

# Management of Eight ‘Ja’ for Economic Development of Nepal

by

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*This paper proposes a theoretically grounded Asta-Ja framework of Eight “Ja” —Nepali letter “Ja”, Jal (water), Jamin (land), Jarajuri (plants), Janawar (animals), Jungle (forest), Jadibuti (medicinal and aromatic plants), Jalabayu (climate), and Jansakti (manpower) and referred to as Asta-Ja in Nepali language for economic development and management of Nepal. More concretely, it identifies and analyzes key elements of the framework to derive its implications for theory and policy development.*

## 1. Introduction

Nepal has experienced no political stability so far, and has been engaged in political debate and turmoil for decades. The entrenchment of monarchy into feudalism became the major impediment to the economic development of Nepal. With the recent conclusion of the historic Constituent Assembly’s election and the abolition of the 240-year old institution of monarchy, Nepal is now yearning for new ways to modernize to catch up with the developed world. But it needs to develop a theoretically grounded economic development framework for sustainable development and economic transformation of the nation.

Just as Michael E. Porter (1998) proposed his four-diamond model for creating national competitive advantage of nations, I am going to propose a theoretical framework based on sustainable development and management of Eight “Ja”—Nepali letter “Ja”, Jal (water), Jamin (land), Jungle (forest), Jadibuti (medicinal and aromatic plants), Jansakti (manpower), Janawar (animals), Jarajuri (plants), and Jalabayu (climate) referred to as Asta-Ja<sup>2</sup> in the Nepali language for economic development and management of Nepal. Nepal has tremendous opportunities for sustainably developing, managing, and utilizing Asta-Ja for economic development and uplifting the Nepalese economy from its current level to the level of one of the richest nations within a couple of decades. Economic transformation must undoubtedly address the basic necessities of education, health, and employment, and it must also contribute to the creation of an equitable, just, and sustainable society, and conserve and develop the natural resource-base for long-term sustainability and environmental quality. For a successful economic transformation, it is important to formulate policies and programs based on the competitive advantages, available opportunities, and resource-base of the nation.

Economic activities that are locally managed and are distributed across the nation will enhance societal sustainability and promote national integrity.

It is important to assess each of these eight *Jas* (Asta-Ja) and evaluate them to see how much potential they have for economic development of the nation. Also, it is important to understand the interrelationships and linkages between and amongst these eight *jas* in relation to their sustainable development and management for economic transformation. To that end, the following sections discuss the Asta-Ja with respect to their current states and future potential, their interrelationships and linkages, and policy implications for economic development and management in Nepal.

## **2. The Asta-Ja**

### **2.1 *Jal* (Water)**

Rivers and streams have great importance for industrial and drinking water supplies, irrigation, tourism, and hydro-electric projects. Nepal's vast water resources include over 6,000 rivers and streams, many snow peaks, lakes, 3,252 glaciers, and 2,323 glacial lakes (Bhandari, 2002; Shrestha and Hisaki, 2007) and groundwater resources. Among the rivers of the first order are Saptakoshi, Saptagandaki and Karnali<sup>3</sup>. Some of the major rivers of the second order in Nepal are Mahakali, Babai, Rapti, Tinau, Bagmati, Kamala, Kankai, and Mechi.

Nepal has a total theoretical hydro-electricity potential of 83,290 MW of which a generation of 42,110 MW of hydro-electricity is in economically feasible terms (Kafle, 2008). Nepal's current total installed capacity is 609 MW (Kafle, 2008) and meets the electricity requirements of 40% of the total population (IRIN, 2008). Based on these facts, it can be safely stated that just about 2,000 MW of hydro-electricity will be sufficient for Nepal's domestic consumption. In this way, Nepal has the great potential of exporting over 40,000 MW of hydro-electricity to other countries. As of 2006, the neighboring countries of China and India had installed capacities of 128,570 MW and 33,600 MW hydro-electric power, respectively (World of Renewables, 2007). The Three Gorge Dam project in China, which is going to be completed soon, is going to have an installed capacity of more than 18,200 MW (SPG, 2008), while the Subansiri (Lower) hydro-electric project in India will have an installed capacity of 2,000 MW (NHPC, n.d.). To meet domestic needs as well as for export, Nepal should develop large, medium, and small sized hydro-electric projects that are environmentally sound, socially acceptable, and economically feasible.

