Volume 2 2022
Nepal Public Policy Review

Policy Commentary

DOI: https://doi.org/10.3126/nppr.v2i1.48687

# Governance of Asta-Ja Resources in Nepal

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Manuscript Received: 14 May, 2022 Final Revision: 27 August, 2022 Accepted: 10 September, 2022

## Abstract

Nepal is endowed with vast natural and human resources, collectively called "Asta-Ja" resources. Asta-Ja means eight Ja, Nepali letter "Ja", Jal (water), Jamin (land), Jungle (forest), Jadibuti (medicinal and aromatic plants), Janashakti (human resource), Janawar (animals), Jarajuri (crop plants), and Jalabayu (climate). Sustainable management of Asta-Ja resources constitutes the major goal of the government of Nepal. Governance of Asta-Ja resources must enhance accelerated economic growth and fast-paced socio-economic transformation of the society while addressing the issues of social and climate justice, inclusion, and other inequalities. A step-by-step, theoretically grounded, inclusive, participatory, and comprehensive Asta-Ja Governance Framework (Asta-Ja GF) are proposed for the best governance of Asta-Ja resources in Nepal. The Asta-Ja GF consists of seven steps, 1) status and linkages of Asta-Ja resources, 2) resources ownership, 3) policies and practices, 4) community engagement, 5) incentives and revenue sharing, 6) infrastructure investment, and 7) monitoring, evaluation, and reporting are proposed. Institution building at the local, regional, and national levels for effective governance of Asta-Ja resources is emphasised. This paper thus studies the Asta-Ja Framework in the purview of laws, policies and plans adopted by the country for the sustainable development and utilisation of natural resources. The paper also enlists the reasons why there is a need for effective governance of Asta-Ja.

**Keywords:** Asa-Ja, Governance, Natural Resources, Human Resources, Policies, Nepal.

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## 1. Introduction

With the advent of federalisation, the administrative and governance structure of the country is divided into seven provinces and 753 local units, devolving authorities or power to provincial and local governments (GoN MoLJPA, 2017). The constitution of Nepal has provisioned for the formation of the National Natural Resources and Fiscal Commission (NNRFC) at the Federal level. The functions and duties of NNFRC include 1) bases determination for the distribution of revenues from utilisation and development of natural resources between Federal, Province, and Local Governments, 2) investment recommendation along with development and estimated returns for natural resources utilisation, 3) study on the dispute concerning distribution amongst three tiers of government 4) studying and making suggestions about Environmental Impact Assessment while/for natural resources development and utilisation, and 5) making a recommendation on the ceiling of internal loans that Federal, Provincial and Local Governments can burrow for natural resources development and utilisation. The NNFRC, in close coordination with the Association of District Coordination Committees (ADCC), Municipal Association of Nepal (M.A.N.), National Association of Rural Municipalities (NARM) and many other stakeholders, is responsible for making recommendations to the Government of Nepal about natural resources development and management in Nepal. Despite decades of governmental efforts on sustainable natural resource management, Nepal is experiencing degradation of natural resources and increases in poverty, resource conflicts, corruption, and environmental pollution.

Nepal's failure in sustainable natural resource management can be exemplified by the massive conversion of agricultural lands to built-up areas, haphazard urbanisation, ecological degradation of the Chure region (the youngest mountain range in Nepal), abandonment of agricultural lands, land degradation, overharvesting and degradation of forest resources, and worsening air quality. Natural resources management conflicts are widespread in several areas, including transboundary water uses, irrigation and drinking water, hydropower, waste disposals, harvesting of forest products, pastureland uses, and park and people resource conflicts. Once a net exporter of agricultural commodities until 40 years ago, Nepal's current food system relies heavily on imports of agricultural goods from foreign countries. Agricultural goods import invoice reached rupees (Rs) 325 billion Nepalese Rupees in 2020-2021, which was about Rs. 250 billion in 2019-2020 (Prasain, 2021).

Out of 5.49 million hectares of land being farmed in Nepal, 1.03 million hectares are fallowed. The Government of Nepal must devise a concrete plan to bring these fallow lands back to agriculture. Continued fallowing of agricultural lands leads to natural

revegetation causing difficulties in bringing the land back to agriculture. Due to climate change impacts, villagers migrate from their ancestral places, abandoning agricultural lands. Cities are congested and polluted, lacking basic education, water supply, transportation, and health infrastructure. Over five million Nepali people are in foreign employment resulting in labour shortage for agriculture, construction, and industrial works back home. The Government of Nepal must develop a comprehensive natural resource governance strategy for sustainable development of natural and human resources for employment generation, food security, and economic development.

