

Myth and reality of the eco-crisis in Nepal Himalaya

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The Himalaya extends from the Pamir in the west to the valley of the Brahmaputra in the east for nearly 2,500 km and passes through Pakistan, India, China, Nepal and Bhutan. The Himalayan area by virtue of its complex geologic structure, snow-capped peaks, a variety of natural landscapes, mountain peoples of unique socio-cultural diversities and adaptation mechanisms has attracted outsiders from the past. The favorable government policies and peaceful native people of the Nepal Himalaya have welcomed thousands of tourists, trekkers and researchers to fulfill their various aspirations and interests. However, the country is often blamed for causing the so-called eco-crisis in the region. During the 1970s and 1980s, publishing several books and articles with attractive titles, some mountain experts showed solidarity with those who propounded a hypothetical theory of Himalayan environmental degradation on the basis of the limited samples collected from a few localities. In this context, the present study is an attempt to review the available literatures and case studies in order to evaluate the potentiality of the so called eco-crisis/environmental degradation in the Nepal Himalaya areas. It also attempts to analyze the present scenarios in relation to the key factors within the area to judge its validity.

Keywords: Community-forestry; degradation; deforestation; eco-crisis; environment; globalization; Himalaya; diversification; myth .

Introduction

The mighty Himalayas are the youngest folded mountain ranges of the world. They extend from the Indus trench below Nanga Parbat in the west to the *Yarlungtsangpo-Brahmaputra* gorge below *Namcha Barwa* in the east, a northwest to east-southeast distance of about 2,500 km (Ives & Messerli, 1989). The ranges of the mountain pass

through Pakistan, India, China, Nepal and Bhutan. The Himalayan mountain areas are characterized by a complex geologic structure, snow-capped peaks, large valley glaciers, deep gorges, river valleys and a variety of natural landscapes. These areas are also homeland of millions of indigenous people who serve as the cultural guardians of rich storehouses of both knowledge and biological resources desperately needed by the world at large (Rhoades, 1997). However, before the first conquest of the Mount Everest by Tenzing Norgay and Edmund Hillary in 1953, the little known region was full of curiosity and a *Shangri La* for the outsiders particularly for the westerners.

The favorable policy of the Government of Nepal and warm hospitality of the native people have helped thousands of tourists/trekkers/researchers and others to fulfill their various aspirations and interests. Flows of a large volume of tourists/outsideers took place into the Khumbu valley to unfold the mystery of the highest snow-capped peak of the world. The Khumbu valley together with the other areas of the Himalaya also have attracted large numbers of university graduates and researchers to pursue researches on physio-geology, socio-economic dimensions of the local people, their interaction with the nature and adaptation mechanisms etc. The same period between the 1950s and the 1970s was also known for the boom of industrial development particularly after the end of the World War II. The industrial progress in the USA and the UK and the technological advent of Japan and Germany together with other developing nations took place in that period. The industrial affluence and pollutions caused by the industrial development drew alarm at regional level and worldwide concern to the environmentalist. The United Nations Conference on the Human Environment held in Stockholm in 1972, raised common people's profound awareness of environmental concerns and set major agenda in the writings of that period. Being influenced from the conference of Stockholm, another conference was organized in Munich jointly by UNESCO MAB-6 working group and GTZ-German Foundation for International Development in 1974. It was claimed that it had initiated the worldwide discussion on environmental problems of the Himalaya (Ives, 2004).

The launching of Earth Resource Technology Satellite (later renamed as LANDSAT) by NASA in 1972 has made revolution in acquiring and analyzing of the real time data for the earth surfaces. Based on the interpretation of the satellite images, Claire (1972) identified formation of islands in the Bay of Bengal and he claimed (1976) that the origin of the most of the materials was in the Nepal Himalaya. This event has inspired series of studies and researches within Himalayas and publication of articles/books with attractive and alarming titles. Eckholm (1975) came forward and blamed the worlds mostly poor and their population growth for forcing farmers with traditional

agricultural technology onto ever steeper slopes and are associated with pristine environment, in some ways “the poor are damaging the environment even more than the rich”. Eckholm (1976) went further ahead and stated, “Topsoil washing down into India and Bangladesh is Nepal’s most precious export, but one for which it receives no compensation”. In the mean time, a theory of *Himalayan Environmental Degradation* was developed by a group of scientists (*the vicious circles* as referred by Ives & Messerli, 1989) and was popularized by the Nobel Laureate Rudyard Kipling.