The bottled water market is currently an expanding global market (Wilk, 2006). There is an increasing demand for bottled water in many countries including India, China, Taiwan, South Korea, Japan, and the gulf countries, due in part to scarcity of drinking water and pollution. Nepal has the great comparative advantage of

harnessing drinking water from its pristine water resources such as glaciers, rivers, and streams that originate from the Himalayas. Many bottled water companies are working towards developing appropriate transportation systems, such as bottled water tankers, and are expanding the bottled water market. To capitalize on this opportunity, Nepal should actively participate in this expanding global bottled water market.

## **2.2. *Jamin (Land)***

The total land area of 14,748,000 hectares in Nepal (LRMP, 1986) consists of a spectacular landscape stretched from east to west. Based on Hagen (1960), Nepal includes seven physiographic zones: Terai, Siwalik Hills (including Chure Hills, Dun Valleys or Inner Terai such as Dang Valley, Chitwan Valley and Trijuga Valley), Mahabharat Lekh, Midlands (or Pahad), The Himalaya, High Mountain Valleys, and Tibetan Marginal Mountains (or Trans-Himalaya) ( RBGE, n.d.). Another commonly used physiographic classification system in Nepal is the three zone topographic classification system. Based on this system Nepal's three physiographic regions include the Lowlands (Terai and Siwalik Hills), Mid-Hills (Mahabharat Lekh and Midlands), and Highlands (Himalayan Mountains, High Mountain Valleys, and Tibetan Marginal Mountains). Certainly, the seven zone physiographic classification system will be more useful in understanding and managing the Asta-Ja for economic development and management in Nepal. Nepal's altitudes range from 60 m in Dhanusha to 8,848 m at the top of Mt. Everest, the highest peak in the world. The Mountains, Hills and Terai respectively contain 35, 42, and 23 % of the total area, and 7, 46, and 47 % of the population (Maltsoglou and Taniguchi, 2004). With the magnificent Himalayas, glaciers, enchanting landscapes, mountains and hills, rivers and streams, wildlife, valleys, lakes, incredible terraces, flat lands, having been the birth place of Lord Budha, and being inhabited by many ethnic groups and friendly and smiling people, Nepal is one of the most attractive countries in the world, and this can be developed into a major tourist destination. Fertile soils in the plains and valleys of Nepal can support intensive agricultural production, while sloping lands in the hills, mountains, and Himalayan belts can be effectively utilized for fruits, vegetables, pasture, and other agricultural activities. Nepal is also enriched with many minerals and mines such as limestone, iron, copper, slate, marble, lead, nickel, pyrite, and gold (Kuo, 1998; Bhandari, 2002). It is estimated that Phulchoki iron mine alone contains over 10 million tonnes of iron. There are 31 copper mines identified in the nation. Better surveying, mining, and utilization of these minerals, along with tourism promotion and development, and the sustainable utilization of land for agricultural production will effectively contribute to economic transformation in Nepal.

## **2.3 *Jarajuri (Plants)***

Agricultural crops play an important role in the economic development of a nation. According to CBS (2007), the cultivated area in Nepal in 2005/2006 for the major crops paddy, maize, wheat, barley, millet, sugarcane, oil seed, tobacco, and potato was estimated respectively as 1549, 850, 672, 26, 261, 62, 188, 2.7,