Historically, natural resource governance is centered around harvesting or utilising natural products for human benefit (Crona and Hubacek, 2010). Recently, the concept has become broader and encompasses various aspects of society, including food security, employment, income generation, equity, social and climate justice, social inclusion, ecology, and environmental sustainability. Natural resource governance is increasingly becoming the task of formal institutions through rules and regulations.

According to the IUCN (2022), natural resource governance refers to *the norms, institutions and processes that determine how power and responsibilities over natural resources are exercised, how decisions are taken, and how citizens – women, men, indigenous peoples and local communities – participate in and benefit from the management of natural resources."*

The IUCN has published a conceptual Natural Resource Governance Framework (NRGF) to promote greater coherence with the existing natural resource governance approaches (IUCN, 2022). The IUCN NRGF include two values, 1) sustaining nature, and 2) social equity and human rights; and ten principles, 1) inclusive decision making, 2) recognition and respect for tenure rights, 3) recognition and respect for diverse cultures and knowledge systems, 4) devolution, 5) strategic vision, direction, and learning, 6) coordination and coherence, 7) sustainable and equitably shared resources, 8) accountability, 9) fair and effective rule of low, and 10) access to justice and conflict resolution.

According to PROFOR/FAO (2011),

*"Good governance is characterised by stakeholder participation, transparency of decision-making, accountability of actors and decision-makers, the rule of law and predictability. Good governance is also associated with efficient and effective management of natural, human and financial resources and fair and equitable allocation".*

The assessment tool of community forestry governance of PROFOR/FAO (2011) includes three pillars: 1) policy, legal, institutional and regulatory frameworks, 2) planning and decision-making processes, and 3) implementation, enforcement and compliance, and 13 basic components such as participation, transparency, conflict management, equity, policies and laws, incentives, property rights, cooperation and coordination, administration, corruption control, and accountability.

Although strong constitutional provisions exist for the governance of natural and human resources in Nepal, there is a lack of a comprehensive framework that can guide natural resource managers and other stakeholders in effective governance of natural and human resources at local, regional, and national levels in the country. The theoretically grounded framework should be grassroots-based, holistic, collaborative, participatory, and unifying. It must ensure economic and social benefits and ecological and environmental advantages to nature and society. It should safeguard social and climate justice, promote community engagement and attract investment in resource development. Subsequent sections present a theoretically grounded framework for sustainable natural and human resources conservation, development, and utilisation (Poudel, 2008), followed by a robust and practical framework for effective governance of natural and human resources in Nepal.

## 2. Asta-Ja Framework

Asta-Ja means eight of the Nepali letters "Ja" viz. Jal (water), Jamin (land), Jungle (forest), Jadibuti (medicinal and aromatic plants), Janashakti (human resources), Janawar (animals), Jarajuri (crop plants), and Jalabayu (climate). The concept was founded about one and a half decades ago by Poudel (2008) in the article "Management of Eight 'Ja' for Economic Development in Nepal", Journal of Comparative International Management. Amid this publication, other subsequent articles published on Asta-Ja Framework include the Asta-Ja policy framework (Poudel, 2009), strategic framework (Poudel, 2011), capacity-building framework (Poudel, 2012), management of the Asta-Ja system (Poudel, 2016), Asta-Ja Nepal Vision 2040 (Poudel, 2018a), Asta-Ja Framework and food, water, environment, and climate security (Poudel, 2021a), Asta-Ja and energy security (Poudel, 2021b), and social inclusion and Asta-Ja (Poudel, 2021c).

Asta-Ja Framework is a theoretically grounded grassroots-based planning and management approach to sustainable development and management of natural and human resources. It is a powerful tool to promote the nation's accelerated economic growth and socio-economic transformation. All the elements of the Asta-Ja system are intricately linked; therefore, it is essential to have sustainable development of each of

the Asta-Ja elements for better functioning of the entire system. Nepal's economic development rests on the best utilisation of Asta-Ja resources; thus, the main goal of the government of Nepal should be the effective governance of Asta-Ja.

