Social Capital and Participation in Commons-A case study from Nepalese Community Forestry in Comparison with Japanese Satoyama

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Abstract

The resources where large groups of people have use and access are the commons. Those can be in different forms such as forest or river or ocean. Globally there are different approaches to manage those commons such as government control, privatize or community-based. The one of the widely-used concept to manage those commons was from the concept developed by Garrett Hardin (Hardin, 1968). His purpose solutions were (i) privatization of the resources by allocating property rights to individuals through free market and (ii) nationalization or bringing full government authority for the regulations of the resources. However, his work was criticized that the concept is for propaganda for privatization or nationalization and it may be very expensive as well as have a high transaction cost. The possible outcomes might accelerate free riding in the resources and might drag to over destruction of commons. The different scholar such as Elinor Ostrom finds out the solution of self-governing local communities with little or no enforcement from the government with relatively economical (Ostrom, 1990). She believes that those, solutions/investment are cheaper, and an outcome is higher than the investment. Ostrom and her associates also discovered that common pool resources are over-harvested or over degraded not only from the technical problem but rather than from a failure of governance or lacking proper institutions (Agrawal and Ostrom, 2007).

Social capital, participation, governance, and institution are some of the fundamental aspects of sustainability of commons. The Institutional Analysis and Development (IAD) framework is one of the appropriate lenses to policy development and can recognize sets of actors engaged in an action arena, within which decisions are made about forest use and management. To draw out fundamental factors that contribute to the sustainable management of community forestry in Nepal, this research attempts a comparative study of community forestry in Asian region through the

application of IAD framework and the Socio-Ecological System (SES) developed by Elinor Ostrom. The core point in IAD and SES is how the users play with resources that called "Action Situation." The "Action Situation" is affected by the key word/points "Social capital" and "Participation" at local community level. Thus, this research hypothesizes that local community with a high level of social capital can promote participation in the decision-making and benefit sharing that results in the high performance in the sustainable management of common pool resources. The intense literature review and field visit have done to complete this research. Two field visits in Nepal and Japan were conducted to understand and make an observation of people's participation and social capital.

Japanese Satoyama is an excellent learning tool on how resources can manage effectively through an entirely decentralized structure with collaboration with the private organization through the local action groups. Japanese Satoyama has an advanced system of participations with wider collaboration from different stakeholders such as government, private organizations and local community action groups. At the same time, the case of Nepal is completely different. The management and conservation of commons are focus entirely on local users with a strict membership. The Japanese Satoyama shows an excellent example of broad participation and focuses on cultural services. However, the management of Nepali community forestry focuses on the livelihood perspectives. It has also observed that the Satoyama model is a bottom-up approach. There is a very little or no governmental influence. The Japanese government only makes a guideline for overall Satoyama. Similarly, Nepalese community forestry is a top-down approach. The government of Nepal has a high influence on the overall management, conservation, and distribution of resources.

Ostrom offers the eight principles' for the sustainable governing of the commons. In the case of Japanese Satoyama some of the Ostrom's principles are not applicable such as the boundary between user groups. This gives an example of how Satoyama develops a "new commons" in the management of local common pool resources. Nepalese community forestry can learn these types of involving wide membership in the implementation of community-based forest management. At the same time, the case of Satoyama suggests some limitations in the application of 'eight principles' to the successful management of the commons.

Chapter 1
INTRODUCTION OF RESEARCH

1.1 Problem statement

The common pool resources are resources where a large number of people have access. There are different types of common pool resources such as oceanic ecosystem (fish can harvest), the global atmosphere (greenhouse gases are released) or a forest (timber is harvested). The under use or overuse of resources can affect or destroy the sustainability. In this scenario "the fish population may decrease, or climate change may occur, or forest might deforest or degrade (NRC,2002). If all users prohibit restrain themselves, then the resources could be sustained. However, there is a dilemma…if users "A" limit use of the resource and your neighbors (users "B") do not, then the resources still collapse and users "A" might lose benefits in the short term or long term (Hardin, 1968). A major characteristic of common pool resources is the sub-tractability of resources units once extraction occurs. Hardin mentioned in his that paper common pool resources are sub-tractable; they can be easily congested, over harvested, degraded and even destroyed (Hardin, 1968). His "Tragedy of the Commons" in *Science* became one of the most often cited papers in the latter half of the 20th century.

The deforestation and degradation in the Asian region have been very high due to several reasons such as population growth, mismanagement, urbanization, high poverty and dependence upon the forest products, and the centralized government system to manage the commons. Nepal has been facing at the "tragedy of the commons" since the middle of the 20th century. This happens due to several reasons. Nepal's economy is dependent upon the agriculture and natural resources. According to the research data, 72 % of the populations are forest dweller, and 31% of the people

live in poverty, and around 70% of household energy is based on fuel wood in Nepal (Dhital, 2009). People cut trees for energy or make charcoal for fuel wood. In Nepal, the management of forest varied from period to period. Before the 1950's most of the accessible forest were controlled by the certain elite group of people. Then in 1950's the government introduced the nationalization policy to try to manage the forest through the high governmental control regime. However, this attempt was unsuccessful because of a lacking workforce, technician, and financial resources. These strong centralized bureaucratic policies also accelerate deforestation, degradation and soil erosion, landslide, and mountain desertification (Eckholm, 1975; World Bank 1978). At those periods, there emerged global discussion on the concept of decentralization. Some of the research suggested that government control forest in Nepal is unsustainably utilized by the communities for fuel wood, fodder and timber because there are no local control or protection measures. Thus, the Government of Nepal has introduced a new policy to manage the forest since the late 1970's, a "community forest" program. Later the concept of community forestry is institutionalized by the Forest Act of 1990 and Forest Regulations of 1993. The community forestry program also got plenty of support from national government, international non-government organization, donor agency and became widely popular at the local level.

Community forestry is a patch of national forest in Nepal that hands it over to the local people for protection, management, conservation and utilization of resources. At the starting phase, the community forestry aimed to provide only essential services such as firewood, timber, leaf litter collection. Today community forests are conceived that it provides different ecosystem services such as provisioning services (timber, wood, food, etc.), regulating services such as water purification and the prevention of soil erosion, cultural services such as recreation and health promotion and supporting services such as biodiversity (World Research Institute, 2005).

According to the report of Department of Forest (DoF) of, Nepal, there is altogether 17,685 community forest user groups that manage 1.6 million ha of forest (Department of Forest, 2016). A community forest program of Nepal is referred by international organizations as a successful model not only to address the poverty but to provide several ecosystem services. However, there is significant variability among rural communities: some are successful, others not.

At the same time, the community forestry in Nepal has several challenges and problems that include resource control by the elite group, lack of governance and transparency, lacking commercialization, and policy overlapping. In addition, the government of Nepal is not very much interested in handing over the forest to the southern communities because the southern area has dense, expensive forest trees/products) and lack of coordination between different stakeholders. Nepal has heterogeneous types of communities where community forestry user groups composed of different caste and economic background. It can be observable that in some community forestry higher caste people capture all the resources. The problem of elite capture links with the governance and transparency on benefit sharing and participation of user groups. The other challenge in community forestry is the commercialization of community forestry products. The community forestry can sell the products with the permission of the government. However, it is a long and tedious process for getting a permission paper from the government authority. Policy overlapping with other governmental body and local customary law are another challenge. This brings a lot of confusions and conflicts among the user groups. Another big challenge is a lacking of coordination between the different stakeholders in the inter-governmental relations and coordination between the non-governmental organization and donor agency. There is also lacking trust between the governmental body and non-governmental organizations.

1.2 Research objectives

This thesis aims to explore the key factors that will make the common pool resources management more efficient in the context of sustainability. Common pool resources are natural resources. Those resources exist commonly in different forms. Today the local commons such as forest and fish are depleting day by day with various reasons such as urbanization, industrialization, rapid population growth. The depletion of the commons is going rapidly in developing and industrialized countries. There are different strategies to manage common pool resources. The success and failure of management of the commons differ from community to community. We can observe some communities are managing common pool resources well, but others are lacking capacities. It has been observed that there are certain factors which affect the management of common pool resources such as socio-economic and demographic, institutional and policy, governance, knowledge on commons, the population density of the area, human incentives, and behaviors.

To draw out fundamental factors that contribute to the sustainable management of community forestry in Nepal, this research conducted a comparative study of community forestry in Asian region through the approach of Institutional Analysis and Development (IAD) framework and the Socio-Ecological System (SES) developed by Elinor Ostrom. The core point in IAD and SES is how the users play with resources that generally called "Action Situation." The "Action Situation" at the community level is affected by the key word/points "Social capital" and "Participation." Thus, this research hypothesizes that local community with a high level of social capital can promote the participation in the decision-making and benefit sharing process that results in the high performance in the sustainable management of common pool resources.

In a comparative study of community forestry in Asia, this research collects most of the findings from Nepalese community forestry and Japanese Satoyama conservation. The primary reasons to choose Japanese Satoyama is that Satoyama has a long history of forest management and it has a new form of co-management system with the involvement of different stakeholders such as private, government and local action group. It expects that it will be very much helpful to understand how local common pool resources are managed in the developed countries like Japan. Also, this research aims to provide some guidance and suggestions to the government and people in Nepal within the context of social capital and participation. It seems possible to replicate the attribute of social capital in Japanese Satoyama to the community forest of Nepal.

The following table 1 shows the typical/sharing aspects and differences between community forestry and Satoyama. The Community forest and Satoyama both are secondary types of the forest, but objectives of management are completely different. In Nepal, community forestry is a livelihood source but in Japanese Satoyama is a concept with living in harmony. We can also say in another form as community forestry is focused more in provisioning services (details in chapter 3) but Japanese Satoyama is focused on more cultural services (details in chapter 5). There are several challenges in both community forest and Satoyama program. The community forestry program has governmental influence, lacking of rule of law, illegal deforestation, heavy dependence on resources due to poverty (details described in chapter 3) at the same time Satoyama has different challenges such as under use of forest resources after fuel revolution, fluctuating price of products/ low economic productivity in landscape area (details described in chapter 5).

Table 1 Showing similarities and differences on Nepalese community forestry and Satoyama

<table>
<tr><td colspan="2">Common/Sharing</td><td colspan="2">Differences</td></tr>
<tr><td>Community forest</td><td>Satoyama</td><td>Community forest</td><td>Satoyama</td></tr>
<tr><td>Secondary forest; forestry is an integral part of agriculture in Nepal</td><td>Secondary forest and agriculture</td><td>Forestry is a livelihood source</td><td>Living in harmony with nature; educational and recreational value</td></tr>
<tr><td colspan="2" rowspan="3">• Target is to conserve biodiversity and human well-being
• Social and participation of local people is common to manage resources
• Devolution of power to local people
• Role of residents is important</td><td>Government forest</td><td>Private forest</td></tr>
<tr><td>Failure of top down approach moving to decentralization and devolution of power</td><td>Limited governmental influence on self-governing</td></tr>
<tr><td>Government influence; lacking the rule of law, illegal deforestation; high poverty and heavy dependence on resources</td><td>Under use of forest resources after fuel revolution, fluctuating price of products/low economic productivity</td></tr>
</table>

1.3 Originality of work

This study focuses on Nepalese community forestry in comparison with Japanese Satoyama conservation program with different contexts such as social capital, participation, socio-ecological systems, and ecosystem services. Social capital and participation are the important indicators in the governance and institutions examination of local commons. A high level of social capital promotes democratic participation. It assumes that a community can collectively solve problems if community members cooperate and trust each other. More importantly, local people have a choice to make interactions with fellow citizens and everyday business. Such social capital can reduce the transaction cost in the management. Also, this study examines the applicability of Ostrom's eight design principles to the community forestry in Nepal.

There is no other study of the institutions and governance of community forestry in Nepal in comparison with the Satoyama in Japan by applying the framework IAD, SES and Eight design principles developed by Elinor Ostrom. As shown in Satoyama conservation in Japan, social capital and participation are the basic principles behind the successful conservation practice. Satoyama conservation practice is an excellent example of how local people involved in conservation. However, it is argued that replication of all the governance and institutions attributes of Japanese Satoyama in developing countries not be possible due to different socioeconomic conditions and political differentiation. However, it seems also to be possible to replicate some form of governance attributes within the social capital and participations in developing countries like Nepal. This partial replication of governance and institutions models of Japanese Satoyama can address the governance, participation and social capital issues of Nepalese community forest model.

1.4 Research methodology

The data for this research is collected both from local communities in Nepal and Japan. As the case in Nepal, this research selected the Sindhupalchok district. This district lies in the mid-northern part of Nepal. Two community forests from Sindhupalchok were chosen for the case study. Some of the reports suggest that community forestry program started at Sindhupalchok districts. The user groups of these districts are also very much heterogeneous types. It composed of different ethnic groups such as Dalit[1], minority and another upper caste group with various economic structures. Thus, this district also gives an overall demographic structure of Nepal[2].

The researcher conducted one-month intensive field trip in Sindhupalchok district in Nepal in 2014. During the field research intensive interview is being carried out with community forestry user groups, government staffs, and non-governmental staff. The researcher also got an opportunity to observe the social capital, participation and group discussions with local community forestry user groups.

In the study of the case of Japanese Satoyama, two study visits have been conducted in Japan. The selected Satoyama are the Nanasawa Satoyama conservation area in Atsugi city and the Naganuki Satoyama conservation area in Hadano city. Both the Satoyama is located in Kanagawa Prefecture. Kanagawa Prefecture government designates the Nanasawa Satoyama conservation area on March 13, 2012, which covers an area of 1,271.6 ha. Nanasawa area is located in the western part of Atsugi city with covering certain parts of Tanzawa Oyama Quashi-National Park located in Kanagawa prefecture. The Naganuki Satoyama conservation area is designated on March 27, 2009,

[1] The Indian sub-continent caste-according to Hindu culture it falls in the lowest category.

[2] Demographic structure of Nepal is very complex with multi-ethnic, multi-cultural and multi-language

which covers an area of 211.5 Ha. It lies in Hadano eastern foothills of the south of Oyama Mountain. It consists of gentle hills in designated Tanzawa-Oyama Quasi-National Park. The forest area is dominated by natural confers.

There were several reasons to select that two Satoyama in Kanagawa prefecture. Firstly, those two Satoyama are located in between the city and rural area. This can give the feeling how local people are managing commons in the semi-urban and rural area. Secondly, people in both Satoyama communities do not fully depend upon the product from those areas and volunteer from the same village. This will help how both Satoyama will invite outside members to participate in conservation. The researcher conducted intense interviews and focus group discussion with the local action groups, volunteers, and government staff. There were five visits to the Nanasawa and Hadano area in 2014 and 2015. Those visits were to observe the social capital and participation of farmers, local action group, and volunteers. During those visit, the researcher also participated in the volunteer program for rice planting, weeding, and harvesting on several occasion during 2014 and 2015 to observe the volunteerism and participation. There was also an intense discussion and interview with volunteers and local people. There were also several informal discussions conducted by the volunteers and students from Yokohama National University. The researcher has also consulted with a different expert from Yokohama National University, a private organization, and students.

1.5 Summary of chapters

The thesis is consists of seven chapters. Following the introductory chapter, chapter two provides the literature review concerning on “tragedy of the commons” and theories of “common pool resources.” This chapters also tried to figure out some theoretical perspectives on “Why some

commons are successfully sustained, and others fail"? After doing the literature review on the global phenomenon of common pool resources, the types of the governing of commons and the cause of sustainability are discussed. In the theoretical framework, this chapter focus on Ostrom's Institutional Analysis and Development (IAD) framework, Socio-Ecological System (SES) approach, and the eight principles on common pool commons. In the discussion, the research focused on social capital, participation, and institutional diversity among the commons.

Chapter three is about the case study from Nepalese community forestry. This chapter provides an overview of forest in Nepal, the development of community forestry in Nepal, community forestry in Southeast Asia, and existing studies on the community forestry in Nepal. In this chapter, the researcher applies the Institutional Analysis and Development framework and Ostrom's eight design principles to the management of community forestry. At the same time, the participation and social capital in community forestry will be discussed. Chapter four discusses management concern, policy and governance issues in the promotion of community forestry programs in the selected Southeast Asian countries.

Chapter five provides the historical overview of Satoyama landscape, the recent development of Satoyama conservation in Japan, local practices in Kanagawa prefecture and a global Satoyama Initiative be discussed. In this chapter, the Institutional Analysis and Development framework and Ostrom's eight principles are applied to the Satoyama conservation. This chapter also analyzed social capital and participation along with the future policy reforms in Japan.

Chapter six examines the hypothesis based on the findings of the case studies. This chapter also examines the applicability of Ostrom's eight design principles in the conservation of common pool

resources in both Nepal and Japan. The final chapter provides the conclusion. It consists of a summary of the analysis, policy recommendations, limitation of the study and future lessons.

CHAPTER 2
RESEARCH FRAMEWORK

2.1 Tragedy of commons

The tragedy of the commons is the scarcity or unavailability of resources due to the failure of governance or institutions. The concept of common pool resources and tragedy of the commons is straightforward. The easiest example is "there is a resource where a large number of people have access which generally called common pool resources." If the resources are overuse or under use, it may collapse or destroy. Thus, if the users of those resources limit themselves, the resources may be sustained for a long time. However, there is always a dilemma. If user "A" limits the resources and user "B," do not, then the resources still collapse, and we can lose the benefits of resources. This type of social and natural dilemma was first published in the journal of Science in 1968 with a title "The Tragedy of the commons," written by Garrett Hardin (Hardin, 1968). According to Hardin, it happens due to overuse of resources. He argued that the users of a commons be caught in a process that eventually leads to the destruction of the resources upon which they depend because each continues to use the resources until the expected costs of utilization equal the anticipated benefits. [3] Hardin has postulated the two solutions for management of commons. He describes that either the centrally enforce regulations or privatization of commons can be a real solution (Hardin, 1968). Hardin's argument was generally accepted by the free market economists.

[3] Hardin used the case study of herders who raise cattle on village common pool resources. He believes that due to the economic incentive and lacking proper institution, individual herders add additional cattle and this will brings huge competition among individual herders and eventually commons will goes for over-exploitation (Hardin, 1968) .

However, Elinor Ostrom came up with the new idea of management of commons. She defined that local people can conserve commons from little or no governmental influence with the bottom-up approach (Ostrom, 1990). She also gave an example that when local users of a forest have a long-term perspective, they are more likely to monitor each other's use of the land, developing rules and regulations.

More specifically, Ostrom postulates eight principles to manage the commons such as 1. Clearly defined boundaries 2. Congruence between appropriation and provision rules and local conditions 3. Collective choice arrangements 4. Monitoring 5. Graduated sanctions 6. Conflict resolution mechanism 7. Minimal recognition of rights to organize 8. Nested enterprise (Ostrom, 1990). Those eight principles are more focus on decentralization, self-governance and low interference from a government body. Currently, several countries are managing the commons in different nature/ manner such as community forestry in Nepal, social forestry in India, and Satoyama conservation in Japan. Those commons have their different challenges, opportunities, and attributes. Nevertheless, in the current century, common pool resources are under threat due to several reasons such as globalization, industrialization, population increase, a haphazard settlement which brought the alarming rate of deforestation, overharvesting of natural resources. Several types of research have shown deforestation and degradation are not a technical failure; it is more to a failure of governance and communities can manage forest well when they can decide their governance structure and benefits are higher than cost (Ostrom, 1990; Agrawal, 2008).

2.2 Institutional analysis and development (IAD) framework

Common pool resources may be governed and managed by a different variety of institutional arrangements. Those institutional arrangements can be governmental, private or community ownership. The IAD framework was initially developed by Elinor Ostrom to describe the relationships of variables that attribute to the governance and institution of communities without or little governmental influence. The core of the IAD framework is the "action situation" described in below (in figure 1),. The IAD framework applied with methods and insights from non-cooperative and cooperative game theory. According to Ostrom, action situations are the social dimensions where organizations and individuals can intensely interact, exchange goods and services, solve problems, and therefore it can "define, predict, explain, analyze behavior within institutional arrangements" (Ostrom, 2011).

The sustainable common pools resources depend upon the participation of local people with appropriate institutions. The appropriate institutions could be placed on rights, rules, and decision-making procedures at all levels of social organizations and with a focused on common pool resources. The roles of institution play a vital role in the sustainability of commons. In the same time, sustainable commons also depend upon the user's participations. The participation of local commons can contribute in different aspects such as community empowerment in planning, implementing and assessing results; resolve conflicts; foster cooperation with government and or outside organizations; regenerate or maintaining the health of natural resources and ecosystems and sustaining local livelihoods and equity (Pimbert, 2004)

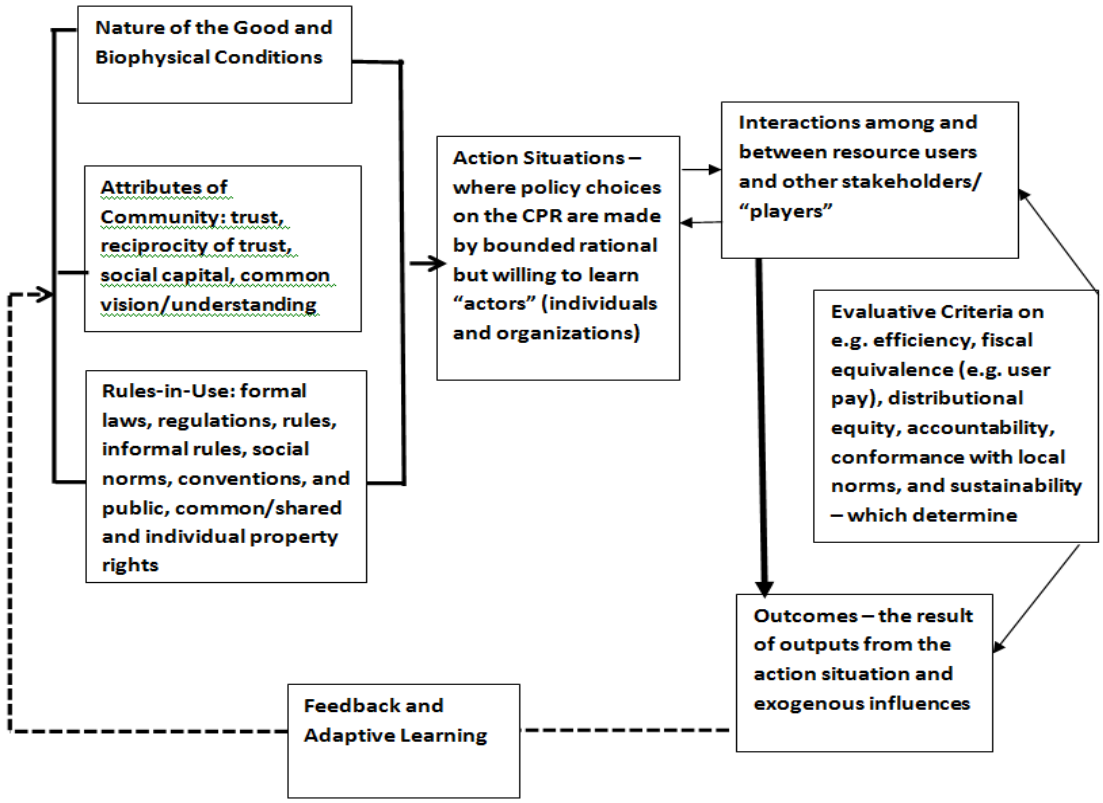


Figure 1 Basic components of the IAD framework

Source: Modified from McGinnis (2011a) and Ostrom (2009:415)

Attributes of community that affect the Action Situation where the policy choice on CPR is made. They include trust, reciprocity of trust, social capital, common vision, and understanding. It indicates that there is a close link between the social capital and the sustainable management of commons. There are several discourses on the relationships between social capital and commons. Social capital can foster collective action by lowering transaction costs and prevent from free-riding (Ostrom, 1994; Putnam, 2001). OECD describes 'social capital' as 'networks together with shared norms, values, and understandings that facilitate co-operation within or among groups" (OECD, 2001:41). The social scientist Robert Putnam has developed a concept of social capital originating from Coleman, referring to 'features of social organizations, such as norms, trust and

networks, that can improve the efficiency of society by facilitating actions" (Putnam 1993:167). More specifically, World Bank has also defined the "Social capital of society includes the institutions, relationships, the attitudes and values that govern interactions among people and contribute to economic and social development (World Bank, 1998). World Bank also mentioned that social capital has a wider meaning which is not simply the sum of the institutions which underpin a society, it is the glue that holds them together (ibid). Moreover, it can also facilitate coordination, trust, and cooperation (World Bank, 2012).

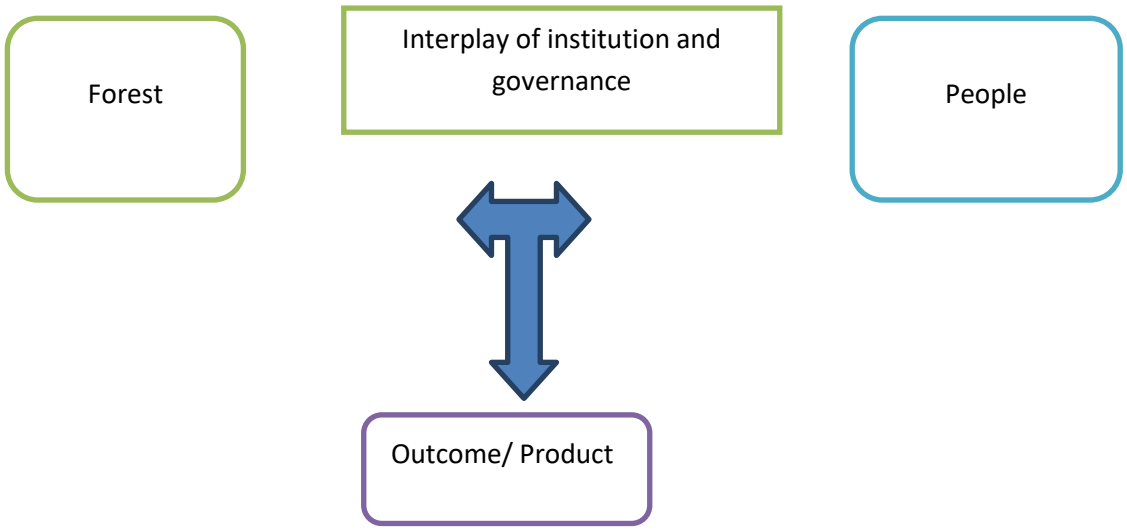
According to Putnam (2000), there are three varieties of social capital such as Bonding, Bridging, and Linking. Bonding social capital links to common identity of people such as family, close friends and people who share culture or ethnicity. Bridging social capital stretches beyond a shared sense of identity, for example to distant friends, colleagues, and associates. Linking social capital is to link with people or groups further up or lower down the social ladder (Putnam, 2000).

There are also very close connections between the social capital and governance. Governance can be defined in different ways such as it is a process (neither a system of rules for an activity); also based on a compromise on society; involves different actors such as public and private; is not necessary formalized and based on an ongoing interaction (Smouts, 1998). Another research conducted by Robert Putnam also shows there is very clear inter-linkage between the social capital and governance. Robert Putnam came up with research in a Northern and Southern part of Italy. He defined that Northern and Central regions of Italy have better delivery of public services and general social well-being as compared to the South of Italy, where governance structures were perceived to be ineffective due to a lack of social cohesion and organization (Putnam, 1993).

Putnam also discovers that social capital provides several benefits such as social capital will allow resolving the collective problem; people often might be better off if they cooperate; it allows communities to advance smoothly where people are trusting and trustworthy; people have the choice to make interactions with fellow citizen and everyday business (Putnam, 2000). On common pool resources, people can manage their commons if they can decide their own governance structure and benefits are higher than cost (Ostrom, 1990; Agrawal, 2008).

The analytical framework of IAD applies to the analysis of different common pool resources in international perspective. It focuses on the institutional contexts that bring various policy outcomes. It asserts that policy selection should not be a kind of 'one size fits all.' Rather, It should be tailored to the diverse institutional contexts. It is quite important for the forestry sector. Problems of common pool resource are serious due to different reason such as alarming rate of deforestation, overharvesting of natural resources, especially given that impact of deforestation and degradation is high on climate change. Several research shows deforestation and degradation are not a technical issue, but rather it is a failure of governance, participation, social capital in communities and can manage by communities if they can decide their governance and institutions (Agrawal, 2008). The IAD framework has been used in different studies to show how local society will organize and collaborate themselves across state boundaries and organization to manage common resources such as forest and fisheries (Ostrom, 1990).