The essence of the Himalayan Environmental Degradation theory is that the increased flooding on the Ganges and Brahmaputra lowland was the result of extensive deforestation in the Himalaya. The deforestation was presumed to result from a rapid growth in the mountain subsistence farming populations dependent on the forests for fodder, fuel and for conversion to terraced agriculture. As steep mountain slopes were denuded of forest cover, it followed that the heavy monsoon rains caused accelerated soil erosion, numerous landslides, and increased runoff and sediment transfer on to the plain. This was assumed to induce progressive increase of flooding in river Ganges that was putting at risk the lives of several hundred million people in India and Bangladesh. The theory postulated a series of eight affirmations that started from – unprecedented wave of population growth – increasing demand on fuel wood, fodder, timber and agricultural land – massive deforestation – soil erosion and disruption in the normal hydrological cycle – increase in disastrous flooding and massive siltation – extending the Ganges/Brahmaputra delta and causing islands to form in the Bay of Bengal – a critical threshold for available human energy – repetition of the above steps for further worst case scenarios on the degradation of the region as a whole. It has been suggested that, in preparation for such an event, His Majesty’s Government of Nepal should transfer its patronage of the Swiss technical-aid system (SATA) to that of Dutch and Nepal can begin the struggle to reclaim (and legally claim) land below sea level and establish polders in the Bay of Bengal, the product of its own topsoil (Ives & Messerli, 1989).

Forest depletion and degradation alarm within the Himalayan region was also raised by Bishop (1978), Blaikie *et al.* (1980), Lall (1981), Karan and Iijma (1985), Bandyopadhyaya *et al.* (1985), Singh (1985), Singh and Kaur (1985), Myers (1986), Allan (1987), Tucker (1987), Guha (1989), Joshi (1986) etc. Blaikie *et al.* (1980) came up with a bleak picture of Nepal and concluded, “The country is now in a period of crisis, a crisis whose major components, over the next decade - will include serious over population relative to employment opportunities, ecological collapse in the densely populated and highly vulnerable hill areas”. The reports of World Bank (1979), Asian Development Bank (1982) and World Resource Institute (1985) possibly further exaggerated the

scenario. World Bank aggressively concluded, “Nepal has lost half of its forest cover within a 30 year period and by AD 2000 no accessible forests will remain”. ADB (1982) blamed subsistent farmer’s role for eco-crisis and quoted, “Terraces, especially on rain fed land, are often poorly constructed; they are outward rather than inward sloping and do not have a grassed bund on the edge”. Pereira in WRI (World Resource Institute), WB (the World Bank), and UNDP (the United Nations Development Program) Task Force (1985) went further ahead and stated, “Over 400 million people (in the plains) are hostage to the land use practices of 46 million hill dwellers”. It is in this context, this paper seeks to evaluate the temporal status of the issue - the eco-crisis in Nepal Himalaya as well as continuity and changes that are taking place within it. The intention of writing this paper is to provoke a discussion on the topic so that flaws in our endeavours can be rectified.

Scenarios on the eco-crisis/Himalayan Environmental Degradation Theory after 1980s

After the 1980s, there were initiations from the native Nepalese scholars (Bajracharya, 1981, 1983a, 1983b; Gurung, 1981; Dahal, 1983; Chalise, 1986; Manandhar, 1988) to refute the hypothetical and exaggerated theories of possibility of the eco-crisis and environmental degradation in the Nepal Himalaya. The challenges had come through the extensive studies of the environmental factors and agricultural practices in Nepal Himalaya area. Similarly, several NGOs and INGOs together with governmental organizations had carried out specific researches on environmental theme within the country and had helped in developing awareness of the people as well as concerns on the ecosystem of the area.

