

Management of Asta-Ja System

by

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About a decade ago, I founded the Asta-Ja Framework which identifies Eight Ja—the Nepali letter “Ja,”—meaning Jal (water), Jamin (land), Jungle (forest), Jadibuti (medicinal and aromatic plants), Janashakti (manpower), Janawar (animlas), Jarajuri (crop plants), and Jalabayu (climate), and proposes their sustainable conservation, development, and utilization for fast-paced socio-economic transformation of Nepal. It is a scientific, holistic, systematic, self-reliance, and multidisciplinary grassroots-based framework for conservation, development and utilization of Asta-Ja resources. For its practical application, I proposed eight principles: 1) community awareness, 2) policy decision making, 3) community capacity-building, 4) interrelationships and linkages, 5) comprehensive assessment, 6) sustainable technologies and practices, 7) institutions, trade and governance, and 8) sustainable community development and socio-economic transformation. The first decade of its implementation in Nepal characterized with a vigorous community outreach, strong membership drive, sound policy advocacy, heavy engagement of high-level government officials and dignitaries, community capacity-building, disaster relief works, and cutting-edge research and development. Future direction for its effective implementation include: 1) institutional strengthening, 2) coordination with governmental agencies and other stakeholders in planning and management of Asta-Ja resources, 3) expedited research and development on Asta-Ja resources, 5) formation of Asta-Ja Consortium, 6) development of a comprehensive Asta-Ja Data Portal, and 7) the establishment of Asta-Ja Think Tank.

1. Introduction

Although remarkable success has been made in the reduction of poverty level in Nepal in recent years (ADB, 2013; UNDP, 2015), economic, social and health indicators of Nepal are still far from satisfactory. Nepal ranks at 145th position out of 188 countries in Human Development Index and 23.7% of its total population is living below US\$ 1.25 per day (UNDP, 2015). Rural and urban poverty levels consist of 27.4% and 15.5%, respectively (ADB, 2013). Nepal’s GDP per capita in 2015 was US\$743.3 (The World Bank, 2016). Despite more than 80% of the 26.6 million total population is involved in agriculture in Nepal, food shortages, hunger and malnutrition still remain major problems (NDHS, 2011; Poudel, 2012a). Nepal’s annual imports of agricultural produce is rising at an alarming rate in recent years (Poudel, 2012a). The 2008/09 import value of the two Standard International Trade Classification (SITC) groups combined (i.e. Food & live Animals and Animal & Vegetable Oil & Fat) was 98.7 times higher compared to 1975/76 (MoF, 2010). Major agricultural imports of Nepal consists of rice, maize, wheat, vegetable oils, apples, live animals (especially goats), beans, dry onions, and potatoes (FAO, 2012). Referring to Trade and Export Promotion Center (TEPC), Government of Nepal, the New Spotlight News Magazine (2014) reported a total import worth Rs.

127.51 billion of agricultural products in 2013/14 fiscal year, Rs. 28.16 billion higher from previous year.

Nepal is one of the high risk disaster countries in the world (Maplecroft, 2010; Ghimire, 2014). Natural hazards that occur frequently in Nepal include floods, landslides, earthquakes, windstorms, hailstorms, thunderbolts, forest fire, drought, glacial lake outburst flood events, avalanche, and epidemics (Chitrakar et al., 2007; DPNep-Nepal, 2017). A simple account of the major natural hazards that occurred over the past two decades shows the seriousness of this problem. The devastating 7.8 Richter scale Gorkha Earthquake that occurred on April 25, 2015 caused 8,790 deaths and 22,300 injuries and destroyed thousands of villages across the 23 districts of Nepal (Poudel, 2016). In addition to killing and injuring several people, the devastating flood that occurred on August 2014 in the western region of Nepal displaced more than 20,000 people and destroyed many houses and infrastructure (Ghimire, 2014). The 1993 landslides and debris flow took 1,259 lives and destroyed many bridges and dams with a total monetary loss of more than 47,194 million rupees in 44 districts of Nepal (Chitrakar et al., 2007). Several agencies predict unprecedented level of future hydrological changes and the occurrence of severe floods due to global warming and glaciers retreat in the region (IPCC, 2007; The UNEP, SAARC and DA, 2009).

Environmental and ecological degradation has become a major public concern in Nepal. Whether it is the capital city of Kathmandu or the Chure or the midhill region of Nepal, protection and restoration of environmental quality, natural resources sustainability, and ecological integrity have become a matter of great challenge for Nepal (Poudel, 2012b; Bannister, 2016; Thapa and Adhikari, 2016; Poudel and Duex, 2017). While air and water pollution, dusts and noises, urban sprawls, and lack of greenery and open spaces account for the environmental degradation of Kathmandu city (Prasai et al., 2007; Thapa and Adhikari, 2016), degradation of the Churia region include massive deforestation, landslides, sand and gravel mining, debris flow, river-cutting, and flooding (Poudel, 2012b; Bannister, 2016). Drying up of springs in the midhill region is emerging as an environmental crisis (ICIMOD, 2015; Poudel and Duex, 2017).

Forest and shrub cover which occupies 39.6% of the total land of Nepal which is suffering from average annual deforestation rate of 1.7% (DFRS, 2008; Acharya and Dangi, 2009). Forest degradation in Nepal has adversely affected rural communities in their food and firewood supplies, fodder and forages for their livestock, supply of non-timber forest products, drinking water supply, wildlife habitat, environmental quality, and other ecosystem services (Acharya et al., 2011). Smallholder mixed-farming system in rural Nepal is very closely interlinked with forest, livestock, and agricultural crop production. Therefore, forest degradation has also negatively impacted the farming system (Poudel, 2015a), ecological, social and environmental conditions in Nepal (Acharya et al., 2011), including the massive degradation of high value medicinal and aromatic plants (MoEST, 2008). Over-extraction of medicinal and aromatic plants has become a major ecological concern in recent years in the country. Sustainable forest management is necessary for conservation of medicinal and aromatic plants.