The below chart exhibits the straightforward way of how local commons runs



2.3 Socio-Ecological System (SES) and IAD framework

The Socio-Ecological System (SES) framework developed by Elinor Ostrom to accumulate and synthesize knowledge about social-ecological systems, particularly about self-organization in common pool resources management (Ostrom 2007; 2009). The variables in SES framework such as resource system, governance system, actors, and resource units impacting the structure of action situations and the focal system is embedded in a social, economic and political setting as well as related ecosystems (Ostrom, 2011). These SES multi-tiered frameworks promote more robust and comparable analyses by providing a diagnostic approach to understand the causes of environmental problems. This framework builds on the foundation provided more thorough consideration of the relevant biophysical variables associated with environmental issues on an

interdisciplinary approach that provided equal consideration of both social and ecological conditions (Ostrom, 2011). In this system, biophysical and social factors regularly interact in a flexible and sustained manner. In this research framework Resources users (the individual who use resource) extract resources units (trees, shrubs, and plants) from resource systems (designated protected area). To use the natural resource on the sustainable way, there will be the good architect of local level governance from and within different stakeholders. Ostrom defined that the SES framework can help to understand how different levels of governance influence resource users on various scales and how they affect resource system; it can also contribute to understanding the layers of interactions and outcomes from one set of rules for the governance and use of a particular resource system, it can also help to understand the specific resource in a particular setting, such as what is the likely endogenous development (based on local people vision and criteria) of different forms of governance and outcomes with or without external imposed rules of financing and to understand how stable and sustainable is a particular type of setting of local users, resource system, resource units, and governance system to external and internal disturbance (Ostrom, 2009).

The SES framework identifies five first-tier components within a socio-ecological system. These first-tier components include the Resources system (RS), Resource units (RU), Governance systems (GS), Actors (A) and the focal "Action situations" where Interactions (I) among first-tier components take place to produce outcomes (O) and it interactions with their broader social, economic and political settings (S) and with another related ecosystem as shown in figure (Ostorm, 2007).

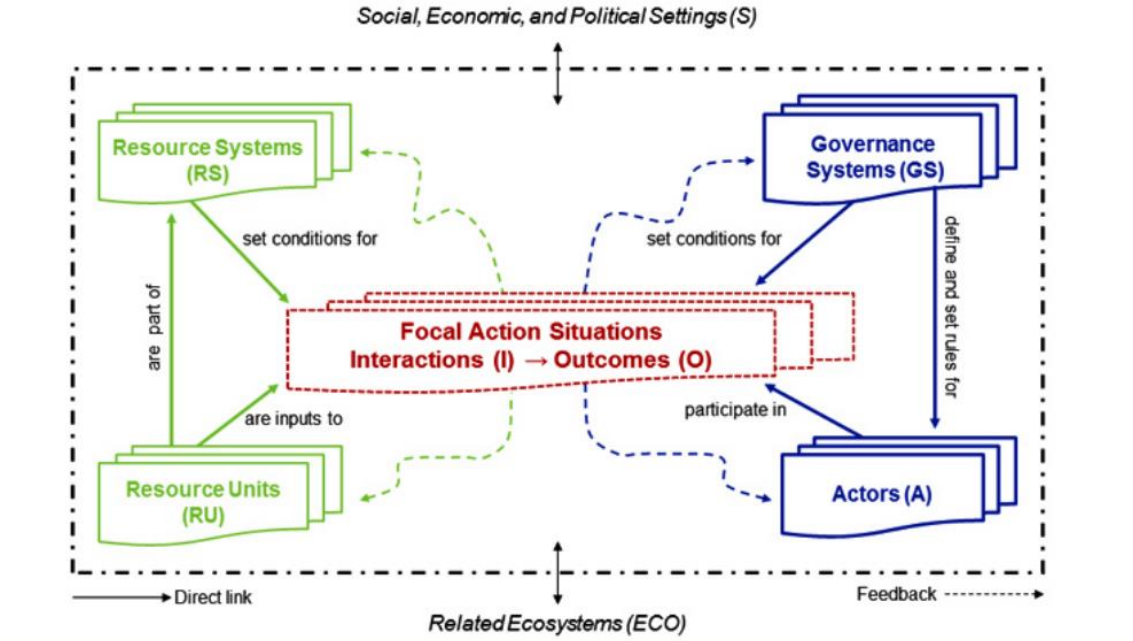


Figure 2 SES framework

Source: Adapted from (Ostrom, 2007 and 2009)

The SES system framework is a nested and complex system, e.g., within each of these large, broad systems there are second-tier variables, and within second tier variables, there are third and frequently fourth and fifth levels (Ostrom, 2011).

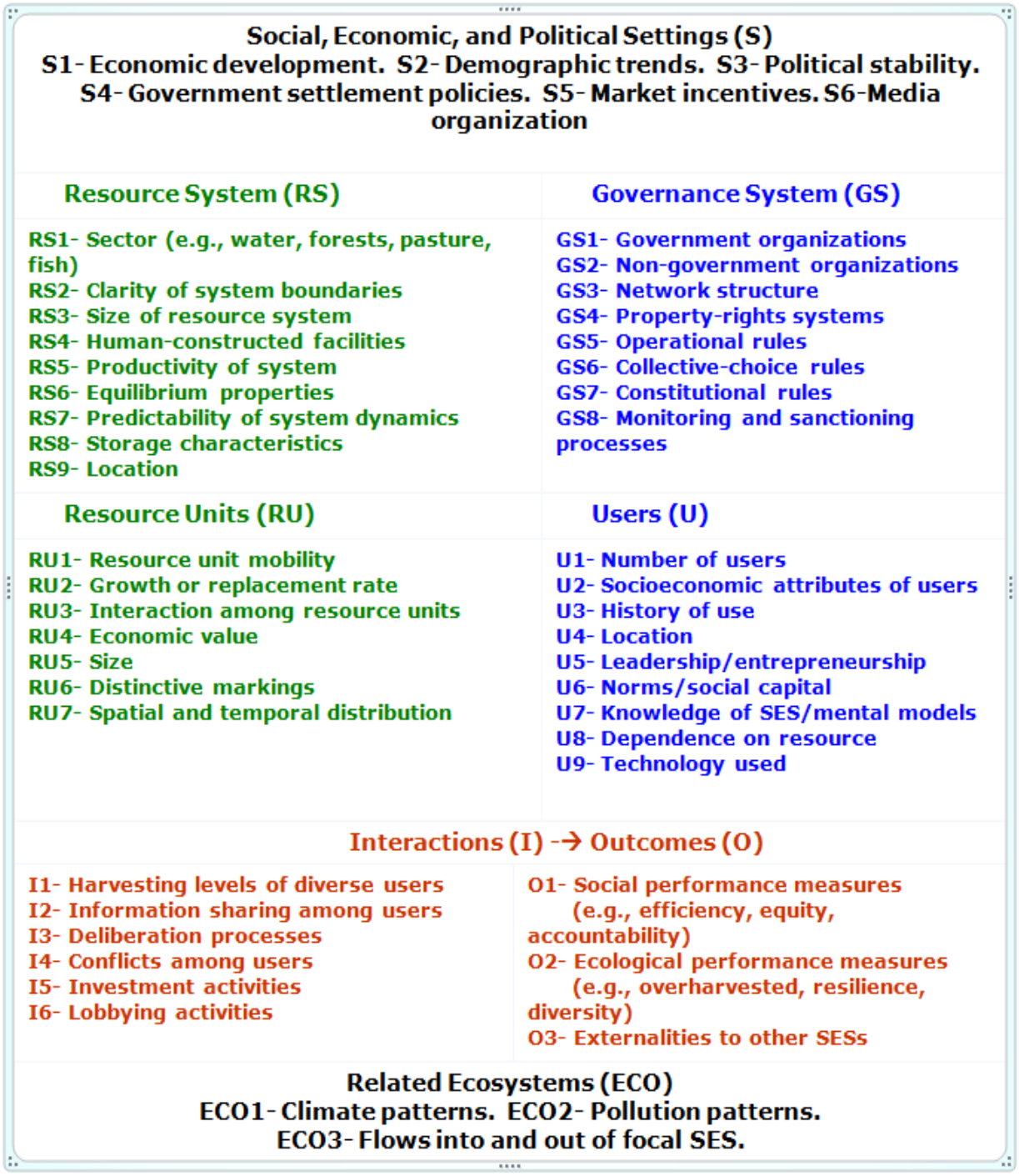
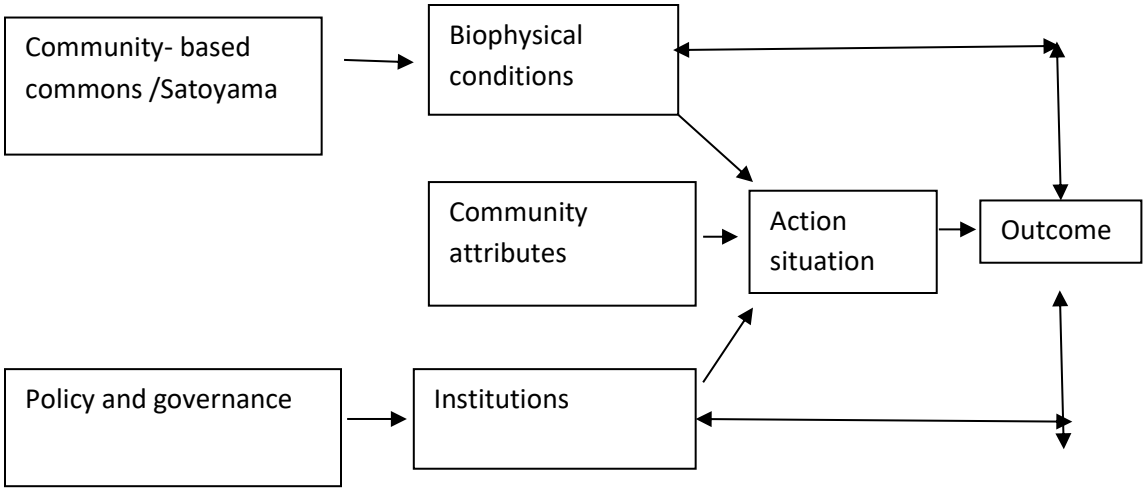


Figure 3 SES second layer framework

Source Adapted from (Ostrom, 2007 and 2009)

2.4 Governing the commons: IAD to SES framework and Eight principles

The community-based management of local commons are successful in some places and not very much successful in other locations. Due to those reasons, the conceptualized framework is essential. The Institutional Analysis and Development (IAD) framework is one of the appropriate lenses to policy development and can recognize sets of actors engaged in an action arena, within which decisions are made about forest use, management, governance and institutions (Ostrom, 1990). The action situation includes providers and beneficiaries of different commons ecosystem services which are characterized by three sets of variables such as biophysical conditions, community attributes, and institutions. The outcomes of community forestry programs depend on the action situation that affected by biophysical conditions, community attributes, and institutions. The action situation is a critical component of local commons. It is a physically limited system (e.g., a place and time) that exists and modified by three essential contextual components: resources, communities, and rules (Ostrom, 1994). The following figure is the Institutional Analysis and Development (IAD) framework adjusted for the study of commons such as community forestry.



In the SES framework action, situation lies in the central core areas that come through the structures of interactions and outcomes, for example, a governance system that includes operation, collective choice and constitutional rules which may affect the likelihood of people to self-organize (Ostrom, 2009). Ostrom listed the eight design principles for the sustainable management of common pool resources (Ostorm, 1990) such as

1. Clearly defined boundaries
2. Rules congruent with local conditions
3. Individuals affected can participate in modifying operational rules
4. Monitors are accountable to the appropriators
5. Graduated sanctions against violators
6. Ready access to conflict resolution mechanisms
7. Recognition of rights to organize, by external government authorities
8. Nested enterprises, where resource is part of an extensive system

This research aims to examine the current status of community forestry program in Nepal by using Ostrom's eight design principles. There is a necessity of understanding the institutional context. To understand the diversity of institutional context, this research used a method of comparative study of community forestry that is also comparing with the similar program in Japanese commons and some selected Southeast Asian countries. Thus, regarding the analysis of institution and governance, research hypothesis is created based on the analytical framework of Institutional Analysis and Diversity and Socio-Ecological System framework with emphasizing the importance of social capital and participation.

2.5 Hypothesis

Ostrom's eight design principles focus on decentralization, self-governance and low interference from the central governmental body. It indicates that participatory, community-based, bottom-up approach is desirable in the sustainable management of common pool resources. With based on those fundamental ideas, the first hypothesis is about participation and institutions. Participation is one of the essential tools in the interplay of "Action Situation" of Institutional and Analysis Development (IAD) Framework and Socio-Ecological Framework (SES). Participation as a variable lies in the actors and governance system in the exogenous variables. Participation in local commons can be measured by the percentage of representation and attendance in the meeting, workshops, general assembly, benefit sharing, etc. However, participation in the only general meeting is not counted as participation, but there should be chance or opportunity to bring agenda, discuss and attempt to make a decision making on relevant topics.

The second hypothesis is on the pattern and structure of social capital in communities. This is a second tire variable in Socio-Ecological Framework (SES) where action situations interplay. People in rural communities engage in the management of CPRs not only for livelihood but also for other values such as human relations and cultural heritage. Multiple values in the management of CPRs are the functioning of social capital in society. To make sustainability a norm of society, it needs to be sustained by the majority of community members. To prove this hypothesis this research conducts field survey both in Nepal and Japan by dissecting in different questions such as a) what the priorities of members of the Common Pool Resources (CPRs) groups are? Moreover, b) Are there any mechanism for the coordination of different interests among the members of the CPRs groups? This hypothesis is critical because community forest in Nepal does not have a stable type of participation from local people. There are strict rules, regulations, and boundary for the

participation of local people in Nepalese community forest. Despite strong governmental policies, there are still several challenges in equitable benefit sharing, exclusion of poor and marginalized group, elite capture in the forest. On the other hand, in Satoyama in Japan, people participate in CPRs conservation more voluntarily with multiple purposes. In the same time, social capital and participatory governance of community forestry system in Nepal are changing according to the political movement, governmental reform, and policy, international discourse and donor agency agendas. However, in the case of Japan, the collective management of Satoyama in Japan has a long history of social capital. It can be observed in all three forms such as bonding, binding and linking social capital. Thus, it has hypothesized that quality of social capital affects the development of participatory governance with different stakeholders such as farmers, the private sector, government and volunteers with cross-scale governance and social interaction.

The third hypothesis considers the institutional diversity in common pool resources policies. For example, The Government of Japan attempts to replicate its bottom-up Satoyama approach in the different parts of the world through the Satoyama Initiative since the Convention on Biological Diversity Conference of Parties (CBD-COP), 2010. It aims to develop societies in harmony with nature through the conservation and advancement of socio-ecological landscapes with three fold approaches; 1) consolidate wisdom on securing diverse ecosystem services and values, 2) integrate traditional ecological knowledge and modern science, and 3) explore new forms of co-management systems (CBD-COP, 2010). However, there exists a significant gap in administrative capacity among local government between developed and developing countries.

CHAPTER 3
CASE STUDY: COMMUNITY FORESTRY IN NEPAL

3.1 Forest in Nepal

Nepal is a landlocked country lies in South Asia. It has an area of total 1,47,181 Sq. Km. which 35.2 % occupied by mountains, 41 % by hills and 23.1 % by fertile plain known as Terai. Nepal has very diverse biodiversity. The country is suffering from the poverty, food crisis, unemployment, environmental degradations, economy crisis, global environmental change, climate change, mountain melting, water crisis, etc. and most of these crises are related to environmental governance and policy. In the same time, Nepal's economy is primarily based on agriculture and natural resources. According to the Central Bureau of Statistics, 2004 around 70% of household energy depend on fuel wood where 31% of Nepal's population lives below the poverty line, and 72% of these individuals are forest dwellers (CBS, 2004). In Nepal, forests are an integral part of the farming system. Nepali farmers bring forest products such as for different purposes such as timber for infrastructure and building fodder for the animal, fuel wood for charcoal and cooking purposes. The National Forest Plan was the first government document to accept the need for people's participation in forest management. In accordance with the plan, the Forest Act, of 1961 was amended in 1977 to hand over government forest to a local unit, and the community forests program has been established. In the starting phase, community forestry aimed only provide essential services such as firewood, timber, leaf litter collection (MPFS, 1989). Then, the Forest Act of 1993 and Forest Regulations 1995 defined that the community forestry is a patch of national forest in Nepal handed over to the local user group for the conservation management and utilization of resources.

Geographically, Nepal is divided into five regions: the high Himalayas, high hills, middle hills, Siwalik range (inner terai) and Terai. The community forestry program is spread across most of Nepal, except the high Himalayas where there is limited forest area. Until now, 17,685 community forests have been handed over to the local community forest user groups where 1,652,654 ha of national forest have been used for 2,177,858 households. Community forests have several positive impacts such as restored degraded forest land; conservation of biodiversity; increased supply of forest products; empowerment of women, poor and disadvantaged groups; income generation; community development activities; and improved livelihood (DoF, 2011). In general community, the forest provides different ecosystem service such as provisioning, regulatory, supporting as well as cultural services. The following table 2 shows the different types of ecosystem services provided by the community forestry program.

Table 2 Ecosystem services from community forest

Environmental services from community forest	**Types of productions**	**How people are getting benefits**
Provisioning services	Timber production Non-timber production	Timber sales Non-timber forest product sales
Regulatory services	Regulations of water quality Erosion control Carbon sequestrations	
Supporting services	Biodiversity conservation	Schemes for biodiversity conservations
Cultural services	Aesthetic and recreation services	Tourism and recreation

Nepal has a wide variation on physiographic zones and different bioclimatic areas. It covers from below 500 m (tropical) sea level to above 5,000 (Arctic high Himalaya). The vegetation is also different in different bioclimatic zones of Nepal.

Table 3 Physiographic and bioclimatic zones of Nepal

Physiographic Zone	Coverage	Elevations (m.s.a.l.)	Bio-climate
High Himalaya	23 %	Above-5000 m	Arctic
High mountains	19 %	3,000-5,000 m	Alpine
Middle mountains	29 %	1,000-3,000 m	Temperate
Siwalik	15 %	5,00-1,000 m	Subtropical
Tarai	14 %	Below 500 m	Tropical

Source: Adapted from Biodiversity Profile Project, 1995

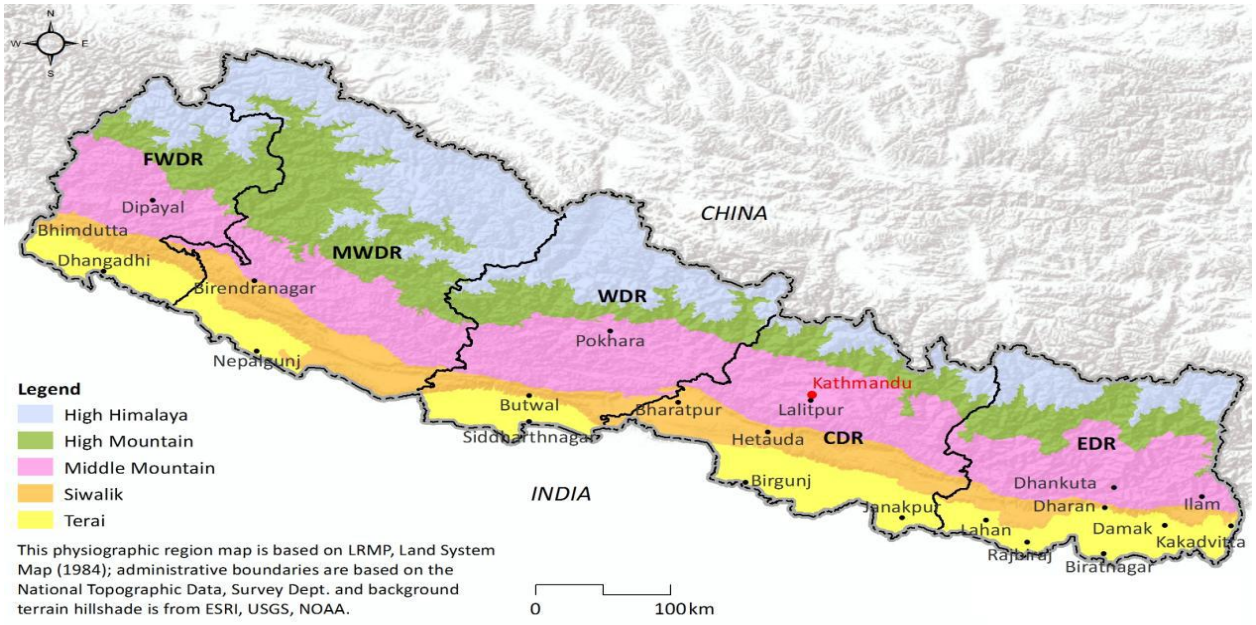


Figure 4 Geographical map of Nepal

Source: Adapted from Department of Forest Research and Survey, Nepal

Biodiversity conservation

Nepal has small geographic scale 0.1 % of land in global but country is disproportionately rich in biodiversity where 874 species of birds, 8750 species of flora, 5052 species of insects, 185 species of mammals, 635 species of butterfly, 3 wildlife reserves, 10 national parks, 1 hunting reserves, 4 conservation area, 17,500 community forest, altitude variations from 87 m to Mount Everest 8,848 m, two UNESCO natural heritage site, four Ramsar site (Bhuju, S. et al, 2007; DoF, 2016). There are different types of management practice for biodiversity conservation such as community forest, protected area, leasehold forest, buffer zone.

Carbon sequestration

Forest cover around 40 % of the total land area of the country (DFRS, 1999) where per capita forest area is 0.27 ha. There are good opportunity by selling a carbon to the international market through the carbon credit. The research shows that carbon market from the community forest will provide financial support to the local community forestry users. The government of Nepal and other non-governmental organizations are working on several projects to design community-based carbon market via Reducing Emissions from Deforestation and Degradations (REDD plus). The concept of Reducing Emission from Deforestation and Degradation (REDD plus) is also one of the Payments for Environmental Services (PES) concept in developing countries which is purposed financial mechanism for carbon credit in developing countries. There are several pilot projects are ongoing for the REDD-plus pilot project mechanism.

Watershed Protection

Nepal is a mountainous country where people are living in High Mountain to the lower level of the country. The country has a two third geographical scale lies in the mountain area. There are several rivers and watershed areas which provide regular water. Although Nepal is rich in fresh water but during the monsoon season there are several high flooding and landslides are happening.

Recreational services in natural resources

Nepal is an excellent destination for the tourists. The attractions were mostly natural resources such as the high Himalayas, mountain, rivers, national parks and conservation areas, and wildife reserves. The torusim activties has contributed a lot on the local economy as well as for national economy. The government of Nepal has made a policy to support for local people by making a bufferzone concept. According to this policy, 30-50% of income from national park or from conservation area goes to the local unit. Those local unit will use this revene in differnet purpse such as infrasturcture development.

3.2 Poverty and forest linkage in Nepal

Poverty is being the development challenges in Nepal where the government has been prioritizing on poverty reduction and employment generation at all the levels. The UNDP defines poverty in Nepal is due to different reasons such as lacking infrastructure, high and fast population growth, the problem on land tenure, deep-rooted culture practice such as caste system (UNDP, 2002; Carney, 1998). Nepali society is very traditional and extremely hierarchal structure by caste, ethnicity, gender, and class. The Nepal living standards survey 2003-2004, which presents the nation-wide assessment, estimates that 31 percent of Nepalese were living below the poverty line

(DFID; World Bank, 2006). According to World Bank, 2004 Nepal has Gross Domestic Product (GDP) US $260 and Nepal is poorest in South Asia and Ranks as twelfth poorest in the world. The following figure 5 shows the trends in poverty incidence for Nepal from 1995-2010.

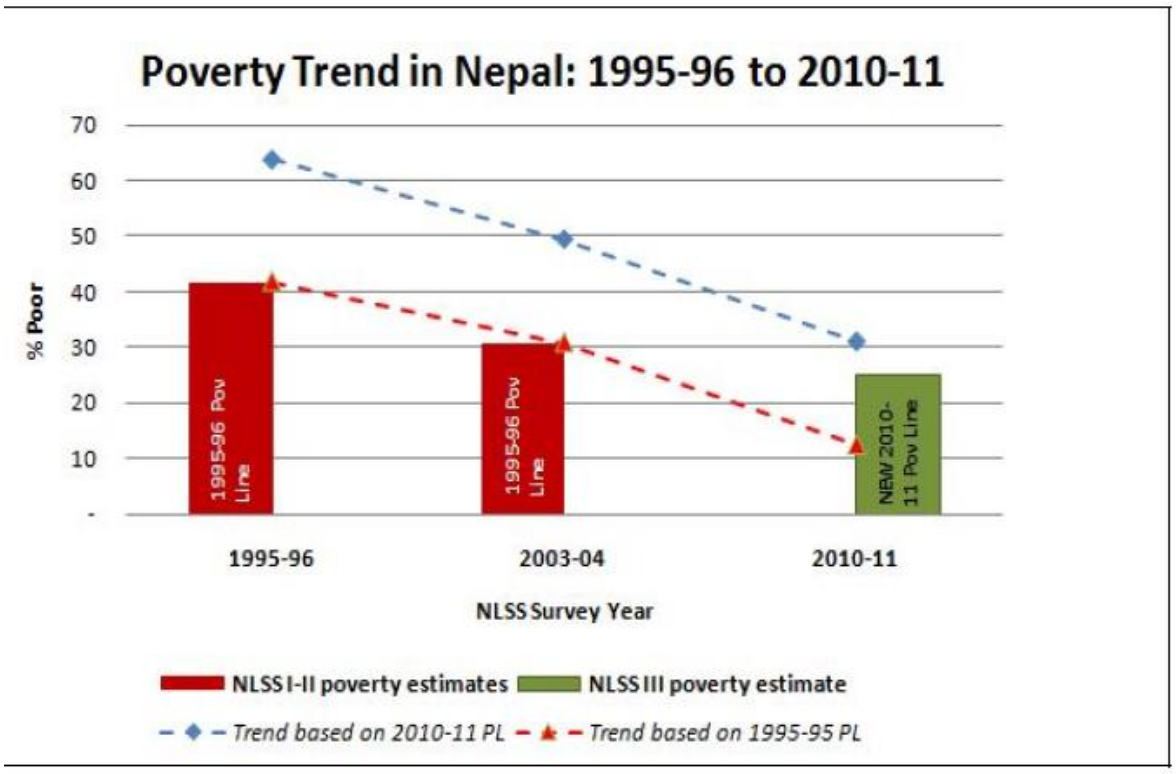


Figure 5 Trends in poverty incidence for Nepal

Source: Adapted from CBS, 2011

The data from Central Bureau of Statistics Nepal (CBS)[4] 2005, poverty of Nepal is linked with the agriculture wage household where 67% of all poverty is falling in this category. Likewise Nepalese farmers are dependent upon forest for income generation like as village carpentry, handicrafts, wood carving labor work, bamboo and cane's good manufacture, production of cloth rope bags

[4] CBS 2011 data is the latest one. The Government of Nepal does Population census on every ten year

net and fiber, sport good, alcohol from grain, fruit and flower, blacksmithing, fruit jam, charcoal making, handmade paper making, medicinal herb processing, gum and resin, mushroom farming, sericulture, bee farm, vegetable farming, maize millet and rice cultivation, Fruit and berries, Poultry farming (Mahat, 1987). According to the literature reviews, it has seen that poverty is direct proportionality with biodiversity. Many people in Nepal are living in poor sanitary conditions with inadequate access to physical conditions. The development of infrastructure like road, drinking water supply, teacher's salary, etc. can be assisted by the money generated from Payment for Ecosystem Services (PES) schemes. In the context of Nepal, the poverty is the main driver to deplete natural resources and generate negative externalities. Paying to the poor through the Payments for Environmental Services mechanisms can improve environmental management activities and generate benefits for their households and other different local or international environmental services. It has also seen that in some countries PES programs have the potential positive impact on the price of food, labor, and land (increase labor demand) which could have considerable effects on the poor people and be effective in Nepal too.