Ruling out of the eco-crisis, Bajracharya (1981; 1983a; 1983b) and Dahal (1983) strongly concluded, “But not surprisingly the idea that environmental degradation (deforestation, accelerated erosion, and landslides) was not found in the villages nor among the conscious Nepalese in the country itself. Cultivation on steep slopes is not necessarily damaging at all times. The tradition of making terraces in hilly and mountainous terrain for agricultural purposes provides good protection if done with sufficient care” (as cited in Manandhar, 1988). Regarding the slopes of *bari land* (un-irrigable cultivable lands capable of producing crops and vegetables except rice) and *khet land* (irrigated terraces or lowlands used for production of rice crop) areas of Nepal, Gurung (1981) argued, “It takes more than an expert agricultural engineer to understand these differences” and added further that the outward facing dry terraces

were not products of native ignorance or indolence but represented the equation between labor and output. The observation of Hagen (1970), Kerasote (1987) and Blaikie and Brookfield *et al.* (1987) came in similar fashions. In the words of Hagen (1970), “These terraces are very neatly cultivated, and the low mud walls that enclose them also have the function that is elsewhere that of the woods, i.e. they retain the water from the monsoon rains and prevent avalanches of boulders from devastating the exceedingly steep slopes during the severe cloudbursts”.

Kerasote (1987) come to the conclusion that the hypothetical crisis supposed to have been created by the depletion of Nepal’s forests, and land degradation was produced by experts who had made brief visits, collected narrow data samples, and extrapolated the results to the country at large. Blaikie and Brookfield *et al.* (1987) questioned them who are pointing fingers at hill farmers, “It would not be difficult to present many examples of scientists and agronomists writing about degradation in a manner which places all blame on the folly, ignorance or ineptness of the people who actually work the land; remedies are not found simply in compelling or persuading the immediate land managers to mend their ways”. Chalise (1986) patiently clarifies, “People in the hills who are held responsible - out of desperation, ignorance, shortsightedness or greed (in the words of Eckholm) are building and rebuilding their terraces constantly since centuries, trying to retain the topsoil and enriching the soil with animal droppings, gathering woods and fodder from forests without which they know cannot survive”. It would not be less justifiable here to contextualize the thoughts of Chalise (1986) on the discourse of the eco-crisis/ Himalayan environmental degradation, which says:

It will be interesting to see how many in the developed countries or in the urban centres of developing countries would like to trade places with a Hillman in any developing country whose occupation is limited to be a farmer and live life below poverty line, without any social security and without being covered by any medical or other insurance schemes. It is indeed ironic that the people who made terraces in the entire hill, from the base to the top and made agriculture possible in the hostile, unstable and extremely fragile environment, when the basic scientific concepts of soil conservation were far from being formulated, not to mention the understanding and application of such concepts and techniques, are now being accused of causing greater harm to the environment than those who have polluted the air and the water of this earth by their industrial wastes. (p. 14)

On the investigation of the belief that land degradation in Nepal due to population growth and deforestation has held eco-crisis, Manandhar (1988) concluded, “The eco-crisis scenario does not hold true in the Kakani area of the middle hills of Nepal”. In her words,

People have immense knowledge about the opportunities and problems the environment poses and about the interrelationship of soil, slope, vegetation and land use. Since around mid-1970s forests have been regenerating adequately and some villages have already produced more fuel wood than their requirements. Similarly, landslides are understood as natural phenomenon and farmers take advantage of landslides to help them develop cultivable terraces.

Thompson *et al.* (1986) immensely contributed to the exposure of the fallacies under-pinning the dangerous approach and stated, “Several aid agencies and governmental institutions were adopting the essence of the Himalayan degradation theory because it justifies their preferred agendas”. Ives and Messerli (1989) claimed that the Mohonk Conference (1986) was leading to dismantle the widely accepted Theory of Himalayan Environmental Degradation and it also helped environmental paradigm shift. Ruling out the crisis of Himalaya, they concluded that it is not in environmental dimensions but is socio-economic and especially political one.