Massive migration of young people for foreign employment in recent years (Ministry of Labor and Employment, 2014) has left the country shorthanded in

agricultural production (New Spotlight News Magazine, 2014). This has made more dependent on agricultural imports, and has resulted in increased economic reliance on low-paid foreign jobs and opportunities. Socially, outmigration has caused tremendous family disruptions and inconveniences. According to the Ministry of Labor and Employment (2014), a total of 2,226,152 labor permits, about 8% of the country's total population, were issued for foreign employment during the six-year period from 2008/09 to 2013/14, with 137% increase between 2008/09 to 2013/14. Although men accounted for 95.1% of the total labor permits, a 239% increase on the number of permits acquired by women during this period suggests that Nepal will also increasingly loose women workforce to foreign employment in the future.

It is obvious from above paragraphs that Nepal needs immediate and bold initiatives in relation to increased food production, sustainable management of environmental and natural resources, integrated community development, and fast-paced socio-economic transformation. In this context, it is important to choose a framework for natural resources development and management, income generation, and overall economic development. There are several natural resources management frameworks, theories, concepts, and models available in literature which were developed and are being practiced in many different conditions. Some of the notable frameworks and concepts can be cited as the tragedy of the commons (Hardin, 1968), adaptive management (Holling, 1978; Walters, 1986; Walters and Holing, 1990), sustainable development (WCED, 1987), ecosystem-based management (Long et al., 2015), and IUCN's Natural Resource Governance Framework (Springer, 2016). Each of these concept, framework, theory, and model in relation to management of environment and natural resources has great values and helps us in conceptualizing the system, reducing complexities, establishing relationships and linkages among system's components, and identifying and studying issues and concerns and developing alternative management options for system's improvement in a more efficient and coordinated way. However, selection of a framework or a theory for its application depends on many factors including its scope, complexity, relevancy to the society, applicability, and documented outputs or performance. While some frameworks and concepts may focus more at macro level, others may concentrate at micro level. Similarly, some frameworks may be heavy on science whereas others may be heavy on governance. It is important to have a theoretically grounded, comprehensive, socially rooted, and scientifically valid and tested environmental and natural resources planning and management framework for sustainable development of Nepal.

About a decade ago, I published a pioneering research article founding on Asta-Ja Framework [Asta-Ja meaning eight *Ja*, Nepali letter *Ja* (*Jal* (water), *Jamin* (land), *Jungle* (forest), *Jadibuti* (medicinal and aromatic plants), *Janashakti* (manpower), *Janawar* (animals), *Jarajuri* (crop plants), and *Jalabau* (climate))] in this journal and argued that Asta-Ja resources have greatest competitive advantages for socio-economic transformation of Nepal (Poudel, 2008). The letter *Ja* is also the eighth letter of Nepali alphabet in Devnagari script. This ground-breaking publication was followed by subsequent research articles on Asta-Ja Framework, which included the Asta-Ja environmental and natural resources policy framework (Poudel, 2009), strategic framework (Poudel, 2011), and Asta-Ja management capacity-building framework (Poudel, 2012c). The Asta-Ja Framework has been implemented for a decade in Nepal and has been successful in gaining attention of a broad-spectrum of stakeholders engaged in sustainable environmental and natural resources

conservation and development and socio-economic transformation of the nation (Duquesne, 2011, 2013; Poudel, 2012a, 2014; Bhattarai, 2017). This author is the Founding President of Asta-Ja Research and Development Center (Asta-Ja RDC), Kathmandu, Nepal, Founding member of Asta-Ja Abhiyan Nepal; International Coordinator of Asta-Ja International Coordination Committee (Asta-Ja ICC), and member of Asta-Ja Agricultural Cooperative, Kathmandu, Nepal.

The sections below present the core and deep-rooted concept of “asta” (i.e. Sanskrit word “asta” means eight) in Hindu scriptures and traditions, Asta-Ja Framework, accomplishments and challenges associated with the implementation of Asta-Ja Framework past decade, usefulness of Asta-Ja Framework as a unifying planning and management approach for various stakeholders, and future recommendations.

2. The “asta” Concept

There are many “asta” concepts which are deep-rooted in Hindu cultures and Nepalese society. Some of them can be cited as asta-Murti (eight attributes of Lord Rudra), asta-Vinaayak (eight manifestations of Lord Ganesh), asta-Laxmi (eight manifestations of the goddess of wealth), asta-Chirinjibi (eight immortals), asta-Vasus (eight attendants of Indra, the king of the gods), asta-Dikpalas (eight lords of heaven), asta-Dhatu (an alloy made of eight metals), asta-Sidhis (eight main powers acquired by spiritual person), asta-Bakra (eight bends relating to a Hindu sage born with eight physical handicaps), and asthanga-Yoga (eight limbed yoga). Similarly, astamangalas (eight auspicious symbols) in Jain religion (Titz and Bruhn, 1998) and astangika-marga (eightfold path) in Buddhism (Lopez, 2011) are other examples of the “asta” concepts which are ideals in Nepalese society. The number eight is considered as an auspicious and positive number also in Chinese (Tiger, 2007), Japanese (Ohtaku, 2006) and Judaism (MysticalNumbers.com, 2017) societies. Beginning of the Opening ceremonies of the 2008 Summer Olympics in Beijing, China, at 8 PM on August 8 (i.e. 8/8/2008) is meaningful.