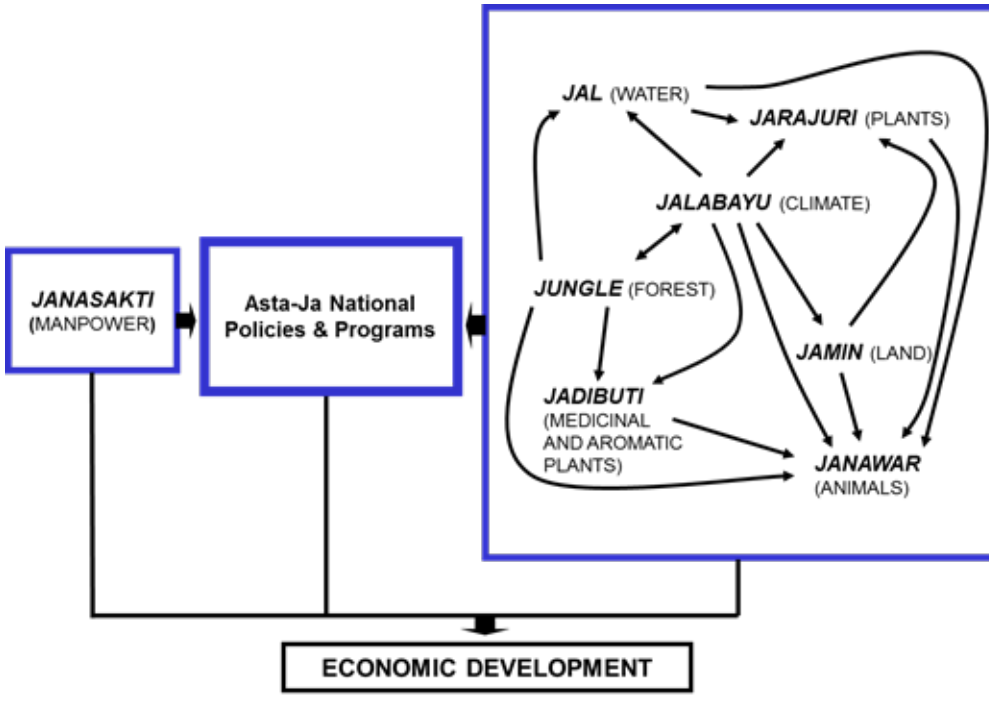


**Figure 1. Interrelationships and linkages among Asta-Ja, and the formulation of national policies and programs for economic transformation (adopted from Poudel (2008)).**

The framework is a grass root-based and self-reliant economic development model. It empowers local communities through resource governance, technology transfer, community capacity-building, social inclusions, income generation, trade, and policy decision-making (Poudel, 2021b). Eight principles guide the framework of Asta-Ja: 1) Community awareness, 2) Capacity-building, 3) Policy decision-making, 4) Interrelationships and linkages among and between Asta-Ja, 5) Comprehensive assessment of Asta-Ja, 6) Sustainable technologies and practices, 7) Institutions, trade and governance, and 8) Sustainable community development. Asta-Ja activities are guided through these eight principles (Poudel, 2009, 2011, 2012).

Asta-Ja strives for sustainable agro-enterprise development and agro-jadibuti industrialisation in the country. Asta-Ja Nepal Vision 2040 aims to elevate Nepal to the level of a developed nation by 2040 A.D. (Poudel, 2018a). The Asta Ja Vision

Nepal vision 2040 has nine strategies for sustainable economic development as

a. Self-sufficiency in food,

b. Renewable resource energy,

c. Thirty million tourists annually,

d. Export of organic foods, medicinal and aromatic plants, and other products,

e. Corruption control,

f. Infrastructural development,

g. Community resiliency,

h. Social services, and

i. Conservation, utilisation and development of Asta-Ja

In addition, the framework gives the highest priority to human resource development and employment generation within the country.

## 3. Asta-Ja Governance Framework

Figure 2 presents the Asta-Ja Governance Framework (Asta-Ja GF), which is a step-by-step, grassroots-based, inclusive, comprehensive, and participatory approach to sustainable development and management of Asta-Ja resources in Nepal. The Asta-Ja GF includes the governance process of natural and human resources (i.e. all eight Ja elements). Human resources are the most critical element for the