3.3 Socio-economic dimension of Nepal

Nepal is one of the low-income countries in the south Asian region. The government of Nepal is conducting population survey in every ten years. According to Central Bureau of Statistics (CBS) in Nepal, the first population census was conducted in 1911 with the population of 5,638,749 and the latest in 2011 with the population of 26,494,504 with the growth rate of 1.35 per annum with compare to 2001 (CBS, 2011). The country population is composed of multi-ethnic diversity. The population is heavily dependent upon the agriculture activities. The following table 4 shows the population census by each year with the total population, population change, and annual growth

rate. At the beginning of 1911 until 1930 the population growth rate was very low with negative growth rate. The population increase started in the 1940s. The latest data shows the annual growth rate is 1.35 in 2011 (CBS, 2011).

Table 4 Population trend from 1911 to 2011.

Census Year	Population	Population change	Population change in %	Annual exponential growth rate %
1911	5,638,749	-	-	-
1920	5,573,788	-64,961	-1.15	-0.13
1930	5,532,574	-41,214	-0.74	-0.07
1941	6,283,649	751,075	13.58	1.16
1952/54	8,256,625	1,972,976	31.40	2.28
1961	9,412,996	1,156,371	14.01	1.64
1971	11,555,983	2,142,987	22.77	2.05
1981	15,022,839	3,466,856	30.00	2.62
1991	18,491097	3,468,258	23.09	2.08
2001	23,151,423	4,6660,326	25.20	2.25
2011	26,494,504	3,343,081	14.44	1.35

Source: Adapted from CBS, 2011

The following table 5 shows the population data in 1990, 2000 and 2014. We can observe that the population increases sharply from 18.1 mln to 28.1 mln. The data also demonstrates the employment in agricultural activities which was 81.2 % in 1990 but decreased to 65.7% in 2000.

Nepal also lacks in the productivity of the materials. The data shows that there is a huge difference in the export and import in Nepal. In 2014, Nepal export amount of 170 million US $ but at the same time, the country fully depended upon the import which was worth value of 829 million US$.

Table 5 Socio-economic data of Nepal

Dimensions	Year		
	1990	2000	2014
Population, total (mln)	18.1	23.2	28.1
Population, rural (mln)	16.5	20.1	23.1
Employment in agriculture (%)	81.2	65.7	
Employment in agriculture, female (%)	90.5	72.8	
GDP per capita (US$, PPP)	1240	1577	2173
Food export (mln US$)	39	28	170
Food imports (mln US$)	69	168	829

Source: Adapted from Food and Agricultural Organization (FAO, 2017)

The CBS report in 2011 mentioned that around two-third of the household (64 percent) use firewood for daily cooking and cow dung 10.38 percent. In the rural part of Nepal, more than 90 % household use firewood (CBS, 2011). Those fuel woods are collected from the community forest as well as national forest. The following table shows the fuel wood collection according to the households. This data shows that still, huge households depends upon the fuel wood collection especially in the rural areas. The following Table 6 shows the fuel wood collection in the different geographical area such as rural and urban areas.

Table 6 Fuelwood collection in the different geographic area

Area	Total Household	Wood/fire wood	Kerosene	LP gas	Cow dung	Biogas	Electricity	Others
Nepal	5,423,297	3,470,224	55,610	1,140,662	563,126	131,596	4,523	57,556
Urban	1,045,575	268,643	20,990	707,674	15,776	19,121	1,255	12116
Mountain	363,698	344,843	1,990	11,143	1,517	792	1,169	2244
Hill	2,532,041	1,696,376	27,554	744,086	2,810	41,147	2,174	17,894
Terai	2,527,558	1,429,005	26,066	385,433	558,799	89,657	1,180	37,418

Source: CBS, 2011

3.4 History of forest management in Nepal

The history of forestry system in Nepal is specifically divided into three phase. Those three phases are before the Rana Regime [5], the decade of the 1950s to 1970s and after 1970s/era of decentralizations/ community forestry era.

3.4.1 Before the Rana regime

The first phase is before the 1950s where Rana regime has occurred. At those times, there was a lacking of democracy and education percentage is also very low. There were very few

[5] The Rana regime is a dynasty started from 1846 until 1951. At those period, Rana made a prime minister and other government positions hereditary.

opportunities for local people to participate in governmental structures. At those times, Rana regime distributed the forest and land haphazardly. Then, most of the resources were captured by the socially elite people and community who holds the local economy. Those elite communities converted forest lands into agriculture land. That farm lands distributed to the local people and collect revenue from the elite group. Gilmour and Fisher (1991) described that the Rana family controlled the forest management "around 1800 to mid-1900 most of the forests and people had limited management, conservation, and utilization rights through the customary law[6]" (Gilmour and Fisher, 1991). This deforestation and degradation were not in under control because the newly formed democratic government has to lack of experience on establishing new institutions and the legislation was also not well discussed at the local level. The rules have put substantial charge and penalties but unable to monitor resources due to several reasons such as lacking financial support and workforce. In the same time, the country did not have electricity and other forms of energy such as fossil fuel in most of the places. Forest fuelwood is the main source of cooking and heating which makes a heavy demand on forest, fuelwood and timber.

Another reason for deforestation at those times is to export a massive amount of timber to India[7] (Joshi, 1993). At that periods, India was colonized by the British, and they need a huge amount of timber for infrastructure development. The southern belt of Nepal has a high deforestation during the 1950s.

[6] Customary law is an unofficial law which is basically designed according to customs.

[7] At those time period India was colonized by British. They need a huge amount of timber for construction.

3.4.2 Decade of 1957s to 1976s

With the beginning of the democracy and elected government, the government of Nepal introduced the nationalization act in 1957. The government was able to control those forest resources into government treasury but failed for conservation, utilization, and management. The government has introduced top down rules and regulations. It has failed due to limited enforcement of rules and regulations as well as lack of proper distribution of forest resources to local people. It created more challenges for residents in utilizing and managing the natural resource. In those times, the deforestation and degradation accelerated rapidly because most of the people are forest dependent for different purposes such as fuelwood and timber. Their research from several scientists such as Eckholm (1975) noted, "Nepal's steep mountain slopes are denuded, the heavy monsoon rains cause accelerated soil erosion, landslides, increased runoff, and sediment transfer onto the plains. If the trend continues on this way, Nepal will lose half of its forest resources in thirty years. The second highly cited work shows World Bank (1978) stated; "If this continuing deforestation in the hills did not stop. This would lead to a loss of all open forests in Nepal by the year 2000. The researcher, Ives, and Pitt (1988) defined the environmental problem in Nepal is severe. If these continue, mountain desertification will increase harmful downstream effects and, in the worst case, Nepal will flow down to the Ganges River by the year 2000".

3.4.3 After 1970: The era of decentralization

The era after the 1970s is the time of decentralization and participative in forestry resources. There were several formal and informal discussions held after the failure of top down conservation approach. The following table shows the historical events starting from 1988. The main policy for

implementing community forestry is a Master Plan for the Forestry Sector enforced in 1988. Then there were several laws and regulations according to the needs with in revision format.

Table 7 Historical events of policy developments in community forestry in Nepal

1988: Master Plan for the Forestry Sector (provision for community forest with focusing in mountain area)
1993: Forest Act gives rights to the Community Forest User Groups
1995: Forest Regulation (rule for implementation rules of community forestry)
2001: Implementation of Community Forestry Guideline.
2009 onward: Several Community Forestry International and National Workshop and Conferences for community forestry enforcement, rights of user groups. There was also huge discussion on how can community forestry contribute for climate change adaptation and mitigation, carbon credit in the international market such as REDD Plus mechanisms.

When the decentralization was started in the same time community forestry program has also started since the 1970s. In 1987, the National Community Forestry Conference held in Kathmandu in 1987 which as the official beginning of community forestry in Nepal (Gilmours and Fisher 1991; Pokharel, 1997). It was followed by the Forest Sector Master Plan of 1988 became a fundamental guideline for providing rights to poorer communities (Granner, 1997). The Master plan has different and wide objectives such as to fulfill the people's basic livelihood need such as fuelwood, timber, fodder, and other forest resources sustainable way; to make a contribution to food production with an effective interaction farmers and forest practitioner; to conserve the forest and land from degradation by soil erosion, high rainfalls, floods, landslides, and other natural hazards; to protect and conserve the ecosystem and genetic resources; to contribute to the growth

of national and local economy by managing forest resources and the forest based industries and creating opportunities for income generation (MPFS, 1988). The MPFS also has a specific objective of promoting the active participation of local people and promote equitable benefit sharing to alleviate poverty and fulfill basic requirements of people (Bhatta, 1998). In the 1990s, the Forest Act of 1993 and Forest regulations 1995 have introduced by the government of Nepal. Those act and regulations also became a baseline for community forestry because those acts and regulations have defined detail roles, responsibilities of local people and government. The following table 8 shows the policy paradigm shifts with the timeframe. The following policy paradigm shift modified from Ojha, 2007.

Table 8 Policy paradigms shift with timeframe

Policy Paradigms	Timeframe	Key Policy change
Privatizations	Before 1950	No definite rules and regulations as well as formal policy Elite capture of forest resources mostly from Rana Informal and unwritten system
Nationalizations	1957-1976	Private forest and declared land tenure from policy Nationalization act 1957 and Forest Act 1961 and Forest Protection Special Provision Act 1967

Participatory and decentralizations	1976 to onwards	National Forestry Plan 1976 Master plan for the forestry sector 1989 Forest Act 1990 and Forest Regulations 1993 Community Forestry Guideline 2001

3.5 Deforestation and degradation in Nepal

The cause of deforestations and degradations in Nepal are diverse, complex and interlinked with different issues mostly with poverty and unemployment. The deforestation and degradations are very much inconsistent. The caused of deforestation in mountain and Terai are very much different. In the southern part of Nepal, the government made a policy for Malaria eradication program in 1960 and the resettlement program in the Terai area. This causes huge deforestation and destruction of the forest. The data shows at that period the deforestation and degradation were around 3.68% per annum (FAO, 1982). The other some common reasons are migration from mountain areas to the southern belt for searching different livelihood objectives. The government also started to make an infrastructure by making a cutting a forest. According to Dangi, to make those facilities, 103,968 ha of forest in the Siwalik and Terai has chopped down, and another 100,000 ha of forest encroached between the 1950s and mid-1980s (Dangi, 2009). According to the research conducted from ICIMOD, the rate of deforestation between 1978 and 1991 was in between 1.3% and 2.3% in Terai and hilly regions respectively (ICIMOD, 2007). This was also high with the country size as well as population dispersion. The other reasons of deforestation and degradation are shifting cultivation, overgrazing, forest fire, illegal chopping, agricultural farming,

and construction different infrastructures such as roads, hydroelectric power, and collection of timber (Karki, 2004). The Acharya and Dangi mentioned that the other factors of deforestation and degradation are mainly from encroachment, forest fire, and shifting cultivations which encroaching 100,000 ha of forest (Acharya and Dangi, 2009). They also mentioned that the other drivers are fuel wood removal, timber removal, fodder collection, leaf litter collection, over exploitation of medicinal and other valuable species, encroachment, overgrazing, development activities, uncontrolled wildfire, invasive species in both mountain and Terai. (Acharya and Dangi, 2009).

The following table shows the major direct threats to forest diversity in Nepal. The table demonstrates that loss of habitat is increasing in the Siwalik and Tarai regions.

Table 9 Major direct threats to forest diversity in Nepal

Physiographic Zone	A	B	C	D	E
High Himal			increasing	constant	
High Mountains	increasing	constant	increasing	increasing	increasing
Middle Mountains	decreasing	decreasing	constant	increasing	increasing
Siwalik	increasing	increasing	constant	constant	increasing
Tarai	increasing	constant	constant	constant	increasing

Impact
High
Medium
Low

A =Loss of habitat; B = Degradation of habitat; C = Poaching and illegal trade; D = Human-wildlife conflict; E = Invasion by alien plant species.

Source: Adapted from Nepal Biodiversity Strategy, 2002

As shown in figure 6, Geist and Lambin (2001) provide the different proximate cause of deforestation such as infrastructure development, agriculture expansion, forest product extraction, other factors such as geological fragility, topography, natural calamities, increasing invasive

species, political transition and underlying causes such as demographic factors, economic factors, governance factors and some cultural factors.

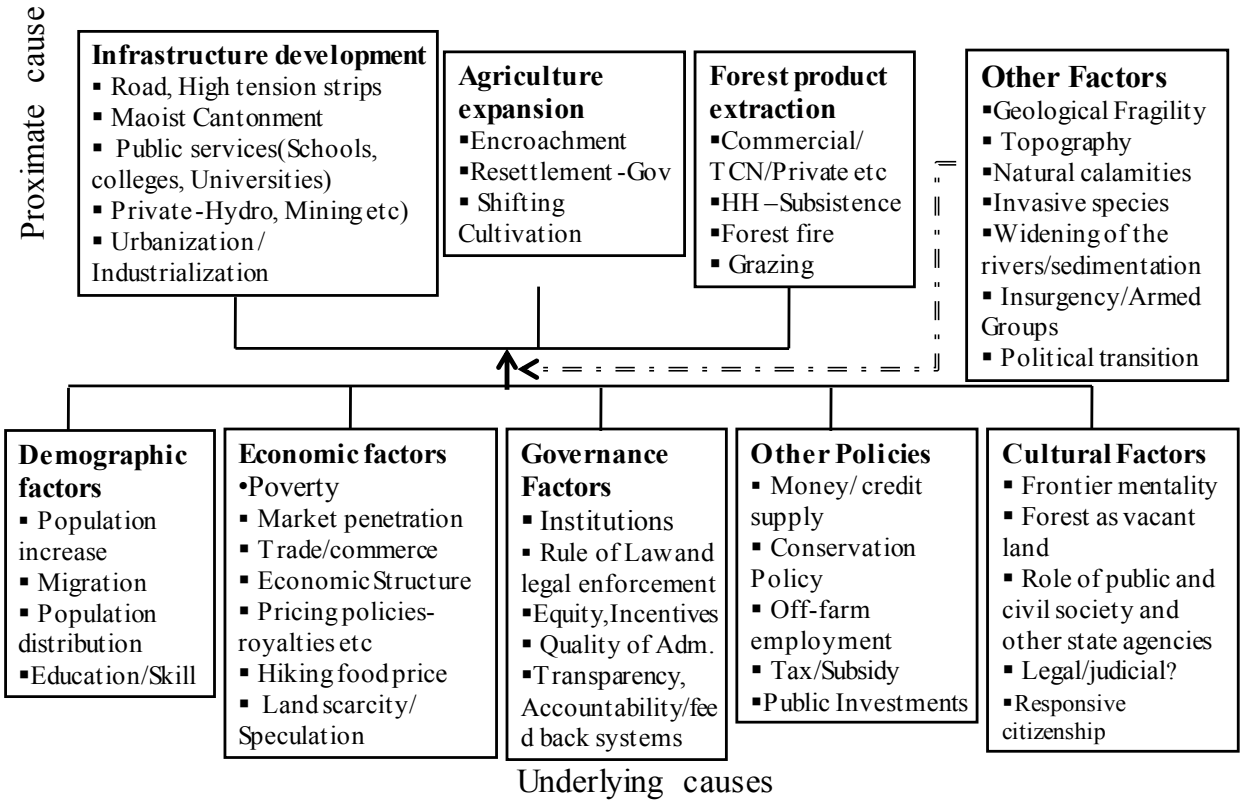


Figure 6 Drivers of deforestation and degradations

Source: Modified and adapted from Geist and Lambin, 2002

3.6 Funding for community forestry program

Nepal heavily depends upon the foreign aid for development as well as other activities such as agriculture, forestry, and environment. In a case of forestry, more than 60% of developmental activities in community forestry is funded by donor agency (Department of Forest, 2017). The forestry program in Nepal is supported by the huge amount of funding from different countries

and bilateral organizations. Currently, the major projects are focused on community forestry governance, institutions development, empowerment of women and different ethnic groups and training related activities. Table 10 shows the project name with date, budget and donor agency.

Table 10 The program, funding amount and donor agency in forestry program

Project name	Date	Budget	Donor agency	Funding process
Chure Conservation program	2012	Nrs 260 M	Nepal Government	Indirect
Forest Resources Assessment	2009-2014	Euro 4.7 M	Finland	Direct Funding
Participatory Watershed Management and Local Governance Project	2009-2014	US$ 5 M	Japan	Direct Funding
Improving research capacity of forest resources information technology	2010-2012	US$ 0.4 M	Finland	Direct Funding
Forest Preservation Program Nepal	2010-2012	Yen 600M	Japan	Direct Funding
Multi Stakeholder Forestry program	2012-2015	US$ 61.8 M	Switzerland, Denmark, Finnish	Indirect and Direct funding
Technical Assistance for Leasehold Forest and Livestock Program in Nepal	2010-2014	US$ 3.5 M	Finland through FAO	Direct
Western Terai Landscape Development Project	2005-2012	US$ 10.5M	GEF, UNDP	Direct
Conservation and Sustainable Use of Wetland	2007-2012	US$ 2.4 M	GEF, UNDP,	Direct
Leasehold Forest and Livelihood Development Program (Second Phase)	2005-2013	US $ 3 M (2M SDR)	World Bank	Direct
Strengthening Institutional Capacity of DNPWC for the Effective Management of Mountain PAs	2011-2014	US$ 0.5 M	World Bank	Indirect

REDD Forestry and Climate Change	2009-2012	US$ 3.6 M	World Bank	Indirect
PPCR Component 1: Under negotiation	2013--	US $ 41 M	ADB	TBD
PPCR Component 5: Under negotiation	2013-	US$ 5 M	WB	TBD
Kailash Sacred Landscape: Under negotiation	2012	US $ 1 M	ICIMOD	Direct `

Source: Data Collected from Website of Ministry of Forest, Nepal in 2017

The Government of Nepal also established treaties with several international organizations. The objectives of those treaties are the collaboration in forest management at international level, wildlife conservation, sustainability of forest, etc. According to the Ministry of Forest and Soil Conservation (MoFSC) of Nepal, 11 international organization and associations have established treaties with Nepal until July 2015 (MoFSC Nepal, 2017). These organizations support capacity building and governance improvement under the Ministry of Forest and Soil Conservations.

Table 11 List of organizations

S.N.	Organizations	Date of membership
1	the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	June 12, 1975
2	Ramsar Convention	April 17, 1987
3	International Union for Conservation of Nature	1975
4	GTF (Global Tiger Forum)	1994

5	Asia Protected Areas Partnership	18 November 2014
6	International Tropical Timber Organizations (ITTO)	1997
7	International Union of Forest Research Organization	
8	Conservation on Biological Diversity (CBD)	Sept. 15, 1993
9	Regional Space Application Program (RESAP)	
10	International Network for Bamboo and Rattan (INBAR0	17 Dec. 2002
11	Asia Pacific Association of Forestry Research Institutions	

Source: Adapted from Ministry of Forest and Soil Conservation, Nepal. Updated on July 2015

3.7 Institutions involving in the community forestry

Institutions is a set of working rules that determine who can make decisions and involved in an action, what relations are taken between the actors, and what actions are allowed or constrained (Ostrom, 1990). It can also be described as being composed of sets of formal and informal rules and norms that can shape interactions of human with others and nature (Agrawal and Gibson, 2001). There are several actors in community forestry that include the government (district, local), the small committees and forest user groups. The donor agencies and other nongovernmental organizations also play crucial roles in the governance and institutionalizations of community forestry. The donor agencies have provided several levels of training and awareness programs for rural people. There are several governmental institutions to implement community forestry program in Nepal. The Ministry of Forests and Soil Conservation is a policy designer and

implemental government authority, and the Department of Forest is the main implementing agency. Also, the Departments such as Department of Forest Research and Survey and the Department of Plant Resources involved in the technical backstopping of the national program. Several civil society organizations, private institutions, community forestry federations and networks, development partners or donors are also involved in the program as well.

The government of Nepal has played an active role in the promotion of community forestry. The role of government is to give property rights to local user institutions and provide legitimacy to the local user groups. District Forest Office (DFOs) of government maintains authority over forests to prevent local users from mismanagement. The District Forest Office support and facilitate the forest user's activities by giving them legal rights (Gilmour and Fisher, 1998). The District Forest Office will play a mediatory role enforcing local rules and regulations. Solely DFO gives a land to the user groups and user groups have responsibility for the conservation of lands, forest, and other resources. The term limits for the community forest depend upon the agreement but five or ten years. During the agreed period the District Forest Office monitors resources. The forest user groups are fully autonomous organizations, but the district forest office will hold all the power for regulating constitutions and operational plan.

The following are some major governmental and other institutions.

Government Institutions

Ministry of Forest and Soil Conservation (MoFSC): This Ministry of Forest and Soil Conservation is the main governmental organization where other governmental bodies are under the MoFSC such as Department of Forest, District Forest Office and other local forest-related

governmental organizations. This organization is the main body to formulating and designing the policy, rules, and regulations for community forestry institutions.

Regional Directorates of Forest

Regional directorates office comes under the Ministry of Forest and Soil Conservation. This is a regional body. The organizations are responsible for planning and evaluation of community forestry institutions.

Department of Forest

The Department of Forest also comes under the Ministry of Forest and Soil Conservation. This body is the main policy executing agency. The main objectives of the Department of Forest are to develop concepts, policies, acts, rules.

Department of Forest Research and Survey

The Department of Forest Research and Survey Division's main role is to research in the forestry sector. This organization conduct the forest research and disseminate to the public.

District Forest Office

The District Forest Office comes under the Department of Forest. The District Forst Office has a district office in most of the except Manang districts. The DFO played a vital role in monitoring, evaluating, designing budget and implementing community forestry program. The DFO office will mobilize the people, help to prepare community forestry constitution and operation. They also transfer different technical skills such as nursery preparation, forest fire control, forest management, and harvesting, etc.,

Range Post

The range post offices are the primary governmental office. They conduct several tasks such as identification of community forestry, technical assistance to the community forestry user group to prepare the constitution and operational plan, monitoring and evaluation of community forestry and providing technical assistance for different issues such as fire line management, sustainable management of community forestry, renew of community forestry/ The most of the task are also depend from the DFO Office. Mostly, they follow the rules and regulations from DFO.

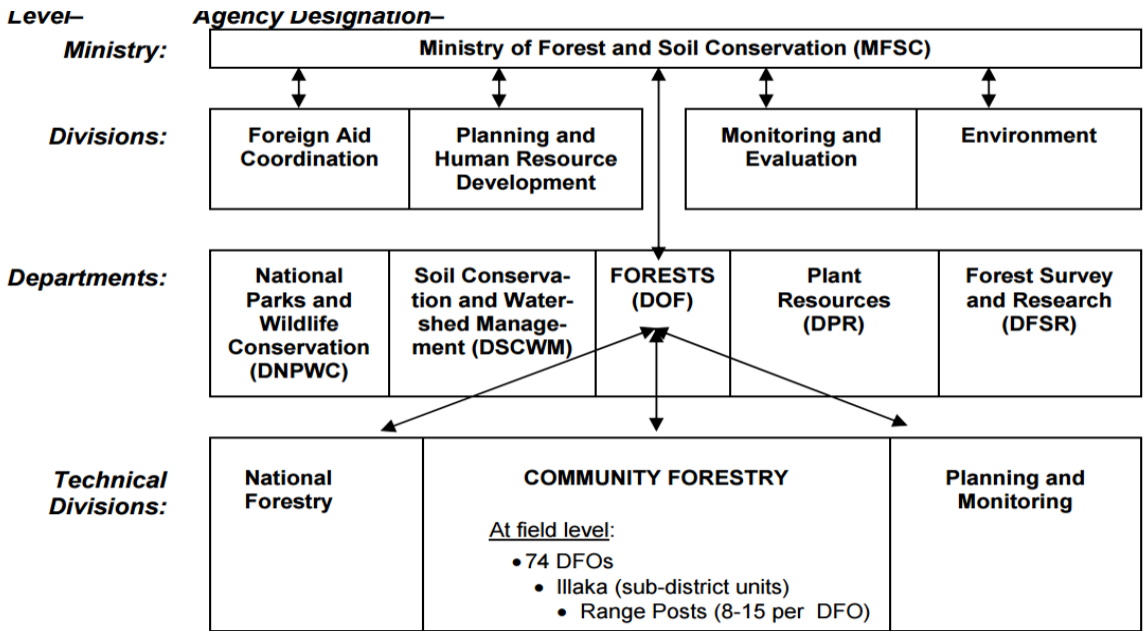


Figure 7 Community forestry implementing agency

Source: Ministry of Forest and Soil Conservation and Department of Forest, Nepal

Forest Act 1993 and Forest Regulations 1995

The Forest Act 1993 and Forest Regulations 1995 are the main fundamental policy documents for community forestry implementation. The Act and Regulations give the rights to Community Forest Groups in managing their community forest. According to the Forest Act 1993, District Forest

Office may hand over any part of the national forest to the communities, who are traditional users of the resources but the land ownership remains with the state, while the land use right belongs to the Community Forest User Groups (Forest Act, 1993). All management decisions especially forest management are taken by the CFUGs. Each household is recognized as a unit for the membership, and every member has equal rights over the resources. The Forest Act defined that the CFUGs is an self fuctinoing, autonomous body. There are mutually recognized use-rights as equitable distribution of benefits. The state provides technical assistance and advice. The national forest can be handed over to CFUGs irrespective of the size of forest and number of households (Source: Adopted from Forest act, 1993).

The Community Forestry User Groups (CFUGs) can accumulate their fund granted from the government of Nepal and other local institutions, by saleing the community forestry products and the amount received from other sources such as fine. CFUG can use their funds for any community development works.

The Forest Regulations of 1995 describes several policys with respect to Forest Act, 1993. It defines specific policy such as user groups are allowed to plant short-term cash crops such as non -timber forest products or medicial plants; User groups can fix prices of forestry products for their use. CFUGs can transport forest products under by having a permit anywhere in the country. In a case of forest offenses and vialotations of rules and regulations, CFUGs can punish their members according to their constitution and operational plan and those constitution and operational plan are prepared from the general assembly (Source: Adopted from Forest Regulations, 1995).

Community Forestry User Group (CFUG)

According to the Forest Act of 1993 gives a legal basis for the groups to function as autonomous institutions in the management of forest resources. The followings are some of the major statutory provisions that provide a strong institutional basis for forest user groups:

The user group shall be an autonomous corporate body that has perpetual succession.

The user group shall prepare a work plan for the community forest.

The user group shall collect, sell and distribute the forests products which are available.

The user groups are allowed to find ways to achieve financial sustainability.

The Act also requires that user groups spend one-third of their income on forest management.

All the forest user groups are voluntarily united under the umbrella of the Federation of Community Forestry Users of Nepal (FECOFUN) to ensure their rights are protected.

(Adopted from forest acts 1993 and forest regulations 1995)

The Federation of Community Forestry Users of Nepal (FECOFUN)

The Federation of Community Forestry Users of Nepal (FECOFUN) established in 1995. This is a formal network of community forestry user group's deal with the rights of community forestry users, to strengthen local capacity, to establish linkages and to lobby on behalf of the forest users. This is an autonomous, non-profit, membership organization that is accountable for community forestry user groups under an integrated and uniform policy. It has three different organizations structures such as 1. Local FECOFUN 2. District FECOFUN and 3. National FECOFUN. The tenure of those three offices will have four years term. The FECOFUN office can have a separate

fund by different moods such as amount received from fees, such as membership, entry and renew fees, etc.; grants, donations, and assistance; amount collected from Forest User Groups as a service charge and amount selling from the publications.

The following chart shows the how local FECOFUN is linked with the district level and national level. There is an assembly in each sector from local to the district and national level. In each of the level from local to national, the committee can also have an advisor and special committees.