The asta-concepts are apparently quite complex and require a good knowledge of Hindu scriptures for their thorough explanation. However, a simple view of the eight elements of each concept reveals a great deal of perspective on our philosophy, metaphysics, spiritual domains, and lives. For example, the asta-Murti, the Lord Shiva’s eight manifestations (Sarva, Bhaba, Rudra, Ugra, Bhima, Pashupati, Isana, and Mahadeva), represent, respectively, earth, water, fire, wind, ether (sky), soul, sun, and moon, which basically serve the basis of the origin, survival, and growth of the living things in this planet. The concept of asta-Laxmi reveals the sources of wealth such as agricultural production, animals, progeny, valor and courage, and knowledge relating the eight manifestations of the goddess of wealth as Dhana Laxmi (money Laxmi, giver of money and gold), Dhanya Laxmi (grain Laxmi, giver of agricultural produce), Gaja Laxmi (elephant Laxmi, giver of animal wealth, like cattle and elephants), Santana Laxmi (progeny Laxmi, giver of offspring), Veera or Dhairya Laxmi (giver of valour in battles and courage for overcoming difficulties in life), Vijaya Laxmi (giver of a victory in battles or any hurdles to be successful in life), and Vidhya Laxmi (knowledge Laxmi, giver of the knowledge). Adi or Maha Laxmi is considered the first or ancient manifestation of Laxmi. Similarly, Asthanga-Yoga which follows a set sequence of practices through Sun Salutations

and other Asanas is prescribed for strength and flexibility of our body; purification of body, mind and nervous system; increase digestion; and foster spirituality. The concept of asta-Dikpalas places a ruler in each direction in the space: Indra (east), Varuna (west), Kubera (north), Yama (south), Agni (south-east), Niruthi (south-west), Isana (north-east), and Vayu (north-west) (Jayaram, 2015), where we can possibly argue that mankind established the eight directions first and then placed rulers in space in each direction for governance.

Based on those examples, we can infer that the “asta” concepts are systems-based and often follow sequential or step-by-step procedures. Also, these four “asta” concepts demonstrate nicely the metaphysics of Hindu philosophy, and the importance of wealth, health, and governance for our personal lives and the society. For a system to perform effectively, it is critical to have all of its components stay sound and remain in harmony. Degradation of one element of a system will affect another element in the system.

2.1 Asta-Ja Framework

The Asta-Ja system encompasses the four spheres of the planet earth: hydrosphere (*Jal*), lithosphere (*Jamin*), biosphere (*Jungle*, *Jadibuti*, *Janashakti*, *Janawar*, *Jarajuri*), and atmosphere (*Jalabayu*) and the eight elements of Asta-Ja system are intricately linked and strongly connected. Hence, it is important to have sustainable conservation and development of each of the eight elements of Asta-Ja for better functioning of the Asta-Ja system. Simply put this way, if a farmer in a smallholder farming system likes to be successful in organic agriculture, he/she should emphasize sustainable management and development of Asta-Ja resources so that a great deal of synergy would develop within Asta-Ja system resulting in a higher level of farm productivity and environmental quality.

The Asta-Ja Framework is a holistic, system-based, scientific, collaborative, interdisciplinary, participatory, self-reliance, and grassroots-based environmental and natural resources planning and management approach for conservation, development, and sustainable utilization of the eight resources within the Asta-Ja system (Poudel, 2008, 2009, 2011, 2012c). This framework has eight principles: 1) Community awareness, 2) Community capacity-building, 3) Policy decision making, 4) Interrelationships and linkages, 5) Comprehensive assessment, 6) Sustainable technologies and practices, 7) Institutions, trade and governance, and 8) Sustainable community development and socio-economic transformation. It starts functioning from community (Principle 1) and ends with the community (Principle 8). Detailed elaboration of these principles can be found in Poudel (2008, 2009, 2011 and 2012c).

The principle of community awareness plays the pivotal role in the Asta-Ja Framework. Grassroots communities are the ultimate change agents and the beneficiaries. Communities participating in the process of sustainable development and utilization of Asta-Ja resources, income generation, and socio-economic transformation must be sufficiently aware, engaged and educated on Asta-Ja system and its development. The principle of community capacity-building emphasizes environmental and natural resources community capacity-building for conservation, utilization and sustainable development of natural resources for socio-economic transformation of Nepal. The principle of policy decision making

underscores effective policy measures for sustainable development, conservation and utilization of natural resources for socio-economic transformation. To develop effective policy measures, it emphasizes multisector, participatory, and holistic approach in problem assessment and analysis and the identification of alternative solutions (Poudel, 2009).

The principle of interrelationships and linkages stresses that Asta-Ja resources are intricately linked each other and among themselves and require a deep understanding of these interrelationships and linkages for their sustainable development and utilization. Similarly, the principle of comprehensive assessment emphasizes detailed assessment of Asta-Ja resources for their sustainable development and utilization and socio-economic transformation of the country. Comprehensive assessment of Asta-Ja resources should lead to the establishment of Asta-Ja database, economic analysis, and the design of Asta-Ja Investment Information System (Poudel, 2008).

The principle of sustainable technologies and practices emphasizes research and development in technologies and practices and innovations for sustainable conservation, utilization, and development of Asta-Ja resources.

The principle of institutions, trade and governance focusses on institutional strengthening, governance, and domestic and foreign trades. It emphasizes handling diverse Asta-Ja related concerns including ownerships, decision-making, resource sharing, customs and duties, trade barriers and restrictions, and international relations.

