four different knowledge system i.e. techno-bureaucratic knowledge system, knowledge system of development agencies, knowledge system of politicians and knowledge system of civil society network. In the process of political interaction and deliberation over issue of natural resource governance, which have four system of knowledge underpin the constitution of the four categories of social and political agents.

There are various types of stakeholders' institutions in Andhikhola Gaunpalika. Most of them are Upper Andhikhola watershed management project had conducted in 1992-2002, Associated with CARE Nepal. Now, *Apasi Sahayog Kendra Nepal*, (ASK) is working as a partner organization of CARE, Nepal. Federation of Community forestry Users Nepal (FECOFUN), *Andha Andhi Samudaik Vikash Kendra*, Cooraptive institutions, political parties, *Panchase Ban Sanrakshit program* and Mother groups etc. Besides this, *Tole Vikash Shanstha*, NGOs, women network, Lions club, *Syanjali Sampark Manch*, *Bichari Chautara* etc. are also active and contributing in different social activities for the development in this area. Most of them are directly and indirectly participated in forest resource management system. These types of institutions have delivered different type of training to improve the conservation, utilization and management of forest resources. Such types of institutions not only focused on natural resources management but also address the social awareness program and agricultural development and others areas. Developing blocks in forest areas, planning for forest development, harvesting, pollarding, thinning, pruning, nursery, plantation and inter cropping are the major activities performed the forest management.

Local government and local practices

Now, Nepal is entered into the federal state and the layer of government in three viz federal, regional and local. All local entity is under the local government. Forest resource management come under the local government authority. It creates a changing concept of forest management.

The chair person of ward no. four Mr. Chinta Mani Paudel aged 52 has said since long time, community forestry was considered as a livelihood base of the rural people. Now, the situation of rural people has changed due to the labour migration in different countries like Middle East countries, Korea, Japan, Malaysia. Most of the young people of rural area do not want to join household work and social and agricultural activities. They want to go abroad to earn money rather than the low income of sources of rural area. CFUGs were very active in the past, but now they are not so active, because of the scarcity of young people of the rural area. The who are there (village), they are not interested to utilize the forest product for their cooking purpose. They use LP gas rather than firewood. So, the forest area is increasing day by day without its utilizations. Forest area is extending near to the village. But, utilization of forest is very low rate due to the poverty of human resources. Now, income generating activities of CFUGs is not so active. Forest products is not considered as the basic needs of rural people. They have different sources of income. Now, the major sources of income of rural people are remittances.

According to above key person saying recent years, young generations neither attracted in the management of forest resources nor creating the new knowledge system in the

conservation of forest. They don't want to protect indigenous knowledge for protections of natural resources. They are interested to go abroad for earning speed money. But this trend has been discontinued only after the paid program introduced in the society in the name of external supported development project (Poudel, 2012)^[18].

Similarly, another the two local forest members Bishnu Prasad Paudel aged 61 and Krishna Sharma aged 56 said that now a days, farming field is covered by different types of invasive bushes, which is not so important for rural livelihood that has not been contributing economically. It has destructed the valuable wooden plant and herbal plant. Lack of participation of people to conserve and protect forest and new plantation program. The forest is not connected to the sources of income of the people of rural municipality. The lack of knowledge identifies the herbal plant in the forest the valuable plants are not utilized for human benefits. Lack of awareness on how to manage our community forest and how to benefited local people by valuable forest resources are under utilized. And how to create new ideas and knowledge system to manage the forest are needed. Now we are thinking such types of issues in the changing context.

This opinion seems to be actives to create new idea or knowledge to manage the community forest in the study area. In this connection, the conservation of community forest is essential for livelihood of rural people. The people,

who live in village seems to be very worry how to innovate the new knowledge for the management of community forest. New ideas and viable options to manage and utilize the forest resources for economic benefits is much important in the changing context. Promotion of commercial agriculture in rural areas is the best option for increasing the economic activities which will automatically utilize the important forest and resources other natural resources available in rural areas.

In the changing social and economic context, traditional community forest program can not be defensible. It is needed to new concept for the development of forest. The community forest program is in impasse situation. The need of forest product is in decreasing condition in household consumption. The consumptions of fire wood will be decreased by 20 percent in the end of 2030 according to sustainable development goal SDG.

Household participation in community forest management activities

Household participation in community forest management activities is considered the most important for finding different knowledge what and how the positions of knowledge system in forest management activities in the study area. It also helps to gain knowledge about the degree of participation of old and new generation in the management of forest resources.

Table 2: Percentage of participation in different community forests for management

CFUG Activity	Participation in CF Activities (%)
Participating activities based on new knowledge system	24
Does not participate in forest management	22
Forest management plan and preparation	9
Implementation of Decision	21
Benefit sharing rule formulation	12
Participation in all activities	12

Source: Field survey, 2018

The Table 2 shows that percentage of household participating in different community forest in the study area. About 22 percentage of household do not participate in any activities. Nine percent of household forest users are active in forest management plan and preparation. More than 21 percent of household are attending meeting and participate in implementation of decision. About 12 percentage of household forest users are involving the benefit sharing rule formulation. Some participate household have remain in favour of indigenous knowledge, especially old people who have the membership of the committee. The household who have no old member of the house, young people of households were not interested to participate in forest activities. The new young people want to Participating forest management based on new knowledge system. They want to adopt the scientific knowledge for the management of forest. 24 percent young generation are in favour of participating activities based on new knowledge system.

Conclusion

The knowledge system discussed here is evolved during practices of forest resources management in the study area. This concludes that the knowledge and skills developed during local practice and its application help in adopting the changing process and build on knowledge which can give better solutions in the form of governance of the community

forest groups. Community forest user groups have developed dynamic institutional knowledge system. They can be used to improve the management for utilization of valuable timber and non timber forest products in the changing context. Knowledge system developed during evolution of community forest management system is being loosed due to lack of proper interaction and transfer of the knowledge to the young generation. It is necessary to blend local knowledge system and modern knowledge to transform the forest management system in the changing context. Traditional knowledge system practiced was very effective in the past is not in practice in many contexts at present. The traditional knowledge system which has different dimensions like institutional, structural and personal are not much in practice which ultimately erode the important indigenous knowledge that's why it is important to document the knowledge system. It is needed to new concept for the development of forest management. Now, the community forest program is in impasse situation. The need of forest product is in decreasing condition in household consumption. In such circumstances, new policy should be formed by the government for the development of new knowledge system of forest resource management and utilization. Moreover, geography education should be linked to the management of forest resource in local and national level for the better development of the nation.

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