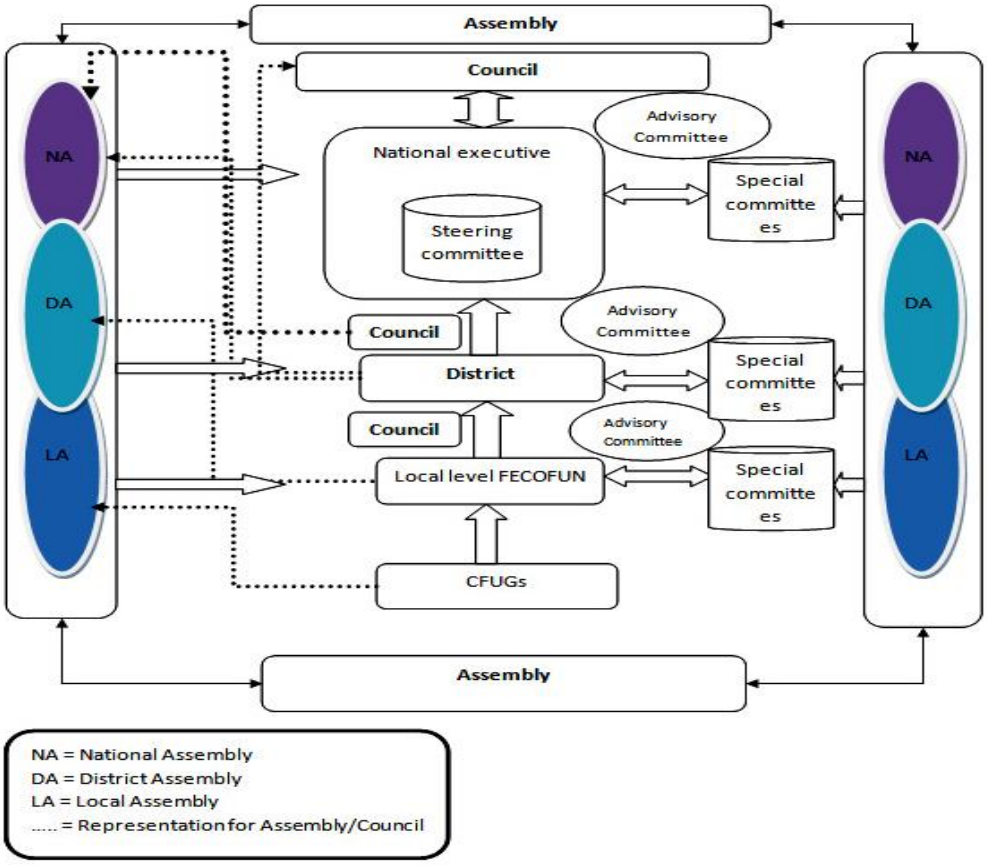


Figure 8 Framework of FECOFUN from local to national level

Source: Adapted from FECOFUN website http://fecofun.org.np/orgstructure.php

Till now among 17,000 community forests, more than 13,000 community forest user groups are affiliated with more than 8.5 million community forest user groups. The FECOFUN Nepal has wide partner organizations in international and national. In the international level FECOFUN Nepal is able to collaborate with some of the renowned agencies such as Rights and Resources Initiatives, Winrock International, World Wildlife Fund, Norwegian Agency for Development Cooperation's, International Center for Integrated Mountain Development, Swiss Agency for Development and Cooperation, Department of International Development, GIZ, International Institute for Environment and Development etc. Similarly like in national level FECOFUN has good collaborations with NGO Federation, Dalits NGO Federation, Community-based forestry supporters networks, Asia Network for Sustainable Agriculture and Bioresources, Nepal Federation of Indigenous Nationalities, Nepal forum of Environmental Journalist, Rural Reconstruction Nepal. It also has an excellent network with the Global Alliance of Community Forestry, Peoples Parliament, Policy Advocacy Forum and Confederations.

The FECOFUN also runs several projects in collaborations with different international donors. The most resent projects are Hariyo Ban (Green Forest) program, Transiting to Green Growth: Natural Resources in Nepal, REDD Plus governance projects, Certification and sustainable marketing of non-timber products projects, policy advocacy for people's rights over natural resources, forest and farm facility program, etc. These projects mostly are focused in climate change, biodiversity conservation, and utilization, livelihoods improvements, capacity building of forest user groups, carbon trade through the REDD Plus projects, forest certifications issues focusing on non-timber forest products, creating awareness through the community rights, land tenure issues, improving good governance, enhancement of different minority groups such as

women, indigenous peoples, etc. Those projects were focused in different geographical areas from mountain to the lower belt of Nepal.

The following chart shows the members list according to the regions. The highest members were in western region which is 3573, and the lowest members are from 1793 from far-western regions (FECOFUN, 2017).

Table 12 Members affiliated with FECOFUN according to regions

Members Distribution of regions	Number of CFUGs
Eastern region of Nepal	2497
Central region of Nepal	3338
Western region of Nepal	3573
Mid-Western region of Nepal	2327
Far Western region of Nepal	1793
Nepal	13,528

Source: FECOFUN, 2017

The FECOFUN is expected to bring some outcomes from the project, advocacy, and other active actions. The major results of FECOFUN are minimizing tax on community forestry products, forcing the government to withdraw the amendment of the Forest Act in a centralized way, empowering Terai community forest user groups to refrain the government from implementing top-down forest management approaches, the five year government plans, forcing the government to stop expansion of conservation areas in existing or potential community forest area, forcing the

government not to license private leased forest and mining factories on existing potential community areas, controlling illegal use and exploitation of valuable forest resources (Ojha et al, 2007).

Table 13 Forest policy decision and contribution of FECOFUN in Nepal

Forest Policies and Decisions	FECOFUN arguments from Civil Society Perspectives	Actions taken by FECOFUN
1998: The Timber Corporation of Nepal, a parastatal granted a "one window" or monopoly rights over the sales and distribution of timber as well as nationally and internationally (GON decision, 9 February 1998)	The decision undermines the development of alternative small-scale and locally suited institutional arrangements for the timber trade.	Organized many protest campaigns against the monopoly of timber corporations
1998: First Amendment of the Forest Act 1993	The amendments to the Forest Act 1993 sought to restrict some of the rights of CFUGs and give power to the DFO.	Users, FECOFUN, and NGOs heavily reacted to this move and raised questions.
1999: Ban on green felling (MFSC decision, 1 November 1999).	The rights of thousands of CFUGs were being curtailed.	FECOFUN and NGOs reacted through press releases, demonstrations and protests.

2000: Circular restricting community forestry in the Terai (MFSC decision, 28 April 2000)	The handing over of the community forest was suspended.	FECOFUN initiated a movement against the decision in collaboration with another stakeholder.
2001: Revision of community forestry operational guidelines (DoF, 2001)	Imposition of additional technicalities on CFUs management of forest	FECOFUN pressurized the DOF to simplify the forest hand over.
2002: Nepal Biodiversity Strategy (GON, July 2002).	The action plan undermined the community approach to biodiversity conservation.	FECOFUN and other stakeholder protested the strategy.
2003: Collaborative forest management (CFM) guideline (MFSC 2003)	Pushed by donor projects with some general consultations.	FECOFUN and other stakeholder protested for the guidelines.

Source: Adapted from Ojha et al., 2007

Non- governmental Organizations and Donor/ Projects

There are several non-governmental organizations are helping to conserve the forest. Generally NGOs are playing vital roles in the policy advocacy and lobbying, support institutional and technical development of CUFGs, support, and monitoring of program, public awareness and capacity building.

Till now donors have initiated several activities in community forestry. The successful projects include forest certifications; community-based pro-poor activities, supporting the policy review, analysis, and feedbacks, support in the implementation of the workshop.

3.8 Implementing community forestry in Nepal

The government of Nepal has been playing an important and crucial role in the efficient and wise implementation of the community forestry program. The government gives full rights to local user groups to access, use and manage the resources (Forets Act, 1993). The government, however, does not give ownership of the land so that community forest user groups cannot sell or transfer the land to another group or people (Forest Act of 1993; Forest Regulations of 1995). The main attractions of community forestry for the local user groups are "rights," "rules" and "benefits." These three interdependent factors in community forestry program give ownership of forest to the local community. Community forest user groups make their *"own rules of forest management."* They have *"rights to access,"* "*use their forests*" and they have "*equitable benefit-sharing mechanisms"* (Neupane and Shrestha, 2012). The community forestry user group is to be identified in accordance with the criteria such as the households that are the traditional user of the forest; the households that are close to the forest; the households that are interested to get involved in the user group; the households that depend on the forest for forest resources and products; the households that can contribute to the protection and management of forest; households that are far distance local users of forest and have no other alternatives for forest products but can help forest management (Community Forestry Guideline, 2009). For each of the community forest, the user group committee is formed based on the consensus as much as possible. Generally the user group committee is formed by the proportionate representation of Dalit, indigenous people, women, poor

and other user groups. There is a mandatory policy for 50% representation from women and remaining 50% should be from the proportionate representation from very poor, Dalit, indigenous people and ethnic group, and women. There is a mandatory provision on one woman should take the post of either president or secretary. The District Forest Officer has a full responsibility and power to hand over or not, to community forest to user groups without fulfilling these mandatory regulations. These selected members will express their commitment and dedication at the general assembly. The committee can form various sub-committees as necessary such as Tole[8], income generation, monitoring, fund mobilization and assign duties, responsibilities, and rights to small sub-committees (Community Forestry Guideline, 2009).

The community forestry user group will generate money from different activities such as selling of products, levy and fine, etc. and income will deposit in community forestry fund. There are several research which shows community forestry can contribute a lot to the national economy. According to the Kadel, the total annual revenue from the sale of forest products was 1.8 billion in 2004 (Kadel, 2004). Those funds are generally utilized in the forest development and common infrastructure development as school, roads, and drinking water supplies. There is a mandatory provision defined by the government that 1/3rd of the total household should be used in sustainable forest management and development program through different activities such as plantations, cleaning of forest (thinning and pruning), training, etc.

Handover process

Community forest can be handed over to the local user group accordance with reference to the Forest Act of 1993 and Forest Rules of 1995. Generally, there are two steps of to hand over the

[8] Smallest unit of the village

community forestry to the user groups. The first step is "the District Forest Officer takes a active roles. They will check the objectives of local user groups, distance between the forest and user groups, the village and the wishes and as well as the management capacity. The second step is 'in case of the local users need to show their desire to make a utalization and management of resources. If those all two cases are overlap then the handing of community forestry process will start then District Forest Office (DFO) may start to hand over forest area as a community forest area to the local user groups (Forest Act of 1993; Forest Regulation of 1995)'. The community forest user group needs to motivate and prepare the constitution of community forest as well as operational plan with the help of forest technician which need to be approved by the District Forest Office and the general assembly of the user group.

There are five major phases for handing community forestry. 1. Identification of users and formation of user groups 2. Formation of CFUGs constitution 3. Preparation of operational plan 4. Implementation of operational plan 5. Revision and update of operational plan (Community forestry guideline, 2001)

The following actions are strictly prohibited such as to clear forest areas for agricultural purposes; to build huts and houses; to take any action which may cause soil erosion; to capture or kill wildlife in violation of prevailing laws; to extract or transport rocks, soil, boulders, pebbles, sand (Community forestry guideline, 2001).

3.9 Benefits of community forestry

It has seen that the Community forestry program is very much suitable in the context of Nepal. There are several reasons such as customary regulations for forest resources, human dependency on forest and moreover failure of the top-down government policies (Malla, 1992; Chhetri and

Jackson, 1995). The overall poverty is also very high, and some data shows more than 95% of the people are directly dependent upon forest resources for timber and non-timber forest products such as fuelwood, forest plays a crucial role in the economic development (Gautam, 2006). There are so many benefits from the community forest such as Chapagain and Banjade (2009) pointed out that community forest provides several benefits such as livelihood improvement, employment opportunities at the local level, controlling deforestation, infrastructure development as well as local level governance and participation in conservation, biodiversity conservation, social unity and improved literacy. The Yadav found after the intensive research in different localities (Terai and Mountain) of the eleven community forest user groups, and concluded that forest user groups are very much responsible for protection and management and utilization of their forest and regulating resources extraction and that the local user communities are benefited from improved forest products and infrastructure development (Yadav et al.,2003). Baginski also finds out that community forest of Nepal has become institutionalized and represent an effective local development institution with social participation as well as increasingly involved in wider community development activities, often networking with a range of government and non-government groups (Baginski-Springate et al. 2003).

The community forest is also helping local development activities and minimize the burden of the central government on development activities such as small roads and schools (Chhetri & Jackson, 1995). It has also seen several small scale enterprise developments based on the public and private partnership model (Paudel, 2005). For example, in the Tamakoshi Bel Juice Processing Company in Ramechap, ten community forest user groups, the private sector, and 60 pro-poor households are working together, sharing different profit percentage. There is also a good proportionate distribution of income such as ten community forest user groups receive 30%, while six private

enterprises receive 40% and pro-poor household of 10 community forest user groups receive 30% (Paudel, 2005).

Thus the community forestry program in Nepal has contributed not only in ecosystem services but as well as livelihood improvement activities and empowerment of women, Dalit, and indigenous people. The civil society organization such as Federation of Community Forestry Users Nepal (FECOFUN) is playing a important role in the community forestry implementation, and for safeguard issues.

Collection, sale, and distribution of the forest products

The community forestry guideline describes the specific rights on how to use collect, sale and distributes the forest products. The user groups shall collect, sell and distribute only those forest products which are available under the work plan. After using and harvesting of timber, firewood and other resources, the user groups should reforest and have a new plantations in the specific areas. The user groups shall have to inform the concerned district forest office about the sale rate of forest products. In case the user groups are capable of running an industry based on forest products according to the work plan, it may run outside the area of community forest after obtaining the approval from district forest officer (Community Forestry Guideline, 2001).

The community forest user groups need to prepare the operational plan. The operational plan includes forest resources assessments and management plan. More specifically, operational plan includes details of the forest name, boundaries, areas, condition of the forest and types of forest; Map of forest; block division and their details name boundaries, areas, aspects, slope, soil, type of forest, main species, useful species, age and situation in respect to the natural regeneration; Objective of forest management; Method of forest protection; Forest promotion activities thinning,

pruning, cleaning and other forest promotion activities; Nursery, tree plantation & income-generating program; Details of areas suitable for cultivation of the herbs, and species of such herbs, cultivation programs and time schedule; Provisions relating to use of income accruing from sale of forest products and other sources; Provisions made for the penalties; Provisions relating to the protection of the wildlife; Other matters prescribed by the department (Community Forestry Guideline, 2009). The all the activities shold need to be done with having a reference of operational plan.

The user groups also need to prepare a constitution for the community forest user groups. These constitutions also need to be approved by the general assembly and district forest office. The constitution defines who use the forest and who gets what type of benefits, provision of royalty and punishment. More specifically the content needs to be included in the constitution are:

- Name and address of the user groups; Number of households; Objectives of the user groups; Seal of the Users groups
- Socio-economic status of the user group; Roles, function, duties, and responsibilities of the user groups
- Constitution procedure of the user groups and user committee; Name list and working procedures of the user's committee
- Roles and rights of the district forest office, Methods to be adopted to control the forest crimes
- Punishment to be imposed on the members of the user's group who operates functions contrary to the work plan
- Procedures to be fulfilled while punishing the members of the user's group
- Methods for the operation of the funds and methods of auditing of the accounts

(Based on Community Forestry Guideline, 2009)

Poor and marginalized groups in the community forestry program

The one of the main objectives of the community forestry program are poverty reduction, livelihood improvement, and empowerment of local people. Thus, the community forestry user groups need to identify the poor and the marginalized groups which are essential for the formation of the policies and plans for equitable benefit sharing and the improvement of participation by the poor and women in the decision-making process by themselfs. Generally those identification are done according to the participatory well-being ranking is conducted (based on social, economic, physical, natural and human resources). The group which are living under severe conditions such as with limited access and control over resources are identified as poor groups, and within the groups, small interest groups can be identified (such as goat farming, herbal plant cultivation, charcoal making, etc.) (Community Forestry Guideline, 2009). Based on the community forestry well-being ranking, problems, needs and interests are discussed within the user group, firstly in small groups and then brought to a large group discussion.

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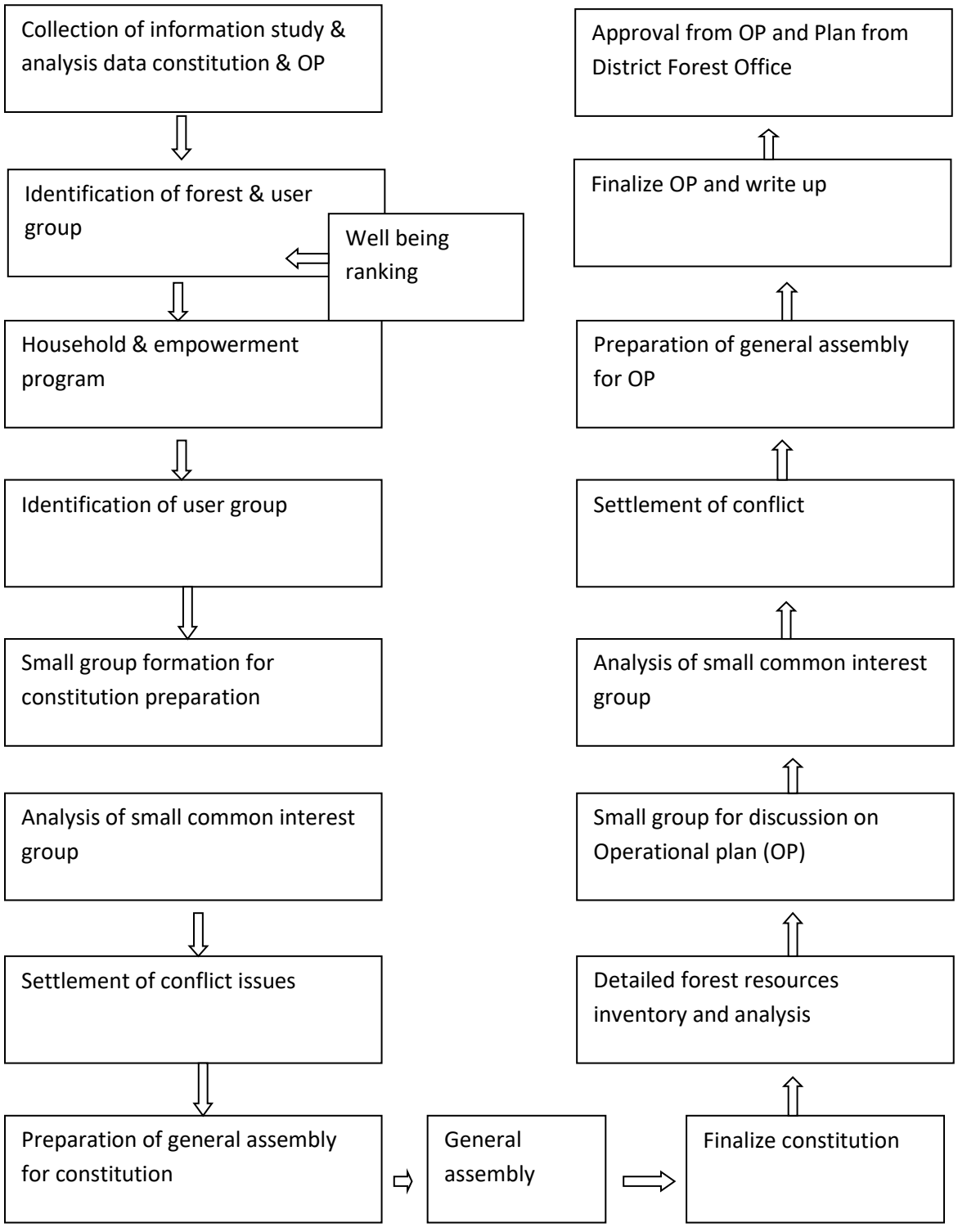
Table 14 Well-being ranking inside community forest

Well-being ranking: The overall Nepal's population is heterogenous in case of economic structure. Similarly, *community forest user groups are also in the same form. Each user groups have different problems, needs, and potential. Therefore, users having the different socio-economic condition are identified. These households further classified into poor, medium and rich through participatory well-being ranking. The basis for this ranking should be decided by the users themselves. Within the poor group, ultra-poor households should be identified, and special programs should be targeted towards these households. After the ranking, categorization is conducted, and the result should be mentioned in the constitution. Finally, the facilitators should work with the users of the poor group to design programs according to their interest, needs, and potential. Benefits from the resources available in the group that can provide equitably to the users should be stated in the constitution (Adapted from Community Forestry Guideline, 2009).*

To hand over the national forests as community forests it requires two basic documents, i.e. the constitution and the operational plan. Those two documents have a differnet rules and regulations. The following diagram shows the process for the preparation of a constitution and operational plan. The process includes the identification of all users, forest resources assessment, and the formulation of forest management plan for five to ten years known as an operational plan. The constitution explains who uses the forests and who gets what benefits; similarly, the operational plan specifies which species and what products can be harvested and when and how they should be cut (Forest Act, 1993; Forest regulations 1995; Community Forestry Guideline 2009).


Collection of information study & analysis data constitution & OP
Identification of forest & user group
Well being ranking
Household & empowerment program
Identification of user group
Small group formation for constitution preparation
Analysis of small common interest group
Settlement of conflict issues
Preparation of general assembly for constitution
General assembly
Finalize constitution
Detailed forest resources inventory and analysis
Small group for discussion on Operational plan (OP)
Analysis of small common interest group
Settlement of conflict
Preparation of general assembly for OP
Finalize OP and write up
Approval from OP and Plan from District Forest Office

For each of the community forests, a user group committee is formed based on the consensus. Each committee is formed by the proportionate representation of Dalit, indigenous people, women, poor and other user groups. For the user group committee, it is a mandatory provision of 50% representation of women, and the remaining 50% should be from the proportionate representation of poor, Dalit, indigenous people and ethnic groups. One woman will take the post of either president or secretary. The committee can form various sub-committees as necessary such as Tole[9], income generation, monitoring, fund mobilization, etc and assign duties, responsibilities, and rights to sub-committees *(Community Forestry Guideline, 2009)*.

3.10 Forest certification scheme in community forestry program

Forest certification is one of the tools for scientific and long-term sustainable pratice of forest resources. This tool is a market-based policy that may contribute to improve management system of forests and support forestry sector development through the local people participation (FAO, 2000). In the beginning phase forest certification was initially focused on tropical forests, but nowadays it has been broadened to include in different types of forest. Forest certification has been identified as one of the most dynamic trends that have experienced any global productive sector. There are several schemes of forest certification such as Forest Stewardship Council (FSC), Sustainable Forestry Initiatives (SFI), Programme for the Endorsement of Forest Certification Schemes (PEFC), etc. In the case of Nepal after 25 years of introducing community forestry, forest certification has been formally submitted by the Private Public Alliance (PPA) as a tool to promote Sustainable Forest Management concerning Non-Timber Forest Products in community forestry program. Nepal is the first country in Asia and fifth country in the world to obtain Forest

[9] Smallest unit of village

Stewardship Council (FSC) certification in medicinal plants and non-timber forest products (NTFPs). The FSC certification has implemented in a handmade paper in Nepal. Till now total 21 community forest user groups with 14,086 ha in Dolakha and Bajhang district received forest management group certification (Subedi and Dahal, 2005). This forest certification scheme made user groups more sustainable in enterprise development. It also provides defenses for communities and indigenous groups from deforestation and degradations.

3.11 Major community- based forestry program in Nepal

Leasehold forest Nepal

This forestry system is established from 1993 with the support of IFAD. Until now 7,413user groups were formed, and 74,950 families were directly got benefited. The primary objectives of leasehold are to reduce poverty through the forest sector. The degraded land area will hand over to the local people, and local people have rights to use with different cash crops.

Table 15 Change in status of pro-poor leasehold forestry between 2002 and 2013

Category	Until 2002	Until 2013	% change (2002-2013)
User groups	1,655	7,413	347.9
Households	11,253	74,950	566.0
Forest Area (ha)	7,011	42,773	510.1

Source. Department of Forest, 2013

Buffer zone forest

The buffer zone forest is implemented surrounding with protected areas. It covers 39 districts in different geographical locations. This buffer zone forest is located around the national park and conservation area.

Collaborative forest Nepal

This collaborative forest management has started since 2003 in the lower part of Terai region with large blocks of forest. So far it covers ten districts in the southern part of Nepal. The collaborative forest size is bigger with compare to other community-based forests. Until now only 20 collaborative forests (total area of 56,637 ha) has been handed over, but 243,997 family members were directly getting the benefit. Biodiversity conservation in Tarai area is the main reason for handing over as a collaborative forest. In two districts of southern part government also established scientific forest management sites.

3.12 Description of case study

General description of Sindhupalchowk District

Sindhuplchowk district lies in the mid-northern part of Nepal in central development region. It has an area of 2542 sq km. This district has wide elevation range from 850 meters to maximum 7,084 meters from the sea level. The Sindhupalchok district has a eastern boundary with Dolakha, Ramechap district and Tibet Autonomous Region (China), the western boundary is Nuwakot and Rusuwa, the northern boundary is Rasuwa and Tibet Autonomous Region (China), and the Southern boundary is Kavrepalnchok, Kathmandu, and Ramechap. The northern part of Sindhupalchok has a wonderful two mountain called Mt. Lampoghyang and Mt. Jugal. This district has climatic variations from 1,000 meter to 5,000-meter high altitude.

The land use change data of Sindhupalchok district is shown in table

Table 16 Land use change data of Sindhupalchok districts

Item	Area	Percentage
Forest area	775.67 Sq.Km	30.51 %
Agriculture area	737.10 Sq.Km	29%
Fallow Land	456.15 Sq.Km	17.94%
Shrub Land	322.53 Sq.Km	12.69 %
Grazing Land	118.23 Sq.Km	4.56%
Snow fed area	47.00 Sq.Km	1.85%

Landslide	2.62 Sq.Km	1.04%
Rivers and Lakes	2.34 Sq.Km	0.1%
Total	2542.00 Sq.Km	100%

Source: Yearly report of District Forest Office, 2017

The following table shows the situation of forest area in Sindhupalchowk district.

Table 17 Situation of forest area in Sindhupalchok districts

Forest Area: 175, 127 Ha Community Forest: 23076.68 Ha Government forest: 58328 Ha Leasehold forest: 804.24 Ha Lease Hold Forest User Group: 220 Number Private forest: 25 Ha Community Forest user Group formation—438 Number Community forestry group members—43605 Number Source District Forest Office, Sindhupalchok

Source: Yearly report of District Forest Office, 2017

The following table shows the population dispersion in Sindhupalchowk district in 2011.

Table 18 Population dispersion in Sindhupalchok districts

Total Population	367,143	
Male	180,849	50.54%
Female	176,294	49.36%
Total Household	60,980	

Source: Yearly report of District Forest Office, 2017

3.13 Community forestry in Sindhupalchok

In Sindhupalchok district over 525 community forest has been handed over to the user group with 58,649 households that get direct benefits (District Forest Office report, 2016). The District Forest Office in Sindhupalchok office monitors 500 community forests among 525. The objectives of monitoring are to check the implementation status of community forestry constitutions and operational plans, checking the different user groups status such as women, minority group, Dalit, etc, the evaluation of forest products distribution, sell, program implementations and distribution of forest products in equity ratio. The District Forest Office also plays a crucial role in the dissemination of governmental activities such as poverty reductions, livelihood improvements, community forest development, social development. The monitoring research of the District Forest Office finds out that 361 (72%) community forestry user group have a general assembly at least once a year, 88 (18%) community forest user group have two times and 51 (10%) community forest user group do not have a general assembly in a year (District Forest Yearly Report, 2015).