Finally, the overarching principle of sustainable community development and socio-economic transformation emphasizes implementation of integrated developmental initiatives across the nation targeting specific communities for sustainable utilization and development of Asta-Ja resources, income generation, and socio-economic transformation. Communities must be free from poverty, hunger and malnutrition, have basic infrastructures for quality education, health, and services, have employment opportunities, have peace and security, have excellent environmental quality, and be resilient. The interrelated complex nexus of these principles can be diagrammatically represented as in Fig. 1.

Considering the universality and the vastness of the Asta-Ja system and corresponding multitudes of stakeholders in very diverse settings, the Asta-Ja Framework is left simple with its eight principles and without dwelling into criteria, standards, indicators, and outcomes. Filling out Asta-Ja log frame consisting of a matrix of Asta-Ja resources and the eight principles of Asta-Ja must be the starting point for Asta-Ja planning and management exercise. A thorough evaluation of the matrix must subsequently lead to problem identification, setting goals and strategies, and project formulation. It is critical to stay focused on Asta-Ja management community capacity-building process (Poudel, 2012c) while designing and implementing Asta-Ja projects. It is my intention that every user identify appropriate criteria, standards, indicators, or outcomes in relation to the eight principles of the Asta-Ja Framework considering specific situation where the framework is being applied.

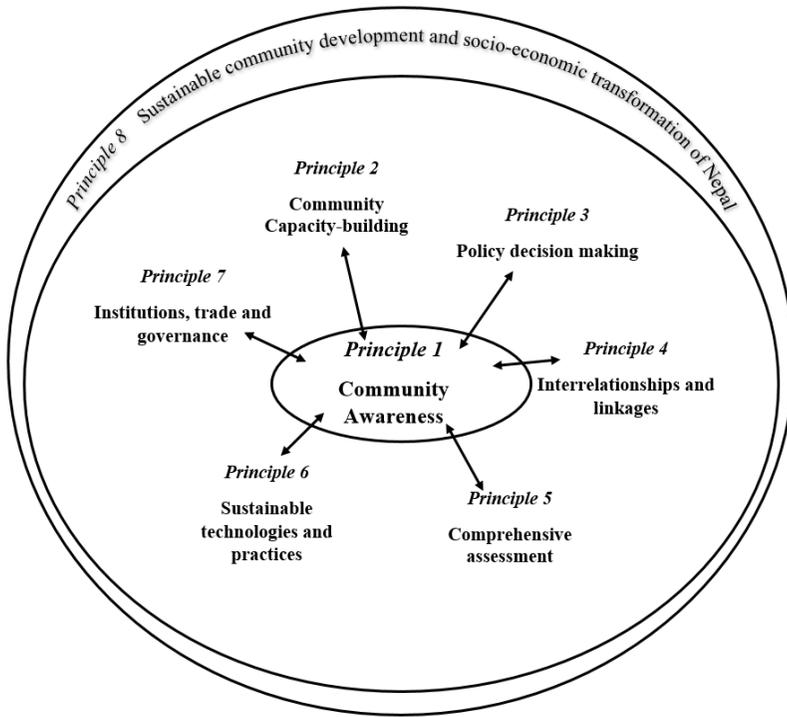


Figure 1. Eight principles of the Asta-Ja Framework

2.2 Implementation of Asta-Ja Framework

In order to implement the Asta-Ja Framework, we established Asta-Ja Abhiyan Nepal, a non-profit non-governmental organization, with its headquarters in Kathmandu, Nepal, in 2008, Asta-Ja Saving and Credit Cooperative Ltd in Kathmandu, Nepal, in 2011, which was later changed to Asta-Ja Agriculture Cooperative in 2014, and Asta-Ja Research and Development Center (Asta-Ja RDC) with its headquarters in Kathmandu, Nepal, in 2014. Major accomplishments made and the challenges faced during its implementation in the past decade are summarized in Table 1, and briefly discussed below.

Table 1. Major accomplishments and challenges associated with a decade implementation of Asta-Ja Framework in Nepal.

Asta-Ja Principles	Major accomplishments	Challenges
<p>1. Community awareness activities</p>	<ul style="list-style-type: none"> • Large number of Asta-Ja Interaction meetings with high level government officials including executive heads, CEOs, Security Agencies, and other stakeholders. • Visiting almost all national political leaders, high level bureaucrats and stakeholders at their residences or offices with “<i>Akbare Khursani</i>” (i.e. very hot chilly plant) or a flower potted plant. • Network of about 200 commercial agricultural producers representing 12 districts. • Formation of district committees in 11 districts. • Hosting field days and public meetings on a regular basis. • Successful membership drive for Asta-Ja Abhiyan Nepal (including life members), Asta-Ja International Coordination Committee, Asta-Ja Agricultural Cooperative, and Asta-Ja RDC. • Hosting a large number of welcoming events in Asta-Ja headquarters where a large number of Nepalese expatriates, visitors from foreign countries, and community leaders from within Nepal were welcomed by presenting Asta-Ja Scarfs and the words of recognition by Asta-Ja team. • Distributed thousands of Asta-Ja pamphlets in several political conventions. • Social networking through Facebook, and information dissemination through websites, newspapers, radios, and TVs. • Scientific presentations in national and international meetings. 	<ul style="list-style-type: none"> • Meeting community expectations on financial assistance, community development, and material support. • Documentation of the activities, lessons learned, and progress made.
<p>2. Community capacity-building efforts</p>	<ul style="list-style-type: none"> • Five trainings relating to fruits and vegetable production and poultry production in Kathmandu, Valley. • Two trainings on goat production and management in Nuwakot. • Water quality training for local communities in Nuwakot, Nepal. • Farmer’s tour for the Thulokhola watershed community in Nuwakot. • One short course on Village Animal Health Worker in Kathmandu. • Distribution of 40,000 SuperGrain hermetic (air-tight) bags for food storage in 23 Gorkha earthquake impacted districts in Nepal. • Planned distribution of 8,000 hermetic bags and 500 Corn Sheller to 1000 households in Kavre district before June 2017. • Distribution of relief materials such as seeds, <i>Jasta Pata</i>, and blankets, following Gorkha earthquake devastation. • Credit mobilization for income generating activities. 	<ul style="list-style-type: none"> • Connecting capacity-building efforts to practical conservation and development of Asta-Ja resources and income generation.