and 150 thousand hectares with a total production of 4209, 1734, 1394, 27, 290, 2462, 139, 2.7, and 1974 metric tonnes, respectively. Nepal's exports overseas in 2006/2007 included a wide variety of agricultural commodities such as nigerseeds (*Filunge or Ramtil*), coffee, tea, cut flowers, live plants, mushrooms, dried onions, chickpeas, lentils, cardamom (large), ginger, turmeric, rice, wheat, sesame seeds, fruit juice, sugar, various bulbs and tubers, bananas, oranges, chestnuts, curry spices, and various vegetables and fruits (MOAC, 2008). Due to variations in climate, soils, and elevation, Nepal has very high bio-diversity and includes a large number of agricultural crops such as rice, wheat, corn, millet, barley, potato, sugarcane, tobacco, tea, cotton, coffee, banana, litchi, pineapple, jack fruit, oranges, guava, apple, apricot, papaya, cauliflower, cabbage, tomatoes, okra, coriander, garlic, onion, cucumbers, rapeseed, mustard, nigerseeds, sesame, lentils, gram, peas, black gram, mung beans, turmeric, ginger, cardamom, and cumin. Thus, there exists a great opportunity for the production of large-scale commercialized as well as specialized high value crops in Nepal, and earning foreign exchange through export. The improvement of disease resistance and high yielding varieties, agricultural intensification, crop diversification, and development of processing and storage facilities are extremely important for increased agricultural production in Nepal. In addition, Nepal's plant bio-diversity is enriched with so many plant species such as *Sajiwan (Jatropha curcas L.)*, soybean, mustard, niger, rapeseed, peanut, corn, sugarcane, and sugar beet which can be used as biofuel/bioproduction feedstock for the production of alternative energy such as biodiesel and ethanol, and bioproducts for replacing materials made from petrochemicals.

#### **2.4 Janawar (Animals)**

Nepal has a large livestock population. In 2003/2004, Nepal's livestock population consisted of 6.96 million cattle (including yaks and hybrids), 3.95 million water buffalo, 0.82 million sheep, and 6.98 million goats (Pariyar, 2006). Overall, three out of four households in Nepal own livestock (Maltsoğlu and Taniguchi, 2004), and livestock production is well-integrated into agricultural crop production systems. Nepal has a fairly well-established livestock trade with China, India and Bangladesh. Live animals, meat, milk and cream, natural honey, and animal fats are some of the major export items from Nepal (MOAC, 2008). Through better livestock (cows, water buffaloes, poultry, and pigs) development and marketing, export of animal products such as milk, eggs, meat, wool, hides, and skins can be increased significantly and contribute to agricultural development and economic transformation in Nepal. In addition, animals such as donkeys, mules, and horses are used as important draft, transport, and recreational animals. Aquaculture, bee keeping, and sericulture have high importance for industrial production and economic development.

Wild animals such as elephants, rhinos, tigers, lions, leopards, crocodiles, deer, bears, wild pigs, monkeys, jackals, wolves, pandas, porcupines, and many snakes as well as insects and butterflies and birds such as pheasant, ducks, storks, egrets, herons, cormorants, owls, doves, crows, sparrows, eagles, hornbills, mynahs, parrots, kalij, vultures, and white-tailed robins are found in Nepal. Conservation

of wild animals enhances not only environmental quality and ecological integrity, but also gives Nepal the opportunity to earn foreign exchange through various activities such as establishing zoos, hunting, safaris, bird-watching, and game fishing. Important game fishes in Nepal include mahasheer, fresh water sharks, catfish, eel, trout, and jalkapoor.

### 2.5 Jungle (Forest)

The Nepali saying “*Hario Ban Nepalko Dhan*” meaning “the green forest is the wealth of Nepal” is still valid. In 2005, the forest land consisted of 3,636,000 hectares which is 25.4% of land area, and the other wooded land consisted of 1,897,000 hectares (FAO, 2005). The forest supplies fodder, firewood and timber, contribute to environmental quality, and maintains ecological integrity. In Terai, Inner Terai, Dun, Chure, and Bhabar, we find forests with *Shorea robusta* (Sal), *Dalbergia sissoo* (Sisso), *Acacia catechu* (Khair), *Terminalia alata* (Asna), *Ficus religiosa* (Pipal), *Ficus indicus* (Bar), bamboo, chestnut, *Bombax ceiba* (Simal), and many other tropical tree species. Forest products from these regions are used for building construction, furniture, bedding materials, grass, etc. While the lower temperate zone forest includes species such as evergreen oak, alder, maple, chir-pine, blue-pine, Himalayan Cypress, deodar, etc., the upper temperate zone forest species includes both coniferous trees and hardwoods such as rhododendron, *Abies spectabilis* (Fir), spruce, *Tsuga dumosa* (Hemlock), etc. Forest products from these regions are used for the paper industry, plywood production, and furniture making in Nepal. Similarly, in the alpine climate we find pasture land for animal grazing, wildflowers, walnut, mountain oak, and many other hardy plant species. Forests are the habitat of wildlife. Thus, forest resources can enhance the industrial capacity of the nation and generate foreign exchange by exportation of forest products.