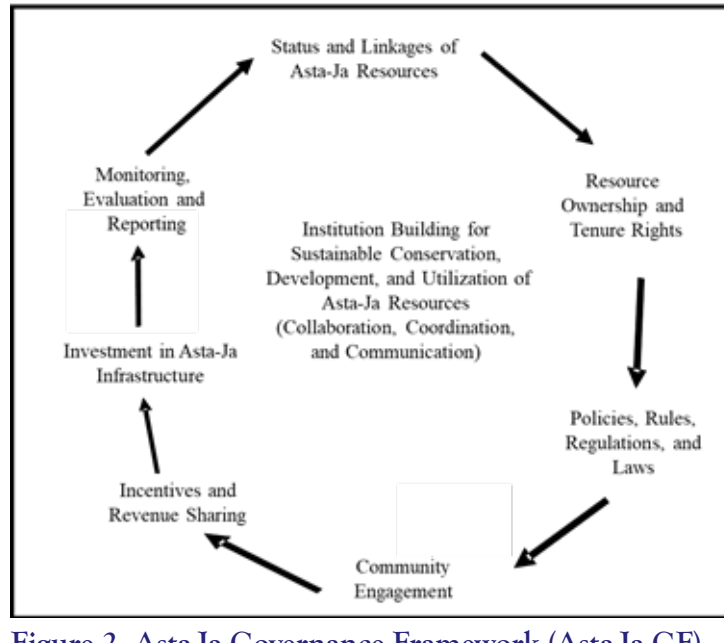


**Figure 2. Asta-Ja Governance Framework (Asta-Ja GF).**

sustainable development and management of Asta-Ja resources. The seven steps of the Asta-Ja GF are depicted in Figure 2 and subsequently discussed below.

### 3.1 Status and Linkages of Asta-Ja Resources

The first step in Asta-Ja governance is having a thorough understanding of the status and linkages of Asta-Ja resources at different levels. A system perspective is necessary to understand Asta-Ja resources' status and linkages comprehensively. Many factors are associated with the degradation of natural resources. For example, regarding the degradation of non-timber forest products (NTFPs), Pandit and Thapa (2003) identified the lack of appropriate institutional arrangements and policy frameworks as responsible factors for the degradation of non-timber forest products (NRFPs) in Nepal. Similarly, Pandit and Ghimire (2011) reported distance from home to forest and food production, active labour force, and forest management skills as critical factors for sustainable management of NTFPs. Gurung et al. (2021) reported that climate change impacts, specifically increased temperatures, changed precipitation patterns, natural hazards and floods, strong winds, invasive plant species, the outbreak of insect pests, and hailstorms affect the availability of NTFPs in Nepal. The NTFPs, which include wide categories of forest products such as fuelwood, fodder, bamboo products, medicinal and aromatic plants, wild fruits, and ritual plants, provide a livelihood for 80% of the rural population, and out of about 700 plant species recognised as NTFPs about 150 species are used in international trade in Nepal (Shrestha et al., 2020). Various tools and techniques for assessing Asta-Ja resources may include surveying, G.I.S. and R.S., focus group discussion, key informant interviews, household surveys, participatory rural appraisals, and field observations (Khanal, 2007; Poudel and Duex, 2017; Corwin et al., 2019).

Human resource is critical for sustainable development and management of natural resources. The human resources of a nation include all the knowledge, skills, talents, workforce, capabilities, attitudes, morals, values, and a sense of community among people. A nation rich in human resources prospers better, enjoys peace, and becomes a good player in global dynamics. The overall development of human resources of a nation depends on many factors, including socio-political setting, educational system, cultural backgrounds, economy, institutional development, scientific advancement, and national drive for the development of human resources. A nation deprived of high-quality human resources can never prosper. It is critical for the Government of Nepal to develop and implement policies to attract and engage an educated workforce by breaking all unnecessary barriers and hurdles, providing incentives, and guaranteeing appropriate jobs in Asta-Ja governance and sustainable development and management of natural resources.

### 3.2 Resource Ownership and Tenure Rights

The second step of the Asta-Ja GF is understanding and recognising natural resource ownership and tenure rights. Hardin (1968) posited the "tragedy of commons" often suffered by natural resources is due to the lack of clearly defined resource ownership and tenure rights. The users of the common property resources, such as public pastureland, exploit these resources to the point that they become entirely degraded or may even disappear. Nobody takes responsibility for sustainable harvesting or utilising them. Therefore, it is essential to have clearly defined ownership and tenure rights for sustainable development and management of natural resources.

Several Acts have defined Nepal's ownership, tenure rights, and protection of natural resources. The Essential Commodity Protection Act 1955 protects drinking water as an essential commodity and the now repealed Muluki Ain 1963 had set the priority of water use in Nepal. These are the few Government of Nepal's early initiatives to establish the country's natural resource ownership and tenure rights. These acts established the rights of individuals, groups of individuals or communities to divert water from sources like streams, rivers, or groundwater. Similarly, these acts regarding water diversion for irrigation stipulate that there must not be any adverse downstream impacts regarding government irrigation schemes or hydropower plants.