3. Policy-related advocacy	<ul style="list-style-type: none"> • Interest rate reduction from 12% to 6% on livestock loans through ADB Ltd., Nepal. • Crop and Livestock Insurance Directives, 2013. • Asta-Ja policy delegation team meeting with high officials including the Prime Minister of Nepal, ministers, Chief Secretary, and other government officials in Kathmandu. • Several policy interaction meetings were organized in which farmer leaders, businessmen, political leaders, academicians, and high level government officials and even the Prime Minister of the country were engaged on policy making. 	<ul style="list-style-type: none"> • Political instability. • Policy research. Science-based policy advocacy.
4. Interrelationships and linkages	<ul style="list-style-type: none"> • Food storage and mothers and children health and nutrition study in Kavre district. • Linkages between climate change and livestock production as well as water, land, forest, animals, and crops in the Thulokhola watershed, Nuwakot, Nepal. 	<ul style="list-style-type: none"> • Compilation, collation, analysis, and synthesis of existing pieces of information. • Generating new pieces of information.
5. Comprehensive assessment	<ul style="list-style-type: none"> • An assessment of Chure degradation using Remote Sensing and GIS. • An assessment of land use potential, food security, and agri-business for community resiliency in Gorkha earthquake devastated region of Nepal. 	<ul style="list-style-type: none"> • Compilation, collation, analysis, and synthesis of existing pieces of information. • Generating new pieces of information.
6. Sustainable technologies and practices	<ul style="list-style-type: none"> • PPR vaccination for goats and the use of FAMACHA cards to assess goat health in the Thulokhola watershed, Nuwakot, Nepal. • Distribution of hermetic (airtight) bags for food storage. • Distribution of Corn Sheller for effective post-harvest and then drying and storing grains in hermetic bags to prevent food loss and improve nutritional quality while preventing grains from toxic mold infestation. 	<ul style="list-style-type: none"> • Compilation, collation, analysis, and synthesis of existing pieces of information. • Generating new pieces of information.
7. Institutions, trade, and governance	<ul style="list-style-type: none"> • Collaboration or contracts and agreements with several institutions including University of Louisiana at Lafayette, Louisiana, USA; The Global Development Group, Australia; Institute of Rubber and Jatropha Research-Nepal, USA; GreaterGood.org and the hunger site; Ministry of Agriculture, Government of Nepal; Ministry of Health and Population, Government of Nepal; Acadiana Indian Association (AIA), Lafayette, Louisiana, USA; Society of Nepalese in Hawaii (SNEHA), USA; UNICEF, Kathmandu, Nepal; PACT, and CTEVT. • Asta-Ja RDC received approval from the Council for Technical Education and Vocational Training (CTEVT) for conducting short training on Village Animal Health Worker, Off Season Vegetable Production, and Community Agriculture Assistant. 	<ul style="list-style-type: none"> • Compilation, collation, analysis, and synthesis of existing pieces of information. • Logistic support, facilities, and manpower.

<p>8. Sustainable community development and socio-economic transformation</p>	<ul style="list-style-type: none"> • Asta-Ja Research and Development Project, Tanahu, Nepal. • <i>Chudher</i> community drinking water project, Tanahu, Nepal. 	<ul style="list-style-type: none"> • Fragmented and uncoordinated developmental initiatives. • Funding.
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3. Accomplishments

Remarkable accomplishments were made in public outreach, organizational expansion, policy advocacy, community capacity-building, research and development, and disaster relief and recovery works.

A vigorous outreach strategy was adapted in terms of reaching out the high level government officials, political leaders, intellectuals, media persons, expatriates, farmers, and other stakeholders (Poudel, 2012a). Accordingly, several Asta-Ja interaction events were hosted which were presided by very high level government officials including sitting Prime Minister, Ministers, Vice Chairmen of National Planning Commission, Chief Secretaries, Secretaries of various Ministries, CEO of the bank, Political Leaders, Governor of Nepal Rastra Bank, and other stakeholders. These events were very well attended and the media coverage through TVs, newspapers, radio, and social media was remarkable. Another approach to reaching out high level individuals in the country included visiting their offices or residences by Asta-Ja team with a potted chilly (*Akbare Khursani* i.e. very hot chilly plant) or a flower plant, and introducing Asta-Ja concept to them, requesting them to water the plant, and then handing over the potted plants to the dignitaries by clapping hands. In this regard, Asta-Ja team visited very high profile individuals including the President of Nepal, ex-King, several ex-Prime Ministers, Chief of Army Staff, Inspector General of Police, Chairmen/Presidents of major political parties in the nation, senior political leaders, media owners, and other stakeholders. All the dignitaries were very supportive and had expressed their solidarities to Asta-Ja campaign (Poudel, 2012a).