### 2.6 Jadibuti (Medicinal and aromatic plants)

Nepal occupies just 0.1% of the world’s total land mass, but contains an incredibly large number of plant species. In 2006, the total number of flowering plant species recorded from Nepal was 6,391 (2.76% of global totals), with 339 flowering plant species endemic to Nepal (Bhuju et al., 2007, p. XXIV). Among them, an appreciable number of plant species are identified and recorded as medicinal and aromatic plants. Some of the major medicinal and aromatic plants traded in and from Nepal include *Aconitum heterophyllum* (Atis), *Aconitum spicatum* (Bish), *Bergenia spp.* (Pakhanbed), *Dioscorea deltoidea* (Bhyakur), *Epimerantha macraei* (Jiwanti), *Morchella spp.* (Gucchi chyau), *Nardostachys grandiflora* (Jatamansi), *Neopicrorhiza scrophulariiflora* (Kutki), *Rheum australe* (Padamchal Amalbed), Silajeet (Olsen and Larsen, 2003), *Cordyceps sinensis* (Yarsagumba) (Devkota, 2006), *Dactylorhiza hatagirea* (Panchaule), and prickly ash (Timur). Other medicinal and aromatic plants commonly found in Nepal include swertia (Chiraito), *Malabar nut* (Asuro), jimbu, rudrachhe, cardamom, *Ocimum sanctum* (Tulsi), rauwolfia root (sarpagandga), *Picrocarpus santalinus* Linn (Ractachandan), *Taxus baccata* (Lothsalla), tejpat (Indian bay leaf), *Butea frondasa* (Amala), and *Acacia catechu* (Khair), and possess high commercial value. There may still be many more

medicinal and aromatic plants that are yet to be known or recorded. The exports of medicinal and aromatic plant products is a trend that increases each year (Olsen and Larsen, 2003; Larsen, 2005; Olsen, 2005a). According to Olsen (2005b), Nepalese exports of medicinal plant material in 1997/1998 accounted to 14,460 tonnes of dried material at a value of 16 million US dollars. Identification, conservation, sustainable utilization, and efficient marketing of medicinal and aromatic plants will contribute remarkably to the sustainable economic development and management of the nation.

### ***2.7 Jalabayu (Climate)***

Climate is the major factor that impacts the natural resource base such as biodiversity, forest types, wild animals, water resources, soils, ecology, and agricultural production of a nation. Where there is extreme climate, agricultural development is difficult, whereas a favorable climate supports a fast-paced agricultural development. According to Bhandari (2002), Nepal contains six different types of climate: Tropical Monsoon Climate, Subtropical Monsoon Climate, Warm Temperate Monsoon Climate, Cool Temperate Climate, Alpine Climate, and Tundra or Arctic Climate. Within these broad climatic zones, there exists a great variety of micro climatic conditions resulting in diversity of vegetation, wildlife, landuse types, and land management practices. This climatic and microclimatic condition offers competitive advantages in year-round production of high value crops such as fruits, vegetables, cash crops, cut flowers, vegetable seeds, spice crops, livestock, and other agro-based products in Nepal. Thus, Nepal has the opportunity to export surplus agricultural produce to other countries during the off-season and, fetching premium prices. Also, climate has historically been one of the major considerations when establishing settlements in Nepal, as agricultural production and health issues are related to climatic conditions. The mid-hills, where beautiful vistas and pleasant weather prevails throughout the year, may attract many theme parks, hill resorts, and retirement homes. For example, retirement communities for foreigners as in Malaysia and Thailand can be developed. It is a huge privilege for Nepalese to have a country with such a variety of climatic zones that range from Tropical in the Terai to Alpine and Tundra in the Himalayan region, and having enormous opportunity for economic development of the nation.