Amidst political change in 1990, Nepal Water Supply Corporation was established as an autonomous government-controlled corporation responsible for supplying drinking water in the country through the Nepal Water Supply Corporation Act 1989.

Similarly, the Water Resource Act 1992 is considered the Umbrella Act for water resource management. The Water Resource Act 1992 gives ownership of water to the State. However, people have the right to use water resources with sectoral prioritisation order of Drinking water, Irrigation, Agricultural Uses (Livestock), Hydropower, Cottage Industries, Industries and Mining, Navigation, and Recreation Use. Water resources are expected to be well-utilised for creating national assets and generating revenues. Many Water User Associations are formed, and licenses are issued under the Water Resource Act,1992.

Similarly, the Drinking Water Regulation 1998, the Water Resource Regulation 1993 and Irrigation Regulation 2000 were formulated to regulate drinking and irrigation water user groups and the licensing of drinking water. The Water Resource Regulation, 1993 prescribed the rights and obligations of Water User Associations and license holders, while the Drinking Water Regulation 1998 authorised the formation of the Drinking Water User Associations and regulated the licensing of drinking water use.

The Irrigation Regulation, 2000, provisioned the Irrigation Water User Associations. The Electricity Act, 1992, established a system of licensing for hydropower production. These acts and regulations clearly show that the Government of Nepal has privatised water use and hydropower generation heavily following the 1990 political change in the country.

In Nepal, the Nepalese Constitution of 1951 incorporated the concept of land ownership rights for the first time, followed by the formation of a Land Commission in 1956, preceded by the formulation of the Land Act, 1964. Then, several efforts to provide ownership rights to the tiller were made.

Out of the country's total land, almost 28% of Nepal's land is privately owned or in leasehold. The policy of Joint Land Ownership (J.L.O.) 2011 is also available, which allows husbands and wives to register their lands for joint ownership. The top 5% of Nepalese farmer households control more than 37% of agricultural land. Meanwhile, only 15% of the land is controlled by the bottom 47% of farmer households. And about 25% of the Nepalese population is landless or on the verge of becoming landless.

In 2019, the Government of Nepal made the eighth amendment to Land Act and provided land to landless people using government lands for the last 10 years. Land ownership rights will be given to certain parcels of such land. The ownership of mines and minerals has always been vested in the State. The Mines and Minerals Act, 1985 has a provision that the private ownership of the land is limited to the surface land and the minerals lying or discovered on the surface or underground is under the exclusive ownership of the Government of Nepal. The same act has also been provisioned licensing mining operations to private individuals or companies and the mandatory requirement to follow environmental protection measures. The constitution has also vested the minerals and mines ownerships to the Federal, Provincial, and Local governments.

While the 1957 Forest Act had nationalised all forests with limited access to local communities in the country, there are national and private forests as prescribed by Forest Act, 2019. National forests are further categorised as (1) government-managed forests, (2) community forests, (3) leasehold forests, (4) religious forests, and (5) protected forests. Local communities or user groups manage a community, leasehold, and religious forests; Government-managed and protected forests are directly administered and protected by governmental agencies, whereas individual households manage private forests. Community forests have become very popular and cover more than 1 million hectares across the country. Similarly, about 8,500 hectares of forests

in 31 mid-hill and mountain districts are under the Leasehold forestry program managed by low-income families. There is a widespread concern that benefits from community forest management have not reached the poorest families.

Pasture lands are also nationalised and are government land, usually in the forest, riparian or open public land. The forest area is used for animal grazing. The pastureland constitutes nearly 12% of the total land of Nepal. Out of total pasture land, 98 per cent of the land is located in the mid-hills, the mountains, and the high Himalayans. Historically, pasture lands in the mountain and high mountain regions were considered communal. Although pasturelands were nationalised following the promulgation of the Grazing Lands Act in 1974, large tracts of pasturelands are still controlled by the elites in certain parts of the country.

The Buffer Zone Management Regulation 1996 allowed the direct involvement of local communities in the Buffer Zone of national parks and reserves. Locals were permitted to collect forest products, generate incomes, and invest in biodiversity conservation and economic development. Despite several regulatory measures implemented by the Government of Nepal in forest protection and management, the country's illegal encroachment of forestlands and illegal harvesting of forest products are some of the major natural resource management problems (Khanal, 2007).