In addition, thousands of leaflets on Asta-Ja were distributed to the attendees of various political conventions and meetings. In other occasions, individuals interested in Asta-Ja concept were invited to the Asta-Ja headquarters and were welcomed with Asta-Ja promotional items such as Asta-Ja scarf and brochures. Formation of district/local committees in about 30 districts of Nepal (Bhattarai, 2017), successful membership drives, and developing networks of commercial agricultural producers were additional accomplishments.

Activities related to policy advocacy included organizing high policy discussion events, visiting policy maker’s office by Asta-Ja team, hosting leader farmer policy advocacy interaction events, and doing popular writings (Poudel, 2012a). Specific policy agendas for advocacy included interest rate reduction for farmers, introduction of crop and livestock insurance policy, inclusion of Asta-Ja in the Constitution of Nepal, and the development of high school curriculum on Asta-Ja resources (Poudel, 2012a). Social media and websites were also utilized for policy advocacy. As a result, at least two policy successes were realized: 1) reduction of interest rate on livestock loans from 12% to 6% by Agriculture

Development Bank, Ltd, and 2) the introduction of Crop and Livestock Insurance Directives, 2013, by the Government of Nepal.

Community capacity-building activities included organizing field days and public meetings, conducting trainings, and introducing sustainable resources management technologies and practices to the local communities. Field days and public meetings were targeted to specific local communities. During these events, commercial agricultural producers and other stakeholders were invited to local farms where current issues and problems in relation to agricultural production and marketing were discussed. These meetings were of high interest especially for agricultural extension agents and commercial producers. Even the ambassador of Israel was often among the attendees (Poudel, 2012a). Various capacity-building training conducted included fruit and vegetable production, poultry production, goat production, and water quality monitoring. Asta-Ja RDC has received approval from CTEVT for running short training on Village Animal Health Worker, off season vegetable production, and Community Agriculture Assistant.

We collaborated with several institutions including national and international universities, governmental agencies, INGOs, NGOs, and community organizations and developed a number of research proposals related to climate change adaptation, environmental restoration, integrated community development, horticultural value chain, agricultural development, and food storage and nutrition and health. We worked diligently in the implementation of research projects and in providing support to our partners in their field investigations. Research findings were disseminated through scientific meetings, journal articles, conference proceedings, and research reports.

Our disaster relief and recovery works related specifically to the devastating Gorkha earthquake on April 25, 2015. Asta-Ja Abhiyan Nepal immediately decided to get engaged on relief works and assisted an international medical team in setting up health camps in some of the affected areas, and, later, providing services through a Health Post for a couple of months in Lalitpur, Nepal. Asta-Ja RDC received funding support from various charity and non-profit community organizations abroad for hermetic (air tight) grain storage bags and rice and vegetable seeds and, in collaboration with the Ministry of Agriculture, Government of Nepal, distributed 40,000 hermetic bags to 23 districts and seed packages to over 600 families nearby Kathmandu Valley. Asta-Ja RDC also distributed *Jasta Pata* (galvanized iron sheet, roofing material) and blankets to earthquake victims. In addition, a rebuilding document was prepared within a month soliciting concept papers from Asta-Ja members, which was distributed to planning authorities and governmental offices in Kathmandu as well as uploaded on Asta-Ja RDC website (Asta-Ja ICC, 2015). In the process of helping food sector following the aftermath of the Gorkha earthquake in Nepal, a Climate Smart Dry Chain proposal was developed and was formally presented to the CEO and the team at the Office of Nepal Reconstruction Authority, Government of Nepal. We also reached out to several international aid agencies for this proposal.

4. Challenges

Major challenges faced during the implementation of Asta-Ja Framework in its first decade can be summarized into three categories: 1) generating funds, 2) institutional establishment, and 3) program coordination with governmental agencies and other stakeholders.

4.1 Generating Funds

Generating funds for logistic support, staffing, and project implementation was a single most challenging task. In order to overcome this challenge, we collaborated with other established agencies for the development of comprehensive research proposals related to Asta-Ja system. This gave us opportunities for testing Asta-Ja Framework on the ground within the scope of projects being implemented. As expected, the framework of Asta-Ja was very well accepted by the local communities and other stakeholders. Through this framework, they could connect very well to their working environment and natural system and comprehend better in relation to their problem and issues and their interconnectedness. We continued developing wide range of research and development proposals including community capacity-building, disaster reliefs, and food storage and nutrition and health. We got notable success on securing funds. Personal donations and support were other sources of funds which were extremely helpful.

4.2 Institutional Establishment

Institutional establishment turned out to be another very challenging task. Having necessary funds to rent and maintain office space, payment for monthly telephone bills and utilities, salaries and perks for staff, website design and hosting, and other day to day organizational expenses were to be met. Given the scope and the importance of Asta-Ja Framework, it was critical to have an office space with at least a minimum staff support. In fact, Asta-Ja headquarters turned out to be basically a melting pot for many expatriates, people coming from outside Kathmandu Valley within Nepal or for farmers and other individuals from the suburb of Kathmandu Valley. We relate and talk about the whole Asta-Ja system, so are the diverse and large number of individuals interested in Asta-Ja. Asta-Ja headquarters were visited by several international groups and professionals.

4.3 Program Coordination with Governmental Agencies and Other Stakeholders

The fundamental operational approach that Asta-Ja had taken was providing assistance to governmental agencies and other stakeholders in community development and socio-economic transformation. This required a high degree of program coordination with the governmental agencies and other stakeholders. In the absence of any formal/informal consortium or coordinating agency, it was very difficult for Asta-Ja in program coordination and implementation. Since it is impossible for the government to undertake all necessary actions in relation to community outreach, research and development, community capacity-building, and sustainable development and utilization of Asta-Ja resources, it is important to have NGOs and other stakeholders engaged in such activities in a highly coordinated

way. In the absence of such a coordination and even resource sharing, opportunities for synergistic and cost-effective fast-paced community development will be compromised. In order to prevent from program overlaps and role duplication, resource wasting, and potential conflicts, it is critical to have an appropriate unifying framework for planning and management of environmental and natural resources at national, regional, and local levels.