### ***2.8 Janasakti (Manpower)***

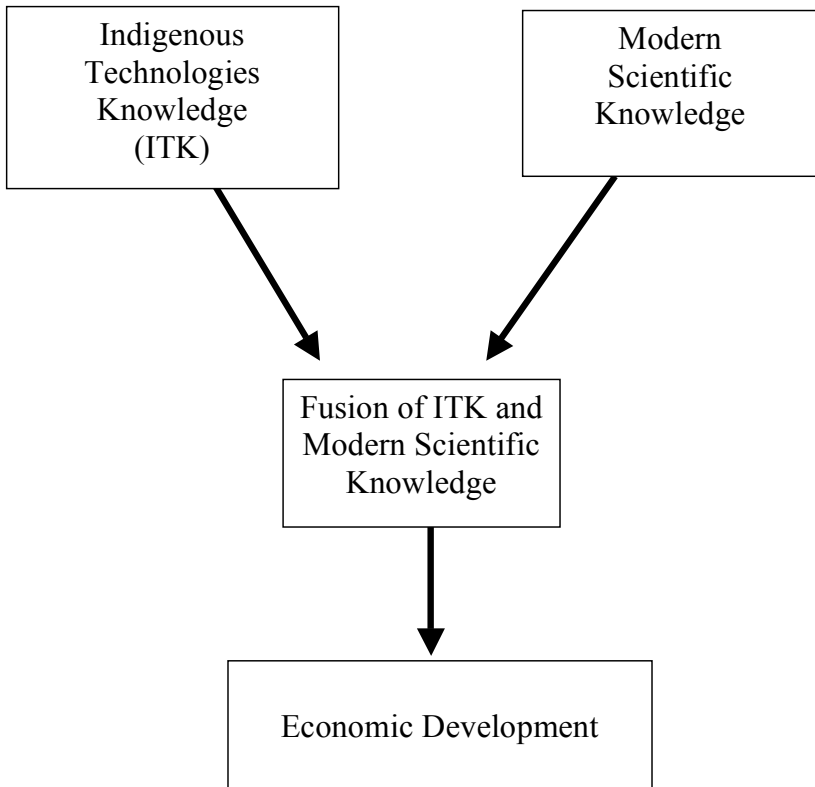
In 2007, the estimated population of Nepal was 26,427,399 (CBS, 2007). We should take this population level positively, and utilize this resource wisely in economic development of the nation. Nepal has about 60 recorded caste and ethnic groups and 70 languages and dialects (NPC, 2003 p. 28). According to CBS (2007), in 2001 the ethnic population in Nepal was Chetri (15.8%) > Brahmin (12.74%) > Magar (7.14%) > Tharu (6.75%) > Tamang (5.64%) > Newar (5.48%) > Muslim (4.27%) > Kami (3.94%) > Yadav (3.94%) > Rai (2.79%) > Gurung (2.39%) > Damai/Dholi (1.72%) > Limbu (1.58%) > Thakuri (1.47%) > Sarki (1.4%) > Teli 1.34% > Chamar, Harijan, Ram (1.19%) > Kori (1.11%), and Others (19.31%). Similarly, the population by mother tongue in 2001 was Nepali (48.61%) > Maithali (12.30%)