A study by Wu and Thornes (1995) on Likhu Khola catchments argued that the terracing did not change the hydrological behavior of the hill slopes and that the effects of human impacts were positive rather than the negative. They observed, “The individual terrace failures during torrential monsoon downpours don’t contribute any sediments to the down slope nor augment lower slope stream flow”. Khanal and Watanabe, (2006) have found “Out of a total of 640 agricultural plots in the Sikless area, 43% were abandoned and 7% under agriculture were completely damaged due to land slide”. This finding contradicts the Himalayan degradation theory in that deforestation for agricultural land triggers the landslide and flow of top soil. Gardener and Gerrard (2003) also were able to confirm that there was less cause for concern about erosion on agricultural terraces than hitherto assumed. Based on the assessment of landscape change in the Khumbu region of Nepal using repeat photography Byers (1987) observed improvement in the areas under the forest covers.

Scenarios in Nepal Himalaya after 1990s

It is not uncommon to observe that the post 1990 AD Nepal has been very much characterized by globalization in effecting socio-cultural changes, agricultural transformations, market-based economy, and accessibility for diversified livelihood mechanisms within the household's level. The eight-point scenarios –as discussed above–ascertained for the eco-crisis/Himalayan environmental degradation theory are no more valid as per the existing situations within the rural areas of Nepal Himalaya. It was basically due to the outcome of the less pressure exerted by agricultural lands and livestock on forest resource as well as community-based forestry management system of Nepal.

Undoubtedly, Nepal has witnessed several paradigms in forest protection and management policies overtime. The deforestation of the 1970s could be explained as the results of the Forest Nationalization Act, 1956 which snatched the ownership of the local people on the forest areas (Koirala, 2006). As a result, the first forestry sector policy was declared by the Government of Nepal in their Sixth Five Year Plan (1981-1985) and emphasized community participation in the management, conservation, and use of forest resources. Mahat (1987) strongly advocated for people oriented forestry development activities which have high potential for creating additional income and employment opportunities, particularly for the poorer section of hill-rural populations, while re-establishing the resource base for supplying their basic needs and reducing environmental deterioration, too. The Forest Act of 1993 has opened the roads for the user group or community forestry in the country. As a result, in 2010 approximately 1.24 million hectares (34.9% of the potential community area) had been handed over to 14,500 forest User Groups by 2008, benefiting over 1.66 million households, which is about 40% of Nepal's total households (DoF, 2010). The forest covered 39.6% of Nepal's land area in 1994 survey. Similarly, altogether 23.23% of Nepal's total area was under some form of protection (protected areas and buffer zones). Apart from the community level, households also started tree farming particularly *Uttis* and other varieties of fast growing trees. Trees supply fodder for animals and timber and fuel wood for household use. These trees are sold easily for the production of woods and plywood (Timsina, 2003; Yadav 2004; Koirala, 2006). The overall increase in areas of forest cover has helped to improve the ecosystem in the mountain areas of Nepal.

The Figure 1 summarizes that the subsistence farming-based rural households of the country are now showing a sign of diversification in their economic structure. The demands in local market centers and international job markets have led to a large flow

of migration of the productive age group population and made shortage of laborers for subsistence farming and large size livestock farming in the rural areas. It has resulted in the change of agricultural practices particularly prioritization to the high value crops (Sharma, 1997) and optimization to other livelihood opportunities for household inputs (tourism, business and services) as well. Hence, adjustment to the situation has led to a change in food habits, energy and forest resource use, management practices, and livestock raising system, forestation in marginal lands led to the overall increment in forest cover. The cumulative effect is reduced pressure to cultivable lands (Khanal & Watanabe, 2006) and forest resource reducing landslide and soil erosion finally to a better eco-system of the region. However, the rates of diversification vary from area to area based on the level of accessibility, market linkage, innovations in the primary productions, and households' capacity for diversification as well.