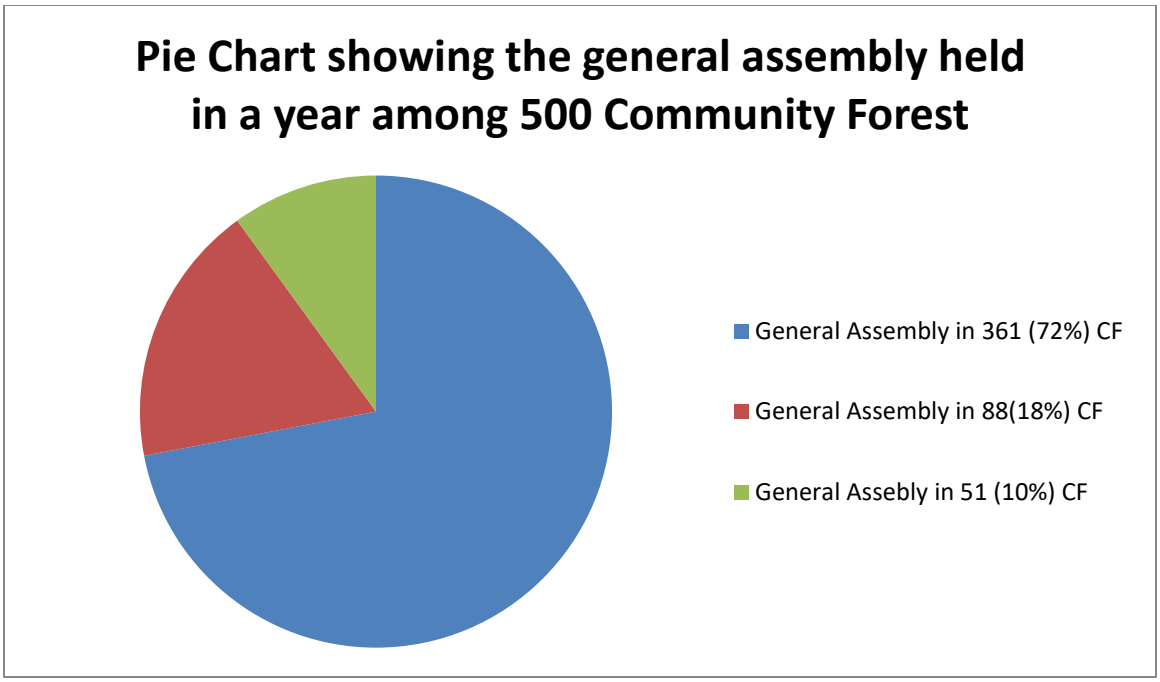


Figure 10 Pie chart showing the general assembly in community forest in Sindhupalchok districts

Source: Yearly report of District Forest Office, 2017

On community forestry committee meeting 53.77 % community forestry user groups have done by the constitutions of community forestry. The 36.23 % of community forest did not hold a meeting by the constitutions and 10 % community forest did not have any meeting at all. The research also shows that among the participants in the community forestry user groups 60 % are male and 40% are female but if we look at the whole populations of the district which is almost equal to man and women. The women representative in the community forestry user group committee is also very low. The data shows only 33.05 % women representative in the committee whereas man's representative is more than double 66.95 % (District Forest Yearly Report, 2015).

3.14 Lampata community forestry

This community forest lies in the Chautara Village Development Committee 3, 4 and 7 Sindhupalchok. This community forestry has elevan members of the working committee with five advisory board. The committee has formed by the community forestry operational guideline of the government. Among elevan members six members are female, and five are male (Field visit survey, 2014). The government has also issued a strict guideline that defines either president, secretary or treasury position should be from women group. This community forestry user group has a secretary and treasury position is occupied by women. The total 864 households with 430 women and 864 men with a total of 262 households (Lampata Community forestry operational plan, 2005 and Field Visit, 2014). The main objectives of community forestry in Sindhupalchok district are to provide forest products for users at a reasonable price and to improve forest condition by protecting, managing and utilizing.

The operational plan describes the mobilization and management of the fund. It specifies that fund would collect from forest resources selling and distribution, penalty, and punishment, donation, scholarship, monthly and yearly membership. The collected fund will be distributed accordingly. The operational plan also describes how the fund will be utilized. At least 25 % of the fund collected will be used for forest development activities. The operational plan also describes resources investment on the empowerment of women, Dalit, pro-poor and marginalized group. It has described that at least 35% of the total money will be used for empowerment of women, Dalit, pro-poor and marginalized group. Those group will be identified from well-being ranking. The operational plan also describes the social development activities. The remaining part of the money will be used in the social development activities. Those activities are road construction, school development, etc. Those activities are conducted outside of forest area. If needs to construct inside

the forest area, initial environmental impact assessment has to be conducted with the permission from District Forest Office of Sindhupalchowk.

To empower the poor and marginalized group loan investment program will be performed. The poor and marginalized group will be identified by the help of consensus from the user group. That loan will be in small interest. That loan can use for a different area such as goat farming, chicken farming, bee farming, vegetable farming, pig farming, etc. In the community forest area, a small and medium enterprise can also establish. Pro-poor, women, Dalit group, can get priority to engage in such small and medium enterprise. There needed to get permission from district forest development and finished all the governmental procedure.

Auditing in Lampate Community Forest

There will be compulsory auditing procedure in each fiscal year. The audit report has to send to the District Forest Office, Ilaka Forest Office and range post office within two months' period. Operational plan also defines the provision of public auditing. Those kinds of public auditing will be conducted by all the community forestry user group, representative of VDC, forest office, journalist, etc.

The operational plan also clarifies the procedure to establish a yearly plan. There are several steps to make an annual plan such as program selection; program prioritization; program pass from the working committee; program approval by the general assembly; and program submission to the District Forest Office and Range Post.

The Community Forestry User Groups need to be authorized to make a plantation activity inside their area. They can manage regenerations by thinning, pruning and control of forest fire and grazing and browsing. The user group can also design the program for livelihood and social

development. There needs to allocate 35 % of income for pro-poor, Dalit, women and marginalized group. Those groups can launch a program directly to different income generating activities, non-timber forest product, vegetable farming, etc. A local group can also use the bare land for fodder. The community forestry operational plan also describes the livelihood forest program inside the community forest. This livelihood program can include different activities for the pro-poor group such as growing grass for animals, plantation of cash crops, etc. However, to implement the livelihood forest program the canopy cover is less than 20 %, and the area is degraded, those areas can utilize to make new livelihood forestry programs. Those livelihood forestry programs can utilize for different income generating activities.

The community forestry also provides several training opportunities for the user groups. From 2013 to 2017, 23 people got an intensive training for different activities. The training programs include several issues such as administration, awareness development, auditing, forest development and micro-enterprise development. The following table shows the number of participants in different training activities. This data is collected during field visit and updated with an operational plan of community forestry.

Table 19 Number of participant in training activities

S.N	Name of training	Year	Participants	Organizer
1	Administrative training	2012/2013	1	District Forest Office
2	Awareness development training	2013/2014	3	FECOFUN
3	Auditing training	2014/2015	2	District Forest Office

4	Forest Development training	2015/2016	13	District Forest Office
5	Micro Enterprise development	2016/2017	6	Donor agency

Source: Field visit, 2014

3.15 Bhagawati community forestry in Sindhupalchowk district

This community forest lies in the Chautara-8 Sindhupalchok. This community forest was handover in 1998 registration number 106. The first amendment of the working plan is 2003. This community forest occupied 68.35 ha. The main occupation of the user groups is farming and agriculture activities. There are two main objectives for forest management short-term and long-term. The short-term objectives were forest conservation, participate in forest development, fulfillment of daily needs of forest products, biodiversity conservations, plantations in the open area, conservation of wildlife and for the long-term objectives prepare a workforce for sustainable forest management, to manage the forest scientifically.

Demographic structure

The following table shows the demographic structure of community forestry user groups in Bhagwati community forest. The table shows that the male and female are almost equal in numbers in this community forest.

Table 20 Demographic structure

Total household	246
Women	619
Male	665
Total	1284

Source: Field visit, 2014

The educational status level is also low among the community forestry user groups. Among 1284 members only 276 join the 12th grade, 110 members have passed the School leaving certificate test (national level test), and 868 have a 10th-grade pass. The educational factor also plays a crucial role in forest management. It has observed in other places if the user groups are educated they can easily figure out on the market for community forest products and can easily contact with other non-governmental organization, donors, and district forest offices.

Table 21 User group education level

1-10 class pass	School Leaving Certificate (government exam)	Join the 12th grade
868	110	276

Source: Field visit, 2014

The community forest user groups are medium level households. The user groups have an economic survey of each household. The data shows 146 households can have enough food for whole 12 months, 38 households have food for nine months and 62 households have a food sufficient only for six months.

Table 22 Economic status of user groups

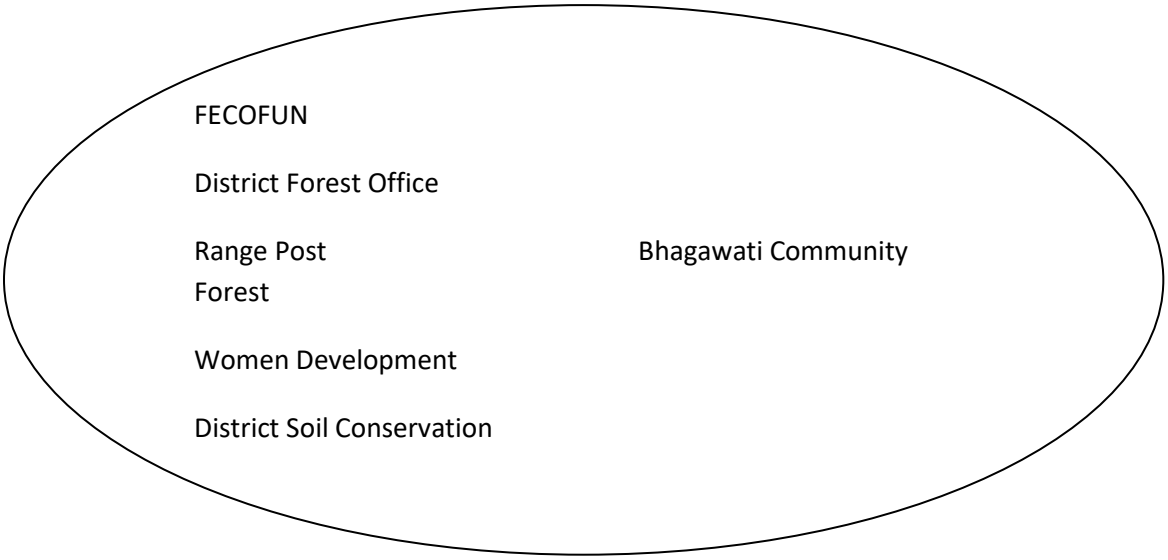
Economic Status of households		
Food for six months	Food for nine months	Food for 12 months
62	38	146

Source: Field visit, 2014

The villagers around the forest have formed a community forestry user group with the coordination from District Forest Office. The user groups were from various background and having different needs and potential. Thus, the user group has a well-being ranking such as Wealthy, Medium, Poor and Ultra poor. This community forestry has also well described operational plan and constitution to run the community forestry. The description of the constitution and operational plan are similar like in other community forests. The operational plan describes the technical part of community forest and Constitution describes the social part of community forest user group. The Operation Plan describes the "forest resources assessments," "what species and what products when" and "how to cut," "Silvicultural activities" etc. The Constitution of user group describes "Who uses the forest," "Who gets what type of benefits," "Provision of royalty & punishment" etc. The Community Forestry User Group formed a Committee with Chair Person, Vice-Chair Person, Secretary, Under-Secretary, Treasury, and Members to make daily activities easy. The committee has mandatory reservation provision of 50% women and either Secretary or Chair person from women and 50 % of another group. This community forestry is performing well regarding conservation, utilization, and management of common pool resources. Before the declaration of community forest, it has a high risk of illegal trading of timber, deforestation and degradation, high risk of landslide due to high slope. The governance systems are with a well-developed

mechanism such as regular meeting, general assembly, reservation for women in community forest user group committee, several subcommittees for pro-poor people.

This community forest user group have made a wider network with different stakeholder.



The community forest user group also collaborates with another community forest for different activities such as plantations, training for forest management, problems during the forest fire.

3.16 Analysis of Ostrom's eight principles

The community forestry guideline is designed in line with the Ostrom's eight principles, and two community forestry have tried to implement the principles. The government of Nepal especially District Forest Office have facilitated to follow all the Ostrom's eight principles. The both Lampata Community forest and Bhagwati community forest have a heterogeneous society with different ethnic groups and caste. The user groups committee in Lampata community forest has 11 members, and among them six are female, and 5 are male (Field visit, 2014). It shows that the participation

of different ethnic groups was satisfactory. The government of Nepal also made strict regulations to upbringing them. The government of Nepal made a mandatory provision of involvement of either secretary or chair person should be women through the community forestry guideline. Those rules and regulations from the government are institutionalized through the constitutions of community forestry. This shows a good example of women participation in forest management. Both community forestry has implemented the livelihood improvement program for the poorest user groups. The basic guideline for the poverty implementation program is designed by the livelihood improvement program from District Forest Office in collaboration with different non-governmental organizations. The main poverty-related issues of the user groups are lack and inaccessibility of fodder and fuelwood for daily requirements, lack of participation in forest user group decision meeting due to several reasons such as lack of time, no access to private forest resources, low-level of education and awareness (Field visit, 2014). Several livelihood improvement programs have implemented in the user groups such as allocation of some area for community forest user groups, training on tailoring and other micro-enterprise development activities (Field visit, 2014).

The constitutions of the both community forest explain about the provision of collaboration between different stakeholders. Both community forests have a similar type of interested parties such as FECOFUN, District Forest Office, Range Post, Women Development organizations district chapters, District Soil Conservation, Village Development Office, Chautara (Field visit, 2014). The main problem with the stakeholder coordination is a conflict among the stakeholders such as governmental authority, e.g., District Forest Office and Soil Conservation Office district branch. The latest example is the Soil Conservation Office that focused on the plantations of trees which can control erosion and the District Forest Office that focused on the livelihood

improvement directly beneficial plants. This also makes several challenges such as overlapping of programs, transparency, effects on the institutional, governance, social capital and participation challenges (Field visit, 2014).

The main difficulties in both community forests are the governmental influence on the market for selling the forest products. The District Forest Office has strict guidelines for the market provision of the products. The user groups can sell them only inside of the districts under the governmental procedures. There can be several other market opportunities for non-timber forest products, but user groups are unable to sell those products due to governmental interventions. The role of non-governmental organizations is very week. It all depends on how they got funding and which donor organization provides funding for example previously there were several training opportunities through the nongovernmental organization, but those training opportunities were no longer available (Field visit, 2014). Once the organization lacks funding the non-governmental organization becomes passive and doesn't implement any program.

Participation of women and indigenous groups is increasing. The women are raising the voices in different meetings and the user group assembly. However, there also cases that workload does not decrease. There is a tendency for Nepalese women with overwork load. The income generation livelihood activities have also helped women and indigenous groups to recover from poverty.

However, still, there is a problem with some strong bonding on social capital and participation. There does not exist any program for the environmental education activities. There are low chances to visit another community forest, but those opportunities were very rare and fully depend on the donor agency and funding. There is provision for mobilizing young people for the conservation and environmental awareness program. The migration to the capital Kathmandu and tendency of

foreign labor is increasing. This problem leads to the fluctuation or reduction on agricultural production, lacking participation in community forestry.

Analysis of Social Capital and Participation in the management of common pool resources with IAD framework and Ostrom's principles

Ostrom's first principle is on boundaries. It is divided in two categories user boundaries and resources boundaries.

(i) User boundaries: In the community forestry, there should be clear boundaries between users and non-users. Roles, responsibility and membership limitations must be clear. In the case of community forestry program, this principle has been applied to. The Forest Act of 1993 and Forest Regulations of 1995 have a clear policy on the role and responsibility of local user groups. The community forestry guideline defines stringent rules and regulations for the membership of user groups. There is clear definition who can be a member and who cannot become a member. The community forestry guideline also controls the use of forest resources from outside the member groups. This strict membership can have several benefits and limitations. The advantages are that local people have a strong social capital and participation issues. It imposes compulsory participation of user groups. However, in the same time, there are some limitations that other non-members will lack benefit sharing from the resources. These rules might create a monopoly, and in some case, non-users might use the forest resources illegally. In the case of Lampate community forest, there is a strict regulation for membership. Each member has to pay 1,500 Nepali Rs to become a member and yearly Rs 25 (Data from Field visit). The people, who are unable to pay the money, will not be allowed to use forest resources. The community forest user group can exclude

a member if he/she does not fulfill the requirement such as migration from one place to another, resigning from the membership and the violation of the rules and regulations more than three times.

(ii) Resources boundaries: According to Ostrom, there should be clear boundaries on resource system. The Forest Act and Forest Regulations define how to fix the boundary line of community forestry. This resources boundary has applied to every community forest. The District Forest Office, the technician, will help to make a demarcation or forest resources. In most of the case, community forests have to pay for the demarcation of forest resources. It would be nice if the user groups themselves can train and do the delineation of forest resources. However, due to lack of technical capacity, local people are not able to do this task.

The Ostrom's second principles are about the congruence. This second principle is also categorized in two different items (i) Congruence with local conditions: The appropriation and provision rules and should be congruent with local social and environmental conditions where local people can afford. Moreover, (ii) Appropriation and provision: The benefits obtained by users from a common-pool resource (CPR), as determined by the appropriation rules and should be proportional to a number of inputs that are required and provided in the form of human capital, or money, which is determined by the provision rules (Ostrom,1990).

These principles became challenging because most of the community forest user groups have homogeneous structures with different groups and socio-economic class. There is a clear policy how those different groups can participate. In most of the case, community forest will do based on the well-being ranking for equitable benefit sharing. There are also some training opportunities for the Dalit and indigenous members. Those trainings are depending upon the funding from the donor agencies because the government does not have enough sources to provide financial support.

The Ostrom's third principle is about the collective choice arrangements. Most individuals affected by the operational rules can participate in modifying the operational rules. The Forest Act and Forest Regulations have clear definitions on people's collective choice arrangements in community forestry. The user group committee is composed of all the ethnic and different heterogeneous community. It can observe that for the successful accomplishment of the third principles multi-tiered, multi-layered and multi-scale polycentric governance system is needed.

The principle four defines the monitoring. Community forestry is handed over to user groups for five years or ten years period. This category in two forms (i) Monitoring users: Monitors who are accountable to the users monitor the appropriation and provision levels of the Common PR users. Moreover, (ii) Monitoring resource: Monitors who are accountable to the users monitor the condition of the resource. The Forest Act and Forest Regulations have a clear mandate for the period of resource use. Thus, with completing those time frame, monitoring of users and resources is mandatory. It can also observe that successful community forestry program follows all the monitoring process in case of users as well as resources. There is a lack of transparency of monitoring of users and resources. Thus, it is necessary to have monitoring institutions with effective, trusted, credible and accountable to all users and other stakeholders at levels.

The principles five is about graduation sanctions. Participants who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and context of the offense) from other participants, by officials accountable to these participants or by both. Graduated sanctions were particularly important when complex and incomplete monitoring and information asymmetries exist. In the case of community forestry program in Nepal, graduation sanctions are fixed by the user group general assembly. The general assembly will decide the punishment system

to the user groups. It can assume that this graduation sanctions can help to control the deforestation and degradations.

The principles six is about conflict resolution mechanisms. The low-cost conflict resolution mechanism is always necessary to make sustainable community forestry. In the case of Nepal, there are several issues of conflicts in community forestry program. So this is one of the basic mechanisms to develop and mandatory. Several successful community forestry have developed this mechanism by the discussion in the general assembly.

The principles seven is about the recognition of appropriators' rights to organize. External governmental authorities do not challenge the rights of appropriators to devise their institutions. This is a more severe principle which difficult to implement. The government of Nepal has imposed several different rules and regulations. In the same time, there are several heterogeneous communities, and those communities have different customary laws. These externally imposed rules, which do not correspond to local conditions at the lower tiers and ignore local expertise, cannot make sustainable community forest.

The principles eight is about the nested enterprise. There should be necessary to have a nested enterprise for monitoring, enforcement, conflict resolution, and governance activities in the community forest. Now those environmental issues are connected to different sectors such as climate change and other ecosystem services. Thus, to manage the community forest properly, the nested governance system is very much important.

The community forest user group is legally independent with full rights for domestic and commercial uses. The management responsible is protection oriented with self-governance under the oversight of District Forest User Groups.

3.17 Participation and social capital in the community forestry

Local people's participation is one of the basic strategies to hand over community forestry to the local people. The government believes that if the participation of local people increase-it will have a direct significance to the deforestation and degradation of forest. Participation of user households in every forest management activity can enhance the conservation learning process by increasing the awareness of collective responsibility approach within the local community (Agrawal, 2001). Nepal is a mix of the heterogeneous community with a different ethnic group with the deeply rooted caste system and economic class. Thus, in deciding whether to participate, or not to participate in a community forest management activity can be motivated by different factors such as very poor households do not benefit from community forests as much as the others rich user groups and medium groups and that ultra poor are not very interested in community participation (Malla et al., 2003). To encourage the participation of local people, the government of Nepal introduced two laws Forest Act 1993 and Forest Regulations 1995. These two laws institutionalize the participation of user groups with clear roles and responsibility of community forestry user groups. According to the Forest Act of 1993 and Forest Regulations 1995, the forest user groups have the rights to manage, conserve, protect, utilize the forest and handed over community forest according to their approved management operational plan and constitution.

The use of social capital in natural resources management evolved in the early 1980s when collaborative natural resources management in many developing countries had emerged (Nath et al. 2010). It has been observed that social capital is one of the important aspects of having sustainable natural resources. Pretty (2003) also defined that social capital can be considered a pre-requisite for the sustainable management of natural resources. There is some research which shows the ideas of social capital and governance of the commons, combined with the recent success of

local groups, offer routes for constructive and sustainable outcomes for natural resources in many of the world's common ecosystems (Pretty, 2003). Social capital has a strong influence in different area such as in the network of relation which binds the individuals and collective actors and also it can contribute to the shaping of appropriate policies (Triglia, 2001). The following web of science data shows that how important is social capital in case of governing the commons at the local level. The data extracted on 9/13/2016 from the web of science shows 318 records publication on title forest and social capital. Those 318 records were published in article 274, proceeding paper 49 and review paper 12. This data shows 112 research published in the web of science journal.

The following chart shows top 25 countries where research conducted on the issues of social capital with respect on the forest.

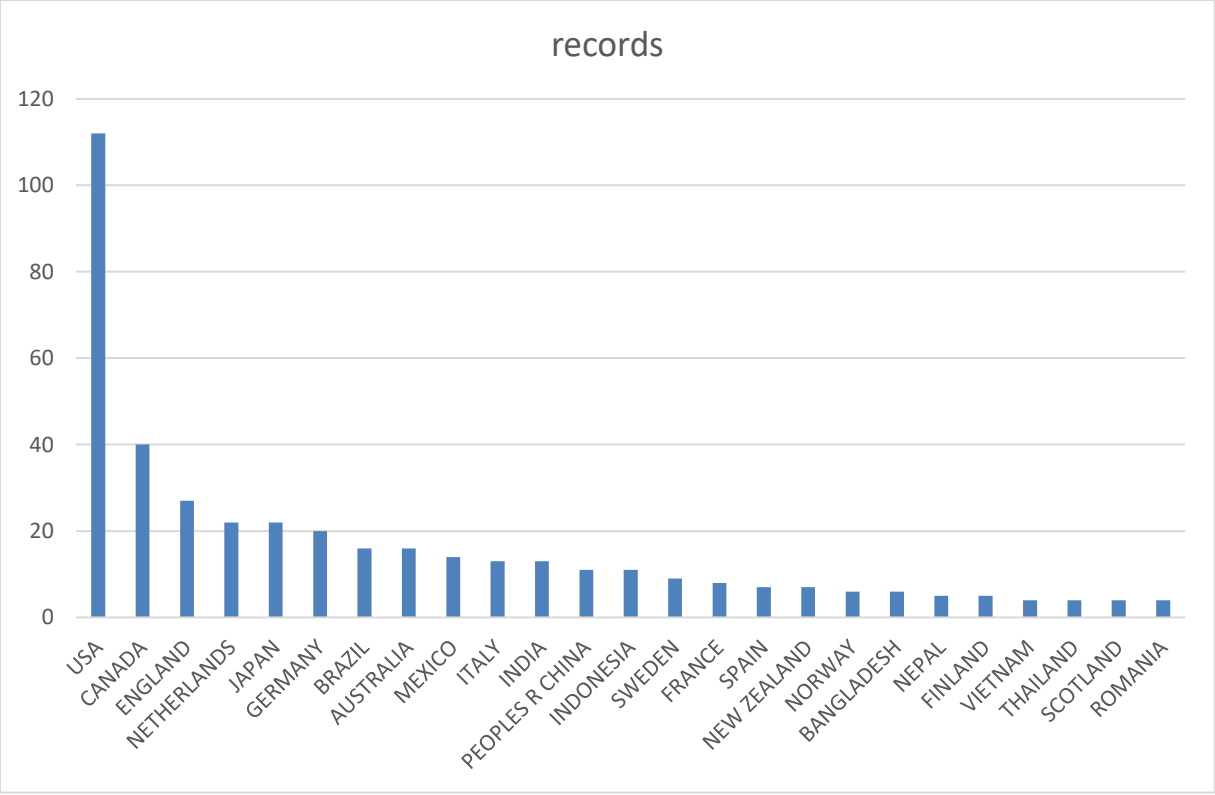


Figure 11 Social capital issues from 1990-2015

This chart shows the social capital matters in forest sector from 1990-2015. The web of science data base shows that total 318 records been observed since 1990-2005. It has been observed that the research in social capital is sharply increased after 200-2006.

The different aspects of social capital are implementing in the governance of community forestry in Nepal. As the Forest Act, 1990 defined the community forestry program is decentralized, democratic and autonomous organizations with active citizen participations.

3.18 Challenges in Sindhupalchok community forest

The research in five hundred community forest from the district forest office discovered that participation is low while the government has given strict regulations to mandatory participation in the forest management.

3.19 Policy reforms for future

Community forestry has a fragile system of governance that sometimes influenced by the external factors such as donor agency, active civil rights movements. The proper effective participation is one of the main challenges in community forestry. It has seen in some of the community forest in Sindhupalchok district the community forest user group committee is mainly dominated by the men for decision-making. The decision is also made from some elite group of small members. Thus, there need to be some types of policy which can encourage other sections of people to participate properly.

The another important aspect is compulsory for the involvement of the different stakeholder for decision-making. The benefit sharing mechanism is not very well-established. The membership of community forestry is also limited only within the group. This limited membership will not help

to involve outsiders to manage the commons. The government of Nepal does not have a environmental educations specifically, but at the same time, the community forestry program is contributing huge percentage in the Gross Domestic Products. Thus, the government of Nepal needs to bring the economic contribution of community forest in the national budget. The forest resources valuation is an important tool to find out the economic contribution from forestry sectors. There is also lacking on the ecosystem services valuation. If the valuation is done, it will also give more importance of ecosystem services to the user groups and can be very much helpful for human well-being. The community forest user groups are running their institutions to the best of their abilities, but this is still inadequate for effective forest management. The capacity of community forest user groups urgently needs to be increased, particularly to help them develop more scientific forest management and reporting systems.

In Nepal poverty is one of the challenges. It has impacted in several aspects, and local level people are suffering from food security. Thus, the community forestry can enhance enterprise management and marketing skills. It can run collaborative enterprise and also export forest products to the outside market.

CHAPTER 4

4.1 COMMUNITY-BASED FORESTRY CONSERVATION IN SELECTED ASIAN REGION

The rural communities in the Asian region are closely linked with natural resources especially forestry for the fuel wood, fodder, and timber. According to Regional Community Forestry Training Center for Asia and the Pacific (RECOFTC) community owned and governed forest are at least 377 million ha, or 22 percent of all forest in developing countries (around 10 percent of the global forest) (RECOFTC, 2005). The Asia regions are vast and diverse which includes one fourth of tropical forests and approximately half of the biological species. Throughout Asian region, a huge number of forest lands have been degraded or denuded due to several reasons such as population growth, economic growth, etc. Moreover, the forest in this region has changed a lot due to several factors such as economic growth, population growth, and haphazard settlement. If we see the example only from India where population pressures and rapid industrialization have been particularly acute, forest cover has decreased since the 1850s from 40 percent to less than 20 percent of the total land area. That rapid deforestation has occurred not only in India but also in other countries such as Thailand, the Philippines, Nepal, Vietnam and Sri Lanka too. Community forest in Asia is an important livelihood way of life in Asian countries. The deforestation and degradation cause various natural hazards besides the loss of biodiversity. These include soil erosion, siltation of riverine and coastal water systems, flooding, drought, destruction of mangroves, declines in agricultural productivity.

In most of the case Asian communities have protested and struggled against for the decentralization of forestry sectors, e.g., since 1970s people from Indian state Orissa have

protested for the forest degradation with similar case happened in the state of West Bengal and Burma for grassroots conservation and protections (FAO, 2016).