> Bhojpuri (7.53%) > Tharu (5.86%) > Tamang (5.19%) Newar (3.63%) > Magar (3.39%) > Awadhi (2.47%), Bantawa (1.63%) > Gurung (1.49%), > Limbu (1.47%), > Bajjika (1.05%), and Others (5.38%). The ethnic and linguistic diversity of Nepal should be considered an asset for Nepal's economic development as various ethnic groups have developed specific practices for harnessing and utilization of available natural resources, have a wealth of indigenous technology knowledge, and have specific cultural and religious bondages developed with the natural resource-base of the nation. Recognition of this asset of ethnic and cultural diversity is important for many development endeavors including tourism development, ethno-botanical advancement, and the preservation of indigenous knowledge and technologies. In Nepal, the CBS (2007) reports a literacy rate of 54.1% in 2001, and the number of students enrolled in higher education in 2005/2006 as Agriculture and Animal Science (373) < Engineering (661) < Sanskrit (1,204) < Forestry (1,570) < Science and Technology (4,559) < Humanities and Social Sciences (13,343) < Medicine (32,879) < Law (41,740) < Management (55,712). Since Nepalese people have been working the land for centuries and possess a lot of indigenous knowledge, sustainable resource utilization and economic transformation of the nation requires the fusion of the local indigenous knowledge with modern scientific knowledge (Fig. 1). The local indigenous knowledge will be an asset for fast-paced economic transformation of the nation.

### 3. Interrelationships and Linkages

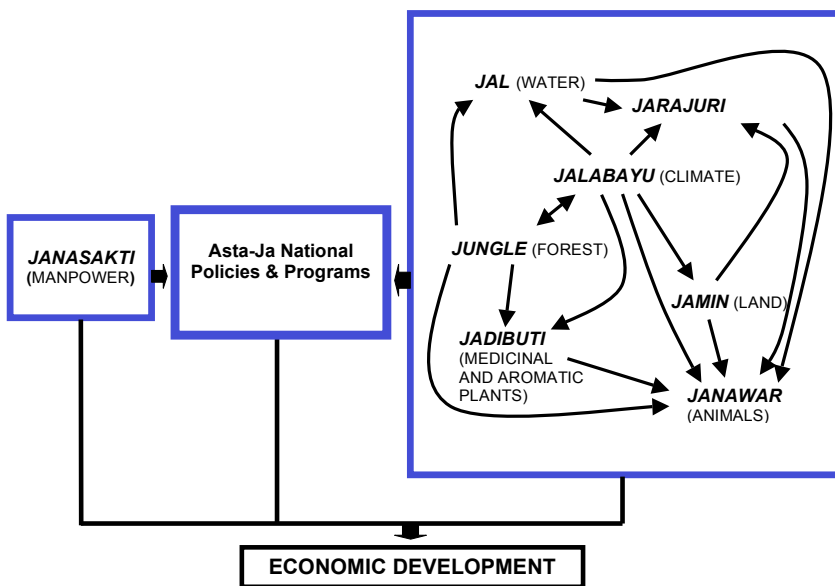
Sustainable economic development and management in Nepal requires a clear understanding of the interrelationships and linkages among these eight *Jas*. Clearly, *JALABYU* (climate) is the dominant factor that drives Nepal's natural resource-base, agriculture, and eventually the whole economy (Fig. 2). *JALABYU* (climate) influences *JARAJURI* (plants), *JANAWAR* (animals), *JAMIN* (land), *JAL* (water), *JUNGLE* (forest), and *JADIBUTI* (medicinal and aromatic plants). As humans are impacted by the availability of *JAL* (water), *JUNGLE* (forest), *JAMIN* (land), *JALABAYU* (climate), and *JARAJURI* (plants), so are *JANAWAR* (animals). Hence, *JANAWAR* (animal) resource management requires very careful planning and sustainable utilization of *JAL* (water), *JUNGLE* (forest), *JAMIN* (land), and *JARAJURI* (plant) resources. As *JAL* (water) resources are directly influenced by the *JALABAYU* (climate) and *JUNGLE* (forest) resources, incidences such as global climate change, deforestation, flooding, and drought will affect the availability of *JAL* (water) resources. As with the *JAL* (water) resource, the *JADIBUTI* (medicinal and aromatic plants) are also influenced by *JUNGLE* (forest) and *JALABAYU* (climate). *JARAJURI* (plants) depend heavily on *JAL* (water), *JALABAYU* (climate), and *JAMIN* (land) resource. Obviously, many complicated interactions and linkages are associated with this system. Therefore, a continuous effort is needed for better understanding of these complexities and interrelationships for the formulation of Asta-Ja policies and programs for economic development and management in Nepal.