### 3.3 Policies, Rules, Regulations, and Laws

The third step of Asta-Ja GF is understanding and recognising various policies, strategies, laws, rules, and regulations related to Asta-Ja resources development and management. Since the promulgation of Nepal's Constitution in 1951, the Government of Nepal has enacted several acts and formulated many policies relating to Asta-Ja resources (Poudel, 2009; ISRSC, 2010).

Some of the major acts and policies in the agriculture sector include Food Act 1967, Plant Protection Act 1972, Plant Protection Regulation 1975, Nepal Agricultural Research Council Act 1991, Agriculture Perspective Plan (1997-2017), The National Agricultural Policy 2004, Agro Biodiversity Policy 2006, and Nepal Biotechnology Policy 2006 (PROSED, 2011). Similarly, major acts and policies related to livestock and wildlife include the Aquatic Conservation Act 1960, National Parks and Wildlife Conservation Act 1973, Buffer Zone Regulations 1996, National Plan of Action on Habitat 1996 and Tiger Conservation Action Plan 2008-2012.

Major policies and strategies related to medicinal and aromatic plants include the National Ayurveda Policy, 1996, Nepal Biodiversity Strategy 2002, and Non-timber forest products (NTFP), 2004. Similarly, major acts and policies related to human

resource development in Nepal include the Labor Act 1991, Industrial Training Act 1992, Trade Union Act, 1992, Local Self Governance Act, 1999, Open and Distance Learning Policy 2006, Non-formal Education Policy 2006, and Technical Education and Vocational Training Skill Development Policy 2007. Nepal's constitution has provided several fundamental rights relating to Asta Ja, including the right to labour. Despite favourable laws to protect and develop natural and human resources, failure in their implementations has caused a major problem in Nepal (Kunwar and Parajuli, 2007; Poudel, 2009).

Many ministries are allocated business of implementing natural and human resources Acts, rules, regulations, and policies with the involvement of many formal institutions and stakeholders in Asta-Ja resource management at different levels of government in Nepal. The situation has led to the fragmentation of jurisdictions and decision-making structures, resulting in a lack of coordination in policy implementation and the poor management of natural resources (Borg et al., 2015; Kim et al., 2015).

In addition to the rules, laws, regulations, and policies from formal institutions, many unwritten rules, regulations, and norms exist at the community level in natural resource management. According to Rahman et al. (2017), inter-institutional gaps exist between formal and informal institutions, which creates hurdles in addressing the interconnectivity of different rules and practices in natural resource management. Thus, the gaps must be addressed at different levels, and strategies for sustainable natural resource development and management must be developed.

Reviewing the policy development process of Nepal's Forestry Sector Strategy during 2012-2014, Ojha et al. (2016) reported that the policy development in Nepal heavily suffers from limited use of scientific evidence, lack of a meaningful engagement of large stakeholders, influence by international aid agencies and politics, and there is a lack of independent voice from civil society. The heavy presence of techno-bureaucratic dominance is another constraint to Nepal's deliberative community forestry governance (Ojha, 2006). Instead of overly relying on technological practices, it is essential to give sufficient attention to human behaviour and intentions, collective learning, and negotiated actions, and have the presence of responsive institutions at the local level for effective governance of natural resources (Upreti, 2004).

### 3.4 Community Engagement

The fourth step in Asta-Ja GF is community engagement. Nepalese society has a long history of resource governance at the local level, whether it is land, water, forest, or pastureland resource, and there exists valuable indigenous knowledge and technology in the society for natural resource management. Asta-Ja GF provides an opportunity

to connect centuries-old proven resource management practices to the present institutionalised natural resources planning and development. Many developmental issues, such as mining, hydromodification, hydropower development, and urbanisation, directly affect local communities. Also, it is critical to have local communities receive benefits from natural resource development initiatives. For community engagement, it is important to put technology and practices in the hands of the community so that the local people see the values of science and technologies and appreciate the initiatives. Farmer participatory research can be an example of such a technology-sharing approach in resource management (Poudel et al., 2000).

Similarly, citizen science projects, town hall meetings, public hearings, surveys, focus group meetings, community groups, local committees, and participatory rural appraisals (Poudel and Duex, 2017) are some of the community engagement techniques in natural resource management. Building trust between the governing bodies and the communities about natural resource governance is of utmost importance for effective natural resource governance (Turner et al., 2016). Local-level social networking is suggested for effective community engagement in natural resource governance (Khanal, 2007; Crona and Hubacek, 2010).