The following table describes the estimates of forest dependents in some Asian regions. This table describes the country India has a huge people depend upon the forest resources with 275 million.

Table 23 Estimate of forest-dependent communities in the Asian region

Country	Peoples Directly Dependent upon forest resources (Millions)	Peoples Living on land Classified as Public Forest (Millions)
India	275	100
Indonesia	80-95	40-65
Nepal	18	8.5
Philippines	25-30	24
Sri Lanka	2-4	..
Thailand	20-25	14-16

Source: Adapted from Lynch, 1992

The following table describes the net annual loss of forest from 1981 to 1990 in different Asian countries.

Table 24 Net loss of forest in the Asian region

Country	1990 Extent ('000 hectares)	Forest Cover % of national territory	% annual deforestation 1981-90 ('000 ha)	Annual Loss ('000 ha)
India	51,729	17.4	.06	339
Indonesia	109,549	60.5	1.0	1,212
Nepal	5,023	36.7	1.0	55
Philippines	7,831	26.3	2.9	316
Sri Lanka	1,746	27.0	1.3	27
Thailand	12,735	24.9	2.9	515

Source: World Resource Report, 2005

In most of the community forest in Asia, we have observed two distant aspects (i) A recognition of the rights of local people who lives near to the forest can extract resources and manage the forest for their basic livelihood needs. A complementary recognition that indigenous management institutions exist and that there is significant local knowledge about the management of trees and forest. Moreover, (ii) A recognition of the classical role of foresters in the protection and management of the national forest, that this has needed to change from foresters as being agents of enforcement and protection to their new role as advisers (RECOFTC, 2005). It has been observed that in most of the Asian countries community forestry started during the 1970s. They

share similar objectives of management such as poverty reductions, conservation, and management of degraded resources.

Some of the characteristics in the community-based forestry in Asian countries are observed as follows:

India

Forest policy in India has changed drastically over the past 100 years. At the end of the 19th century, 80 percent of India's lands were under "common" management (Singh, 1991). However, those land rights were taken out from British first and then Indian government. In the British time, there was a huge deforestation and degradation for the infrastructure development and railway constructions. There was a discussion on devolution of power and involvement of local people for the forest management and discussion and then a new form of decentralized forest governance institution is implemented which called Joint Forest Management (JFM) program is implemented (MOEF, 1990). There are two different types of community-based forest management systems such as (i) JFM and (ii) Social Forestry Program.

The JFM scheme has been implemented in India with approximately 75 million people with 14 million ha of forest are handed over to the local people. There were several challenges in the forestry sector in India such as huge infrastructure development in forest areas, conversion of forest into agricultural land, rapid urbanizations in forest surroundings areas, excessive timber smuggling, etc. After the independence of India in 1947, the government of India deliver a National Forest Policy of 1952 which classified forested areas into different groups such as protected forest areas, National Forests, Village forests and Tree lands.

Another type of community-based forest management scheme is a social forestry program. This system is governed by the Van (forest) Panchayat. Those types of institutions are more common in the mountainous area of India. Those types of institutions have a long history from the British colonial period since 1931. This is a purely community-based governing system where one-third of the villagers can propose the village council and form a Van (forest) Panchayat. Those types of institutions have an election system with low governmental influences. The Van (forest) Panchayat has specific rules, rights, and ownerships for the management, protection, and conservation of forest resources. The government had also brought a Van (forest) Panchayat policy in 1976. This policy described the different rules such as (i) Panchayat forest land could not be sold or subdivided (2). The forest products and benefits from the sale of forest resources of the Panchayat forest are to be used for the interest of the local rural community (3). The Panchayat forest is to prevent villagers from cultivating the Panchayat forestland (4). The panchayat is to demarcate the forest area (5) The Panchayat is to maintain minutes of meetings and records of accounts and make decisions on regular meetings (Forest Panchayat Rules, 1976). More specifically, the Forest Panchayat has described following duties such as (i) Forest Panchayat can make a reasonable provision within jurisdiction (ii) the forest resources can use from user groups but only from the prior consensus of forest department (iii) the Forest Panchayat can maintain the boundary of forest resources (Forest Panchayat Rules, 1976).

Philippines

In the past, Philippines was one of the main timber exporter countries in the Asian region. Community-based forest management scheme has started in the mid-1970s with objectives of participatory planning and bottom-up approaches to forest development and poverty reductions. This strategy is a national strategy for management and conservation of forest resources in the

Philippines. In the past, there was a huge deforestation and degradation problem, and at the same time, the export of forest products was very high. There are several governmental policies, rules and regulations are implemented to support the community-based forest management scheme. This country has specifically ties with the developed nations, especially with Japan. During the 1960s and 1970s Philippines was a number one timber supplier to Japan. In this region, there were several factors which drive deforestation and degradations such as unsustainable commercial logging, agricultural conversions, development of roads, ports and other infrastructural and technological advances. Moreover, poverty is also the main driving factor which plays a crucial role in deforestation.

The community-based forest management policy has implemented since 1982 with an Integrated Social Forestry Programme with giving power to communities for up to 25 years. In 1995, after a decade of experimentation with community forestry projects and schemes, a community-based forest management policy was launched for more participation of local people and decentralized scheme (Pulhin et al. 2007). In 1997, the country approved the Indigenous Peoples Rights Act (IPRA), providing an additional legal basis to develop community forestry further, as the state acknowledged its responsibility to secure the rights of indigenous communities to their ancestral domains, as well as to ensure their economic, social and cultural well-being. The main three objectives of the community forestry scheme in the Philippines were poverty reductions, forest sustainability, and resources democratization.

The following table shows the historical evolution of community forestry program in the Philippines.

Table 25 Evolution of Philippine community forestry program

Date	Program
1982	Integrated Social Forestry Program
1984	Rainfed Resources Development Program
1986	National Forestation Program
1989	Community Forestry Program
1993	Central Environmental Program
1995	Community-Based Forest Management Program

Source: Adapted from Fisher et al., 2007

Cambodia

Cambodia has several problems in forestry sectors, especially in the deforestation and degradations. The main cause of deforestation and degradation is due to extensive commercial forest exploitation and agriculture expansions. Cambodia, community forestry program is a donor initiative. The program is implemented with an agreement to manage and utilize the forest in a sustainable manner between international non-governmental organizations, donor agencies, national non-governmental organizations, civil society and Royal Government of Cambodia. The community

forestry program has implemented since 1992. The government has brought several strategies for implementing community forestry such as interim poverty reduction strategy with emphasis on sustainable management of natural resources. Another specific policy is National Forest Sector Policy Statement 2002 and Strategy of Land Policy Framework 2002. The Community Forestry Working Group (CFWG) established in 1998 with the involvement of institutions, donor, and interested organizations. The goal and objectives of CFWG is "to promote participatory processes among stakeholders in the management of forest resources as a means help for poverty reduction, sustainable forest management and decentralization policy with objectives to contribute to the development of policies and legislation for community forestry; to increase awareness and understanding of community forestry among governmental stakeholders; to support research and documentation for community forestry; to improve collaboration between community forestry and broader natural resources management initiatives (FAO, 2016). The donor agency is also playing an active role in community forestry implementation and planning in Cambodia. The FAO mentioned that there are several conflicts regarding the community forestry program in Cambodia. The destruction of livelihoods caused the major conflicts through unsustainable use of forests, overlapping resources users, denial of customary user rights, reduction of income generation possibilities, illegal logging from military/land grabbing as well as overlapping of resources uses with unclear village territories and encroachments (FAO, 2016).

Vietnam

The concept of Community Forestry Management (CFM) was officially recognized for the Vietnam since 2004 with the implementation of Law on Forest Protection and Development. The beginning of community forestry in Vietnam is a pilot scale. There are several implementation stakeholders in Vietnam community forestry. Those stakeholders have their own rules and

responsibilities. The local community is a core stakeholder including all the users and villagers. Community forestry organization which advocates the state laws and policies on forestry, forest development, and monitoring. Commune, district, and provincial authorities execute state administrations. District and provincial forestry expertise agencies support., guide and promote forest management activities of the community. State forestry agencies transfer technologies, provide consultations and technical services to and invest capital in construction and forest development. Finally, non-state forestry agencies provide supporting services, sign contract for training and techniques transfer (Ngai, 2009:12).

Indonesia

Indonesia is a tropical country with a huge deforestation problem. The data shows that around estimated 840,000 ha of the primary forest is destroying annually (Hansen, 2013; Margono et al., 2014). Those losses were due to the governance system with huge population increase, economic development, and export of timber. The community forestry in Indonesia has started since 1998 with the fall of Suharto regime. Indonesian community forestry is also a donor-based similar to Cambodia. The donor such as Ford Foundations is very active. The individual user groups have legal rights for direct forest use. The Forest Law 1999 is the main policy implementing through the District Government, Village Government, and Provincial Government. There are several Indonesian governmental programs that have supported the development of community forests. People's Nursery Garden (KBR, operating during 2010-2011) provides seeds for timber and multi-purpose species, which are grown by local community groups. The Community Direct Assistance for Development of Rural Community-Based Forestry Conservation (BLM-PPMBK) program has a strong agrarian focus, with 85% of the funds used for establishing woody species on the farm and forest lands and 15% for development of other agricultural enterprises such as

livestock, material for crops or animals fodders. Moreover, the Village Nursery (KBD) began in 2009 and is delivered through the District government, provides funds for the purchase of seeds of woody species for planting in rural areas (Irawanti et al., 2014).

Comparative aspects of community-based forest in Asian countries

The following table shows the legal basis on community-based forest in different Asian countries. This table shows that in most of the countries people can use forest resource directly.

Table 26 Community forest and its legal basis

State	India		Philippines		Thailand		Indonesia	Nepal
Legal issues	Community	Individual	Community profit	Individual profit	Individual claim certificate	Household	Individual	Community
Direct use	Yes	Yes	Yes	Yes	Yes	Yes	yes	Yes
Indirect economic	Land (no) Tree (yes)	Land (no) Tree (yes)	Tree	Only some tree	Land (no) Tree (yes)			Yes
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Transfer	No	No	No	No	No	No	No	No
Participants	anyone							Forest dependent people

Source: Modified from IGES White Paper, 2014

The table 27, 28 and 29 summarize the community-based program in the six nations on the legal basis and responsible organizations for implementation of the program.

Table 27 Community-based forest on legal basis

Country	**Name of Community forestry program**	**Legal Basis**	**Responsible government agencies**
India	Joint Forest Management	National Forest Policy (1988)	State Forest Department
	Panchayat Forest	Forest Rights Act (2006)	
Nepal	Community Forest	Forest Act 1993 Forest Rules 1995	District Forest Office
Philippines	Community-Based Forest Management (CBFM)	Indigenous peoples Rights act 1997	Department of Environment & Natural Resources (DENR) Local Government Units (LGUs)
Cambodia	Community Forest Management	Forestry Law 2002	Forestry Administration
Vietnam	Community Forest management	Forestry protection and Rehabilitation Law	District Government Commune
Indonesia	Community Forest Village Forest	Forest Law 1999	District Government Village Government Provincial Government

Source: IGES White Paper, 2014

Table 28 Roles and responsibilities of users

Country	Program	Rights to user group	User group responsibility
India	JFM	Collect & commercialize specific resources Financial maintain, e.g. maintain accounts and incur expenses	Benefits distribution from conservation Define rules governing forest management Membership cancellation and renew
Nepal	CFUGs	Community user rights	Fix and transport of forest products under some conditions (in the case of timber, the DFO must be informed of the details)
Philippines	CBFM	Utilize and develop forest lands in designated areas Develop agroforestry farms and sustainable agriculture	Claim ownership To seize illegally extracted forest products Imposition of penalties
Cambodia	CFM	Acknowledgment of customary user rights Manage and harvest forests according to regulations and management plan	Share benefits from CFM Participate in monitoring of CF
Vietnam	CFM	Enjoy benefits from assigned forest areas Use of products for public and individual use	The pilot phase foresees that communities can define and institute proceedings about any laws on the land

Country	Program	Role of community organizations	Role of government agencies
India	JFM	JFM Group: Create Joint Forest Management Committee (JFMC) Self-initiated Forest Protection Groups (SIFPG)	Acknowledge and formalize agreement with JFMCs Study of JFM before giving them JFMG status
Nepal	CFUGs	CF User Group: Letter of interest to the DFO Identify traditional forest users Draft Constitution of CFUG Submit formal application to the DFO	Support CFUGs throughout the identification of traditional forest users Provide technical assistance throughout the process of establishment of a CFUG Endorse CFUGs and issue registration certificates
Philippines	CBFM	Peoples' Organizations (POs); Represent communities Prepare Community Resource Management Framework (management plan)	DENR: Identify potential sites, plan forest uses with communities Organize and prepare communities for Community Based Forest Management Agreements (CBFMA)
Cambodia	CFM	Letter of interest to the Forest Administration Establishment of Community Forest Management Committees (CFMC): Participation of at least 60% of the community in the	Forestry Administration: Establishes facilitation team that selects CFM site Analyses land use history and tenure, community organization,

		formation of the CFMC (women must be encouraged to participate) Participate in (GPS) demarcation of forest boundaries Prepare forest management plan	indigenous management systems and land conflicts Performs workshop to disseminate information on the chosen CFM site
Vietnam	CFM	Develop rules on forest protection and development Develop forest management plan	Districts: Authorizes timber harvesting Provides legal support Communes Provide logistical organization for planning and reporting

Source: Modified from IGES White Paper, 2014

4.2 Ostrom's framework and analysis in some Asian countries

The IAD framework and other Ostrom's frameworks are very much relevant. The flexible decentralizations/diverse set of institutional solutions provide the greatest opportunity for sustainable management of forests by local communities and local governments (Agrawal and Ostorm, 2007). The centralization approach is failed in most of the Asian countries but can give a good example in the Nepal. The forest user rights are clear in community forest of Nepal. It has proved in the Asian region that centralization cannot help controlling deforestation, but it will stop access to forest resources from the community. Community forestry in the Asian region provides several environmental, economic and political benefits where local people have rights to manage the forest. It can observe that communities have active control over forest management, improved

livelihood, and participation in local discussions. Comparatively, among the different Asian region, community forestry of Nepal has a more bottom-up approach. The forest cover has also changed in several areas of community forestry program in Nepal. The research conducted in 55 forests of middle hills and the Terai region and compared the effects of 25 forest user groups to those observed under other forms of management and found that forest cover increased in the forest under the control of forest user groups and decreased in the forests under direct state management (Nagendra, 2007). It has also observed among the Asian countries, Nepal community forestry has accountable and transparency institutions. There are a variety of rights, responsibilities, and benefits that ensure under community forestry Nepal. The Indian community forestry program also tried to link up with the poverty reduction activities. This will provide an opportunity for the pro-poor group to participate actively in the forest management. In most of the Asian region, the local level institutions have created, but those institutions were not built up with local rules and regulations. These institutions need to be well equipped with resources, training, and transparent governing system.

The communities in most of the South Asian region government hand over the responsibility to protect and utilize the forest resources but at the same time, there is a lacking of rights to sanction encroachers or to use the financial benefits earned from forests. There is clear overlapping of international treaty and rules regulations from the national level. The one example is the International Labor Organization (ILO) 169 convention mentioned that tribal people in independent countries whose social, cultural and economic condition distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their customs or traditions have sole rights to use the forest resources in their respected areas. However, the communities in Nepal, India and other Asian countries are heterogeneous. The community is

mixed with different caste and economic groups. Thus, it is challenging to implement the ILO 169 laws. The effective monitoring of community forest lacks in several Asian countries. The effective oversight is vital to long-term forest management. Communities may need to be trained, so they can be clear on what specific roles can they play.

Collective actions in Forest Power Decentralization in Asian regions

If the forest resources are under the central government authority, local people have very little interest in the management and conservations because in many cases local residents do not have access to use the resources on centralization period. Three different actors' plays a crucial role in the collective action aimed decentralizations such as central government politicians and bureaucrats; international donors, bilateral agencies, and multilateral institutions; and local communities and their leaders whom decentralization processes seek to invest with more power (Agrawal and Ostrom, 2007). The role of central government politicians depend upon the countries in Asian region such as some countries were colonized for an extended period such as India and Philippine. Even in that colonized period, local people have demonstrated to get more power and use of natural resources. In other Asian countries which are colonized for a short period, the central government had reviewed the impact and benefits of putting the forest power on them. If we look the example of Nepal, the central government starts for decentralization since the 1970s due to the huge problem of deforestation and degradations. In some case, the international donor agencies such as Danish International Developmental Agency (DANIDA), Canadian International Development Agency (CIDA), Swiss Agency for Development Cooperation (CIDA), Norwegian Agency for Development Cooperation (NORAD) had played a active role to facilitate the decentralization approach to central government. In most of the case, international donor agencies have provided the financial support for the decentralization approach.

The activities and participation of local people are always playing a positive role in the sustainability of decentralization approach. The involvement of local people in the governing of the commons depends upon the objectives and interest of proper user groups. It has observed that in most of the Asian region the management of local commons has tried to link up with the poverty reductions and livelihood improvement through the forestry sectors. The equitable participation of local people is very difficult if the communities are large and heterogeneous. In most of the heterogeneous communities, local people have different objectives for the management of commons.

CHAPTER 5
CASE STUDY: SATOYAMA CONSERVATION IN JAPAN

5.1 Forest in Japan

The total forested area in Japan was maintained to a certain extent during the period from the early 1850s to the mid-1980s (Himiyama, 1995). Before the World War II three types of institution existed. Private timber forest, state-owned timber forests, and community forest. Timber forest is located far from the village, whereas the community forest for charcoal, firewood, and grass located near the village. During the Meiji era (1868-1912) community forest was managed efficiently, and community ownership rights were granted. People collected the assigned amount of minor forest resources on "open days" of forest (McKean, 1992). The Japan community managed forest can be divided into three forms such as before the fossil fuel revolution, after fossil fuel revolution and the current time. Before the fossil fuel revolution time, villagers were living closely with the natural ecosystem. Villagers used fuel wood for cooking and produced the charcoal in the market. At those times, *Iriai* forest system was ubiquitous. The social capital/cooperation was well-established within the local community for natural resource management, and ecological system was intensively managed at the local scale (Takeuchi et al., 2016). Then the rapid economic growth period starts since completion of Second World War II. During those time large scale of natural regeneration forest (primary and secondary forest) was clear-cut and replaced by large-scale monoculture plantations of trees for timber production, such as sugi (Japanese cedar, *Cryptomeria japonica*) or hinoki (Japanese cypress, *Chamaecyparis robusta*). There are several reasons for declining of the rural ecosystem such as widespread use of chemical fertilizers, imports of the massive amount of timber from abroad, the excessive use of

fossil fuels, lacking the manpower to work in the agriculture sector (people migrate to city area). In between 1950 to 1960s the increased use of fossil fuels and chemical fertilizers led to many ecologically important species on Satoyama including insects and aquatic biota (Washitani, 2001). Then the conservation of Satoyama era has started. Local people and government starting to think about the ecosystem services provided from the Satoyama landscape.

5.2 Development of Satoyama conservation in Japan

Sato means village and Yama mean mountain in the Japanese language. The definition of Satoyama is various on different time scale period. In the Edo period (1603-1867), the forests near the villages were called Satoyama (Morimoto, 2011). At present, it means a holistic set of interlinked units, including settlements, rice paddies, agricultural field, bamboo forest, woodlands, and grassland (Yokohari and Bolthouse, 2011). Satoyama concept is a traditional way of conservation of socio-ecological production landscape which can be managed by a single-family, or landscape used by an entire village or cluster of the village (Kobori and Primack, 2003).

Evolving definitions of Satoyama.

Table 29 Definition of Satoyama

Definition	References
Forest managed by local agricultural communities	Takeuchi, 2001; Ichikawa et al., 2006; Kobori and Primack, 2003; JSSA, 2010

Japanese traditional rural landscape, comprised of an integrated social and ecological network of a village and its surroundings such as agricultural lands, open forest lands, and forest	Fukamachi et al., 2001
In the broadest sense of the term, Satoyama is a mixture of forests, wet rice paddies, cultivated fields, pastures, streams, ponds and irrigation pond surrounding a Japanese farming village-the entire landscape necessary to supply the needs of a community	Kabori and Primack, 2003; Sakamoto, 2007
A dynamic mosaic of managed socio-ecological systems producing a bundle of ecosystem services for human well-being	JSSA, 2010

Source: Modified and adapted from Indrawani et al., 2014

Satoyama has a long history in Japan. In the Edo period, community people were dependent on the Satoyama surroundings: grasslands were used for horses and cattle, streams, ponds, and ditches were managed for the rice paddies and supplied fish to eat (Kobori and Primack, 2003). In the past, people in Japan depend upon forest resources on different purposes: a clean and reliable water supply for rice field irrigation and household use; fuelwood and charcoal for domestic cooking and heating; leaf litter and grass that villagers use it as an organic fertilizer (Martin, 2005).

A joint ownership of forest land by the village people is traditionally called as '*Iriai*.' Those *Iriai* systems had a robust institution with histories of centuries with traditional agriculture (McKean, 1992). Local *"Iriai"* system that relies on a rural-specific area extracted timber to make a new

house, collected firewood, fodder, dry grass, leaf for fertilizing paddy fields and charcoal making (McKean 1992). However, the Government of Japan brought forest nationalization policy in Meiji era (1867-1911). Then, many *Iriai* forest transferred to the state ownership. At the same time, the government introduced the private ownership of forest-based on the western concept of 'property right' to encourage afforestation through the private property (privatization) of forestry. Traditional *Iriai* system survives in some satoyama area. However, the Iriai land has decreased rapidly by the development of silviculture after the World War II.

Recently, the *Iriai* system is recognized as typical common pool resources from renowned researcher such as Elinor Ostrom. Ostrom cited McKean(1986) argued that most characteristics of traditional *Iriai* system correspond to the eight design principles (clearly defined boundaries, congruence between appropriation and provision rules and local conditions, collective choice arrangements, monitoring, graduation sanctions, conflict resolutions mechanisms, minimal recognition of rights to organize and nested enterprise) illustrated by long enduring common pool resource institutions (Ostrom, 1990: 65-69; 94-100). There were four different types of "*Iriai"* use patterns were existed such as collective use: right-holders as individuals can enter any part of the *Iriai* forest to collect forest products according to group norms; corporate use: rights-holders collectively harvest *irai* forest products to generate income for common use while prohibiting access by individuals; individual use: each right-holder as an individual uses an allocated part of *Iriai* forest, but can't sell her/his part; and contract use: all rights-holders retain collective ownership and can lease *Iriai* forest to another party for harvesting timber or other benefits (McKean 1992). However, those types of theory/typology of *Iriai* rights and forest use patterns were different from place to place, and once the family moves out of the locality, they also lose its rights on *Iriai* system (Yamashita et al. 2008).

Margaret McKean pointed the ten attributes of successful common property regimes of the *Iriai* (McKean, 1999). They are (i) user groups need the right, or at least no interference with their attempt, to organize (ii) the boundaries of the resources must be clear (iii) the criteria for membership in the group of eligible local users to use the resource must also be clear (iv) users must have the right to modify their use rules over time (v) use rules must correspond to what the system can tolerate and can environmentally conservative to provide a margin for error (vi) use rules need to be clear and easily enforceable (vii) infractions of use rules must be monitored and punished (viii) distribution of decision-making rights and use rights to co-owners of the commons need not be egalitarian but must be viewed as fair to the local people who are poor and can not put their voice (ix) there need to be inexpensive and rapid methods of resolving minor conflicts (x) Institutions for managing extensive systems need to be layered with considerable devolution of power to small parts to give more flexibility and some control over their fate (McKean, 1999). Also Stern, et al. (2002) noted the seven challenges of institutional design: (i) low-cost enforcement rules (ii) monitoring the resource and users compliance with rules (iii) address negative externalities for other resources (iv) reconciling conflicting values and interest (v) managing resources with imperfect knowledge (vi) establishing appropriate linkages among institutions (vii) adapting to change in social and environmental conditions for managing common pool resources (Stern et al., 2002). The type of ownership of Iriai forest before the enforcement of privatization policy is shown in table 31.

Table 30 Ownership of Iriai

Ownership	Area ("000 ha)	Number of groups of rights holders
Old municipalities (before merger into single municipalities)	26	543
Divisions of old municipalities (before merger into single municipalities)	325	18,120
Previous municipality (before merger) established as financial wards	491	2,047
Individuals	26	3,050
Group of individuals with joint ownership	500	52,250
Private companies	1	56
Organizations with corporate status	86	2,887
Associations	73	21,643
Temples or shrines (community)	75	21,643
Total Iriai forest area	1,603	109,909

Source: Adapted from Government of Japan, 1960 cited in Yamashita et al. 2008.

5.3 Devastation of Satoyama landscapes

According to the Ministry of Environment (2002), *Satoyama* landscape covers more than 800 million hectares of secondary forest and 700 million hectares of agriculture area (MoE, 2002). According to the survey of Japan's *Satochi-Satoyama*[10] between 1999 and 2001 (Ministry of the Environment Japan, 2001), *Satochi-Satoyama* amounted around 43% of the national land, and 55% of habitats with high concentrations of endangered species were distributed in those areas. This figure shows that how the importance of *Satoyama and Satochi*. Thus, if the *Satoyama* resources are abandoned, and resources degradation continues, a significant loss will place in the ecosystem services because of the diversity of resources in that area (Kada, 2012).

As shown in Table 31, Satoyama in Japan has faced difficult challenges throughout the after-War period. Due to socio-economic changes caused by energy revolution and modernization of agriculture in from 1960, farmers abandoned the use of secondary forest resources led to the degradation of *Satoyama* forest across Japan.

[10] Satochi-Satoyama refers to an area consisting of farmlands, irrigation ponds, secondary forest, plantation forest and grasslands around the human settlements.

Table 31 Historical Events in Satoyama

Year/period	Event
1940s	Reckless deforestation during and after world war II
1947	Emergence of small landholdings through the implementation of a land reform
1960s	Fossil fuel revolution begins Intensive conifer plantation imitative begins; broad-leaved forest turn to conifers Satoyama issue highlighted
1970s	Increase wild pine disease Remarkable slowdown in Pine mushroom production Massive urbanization begins in Satoyama area
1980s 1988 1989	Oak wilt disease begins to prevail Dr. Moriyama/ Scientists start to advocates Satoyama for biodiversity 100 best homelands with living things by the Environmental Agency
1991 1995 1997 1999	Contest for beautiful scenes for Japanese villages by Ministry of Agriculture, Forestry, and Fishery (MOA). Many weeds were listed as endangered in Kansai The Red List of Japan detailed many Satoyama species 100 best-terraced paddies by the MOA
2001	Land improvement law that considers the environment
2004	Top 30 conservation activities in Satoyama by the Ministry of Environment
2005	Expo 2005 Aichi, Japan
2007	Satoyama Initiative mentioned in environment nation strategy
2007-2010	Satoyama Sub global assessment begains
2008	100 best Satoyama of Japan selected by Asahi Shimbun
2008	Satoyama Initiative by the Ministry of Environment

Source: Adapted and modified from Morimoto, 2010

On the other hand, abandoned farmlands also have increased due to the aging farmers and the migration of their children to an urban area for the job opportunity. The following chart adopted from the (Duraiappah et al., 2012) shows the farm household population has decreased rapidly during 1960 to 2005. The rapid urbanization accelerated the devastation of satoyama since the 1970s in particular in the area adjacent to urban cities. For example, *Satoyama* area in Yokohama City decreased from 10,000 hectares in the 1960s to 3,000 hectares at present (Kobori and Primack, 2003).