5. The Unifying Asta-Ja Framework

Nepal has competitive advantages for sustainable development and utilization of Asta-Ja resources for socio-economic transformation (Poudel, 2008). With these advantages, a large number of environmental and natural resources developmental initiatives are expected to occur in the future. Current and future developmental initiatives include the construction of reservoirs for hydropower, irrigation canals, drinking water project, groundwater utilization, agricultural development, road construction, mining and excavations, forest products, harvesting medicinal and aromatic plants, agro-industrial development, tourism development, etc. In addition, rural settlement planning and development, urban development, waste disposals, land rehabilitation, and manpower development are other activities that relate to Asta-Ja system. In this process, a multitude of resource issues and concerns including policy decision making, rules and regulations, governance, environmental impacts, data sharing, and research and development need to be tackled. Resource conflicts due to lack of coordination among various stakeholders may drag the developmental initiatives for a long time, and often lead to court cases. Therefore, it is very important to have a unifying planning and development framework for natural resource management which leads to a highly coordinated planning, management, and decision-making in sustainable utilization and development of Asta-Ja resources.

Asta-Ja Framework serves is as a unifying framework for environmental and natural resources planning and management. Through this framework, all governmental and nongovernmental agencies, private businesses, community organizations, academia, international aid agencies and other stakeholders, who are concerned with the Asta-Ja resources, will come together in natural resources planning and management. They will work together in the assessment, understanding, conservation, and sustainable utilizations of Asta-Ja resources.

Currently, capacity-building programs in Nepal are largely uncoordinated, fragmented, single disciplinary, and partial. In order to develop community capacity-building as an approach to socio-economic transformation, capacity-building initiatives should be holistic, comprehensive, participatory, and issue specific. The Asta-Ja framework presents an opportunity for community capacity-building by addressing community resource problems comprehensively and holistically (Poudel, 2012c).

The value and the utilities of the Asta-Ja Framework on Nepal's economic development was well recognized and cited by Duquesne (2011) in her book entitled *Nepal: Zone of Peace*. She has identified four pillars (Nepal as a Transit State, Nepal as a Guardian of the Blue Gold, Hospitality, and Voluntary Simplicity) for Zone of Peace. In her Voluntary Simplicity pillar, she has emphasized peaceful local

economies, microcredit, empowered grassroots governance, social justice and equity, shared welfare, upsizing of human security and basic livelihood, and the importance of Asta-Ja for socio-economic transformation of Nepal. She has dedicated four pages on Asta-Ja in her book. In 2013, she published an article entitled “Eight Ja Crusade for Economic Growth and Nirdhan Bank” (Duquesne, 2013) in which she has emphasized the role of microfinance (based on group solidarity, no collateral) to make investment in Asta-Ja system for increased food production, increased household incomes, export of goods and services, employment generation, resource conservation and development, and overall socio-economic transformation of Nepal.

A large number of stakeholders including national, regional, and local natural resources planning and management agencies, settlement development and urban planning and management organizations, and agribusiness/industries and financing institutions can utilize Asta-Ja framework as their planning, management and decision-making tool. Urban planners can use Asta-Ja Framework to locate residential areas, park and services, water management, waste disposal sites, vegetation and wildlife, urban agriculture, landscaping, and ecological restoration so that sustainability and environmental quality of cities and towns can be enhanced. Academic institutions, research and development agencies, and scientific communities can utilize this framework as a foundation for the development of environmental and natural resources theories and models, teaching environmental and natural resource courses, studying ecosystems and ecological integrity, or for conducting field research.

For governmental agencies, Asta-Ja Framework provides a sound unifying platform for bringing together all stakeholders associated with Asta-Ja system and developing coordinated comprehensive plans, programs, and projects for conservation, utilization and sustainable development of Asta-Ja resources. Through this framework, government agencies and other stakeholders can effectively communicate, discuss, dialogue, debate, and finally come to a consensus on policy decision-making related to Asta-Ja resources and nation-building.

Farm managers can use this framework in their farm planning and management, production decision-making, sustainable resource conservation and utilization, and environmental quality. For general public, this framework is helpful in developing comprehensive view of their natural resource base, understanding problems in Asta-Ja system, policy advocacy, and making necessary changes in their behavior and habits for environmental quality and sustainability.

Using Asta-Ja Framework, system modelers can develop comprehensive environmental and natural resources system models which will assist in understanding complexities within the Asta-Ja system further and making learned decisions for sustainable conservation, utilization and development of Asta-Ja resources. Such a system-based computer model will be very valuable tool for Asta-Ja system decision support. As most natural disasters in Nepal such as landslides, flooding, earthquake, forest fires, hailstorms, and Glacial Lake Outburst Flood (GLOF) directly relate to Asta-Ja system, disaster management agencies can utilize Asta-Ja Framework in their risk assessment, disaster preparedness, and recovery efforts.

Asta-Ja Framework will be very useful tool for developing plans and programs for community resiliency. For climate change communities, Asta-Ja Framework will provide an excellent platform for an assessment of climate change impacts and adaptation. Through this framework, any stakeholder within the Asta-Ja system will be able to comprehend, understand, make better decision which will result in sustainable conservation and development of environmental and natural resources.

Figure 2 depicts these various relationships within the context of the unifying planning and management.