### 3.5 Incentives and Revenue Sharing

The fifth step in Asta-Ja GF is incentives and revenue sharing. Incentives may be given as tax breaks, subsidies, cash matches, rewards, gifts, interest rates, or other appropriate measures that motivate local communities, landowners, or other stakeholders in natural resource conservation, development, and utilisation. Incentives may be given to implementing best management practices in various activities, including agricultural production, land management, forest management, or livestock production. The Incentive system must be pellucid, accessible, socially and environmentally just. The Incentive system must be reviewed and periodically adjusted according to the need and the outcomes.

In Nepal, direct benefits from community forests such as fodder and forages, lumber, animal grazing, or other forest products are allowed to harvest only during certain month(s) of the year and can be considered incentives for managing forest resources. However, community forestry governance in Nepal can still not provide needed benefits to poor households (Poudel, 2015; Kimengsi and Bhusal, 2022). Kunwar and Parajuli (2007) identified the need for appropriate incentives for income-generating activities such as carpet weaving, livestock rearing, cultivation of medicinal and aromatic plants, sheep/goat farming and other similar activities for sustainable natural resource management in the buffer zone of a national park in Nepal.

Other incentives could be carbon credit for agricultural lands, incentives for adopting soil and water conservation practices in farmland, and incentives given to the farmers who plant green manure crops or cover corps during those months when crops are not grown, agri-tourism, or for agroforestry intervention. Incentives can also be given as prizes, awards, farmer's tours, etc., for practising good agricultural practices and being successful in agricultural production. Revenue sharing on natural resource utilisation and development is another mechanism for encouraging local communities and stakeholders in natural resource governance. The project related to natural resources, including hydro projects, highway construction, freshwater diversion or those related to minerals and mines, flood controls etc., has significant environmental, socio-economic, human, and ecological impacts. Mitigation of these impacts often becomes very costly, and resources become limited.

Regarding revenue sharing, Nepal's Constitution stipulates that the federal, provincial, and local governments can collect the royalty on natural resource utilisation and development within their jurisdiction. Major revenue-generating items include mountain climbing and tourism, forestry, electricity and water resources, minerals and mines, medicinal and aromatic plants, and the sale of other natural resources. For equitable distribution of the revenues collected at different levels, factors like population, geographical area, Human Development Index, and development status are considered. The Intergovernmental Fiscal Arrangement Act 2017 regulates the issue of revenue sharing, revenue rights, budget, grants, fiscal discipline etc., of all three tiers of government.

### 3.6 Investment in Asta-Ja Infrastructure

The sixth step in Asta-Ja GF is the investment in infrastructure such as drinking water supply, flood control, hydroelectricity, irrigation, forest products, agricultural development, land management, factories, etc. Private sector investment is seen in hydropower, tourism, agricultural development, livestock, and the development of herbal industries. Other areas for private sector investment could be mines and minerals, processing raw materials, and forest products. Clear rules and regulations are necessary regarding the roles and boundaries of private sector investment in Asta-Ja resources. The private sector must be accountable, transparent and concerned about resource conservation, development and sustainability. Cooperatives include other viable entities for investment in Asta-Ja (Poudel, 2018b). Poudel (2011) proposed Asta-Ja Investment System in Nepal, an online business investment system using one portal to enhance investment in Asta-Ja resources. Nepal has adopted one window policy for attracting foreign investors. Government bonds, FDIs, cash, loans, or other instruments for financing should be laid out and stipulated. Because it is often too

costly to retrofit environmental projects when problems occur, it is prudent to thoroughly investigate proposed development projects about the environmental impacts before deciding on implementation. Environmental Impact Assessment is an essential approach to sustainable development and management of natural resources. Public-private partnerships are necessary for investment and the co-production of knowledge and products. It is vital to co-produce knowledge and strategies for investment in Asta-Ja resources and to enhance the sustainability of the Asta-Ja system.