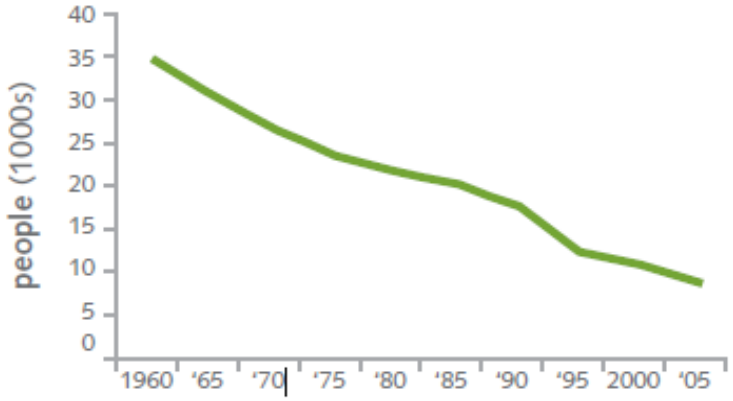


Figure 12 Farm household population

Source: Adapted from Duraiappah, et al. 2012, cited from Census of Agriculture and Forestry, Ministry of Agricultural, Forestry, and Fisheries of Japan

It was the late 1990s that the Government of Japan recognized the issue of *Satoyama* ecosystem conservation. In 2002, the national government revised the National Biodiversity Strategy that states three 'crises' lead to the loss of biodiversity in Japan. The first crisis is the destruction of ecosystems due to overdevelopment and overuse. The second crisis is the loss of biodiversity due to the abandonment of *satoyama* areas. The third is the deterioration of ecosystems due to invasive alien species. The new Strategy stipulates several measures for *Satoyama* area in both urban and

rural areas including the introduction of an agreement system for S*atoyama* management within Natural Parks (landscape protection agreements) and implementing nature restoration projects in the S*atoyama* area. Under the initiative of the Ministry of Environment, *Satoyama* conservation pilot projects have carried out with public participation across Japan. In 2007, MoE formulated the National Sustainability Strategy titled 'Becoming the Leading Environmental Nation.' The strategy exhibits a state vision on sustainable society with the slogan of "low-carbon society," "sound-material cycle society," and "society in harmony with nature." It proposed the 'Japan Model for a Sustainable Society' and announced the promotion of 'Satoyama Initiative' to the world. In parallel with MoE, the Ministry of Agriculture, Forestry, and Fisheries develops 'MAFF Biodiversity Strategy' in 2007. It emphasized the conservation of farmland and forest contribute to the biodiversity through the establishment of an ecological network between paddy field and water reservoir, etc (Koike 2017).

In 2010, the Government of Japan established the *Satoyama* Conservation Action Plan that includes the 2010-2020 vision for Satoyama conservation (MoE, 2010). The Action Plan provides conservation measures as follows;

- Promote efficient conservation activities by assessing the future changes in the natural environment and social circumstances in different parts of Satoyama area such as areas close to remote mountains and regions closer to cities
- Achieve better harmony between humans and nature through the revitalization of sustainable agriculture and forestry which puts more importance on biodiversity
- Promote the establishment of appropriate relationships between humans and wildlife, for example by developing buffer zones
- Promote the revitalization of rural districts through vigorous and efficient utilization of local natural resources and the discovery and creation of new value, including the use of local areas for eco-tourism and use of biomass resources
- Promote support for conservation activities and the creation of systems through which the community as a whole including urban residents and business can support conservation activities

5.5 Satoyama landscape conservation in Kanagawa Prefecture

It is not a surprise that local governments took measures on Satoyama conservation before the national strategy. It is local government that led the development of environmental regulations in the 1960s and 1970s. The Kanagawa Prefecture is one of the top runners in the development of environmental policies including satoyama conservation in Japan. Kanagawa prefecture is located in the capital zone adjacent to Tokyo Metropolitan Government. It includes heavily urbanized two big cities, Yokohama city, and Kawasaki city. As shown in the Table, Kanagawa prefecture started environmental policies early in the 1950s. In 1951, the Kanagawa prefectural government introduced the Enterprise Pollution Control Ordinance. It was the Japan's first local ordinance to contain provisions for ensuring harmony between industrial development and the well-being of residents. It handled more than 1,600 disputes concerning industrial pollution by 1963 (Matsuzawa, 2003). In 1971, the environmental pollution countermeasures ordinance was established. In the 1980s, the prefecture introduced the Local Ordinance on Environmental Impact Assessment that was the most advanced local regulation on those periods.

Table 32 List of ordnance and policy

1951	Local Ordinance on Enterprise Pollution Control
1964	Local Ordinance on Industrial Pollution Control
1971	Local Ordinance on Environmental Pollution Counter Measures
1971	Basic Ordinance for securing a safe environment

1972	Nature Conservation Ordinance
1980	Local Ordinance on Environmental Impact Assessment
1983	Kanagawa environment plan
1993	Adopted Agenda 21 Kanagawa
1996	Basic Environment Ordinance
2005	Watershed Forest Environment Conservation and Rehabilitation Plan
2007	Local Ordinance on Watershed Forest Conservation Tax
2007	Local Ordinance on Satoyama Conservation

Source: Modified from Matsuzawa, 2003

In 1993 Kanagawa Prefecture adopted the "Agenda 21 Kanagawa" as the Kanagawa version of UN Local Agenda. At the same time, the Kanagawa Global Environment Conservation Promotional Forum was held with municipalities, corporate organization and citizens to contribute to the implementation of the agenda. 1996, Kanagawa prefecture basic environment ordinance is also another milestone for environmental issues. This ordinance sets out for comprehensive approaches to implementing policies and projects from the planning stage, promoting self-regulated environmental management in business and prefectural government (semi-national-mid level) and independent local government programs for international cooperation.

Under the governor of Shigefumi Matsuzawa (2003-2011), two important local ordinances enacted; the Local Ordinance on the Watershed Forest Conservation Tax and the Local Ordinance on Promotion of Conservation, Rehabilitation and the Utilization of Satochi-Satoyama in

Kanagawa prefecture (from now on, the 'Satoyama Conservation Ordinance'). The former introduced a special tax for the conservation of watershed forest area. It was unique that the tax rate was determined based on the valuation study using Contingent Valuation Method (CVM). The latter is also unique in the emphasis on the multifunctionality of Satochi-Satoyama ecosystem services. Satoyama Conservation Ordinance respects initiatives of landowners and community members, the solidarity and collaboration between landowners, residents, prefectural government and municipalities, and continuing conservation respecting agricultural and forestry in the area.

5.4 Features of Satoyama in Kanagawa prefectures

By the Satoyama Conservation Ordinance, the Agriculture Division of Kanagawa Prefecture Government published the Guideline on the Conservation Promotion in 2008. The first Guideline was effective from 2009 to 2013 and the current second is from 2014 to 2018. The Guideline expects that local people can take a benefit of several ecosystem services from Satoyama area such as seasonal scenery, biodiversity conservation, cultural heritage, fresh air, safe food, disaster relief, forest therapy, etc. through the conservation of satoyama area (Koike, 2013).

The Satoyama conservation ordinance defines that conservation should be promoted through the partnerships among three different stakeholders; local governments, private landowners, and local conservation action groups. Those three various stakeholders have distinct roles and responsibility. Local governments provide financial assistance, monitoring, and evaluation of different activities, providing technical assistance and communication and public relation. The private landowners provide the land to the local conservation action group without compensation. The main stakeholder is the local action group. The local action group is responsible sustainable management of resources for the protection, management, conservation and utilization of resources. The groups

engage in the landscape formation and preservation of traditional culture and the promotion of ecotourism. They welcome citizen volunteer and school students in their conservation activities to disseminate traditional knowledge for sustainable living.

The collaboration of three-tier institution is interesting in Kanagawa satoyama conservation. The following illustration (figure 13) shows the overall structure of Kanagawa satoyama areas.

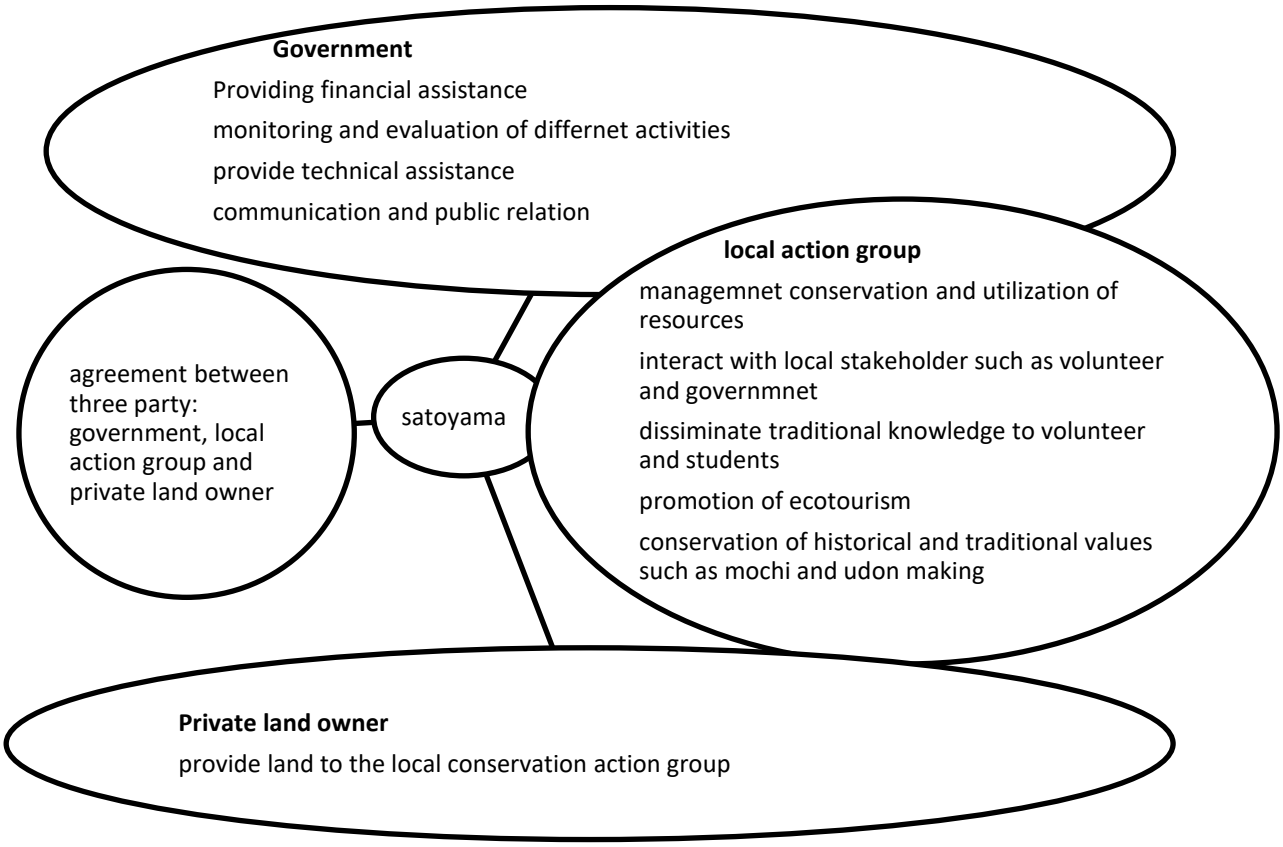


Figure 13 Overview of different stakeholder in Satoyama in Kanagawa

The local action groups will establish an agreement with landowners. This is generally done to the rehabilitation of abandon farmland. The Kanagawa prefecture takes the role of a technical advisor as well as a facilitator. The Kanagawa prefecture also supports sometimes of financial assistance to rehabilitate the Satoyama. The local action group will have full ownership of the area. Local people in Kanagawa prefecture are hugely motivated to conserve the abandoned area. In 2009 there were only seven areas (5,453 ha) was occurred and it sharply increased to 20 areas (12,580 ha) in 2016 (Koike, 2017). In the same time, the partnership was also increased from 28.8 ha to 41.78 ha in 2016.

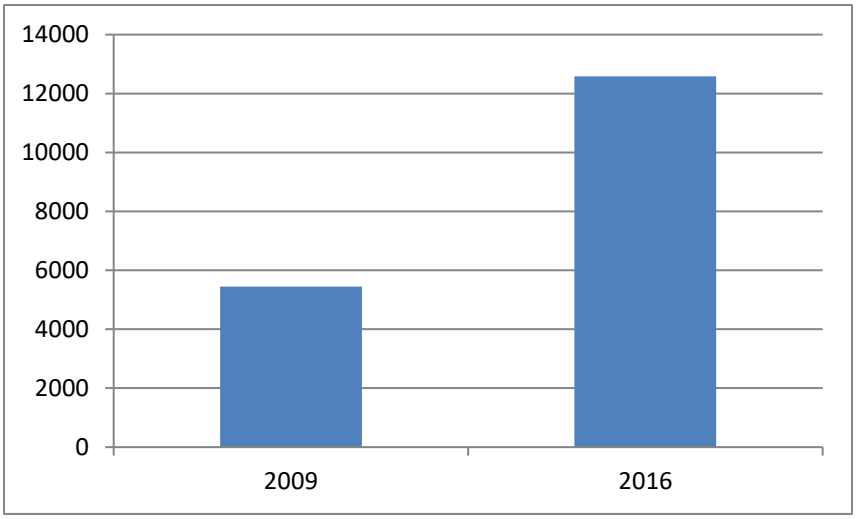


Figure 14 Satoyama conservation area

Source: Koike, 2017

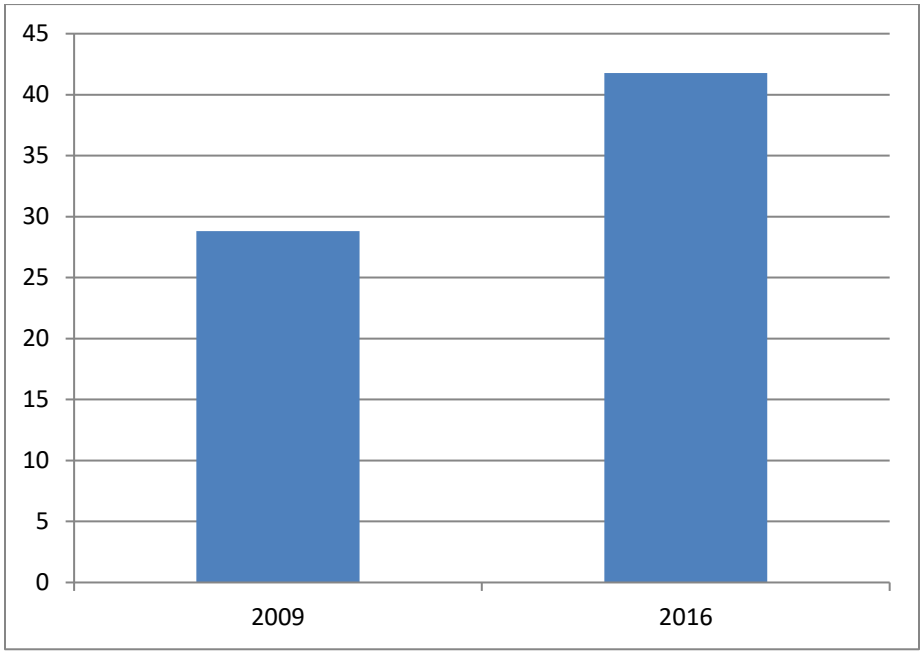


Figure 15 Agreed action area

Source: Koike, 2017

In the Kanagawa prefecture, more than 20 local action group are very much active in conservation and management of Satoyama. The details of Satoyama with name and objectives are listed in table 33. The objective of Satoyama in Kanagawa prefecture is very much wide such as rehabilitation of abandoned forest and farmland to environmental education and cultural events and some also promote a social program that invites handicapped person in the farming experience program as well as collaborate with business enterprises to promote eco-tourism (Koike, 2013 and Koike, 2017).

Table 33 Number of Satoyama in Kanagawa Prefecture

S.N	Area	City	Major activities
1	Komatsu-Johoku	Sagamihara	Rehabilitation of forest, irrigation, and farmland; Environmental study with elementary school students
2	Kurokawa	Kawasaki	Rehabilitation of forest, irrigation, and farmland; Maintenance of orchard
3	Nanasawa	Atsugi	Rehabilitation of agricultural land/orchard; Rice planting/harvest activities
4	Ogino	Atsugi	Maintenance of forest, irrigation, and farmland; Rice planting activity
5	Atsugi	Atsugi	Maintenance of forest, irrigation, and farmland; Rice planting/harvest activities
6	Ishikawa-Maruyama	Fujisawa	Firefly conservation; Maintenance of forest; Biological study
7	Nanganuki	Hadano	Rehabilitation of farmland; Biological study; Cooking class using homegrown ingredients
8	Minoge	Hadano	Rehabilitation of forest, irrigation, and farmland
9	Bodai	Hadano	Rehabilitation of abandoned farmland; Food education using homegrown ingredients
10	Horinishi	Hadano	Rehabilitation of irrigation and farmland; Biological study; Collecting ingredients

11	Shijuhasse	Hadano	Rehabilitation of irrigation, farmland, orchard; Farming activities
12	Terayama	Hadano	Rehabilitation of irrigation and farm land,
13	Tsutizawa	Hiratsuka	Rehabilitation of forest, irrigation, and farm land; Biological study; Cooking class using homegrown ingredients
14	Tsuchiya	Hiratsuka	Rehabilitation of forest, irrigation, and farm land; Biological study; Cooking class using homegrown ingredients
15	Daiyucho	Minamishigara	Satoyama conservation program; Nature education; Appealing satoyama
16	Yagyurasawa	Minamishigara	Satoyama conservation program; Nature education; Appealing satoyama
17	Uchiyama	Minamishigara	Rehabilitation of agricultural land; Cooking class using home-grown ingredients; maintenance of forest (charcoal)
18	Kamisoga	Odawara	Maintenance of orchard; Farming activities
19	Kuno	Odawara	Rehabilitation of forest and farmland; Environmental study
20	Higashikayama	Odawara	Rehabilitation of farm land; Farming activities; Biological study; Flower festival
21	Hatajuku	Hakone Town	Rehabilitation of forest and farm land; Farming activities, Workshop

Source: Adapted and modified from Koike, 2013 and 2017

The author visited two satoyama conservation area during 2014-2016 for the interview survey. Key findings from the cases are as follows.

5.5 Case 1 Nanasawa Satoyama conservation area

Kanagawa prefecture government has designated Nanasawa satoyama conservation area on March 13, 2012, which covers an area of 1,271.6 ha. Nanasawa area is located in the western part of Atsugi city with covering some parts of Tanzawa Oyama Quashi-National park located in Kanazawa prefecture. This satoyama is providing several ecosystem services such as biodiversity conservation, watershed protection, micro-hydro electricity generation, landscape recovery, and purification of local water/river, cultivation of different organic agriculture such as sweet potato, rice, and pumpkin. Those all activities are managed by a local action group with collaboration with various stakeholders such as volunteer, students and local government.

It has found that Nanasawa Satoyama local action group is working together to help share and accommodate different ideas and interests. Residents are working in a group with the strong bonding that helps people to learn a lot. Those learning can be in various forms such as bringing traditional and scientific knowledge together. Resident also mentioned that those learning are helping to encourage participation, revitalize natural resources, teaching and sharing benefits and use of natural resources and organic food (field visit and interview with local action group)

5.6 Case 2 Hadano Naganuki Satoyama conservation area

This satoyama area is selected on March 27, 2009, which covers an area of 211.5 ha. It lies in Hadano eastern foothills of the south of Oyama. It consists of gentle hills in designated Tanzawa-Oyama Quasi-National Park. The forest area is dominated by natural confers. The foothills of this area are covered by secondary broad leaves forests.

Major four stakeholders involved in the management of Naganuki Satoyama 1. Forest owners- provides places for activities 2. Neighborhood resident- carry out forest management and other work, with the consent of and in cooperation with forest owners 3. Hadano city- Implement supporting measures and projects for activities of forest owners and neighborhood residents 4. Kanagawa prefecture- provides financial assistance to Hadano city, using the water source environment tax as a source of funds.

5.7 Satoyama conservation and human well-being in Kanagawa Prefecture

Koike (2017) has evaluated the rehabilitation of Satoyama in Kanagawa prefecture with the United Nations Millennium Assessment conceptual framework with dividing in Satoyama ecosystem into different five fields local economy, environment and land conservation, landscape formation, education and human development, and health and community (Koike 2017). Those five areas were corresponding with ecosystem services defined in the Millennium Assessment; 'Local economy' corresponds to the provisioning services, 'Environment and land conservation' corresponds to the regulating services. 'Landscape formation,' 'education and human development,' and 'health and community' are corresponding to the cultural services. In his study, the biodiversity is included in the field of 'environment and land conservation.' It is based on the assumption that the recovery of biodiversity will be evaluated through environmental conservation activities (Koike, 2017).

Table 34 Evaluation of Satoyama with MA conceptual framework

Subfield	Activities	outcomes	Generated Value
Local economy	Rehabilitation of abandoned farm land, sale of agricultural products, farming experience, event	Vitalizing agrarian economy, increase of agriculture-related consumption, increase of urban-rural exchange	Economic value (contribution to agribusiness)
Environment/ land conservation	Rehabilitation of satoyama ecosystem, use of biomass, environmentally friendly agriculture	Recovery of biodiversity, promoting understandings of low-carbon society, cyclical society, and society in harmony with nature	Environmental value (improvement of urban life with satoyama conservation)
Landscape formation	Landscape formation (planting, thinning, maintenance of walkway), event	Increase number of tourist (firefly viewing, chrysanthemum festival, satoyama art)	Landscape values (Agri-tourism)
Education/ human development	Biological study, farming experience, food education, traditional culture, acceptance of volunteers	Farm to School partnerships, promotion of food education, development of voluntary actions, promotion of CSR	Cultural values (secondary nature, traditional culture)
Health/community	Cooperation with community organization, traditional event, interaction with welfare institutions	Health promotion, community development, partnership with Non-profit organizations, agriculture-welfare cooperation	Social values (social capital, empowering women and the elderly)

Source: Koike, 2017

As shown in Table 34, most of the local action groups were engaged in economic activities such as rice planting, vegetable farming, cooking class sell the hand-made craft, charcoal, vegetables, and fruit at the events. etc. In some Satoyama area, participants have to pay for the joining the events. Those fees are also going to use in different conservation activities or official activities. These outcomes show that some economic values are rehabilitated through the conservation efforts (Koike 2017). Another benefit to the local action group is, action group can conserve the

biodiversity and some rare plants, butterfly or other attractive birds. Action groups promote environmentally friendly agriculture such as organic farming and among this education and human development (Elementary school student study the environment and traditional culture) is the very popular activity (Koike, 2017).

The Kurokawa Satoyama conservation area can attract tourist and visitors from different regions. It has well-maintained landscapes which attract tourist and visitors. The local students also exhibit the works around the rice field. These rehabilitated Satoyama ecosystems provide a variety of cultural services (Koike, 2017).

The Satoyama in Kanagawa prefecture is very much active in the networking with the private sector as well as the university, school, and urban people. More citizens participate in the conservation activities as volunteers, and private companies dispatch their employee for satoyama conservation as a part of 'corporate social responsibility (CSR).' It suggests that practices of working together would bind members to increase a sense of solidarity.

However, challenges remain. Firstly, the provisioning services are limited mainly due to the size of the economy. As the majority of group members are the retired person, who does not need to depend on income from farming. It suggests that economic benefits do not work as the incentives for 'collective action.' Rather, cultural values such as friendships and health can be the motivation for engagement. Secondly, as Koike points out, the values of satoyama ecosystems are not yet popular among the population of Kanagawa prefecture (Koike 2017).

In comparison with community forestry in Nepal, participation is open to the other non-active members in the Satoyama area. They invite school children, university students, governmental body, the private sector, non-active members and active members around the Satoyama to the

conservation activities. This broad participation can help to disseminate the environmental education widely. There is also a strong bonding on social capital. Local action group member has a deep trust in each other. It is because the local action group and the neighbored association have a close link in community development.

5.8 Applying institutional analysis and development and eight principles on Satoyama

Elinor Ostrom provides eight principles for successful management of common pool resources be clearly defined boundaries, congruence between appropriation and provision rules and congruence between provision rules and local conditions, collective choice arrangements, monitoring, graduated sanctions, conflicts resolution mechanisms, minimal recognition rights to organize, nested enterprises (Ostrom, 1990).

The first principle is a definition of the user and resources boundaries. Both use and resource boundaries are the basic principle for any type of commons. In the case of Satoyama landscape, there is a clear boundary on the resources. However, at the same time, there are no clear definitions of user group boundaries. The user group boundaries depend upon the specific Satoyama where some of the action groups are very much flexible and open to outside members. The objective of Satoyama is conservation as well as the awareness on environmental conservation. Thus, local people want to make an environmental awareness on environment.

The Ostrom's second principle is about the congruence between appropriation and provision rules and congruence between provision rules and local conditions. The most of the Satoyama group are following these second principles. The benefits are congruent with local social and environmental conditions, and the appropriation determines those according to rules.

The Ostrom's third principle is about the collective choice arrangements. It has been observed that most of the Satoyama users can make collective choice arrangements. It has been observed that Satoyama local action group discussed in the upcoming events, traditional festivals and environmental education program for the children. Nanasawa Satoyama has an event that shows the traditional drama for the children program. This will help aware local children on important issues on environmental awareness.

The principle four defined about the monitoring. It is categories in two forms two forms (i) monitoring users and (ii) monitoring of the resources. In the monitoring of users, monitors who are accountable to the users monitor the appropriation and provision levels of the Common Pool Resources users. In the monitoring, the resource, monitor who is accountable to the users monitor the condition of the resource. The user groups in Satoyama do regular monitoring of resources and user groups. They have an attendance sheet about the participation of local volunteer and action group. It has been observed that if the resources/Satoyama area is big, monitoring would be a big challenge due to lack of funding. In this case, the Satoyama maintenance is also very difficult.

The principles five is about a graduated sanction. Participants who violate operations rules are likely to assess graduated sanctions. The user groups in Satoyama follow all the rules and regulations. Thus, this principle is not very applicable to the Satoyama action groups. The general trend in Japanese culture is a person does not violate rules and regulations. The both Satoyama action group did not prepare for the graduation sanction principles. Thus, we can also observe that Satoyama is managed beyond the Ostrom's eight principles in the case of graduated sanctions.

The principle six is about the conflict resolution mechanism. It should be a low-cost. There is a very little chance of conflict among the users. The institution and governance are well-established

already. There is a clear role for local action group, government, and private landholder. Thus, this principle is also not very important.

The principle seven is about the recognition of appropriators' rights to organize: The rights of appropriators to devise external governmental authorities do not challenge their institutions. It has been observed that the Satoyama concept is a bottom-up approach and governmental interventions are limited. The government will provide an overall guideline and a small amount of financial support.

The principles eight is about the nested enterprise. This principle also defined as a building a responsibility for governing the common resource in nested tiers from the lowest level to the top level as well as with different horizontal groups. This principle is very much applicable to the Satoyama. The Satoyama has a wide variety of interconnected multi-lateral governance systems. There is a wonderful coordination between the local action groups, government organizations, private sectors, and volunteers.

5.9 Participation and social capital in Satoyama conservation

Around northern and western parts of Kanagawa prefecture, rural households are losing participation opportunities due to several reasons such as depopulation, migration to the cities, rapid urbanization. However, Satoyama landscape is excellent opportunities for local people participating in commons issues. It can observe that increasing participation in Satoyama is not only from the surrounding local action group but the outside such as university students, school children, and outside members. It has analyzed that boundary rules influence the number of participants, their attributes, and resources, the individuals and groups who are included and excluded from the management of Common Pool Resources group. In Nepal community forest it

has strict boundary regulations. However, Japanese Satoyama does not have such type of provisions. Thus, this open boundaries provision brings a lot of benefits and the opportunities and conditions for entry and exit by participants.

The success and failure of local commons depend upon the social capital and governance. There is a strong necessity of social capital in the management of natural resources. The principles of social capital and participation will be applied in this research paper. The analysis of Robert Putnam's theory has been applied in this research. Putnam suggest three different forms of social capital such as bonding social capital (which refers to among the same groups, among family members and ethnic groups), bridging social capital (which refers to between two different groups, across families and ethnic groups) and linking social capital (which refers to between the various social classes). Those three types of social capital bonding, bridging and linking social capital is further elaborated in different variables such as such as community networks, stakeholder participation, the connectedness of local people, reputation/trust, and satoyama program implementation.

It has been observed that there is a strong social capital and participation in the Satoyama conservation activities such as rice planting, vegetable farming, and other activities. Both Nanasawa and Naganuki Satoyama conservation groups are also very active in the environmental education program. The researcher found that there is an active participation of school children and university students in the conservation activities such as rice planting and harvesting activities, biodiversity identification activities, and environmental drama event activities.