Nepali hill farmers are by no means passive, inflexible, ignorant 'victims' of unsustainable development, but they are highly active, adaptive and dynamic actors (Adhikari, 1996). The case studies carried in different parts of the country such as Ilam district (Sharma, 1997); northern Dhankuta (Koirala, 2006); hinterlands of Pokhara (Adhikari, 1996); Bhimeswar municipality (Koirala, 2011) etc. show a diversification of livelihoods at household levels. Cereal crops and livestock raising together with high value cash crops (tea, cardamom, broom grass, ginger, potato and other commercial seasonal/off-seasonal vegetable growing), remittance, service, off farm works and business led to a significant development in livelihood options of the local farmers of the rural Nepal. Studies carried out in Indian mountain areas such as Himachal Pradesh (Sharma, 1996); Nainital district of Uttaranchal (Badhani, 1998) and Sikkim (Sharma & Sharma, 1997) have also observed almost similar trends in diversification of household's economy.

The records of migration particularly to the local market centres are not known. However, the number of workers visited to West-Asian countries and Malaysia from Nepal is 2.37 millions in the last three fiscal years (Kantipur, 2012), out of which the shares of Malaysia, Qatar, Saudi Arabia and United Arab Emirates are 33.1, 29.3, 21.6 and 13.4% respectively. Koirala (2006) observed 58 out of the 195 sampled households (8% of the economically active population) had remittance earners in three Village Development Committees (lowest administrative unit) of the northern Dhankuta in 2006 and it had 39% contribution to the total income of the total households. The same survey revealed 7% of the economically active population engaged in off-farm works. The studies carried out in other areas (Adhikari, 1996; Thapa, 2001 as cited in Khanal & Watanabe, 2006) also concluded in similar fashions. Khanal and Watanabe observed

13.1% of the total population of the Sikless area in foreign country owing to employment which was more than 48% of the total economically active population. The large flow of out-migration certainly led several consequences in rural landscapes of Nepal.

A change can be seen in agricultural practices where abandonment of agricultural land and shift to high value crops in which less labor inputs are required. The abandoned agricultural land covers particularly marginal and less productive areas (Koirala, 2006; Adhikari, 1996; Virgo & Subba, 1994; Jackson et al., 1998; Thapa, 2001 as cited in Khanal & Watanabe, 2006). Khanal and Watanabe (2006) observed 49% of all *khet* land and 37% of all *bari* land of the total 149.6 hectare area of Sikless of the Gandaki basin in the Nepal Himalaya as abandoned agricultural land.

The diversification of economies and remittances are leading to several changes in mountain areas of Nepal. The foremost change is taking place in dietary habits of the people- earlier local products such as maize, millet and buckwheat used to comprise in staple foods whereas there has been a shift of staple food from local to imported rice for the last few years (Koirala, 2006). Similarly, there has been a change even in the Tiffin (*khaja*) stuffs with the introduction of noodles, *momo*, biscuits and ready made items by replacing the native items. In earlier days the Nepali households were more or less self-reliant on food items produced by themselves and had a consumption habit with minimum commodities from the market. On the contrary, the households of the present days are experiencing changes not only in expenditure pattern but also in using a range of commodities made available by the modern markets (Koirala, 2006). The consumption pattern in turn led to the less pressure in agricultural land, livestock raising and forest resources use. The National Sample Census of Agriculture 2001/02 has recorded a net decrease in numbers of cattle and sheep population in the country whereas there was an increase in the overall numbers of milking animals in comparison to the Census 1991/92 (CBS, 2001/02). It also signals for the important changes in the livestock sector - a switch over from larger numbers of low quality grazing animals to the lower numbers of animals with improved breeds with stall feeding. It has released the pressure on the forest areas as well as helped in protection of the badlands and ditches through the plantation of good quality fodder to fulfill the demands of the livestock sector. The changes on consumption patterns of light and energy sources over time by the population in Nepal also exemplify the lesser pressure exerted on the forest resources. According to the National Population and Housing Census (2011) more than two third (67.26%) of the households of Nepal have access to electricity for lighting which was 64% in 2001. There is also decrease in percentage of households using fuel

wood day by day and is currently 64% followed by liquefied petroleum gas (21.03%), cow dung (10.38%), bio gas (2.43%) and kerosene (1.03%).