### 3.7 Monitoring and Evaluation and Reporting

The seventh step in Asta-Ja GF is monitoring, evaluation, and reporting. Periodic monitoring, evaluation, and reporting of Asta-Ja governance are critical for learning from past mistakes and setting the future course of action for sustainable conservation, development, and utilisation of Asta-Ja resources. Based on a natural resource management study in Shey-Phoksundo national park and its buffer zone in Nepal, Kunwar and Parajuli (2007) concluded that participatory monitoring and the formation of inclusive user groups and sufficient post-formation support for these user groups as the key element for effective governance of natural resources. The monitoring and evaluation process must ensure the participation of grassroots communities and other stakeholders. It should be a comprehensive and holistic monitoring and evaluation system. The Impacts of Asta-Ja governance must be monitored and evaluated, covering multiple dimensions of the society, including social, economic, infrastructure, environment, and national securities. The program evaluation must include the direct and indirect impacts on the societies, cost-benefit analyses, assessment of drawbacks, opportunities created, and recommendations for future actions. Reporting must be regular, coherent, and comprehensive, and the reports must be widely circulated. Outcomes from the monthly meetings, quarterly meetings, annual meetings, task-specific meetings, stakeholders' meetings, and other meetings related to resource governance at the local, regional, or national levels should be reported in the form of press releases, media coverages, and one-on-one meetings.

Institution building is the central element of Asta-Ja GF. The formation of community-based organisations has been one of Nepal's major strategies for natural resource management. Kunwar and Parajuli (2007) found 193 community organisations, including forest users' groups, buffer zone user committees, eco-clubs, sister groups, rangeland management committees, snow-leopard conservation committees, medicinal plant management committees, and buffer zone user councils for the management of Shey-Phoksundo National Park and buffer zone areas in Nepal. Institution building at all levels is critical for the sustainable management of Asta-Ja

resources. In natural resource governance, governmental agencies often serve as the central coordinating agencies, and other stakeholders play their roles through projects or other platforms.

By reviewing community forestry governance from Cameroon and Nepal, Kimengsi and Bhusal (2022) reported that it is necessary to have a strong legal and institutional setup at the local level for effective governance of community forestry. Mustalahtia and Agrawal (2020) suggested that the legal mandates of local institutions should be matched with necessary resources and powers for decision-making and support their activities at the local level. Mustalahtia et al. (2020) argued that instead of responsibilisation in natural resource governance, it is vital to understand local-level institutions' capabilities, agency, and structures to promote locally responsive and collaborative natural resource governance. For the sustainable development and management of Asta-Ja resources, it is essential to have effective collaboration, coordination, and communication among all the stakeholders. According to Angst et al. (2018), bridging actors engaged in natural resource governance at different scales and coordinating their actions is critical for effective natural resource governance. Davies and White (2012) suggested collaborative management of natural resources in which stakeholders participate in resource management with common goals and strategies and share their resources and responsibilities.

## 4. Summary and conclusions

Sustainable development and management of natural and human resources are challenging, involving many formal institutions, community-based organisations, private organisations, businesses, non-governmental organisations, local communities, and other stakeholders. This involvement of many formal and informal institutions in various jurisdictions and decision-making in different ways bring natural and human resources management complexities. Many policy gaps and policy implementation failures in natural resource governance lead to massive degradation of natural resources and environmental quality. The sustainable development and utilisation of natural resources are viewed as an essential strategy for creating employment and generating income at the local level and foreign exchange earnings at the national level. Conflicts and corruption in natural resources management are widespread, and the benefits from natural resources have not reached to the poor people. Although several legal and constitutional provisions are made, and many initiatives are taken in natural resource management, massive degradation of natural resources and failures in sustainable income generation, employment creation, and environmental quality has remained a significant problem in Nepal. The main reason for this failure in sustainable development and management of natural and human

resources is the lack of a comprehensive and theoretically grounded resource governance framework for sustainable development and management of natural and human resources at different levels and scales. Asta-Ja Governance Framework (Asta-Ja GF) is proposed to fill these voids in natural and human resource management. Asta-Ja GF is a comprehensive, systematic, dynamic, inclusive, grassroots-based, participatory, and step-by-step developmental approach to sustainable development and management of natural and human resources in Nepal using the seven steps of Asta-Ja GF. Asta-Ja governance is time and space dependent and is dictated by societal and ecological needs. Asta-Ja governance crosscuts the biophysical, socio-economic, institutional, and global environment. However, the central element of Asta-Ja GF is institution building for sustainable development and management of Asta-Ja resources at different levels.

## Acknowledgement

My sincere thanks to Dr. Basu Sharma, a Professor at the University of New Brunswick, Canada, for his excellent reviews and comments on the draft of this article. I would also like to express my sincere thanks to Telegraphnepal.com and its Editor In Chief, Mr. N.P. Upadhyaya for publishing my series of articles on the governance of natural and human resources in Nepal, which served as the bases for this article. Thanks to the anonymous reviewers for their excellent reviews and comments.

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