**Figure 1: Fusion of indigenous technology knowledge (ITK) and modern scientific knowledge for the economic transformation of Nepal**





**Figure 2: Interrelationships and linkages among Asta-Ja, and the formulation of national policies and programs for economic transformation**



#### 4. Policy Implications

A nationwide, scientific, and sustained Asta-Ja monitoring program aimed at understanding the magnitude and status, properties, ecology and environment, sustainable utilization and management, and linkages and interrelationships between and amongst Asta-Ja is critical for economic development. Effective data generation, handling, archival, retrieval and update systems should be in place. As depicted in figure 2, national Asta-Ja policies and programs for economic transformation should be developed based on scientific understanding of this natural resource-base and considering the availability of *JANASAKTI* (manpower). It is important to formulate national policies based on ground realities, public involvement, competitive advantages, and global considerations. Government should have sufficient provisions for building confidence among investors for expedited economic development. Effective program implementation and evaluation is necessary for success. As empowering everyone to strive for the best results in every aspect of business is the *mantra* for the success of a business (Sharma, 1999), all stakeholders, communities, participating agencies, governmental institutions, the public, and those involved in the development and management of Asta-Ja and economic transformation of Nepal should be sufficiently empowered for success.

## 5. Conclusions

The Eight “Ja” (Asta-Ja) framework for economic development and management of Nepal is in line with other historic “asta” frameworks such as astamangals, astangika-marga, and asta-Laxmi, which have been the ideals in Sanskrit as well as in Nepali language and are well-rooted into Nepalese society. The Asta-Ja framework, while being well-established in Nepalese society, will be the icon of economic transformation in Nepal. Through this framework, Nepal can sustainably manage, conserve, harness, and utilize her tremendous amount of natural resources, achieve fast-paced economic development, built a sustainable, equitable, and just society, and enhance environmental quality. Of course, further research exploring various dimensions of each of the Asta-Jas is urgently needed to make the proposed framework more useful to policy makers.

## Endnotes

<sup>1</sup> Out of these eight Jas, the first five were casually mentioned by Dr. Babu Ram Bhattarai in his BBC interview *Shaja Sawal* program on April 20, 2008.

<sup>2</sup> Asta—meaning eight—has remained an auspicious concept in Sanskrit as well as in the Nepali language. For example, the astamangals — *darpana* (mirror), *bhadrāsana* (throne), *vardhamanaka* (powder vase), *kalasa* (full water vessel), *matsyayugma* (pair of fish), *śrivatsa* symbol, *nandyāvarta* (an elaborated swastika), and swastika—meaning eight auspicious symbols frequently represented on Jaina ritual objects; and astangika-marga meaning Eightfold Path in Buddhism (*Encyclopaedia Britannica*, Micropaedia, Volume 1, p. 601). Similarly, asta-Laxmi referring to the eightfold Sri Laxmi (The Hindu goddess of wealth) presiding over eight sources of wealth are: Adi Laxmi or Maha Laxmi (the First manifestation of Laxmi), Dhanya Laxmi (granary or agricultural wealth), Gaja Laxmi (elephant, animal wealth), Dhana Laxmi (monetary wealth), Vidya Laxmi (wealth of knowledge and education), Santana Laxmi (wealth of continuity, progeny), Dhairyā Laxmi (wealth of courage), and Vijaya Laxmi (wealth of victory) (Swami Adhyatmananda, n.d.).

<sup>3</sup> Tributaries of Saptakoshi include Sunkoshi, Tamakoshi, Dudhkoshi, Arun, Indrawati, Likhu and Tamor. Tributaries of Saptagandaki include Trisuli, Budhigandaki, Marsyangdi, Daraudi, Madi, Seti and Kaligandaki. Similarly, the tributaries of the Karnali river include the Humla Karnali, Mugukarnali, Sani Bheri, Thuli Bheri, Seti and Tila rivers.

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