The social capital is measured with different variables such as community networks, stakeholder participation, connectedness, reputation/trust and implementation of Satoyama program. The local

action group and volunteer group are organized in a bridging and bonding type of social capital. The community networks are powerful and working collaboratively. The collaboration is linked with the voluntarism. The local action group invites volunteer from outside the surroundings such as from the university student or private citizens. Those types of connectivity and participation are based on the membership. The membership rules and regulations are not very strong. The trust in between the group is also very high among the groups. The trust with government and private landholders is also working strongly. The Satoyama is an agreement with local action group and private landholders with facilitations from the government. The different program has implemented in the Satoyama. That program will be conducted with very collaborative way with volunteers and local action group members. The research findings of social capital are summarized in table 36.

Table 35 Variables used for social capital analysis

Variables used for Nanasawa and Naganuki	Measures and findings
Community networks: strong networks working collaboratively.	Participation, membership, voluntarism
Connectivity and participation: Community is connected through the members and volunteers; stakeholders are linked in social form.	Volunteer are connected through the different medium such as membership, newsletter announcement.
Trust: Both Satoyama action group have trustable institutions. It has good collaboration with government, private and volunteer.	Community participations
Implementation of satoyama program such as rice planting, vegetable planting program. It is a good example of collaboration.	With good monitoring and evaluation

However, there are some challenges in Nanasawa and Naganuki Satoyama conservation areas. Direct threats –in the area include land use change, agriculture products are not enough for commercial purposes, under use of resources, lacking productive area. The indirect drivers are demographic factors such as lacking youth farmers and aging, low priority in the government programs, lacking local people who haves technical knowledge (hiring technician from the market is expensive) and a limited number of volunteers.

5.10 Policy reforms for the future

The Satoyama area is a good example of how human and nature coexist. There needs to be done more research on how to position satoyama landscape on ecosystem networks and how to manage satoyama landscape in such a way that the balance between the needs of human and nature can be restored. It also observed that the example of collaboration and coordination between the government, volunteer and local action group. Most of the Satoyama landscape in Japan has a stable type of social capital with active local people participate in different volunteer activities. The Satoyama landscape is not only confined with biodiversity but also a conservation of traditional knowledge and inspiration of emotional values. It has also observed that Satoyama area has a culture of working together, bringing traditional and scientific knowledge together, encouraging participation, revitalizing natural resources and promoting sustainable use of natural resources and organic food. The trust in between the group is also high. This type of institution and governance can be a good example to other places where the private landowner is not able to manage the commons.

However, there are several challenges in the Satoyama area. Development of residential and commercial area in the Satoyama area is a direct threat not only to biodiversity but the sustainable lifestyle of 'Living harmony with nature.' Although the social sector such as social capital and participation is robust in the Satoyama, revitalization of Satoyama landscape needs innovative program bringing more youth back to rural areas such as partnerships with private sector and company. The new market-based economic mechanism such as the payment for environmental services (PES) mechanism can be adopted to get more financial support from the people or government. Now, the green tourism with local organic food is becoming popular worldwide. This mechanism will be applicable in the Satoyama area. The cultural and spiritual value of Satoyama can be conserved in a way with the connection to market.

The Satoyama Initiative is a global movement for conservation around the world. In the same time, local Kanagawa prefecture Satoyama can also be a partnership with this movement and invite the other community members to show how the participation and social capital is helping to conserve it.

The Satoyama conservation and management practices in Kanagawa prefecture are unique to each other. The approach of conservation differs from each other. It is desirable if the Satoyama conservation action group shares their knowledge with another action group within the prefecture or even outside the prefecture. The local government office can document knowledge of that uniqueness and market outside the group. That knowledge can develop further coordination and collaborations. It can help widening the fields such as promoting eco-tourism, conservation of biodiversity, genetic resources conservation, sharing and documentation of traditional knowledge, etc.

CHAPTER 6
ANALYSIS

6.1 Examination of the hypothesis

There are three fundamental research hypotheses for this research. The first hypothesis is related to the participation and institutions. Participation is an important indicator of democratic governance. The participatory governance is very much important in the sustainability of commons which falls in the SES in action situations variables where actors are participating actively. It could be accomplished by checking the participation of local peoples in local commons on community forestry and Satoyama program. The participation in managing the commons has been observed in different forms such as not only the attendance in the executive meeting or general assembly but the voices in the decision-making process is fundamental things. The second hypothesis is about social capital. Social capital is the "glue that brings and holds them together, and it can also facilitate coordination, trust, and cooperation" (World Bank, 2012). This hypothesis is examined by checking the different aspects of social capital and participatory governance. The final third hypothesis is on the institutional diversity in the policy practice of common pool resources among the countries. The case study from Nepalese community forestry gives an example that the community forestry provides several training opportunities for different activities such as administration, forest development, microenterprise development, etc. Those training opportunities also plays a vital role in making stable governance and strong institutions. The following are the in-depth description of the evidence of hypothesis.

a. Participation and institution

This hypothesis is checked by the participation of local peoples in local commons. It is analyzed in three different areas. The first analysis is with comparative study with Nepalese community forestry. The second analysis is on the participation in the Asian region, and finally, the third analysis is based on the findings from the Satoyama landscape Japan.

Findings from the case of Nepal

Participation directly affects the action situation in any kind of local commons. In the case of Nepal, there is a lack of proportional participation of different ethnic groups, women and Dalit communities (Bijaya Dhurba G.C. et al. 2016). In the case of Sindhupalchok district, the research data shows only 33.05 % women representative are in the committee where man's representative is more than double (Details discussions in Chapter 3.13), even though Government of Nepal defines stringent membership provisions. The government of Nepal has also imposed strict provision for participation of different communities. The government of Nepal issued guidelines for ensuring participation from various ethnic groups. There should be at least 25 % from minority groups. However, that strict rule is also not widely applied to all community forestry especially women engaging in heavy workloads compared with men. There are certain other factors that affect participation such as rules of entry in community forestry (in many case male wants to participate in those activities), social norms that define who should attend and speak at the meetings, who should form the patrol, how men and women should behave in public and so on (Field studies, 2014). There is also a huge different perception regarding women's ability to contribute to the community forestry. The other factors are personal endowments and attributes (e.g., educational levels, property status, marital status, age, etc) and the tradition of male-

dominated community. Despite these difficult situations in the visited sites for the case study, six members are female, and five are male in 11 member committee (field visit, 2014). This data shows that there are some examples that women participation is satisfactorily, but there are lacking effective participations (such as making the strong voice in a meeting). There can be several ideas to ensure the participatory governance through the diversity of groups. Such ideas like one are to give incentive mechanism to the poor and marginalized group of people. Due to the low wealth and lack of enough salary people have to earn money buy food on the same day (almost impossible to save money for other days). The data obtained from Bhagawati community forest shows that among 146 households among 246 households have food for 12 months, 38 households for 9 months (they have to work outside[11] for 3 months) and 62 households have food for 6 months (they have to work outside for 6 months) (Data obtained during field visit; more in chapter 3.15). Due to those circumstances, effective participation is more challenging for the group of poor people. Another idea to ensure participation may be the introduction of rotation to share roles and responsibilities among group members. In this system, all the groups of people can participate in the conservations. A broad range of ecosystem services analysis is necessary so that local people can understand the importance of participation of in forest conservations. Also, the size of groups also matters in the degree of participation. It has seen from another case study that small and medium level groups can manage the commons very well. In the case of Nepal, some community forests are too large to incorporate all the people's voice in same time. Also, community structures matter. Nepal's community is generally heterogamous with complex issues such as upper caste, medium level caste and lower caste with a different economic background that makes things difficult. The different educational levels among the community groups also make things more

[11] Work Outside means work in the informal sector such as daily wage labor

complicated. There were some types of competitions for taking a vital position in community forestry through the election. It is easy for the educated members to win the election if the other side of the members is uneducated. The data obtained during the field visit shows that in the case of Bhagawati community forest only 276 members among 1284 members have passed 12th grade, 110 members have passed School Level Certificate, and more than two third (868 members) have knowledge on very basic education (See more in 3.15 section). The wider stakeholders also encourage the participation from different areas. The Bhagawati community forest has a connection with the various stakeholders such as FECOFUN, District Forest Office, Range Post, Women Development Office, District Soil Conservation Office and Chautara VDC (Data Obtained from field visit).

Findings from Southeast Asian case

In Southeast Asia, overall participation is insufficient. Some governments have a mandatory policy for participation in forest conservations. Both the Philippines and Nepal are getting progressive in formulating policy and implementation stage, but a concept is a top-down approach. The monitoring is very weak, and it makes the participation very ineffective. Lack of proper mechanism for participation from the private sector is common in Asia and Nepal. Community forestry in the Asian region lacks the capacity to sell the timber on the market. There is no clear provision on how timber or forest products can sell outside the market. If local people see the benefits from timber market, there might be a high participation from all the groups of people. Generally in the Asian region, there are three sets of actors most commonly involved in participation and developing institution through collective action aiming forest policy decentralization and governance, 1) politician and bureaucrats; 20 international donors, bilateral agencies, and multilateral institutions;

and 3) local communities and their leaders who seek to invest with more power in the decentralization process (Webb and Shivakoti, 2007).

Findings from the case of Japan

The Satoyama has a long history of management comparing to the community forestry in Nepal started in the 1970s. With good social capital, due to a long history of management experience, local people participation with good social capital in Satoyama is very much stable. The participation of local people in Satoyama is not only on the conservation and benefit sharing. It has been observed that local people are participating in the conservation education purpose as well as the concept of living in harmony with nature. The participation of outsiders is also very common in Satoyama. Diverse stakeholders such as private company, urban people, government, and student participate in Satoyama. Such wider participation in Satoyama also helps to mobilize more people. The participation concept is beyond the Ostrom's first principles. Ostrom has defined that there should be a boundary of users to have a successful commons. However, in the case of Satoyama in Japan, there is no fix user group boundary. This gives an example of how Satoyama is "new commons" in the case of local common governance. These types of involving wide membership can be learned from Satoyama model in Japan and can implement it in Nepalese community forestry. These types of participation provision can provide educational opportunities to another group of stakeholders. During the field visit in Satoyama in Kanagawa prefecture, the people's participation has different objectives such as people like to work in agriculture, being close to nature, preserving rice terraces, recreation and working in clean air, meeting people and educating children (field visit, 2015).

b. Social Capital and institution

The second hypothesis is on social capital and institution. This social capital is also one of the important aspects of action situation. This social capital also plays crucial roles in SES framework second tire. This research hypothesized that social capital is a necessary condition for participatory governance. The successful participatory social capital will help to make commons more sustainable because local people know in a better way on local needs, costs, resource capacity, etc.

Analysis from Nepal

That social capital and participatory governance of community forestry system are changing in Nepal according to the political movement, governmental structure, and policy, international discourse and donor agency agenda. There can be two different aspects in social capital. The one is social capital dealing with other stakeholders. The other issues are social capital regarding local people to deal with internal aspects. Fundamentally if the communities have a good social capital they can enhance, filter, alter or ignore a central government policy (Gibson, C. et al. 1999). Thus if we look the case from Nepalese community forestry, they can deal with different issues but at the same time. The government of Nepal still sometimes enforce different rules and regulations, but in the same time, there were several successful examples that community forestry has opposed those policies (the details is in chapter 3 institutions in community forestry table 3). The social capital in Nepalese community is not very well-developed to deal with the internal co-management systems. Still, there is lacking participation from different groups. As the Nepalese community forestry user group is a different mixed community. The social capital in Nepal can categories in different variables such as bonding, bridging and linking. We can observe several bridging types of social capital, but at the same time, it is very difficult to see the bonding and linking social

capital. Thus, it is difficult to understand the bonding social capital. Another reason behind the lacking of social capital is most of the livelihood benefit program are unsustainable. Those livelihood benefit programs run through the non-governmental organization. Those non-governmental organizations get money from donor agencies. It has seen that those donor agencies give funding only for a short time. Thus, once the program finished, then local would lose their trust on the projects.

Analysis from Southeast Asia

The social capital in community forestry program among Southeast Asia countries is not so strong. In most of the countries, there are not very clear policy on community forestry such as land rights, property rights, etc. For example, Cambodia community forestry does not have property rights as well as in Nepal several land tenure issues[12] exist. Those factors also affect the social capital. Although there is a lacking of social capital, there are adaptive co-management systems in Asian community forestry. Those adaptive co-management systems share rights and responsibilities for the stakeholders and learning of the stakeholders through actions and modifications of these measures over time.

Analysis from Satoyama in Japan

The Satoyama in Japan has a long history of social capital. Social capital has been informally institutionalized through the history. At present, user groups in Satoyama area share knowledge, understand individuals and regularly interact with each other. This regular interaction helps to develop trust, norms, rules, and regulations. We can observe all three types of social capital such

[12] Nepali community forestry has some issues of land tenure that community forest user groups have rights to use only forest resources, while government controls the rights to extract soil, sand etc.

as bonding, binding and link social capital in Japanese Satoyama. It has been observed that different variables of social capital are well implemented. The variables used in the Satoyama area, to check the social capital are community networks, connectivity, and participation, trust, and implementation of the program. Those variables are measured by the different indicators such as participation, membership, voluntarism, community participation and monitoring and evaluation system.

c. Institutional diversity in the policy practice of common pool resources

The third hypothesis is about the institutional diversity of common pool resources systems. There were four different factors that accelerate decentralization. Firstly, many countries in developing world were facing a fiscal crunch. Thus they need to reduce the cost and become more efficient. The second factors are decentralizations. As institutional diversity is obvious, it is a convenient mechanism to transfer the costs to others. The third factors are the international donors. They make significant funds available to support new mechanism of cooperation and governance that covert local actors into partners. Moreover, finally, many national governments have begun to accept the view that protecting resources does not necessarily require exclusively private property arrangements, or government ownership and management (Agrawal and Ostrom, 2007; Dietz et al., 2003). The Satoyama concept is a bottom-up approach with compare to Nepalese community forestry is top-down. It has observed that there is low or very little governmental influence on Satoyama. The government of Japan only provides a guideline to manage the Satoyama. However, in the case of Nepal, there is a huge influence from government and donor side. The most of the Satoyama institutions are based on the private and public partnership. In the case of Nepal, the land property is owned by the government where local people can only utilize, manage and sell the forest resources. The Satoyama members can open wider market opportunity. People from

outside also can buy the products. It has also observed that members are acutely aware of what type of products, how to manage, how to harvest and how to make a profit by selling. In the case of Nepalese community forestry, the market should be only limited to the user groups. If there is access to the user groups-then only can sell outside the user group, which will provide limited opportunity for market productions. Those market opportunities are also linked with the education level of members. It can observe that the Satoyama members are more educated than the community forestry members in Nepal. Community forestry in Nepal can also use a similar concept of Satoyama and train the user group on how to make a profit orientated market opportunities.

The actors (users) are the main player in the action situation in the first tire of Socio-Ecological System framework both in Satoyama and Community forest. There are several attributes in actors (users) such as some users, leadership, trust and reciprocity, economic independence, history and importance of resources. In the case of Satoyama user groups, those attributes are playing positive role such as number of users are well-defined, the leadership quality is also established, there are a high trust and reciprocity among the user group members, the commons and users are economically independent, and people often see the importance of the commons with living in harmony aspects. On governance systems in the SES framework, wider vertical and horizontal network, property rights systems, monitoring, and sanctioning systems were well institutionalized in Satoyama.

On the other hand, community forestry in Nepal has strict rules on user's side. There is always fixed a number of users. The government has made a strict guideline for user groups although the community forestry user groups have different socioeconomic attributes. It also makes things more complicated if the majority and elite group do not recognize the value of minority groups such as

Dalit and other marginalized groups. The leadership plays a vital role to make a sustainable community forest. Those leaders will ensure the participation of community members, stakeholder discussions and dealing with government, non-governmental organizations as well as donor agency. It can observe that in some community forestry, user groups have unhealthy competitions to lead the community forest. Another attribute of SES framework is monitoring and sanctioning process. Those attributes are well-established in community forest.

6.2 Limitations of IAD framework and Ostrom's eight principles

The Institutional Analysis and Development framework is a general framework to compare institutional diversity among local commons in different settings. The IAD framework is a general term where Socio-Ecological System (SES) and Ostrom's eight principle lies. This approach has been used to analyze community-based commons and fisheries in developed and developing countries. Another criticism is that the Ostrom's eight principles do not take sufficient account of external conditions and constraints. For example, market integration, globalization, and rapid economic development can lead to (i) greater heterogeneity and inequality between CPR participants; (ii) greater pressures on and risks of over-utilization of tangible and intangible resource pools; (iii) reductions in cooperation, trust and reciprocity; (iv) loss of control over resources by local user groups; and (v) reduced dependence of local users on common-pool resources because of alternative income opportunities and greater opportunities for exit – leading to reductions in common understanding, vision and interests, shared vulnerability, trust, reciprocity of trust, and cooperation at local and other tiers and geographic scales (Cox et al., 2010). Some of the major limitations of Ostrom's eight principles are observed as follows:

The size of resources and user group: It has observed in the community forestry of Nepal that Ostrom's principles can be applicable or suitable more in the small and medium size of resources. If there is a huge number of resources and user groups, it may be a chance of over harvesting or free riding problem. A comparative study of Satoyama and Nepalese community forestry also find out that the Ostrom's principles are more applicable to the homogenous community and difficult to address in the heterogeneous community. The Japanese community is more homogenous than Nepal, and the principles of commons are more applicable and sustainable in Japanese Satoyama. In some cluster, the age of user groups also matter. Older age group does more interactions and has a strong social capital with compared to younger age group.

Education of user group: Education of user group also plays a vital role in social capital and sustainability of the commons. Ostrom's eight principles and IAD framework do not explain about the education of user groups. A comparative analysis between Japanese Satoyama and Nepalese community forestry explains that the education is also a factor for sustainability. The Japanese Satoyama action groups and volunteers are more educated than the Nepalese community forestry members. The Japanese Satoyama action groups know how to do with management, cultivation, and business of the products. At the same time, the Nepalese community forestry user groups are lacking those opportunities. In most of the case user groups in Nepal depend upon the forester or agriculture technician to do the farming cultivation. The business opportunity is also very low for Nepalese community forestry user groups.

CHAPTER 7
CONCLUSION

7.1 Summary of the analysis

The decentralization and powerful, inclusive institutions are very much necessary in the case of sustainable management of commons. In the case of Nepal's community forestry program, the Ostrom's eight principles were very much applicable and tried to implement as guidelines. The government of Nepal also sought to bring a guideline similar to Ostrom's eight principles for governing the commons. Those guidelines are based on institutional analysis and development framework where different variables play with action situation, participants, and an attribute of community with rules regulations in various biophysical conditions. Those IAD frameworks will play where there is a clear boundary to resources and users, high levels of interpersonal trust or social capital, procedures for resolving disputes, sufficient decision making autonomy, monitoring and evaluation.

Several aspects of participation can learn and replicate to Nepalese community forest from Japanese Satoyama. The challenges in the participation in Nepalese community forest such as in elite control over decision making, participation in meetings, a feedback mechanism can learn from Japanese Satoyama. Those aspects can be addressed by the involvement of different stakeholder, effective conflict management, valuing of ecosystem services (much Nepalese community forest user group does not know the proper value of ecosystem services). The proper decentralization is also one important aspect of making efficient management. In Nepal, it may take several days/weeks to get the certificate to sell the products from community forest. However,

in the case of Japanese Satoyama, local action groups can decide the market or types of products. This is also due to lack of effective institutions and governance.

Japanese Satoyama is an excellent learning tool on how resources can manage effectively through an entirely decentralized structure with private and community structures. Japanese Satoyama has an advanced system of participations. The participation of user group does not limit only to the surrounding user groups. However, in the case of Nepal, the involvement of user group is limited only to the strict membership for user groups surrounding the forest. This broad participation in Japanese Satoyama provides ample opportunity to interact with other people which are a fantastic opportunity to disseminate the environmental education to the other groups of individuals. It has also observed that the Satoyama model is a bottom up approach. There is a very little or no governmental influence. The Japanese government only makes a guideline for overall Satoyama. Similarly, Nepalese community forestry is a top down approach. The government of Nepal has a high influence on the overall management, conservation, and distribution of resources.

It has also observed that Ostrom's eight principles on the local commons have a significant variable for sustainable governance of commons. In the case of Japanese Satoyama, some of the Ostrom's principles are not very much applicable such as boundary for user groups. This principle of the boundary of user groups is beyond the Ostrom's principles. If the system is very much decentralized, those systems might not need to work entirely.

However, there are some challenges on Satoyama such as underuse of resources, low economic productivity, lack of technical volunteer manpower, aging society. The National government is much more interested only in economic dimensions/ benefits from the agriculture area. The government of Japan has ignored ecosystem services provided from Satoyama area. Thus, local

government needs to think of effective support program for revitalizing Satoyama for multiple uses of underused resources. The local government can think on the issues of biodiversity conservation, environmental education, health promotion, cultural aspects, community development, etc.

There has been some interest in the environmental educations, especially for the children. Environmental education can relate with the Satoyama action group and school.

7.2 Policy recommendations

Nepal community forestry has several challenges. The governmental influence is very high. The corruption and lacking of the rule are other significant problems. There is also an alarming rate of illegal deforestation and degradations. The user groups in Nepal are suffering from high poverty and people heavily depend upon the resources. There needs to be open the participation of user groups to other non-members in community forestry. It can also help to make more awareness of local people. The Satoyama landscape and user groups have different challenges. The over-dumping of resources is one of the main difficulties which is due to the high cost of resources collection and firewood is not being collected for a long time. The other challenges are the low economic productivity of the resources. The production capacity is also small and tough to compete with the market price. Land use change, reclamation, and construction are ongoing in Satoyama landscape area. At the same time, the Satoyama landscape has different objectives than community forestry program. It would be better that if Nepalese community forestry can introduce

those Satoyama objectives such as living in harmony with nature, educational and recreational activities, and forest therapy and disaster prevention evacuation areas.

Based on Ostrom's eight principles, some recommendations for Nepalese community forestry are provided as follows;

Boundaries: The Nepalese community forestry can adopt the similar open boundary system for the user group side. This open boundary system can help to disseminate knowledge to other user groups and can learn several aspects of environmental management issues. The forest act and forest regulations made institutional limitation for the user to fix a boundary between user groups. The government might have thought about the problem of overcrowded users and can accelerate the free riding problem. The free rider problem can be limit by the user's interest, and the user members can get benefit from different environmental services. There is a huge difference between the handover of common pool resources in Nepal and Japan. This can be done with a number of ideas. There can be done a proper valuation of different ecosystem services of the community forest. Then the nearer user groups can have rights to use the provisioning services and the further member such school children or distant users can enjoy the cultural values of the community forest.

Rules and regulations: The rules and regulations from within the Satoyama group are well accepted which happens basically due to the bottom-up approach with extensive participation from local people. In the same time, community forestry does not have the provision to take all the rules and regulations. The government of Nepal imposed strict guidelines to make rules and regulations. This happens due to a top-down approach. Thus, the government of Nepal can also follow similar Japanese system of clear standards rules and procedures for when and how the resources can be

used. Implementation of international rules and regulations is very much important the successful management of the commons.

The importance of locally adapted rules: The locally adopted rules are very much important. It has been discovered that a culturally homogenous and stable community with strong social bonding and community with long-term commitment has a less likely to have free-riding. The Japanese Satoyama users committee has a similar culturally homogenous and stable community. There are no stereotypic single managed rules and regulations for the commons. There is a vast difference between each local commons with different local rules and regulations. If the government imposed tried to influence locally adopted rules, there might be a high chance of free-riding and opportunistic behaviors. It has observed that Japanese government had worked hard to conserve the locally adopted standards in Japan. However, in the case of Nepal, there is a huge chance of overlapping of rules and regulations from National to local government and sometimes from international agreement too. Nepal has a different community, which also makes very difficult to institutionalize all the locally rules and regulations.

Monitoring and enforcement: Ostrom's has described successful systems for common pool resource management also include strong monitoring and implementation mechanisms. This follow-up and enforcement are very much successful in the case of local commons if the size is comparably small. This follow-up and implementation are applicable in both the Japanese Satoyama and Nepalese community forestry. Globally it has observed that if the community has strong social cohesion, this monitoring and enforcement is very much difficult. The other dependable factors in monitoring and evaluation are the provision of rewards and penalties to the communities on monitoring and enforcement. In the case of Nepal's community forestry program,

monitoring is very much compulsory. The community forestry hand over is in strict time bonding such as five years or ten years.

Dispute resolutions: The conflict or natural resources conflicts are common in local commons. There are different types of conflict arises such as the conflict between government and community, the conflict between within the community and conflict between community-community. There should be transparent dispute resolution mechanisms. In the case of Japan, the power is decentralized more to local people, thus to manage the conflict and outcome of conflict local people are accepting results easily. In the case of Nepal, the conflicts arise in two different forms such as user rights conflicts and conflicts between the traditional use of forests and commercial markets. The user rights conflicts are about the right to enter forests or become a permanent member of community forestry user groups. The general assembly of user groups will fix the rules and regulations on forest distribution mechanisms. Thus, there is a huge chance of conflicts. The community is mostly composed of heterogeneous community where different ethnic group and class of peoples composed. There is always a chance of significant competition between the user groups that bring conflicts and might lead the loss of resources-increase of free riding. The other types of conflicts arise in Nepalese community forestry is a traditional use of forests and commercial market disputes. The government of Nepal is still not interested in handing over the forest resources if the production is very high or valuable forest products.

7.3 Limitations of the study and future lessons

This study focused only on the social capital and participation aspects with the Ostrom's eight principles and IAD framework. This research is based on the literature review and several field visits to understand the social capital and participation in Satoyama. Thus, this research is lacking the quantitative data on Satoyama. It may be a good idea to do an in-depth quantitative analysis concerning social capital and participation in the conservation of Satoyama across Japan.

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ANNEXES

Annex I. General Questions for group

1. Name of Satoyama
2. Name of leader/position

3. Number of permanent active household……..& number of active volunteer…..
4. Is population density increasing or decreasing?
5. What are the major agriculture product from Satoyama?

Such as Rice, peanuts,

6. What are the benefits of Satoyama?
7. Historical story of Satoyama……..such as when it was started……..how it started…..
8. What are the traditional ecological knowledge you are disseminating to public?

Such as storytelling with drama to educate children, rice farming in traditional way,

9. What are the new innovation for revitalization of Satoyama?

Such as charcoal, forest therapy, hiking etc…

10. What are the motivations to you for active participation?

Such as: this work is example to other people, we are doing from long time,

11. How do you select for volunteer?

Such as from website/ distribute poster,

12. How do you distribute agriculture products to volunteer and active member?

Such as: we allocate land,

13. What are the direct impact in local people and their family?

Such as: we learn about rice production, vegetable production…

14. How long have you been doing such volunteer type of volunteer?
15. Will you sharing your experience to family, friends or co-workers?
16. What are the main rules and regulations people have to follow to run Satoyama?
17. What are the guidance/benefits/ support from local government? Such as technical, financial etc
18. What is the role of government in Satoyama?
19. What are the major challenges in Satoyama?

Such as Volunteer are increasing or decreasing,

20. What are the impact of urbanization, agriculture reform and market in Satoyama?

Such as land is shrinking, value of agriculture is decreasing,

21. How can be address major challenges such in Satoyama?
22. What are the major challenges in Satoyama area?

Annex II: Questionnaire for the field trip in Nepal

1. Name….. Number of household….Male/ Female/Janajati/Dalit
2. Committee structure…….Any classification among user group….
3. Income of community forestry/ fund from donor/ fund from government
4. Investment percentage in community forestry activities……..
5. Investment percentage in training and social activities……

6. Participation in Community forestry management program….
7. What percentage of different caste group are in decision making body ….
8. Selection procedure of community forestry user committee
9. Participation in decision making and program implementation activities
10. Benefit sharing mechanisms for most expensive forest products
11. Involvement of pro-poor group in price determination for expensive forest products
12. How do you share benefit among user groups/ benefit sharing mechanism?
13. How do you manage conflicts among user group?
14. Which policies do you follow to run community forestry?
15. What is the law enforcement and monitoring mechanism?
16. What are the livelihood impacts to Community forest user groups?
17. Are there any income generating activities to improve livelihood?
18. Value of community forest Conservation/ revenue collection/ empowerment etc?