Figure 2. Asta-Ja Framework as a sound unifying planning and management tool for environmental and natural resources planning, management and development.

6. Future Recommendations

Based on lessons learned from the implementation of Asta-Ja Framework for a decade in Nepal, I recommend the followings:

1. Identification of a set of coherent criteria, standards, indicators, and outcomes in relation to the principles of the framework when applying it to specific resource management or community development projects. A good comprehension of the complexity of Asta-Ja system is necessary for an effective implementation of the framework.
2. A comprehensive assessment of the status, magnitude, trends, and problems associated with Asta-Ja elements and the system as a whole is necessary for environmental and natural resource conservation and development. Expedited basic and applied research on Asta-Ja system is critical for better understanding of the interrelationships and linkages among the elements as well as in developing sustainable technologies and practices for the conservation and development of Asta-Ja resources.
3. Establishment of a comprehensive Asta-Ja Data Portal to help investigators in understanding the current status and development of future scenarios on Asta-Ja resources. There is already a large amount of data related to Asta-Ja elements which is scattered all around with governmental agencies, research institutions, and other organizations.
4. Natural disasters such as landslides, flooding, earthquakes, Glacial Lake Outburst Flood (GLOF), forest fires, or drought directly fall within the domain of Asta-Ja system. Development of a close coordination among disaster management agencies and other stakeholders of Asta-Ja system is necessary for appropriate disaster preparedness, management and recovery (Poudel, 2015b).
5. Formation of an Asta-Ja Consortium consisting of relevant agencies and stakeholders for research and innovation and the development of Asta-Ja Data Portal. This Consortium can play a major role in developing research and developmental strategies as well as coordinating the stakeholders.
6. Giving high priority for integrated sustainable community development by targeting specific communities across the nation. For this, it is critical to have a strong collaboration among various stakeholders including governmental agencies, financial institutions, INGOs, NGOs, international aid agencies, bilateral and multilateral organizations, and others in program development, implementation, and monitoring and evaluation.
7. Establish Asta-Ja Think Tank for science-based policy advocacy, policy research, policy discussions, and development of strategies for Asta-Ja resources management and utilization. Asta-Ja Think Tank can also track international trades, rules and regulations, and agreements in relation to Asta-Ja products for global markets. It can also work on keeping track of cutting-edge technologies, innovations, and research findings that relate to Asta-Ja system.
8. Strengthen community outreach on Asta-Ja system through various activities such as field days, meetings, workshops and conferences, group discussions, interaction events, and farm tours. Disseminate information thorough different outlets including social media, TVs, radios, newsletters, websites, newspapers, brochures, leaflets, promotional items, etc.

7. Goals of the Asta-Ja framework

The Asta-Ja Framework complements heavily to the recent United Nation's global Sustainable Development Goals (SDGs), declared at the UN's New York Convention on September 25–27, 2015 (UN, 2015). The 17 SDGs are:

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition and promote sustainable Agriculture
3. Ensure healthy lives and promote well-being for all at all ages
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5. Achieve gender equality and empower all women and girls
6. Ensure availability and sustainable management of water and sanitation for all
7. Ensure access to affordable, reliable, sustainable and modern energy for all
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10. Reduce inequality within and among countries
11. Make cities and human settlements inclusive, safe, resilient and sustainable
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts
14. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development
15. Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

A close look on the SDGs and the eight principles of Asta-Ja Framework reveals that there is a great deal of synergy between them. While Goal 1 through 8, 12, 13, 15, and 16 directly relate to Asta-Ja Framework's principle 8 (i.e. sustainable community development and socio-economic transformation) and principle 6 (i.e. sustainable technologies and practices), Goal 9 and 11 relate to principle 2 (i.e. community capacity-building) and Goal 10 and 17 relate to principle 7 (i.e. institutions, trade and governance). Therefore, it is prudent for the Government of Nepal in adopting Asta-Ja Framework as its developmental platform and working closely with UN agencies for next 15 years on sustainable development of Nepal. The Asta-Ja Framework emphasizes sustainable conservation and management of environmental and natural resources and socio-economic transformation both at the macro and micro levels in Nepal.

8. Conclusions

Nepal is currently facing multidimensional developmental challenges including not only the development of infrastructures such as road networks, irrigation system, hydroelectricity, hospital system, educational facilities, and industries, but also overcoming serious environmental and ecological degradation issues. These challenges in the coming years will be further intensified and complicated as population growth continues resulting in further shortages of food and energy, unemployment, global climate change, and increasing natural disasters unless immediate remedial actions are undertaken. Natural resources problems such as erosion and land degradation, contaminated water and food system, depleting aquifers, and deforestation continue to be the major challenges. In order to effectively address these challenges and drive the nation in the fast-paced path of socio-economic transformation, a grassroots-based, theoretically grounded, ideologically neutral, and tested unifying framework for environmental and natural resource planning and management is necessary. Since Asta-Ja Framework is ideologically neutral, it serves as a unifying framework for planners, developers, educationists, research scientists, and other stakeholders who are engaged on environmental and natural resources planning and management. Development of Asta-Ja Data Portal, formation of Asta-Ja Consortium, and establishment of Asta-Ja Think Tank will be very helpful in the implementation of Asta-Ja Framework. Since the Asta-Ja Framework has been well accepted by the Nepalese society and there is great deal of synergy between the UN's 2030 SDGs and the Asta-Ja Framework for nation-building, it is strongly suggested that the Government of Nepal adopt Asta-Ja Framework as its national developmental framework and implement UN's SDGs and other similar initiatives for other stakeholders through it for expedited sustainable development of Nepal.

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