Of course, the steep slopes, unpredictable violent weather and ongoing tectonic activities lead the mountain areas susceptible to weathering, mass movements, erosion and transportation of materials through the surface runoff and overall denudation of the landscape at any time. Weathering that changes hard-massive rock into finer material often prepares rock materials for transportation by other agents of land erosion, including mass movement of material down slope. Further, the Himalaya is also prone to glacier lake outburst flood (GLOF) hazards. Mool et al. (2001) observed a total of 3,252 glaciers and 2,323 glacial lakes with a total area of 75.7 sq. km situated above an altitude of 3,500 m in Nepal Himalaya. According to Khanal (2009) altogether 21 GLOF events with large scale damages in downstream have been experienced in Nepal. The country has 20 potentially dangerous glacial lakes leading to GLOF with catastrophic consequences for nature and human alike (Mool et al., 2001). Therefore, the potentiality of environmental hazards is natural and likely to occur in some areas of the Himalayas. These areas become hazardous because human elects to use areas susceptible to these natural phenomena. Hence avoidance of the hazard is often better than the almost impossible task of making everything hazard-proof. However, Timsina (2003); Yadav (2004) and Koirala (2006) observed that community forestry had led control of landslides and soil erosion within Dhungeswari VDC of Kabhre district, Koshi Hills (parts of Dhankuta, Tehrathum, Bhojpur and Sankhuwasabha districts) and northern parts of Dhankuta district respectively. It seems that the Nepali people have been doing their best to maintain ecological balance and ecosystem for centuries through their limited technology and resources. However, the further awareness and continual efforts should be made to mitigate the natural hazards, control human triggering factors and maintain the ecosystem as far as possible.

Conclusion

By virtue of its unique physiography, people with cultural diversity and varieties of interactions for livelihood, adaptation and sustainability mechanisms, the Himalayan regions have been the place of attraction for the outsiders over the years. However, the region was blamed through a mythical theory of eco-crisis/environmental degradation of the whole Himalayan regions. The books, reports and articles published with attractive and alarming titles such as *Loosing grounds*, 1976; *Nepal in crisis*, 1979; *Degraded upland watershed*, 1985; *Environmental stress in the Himalaya*, 1985; *Environmental repercussions of deforestation in the Himalayas*, 1986; *Land degradation and society*,

1987; *Himalayan dilemma*, 1989; *Karnali under stress*, 1990 etc. had helped to make grounds for several speculation on the issue.

In fact, the mountain areas are always potential to weathering, mass movements, GLOF (if glaciers exist), erosion and transportation of materials through the surface runoff and overall denudation of the landscape due to the existence of the steep slopes, unpredictable violent weather and ongoing tectonic activities including global warming and climate changes. Therefore, the potentiality of environmental hazards is natural, and it is likely to occur in some areas of the Himalayas with catastrophic consequences for nature and human beings. As a result, some of these areas become hazardous because human elects to use the areas susceptible to these natural phenomena. Therefore, if possible, avoidance of such hazard areas is often better than the almost impossible task of making everything hazard-proof.

It can be concluded that the eco-crisis/Himalayan environmental degradation paradigm was more or less baseless to postulate the depletion of Nepal's forests and land degradation and it has been produced by experts who made brief visits, collected narrow data samples, and extrapolated the results to the country at large. The country is not in isolation from the globalization and changes in food habits, health, sanitation and environmental awareness. Dramatic change has also taken place in the subsistence farming areas of the past and economy of the households. Ultimately, the success of participatory forestry system and the coverage of 39% area under forest have diminished the potentiality of the eco-crisis within the region. The role of several governmental organizations, NGOs and INGOs particularly ICIMOD, WWF Nepal and CARE Nepal etc. could not be ignored in improving awareness of the local people on environmental concerns as well as to increase in the forest areas, biodiversity and for overall improvement of the ecosystem. Finally, the proponents of the discourse of eco-crisis/environmental degradation can be thanked for their substantial contribution in developing awareness on the theme and creating ground for the researchers to gather more empirical knowledge on the whole Himalayan region.

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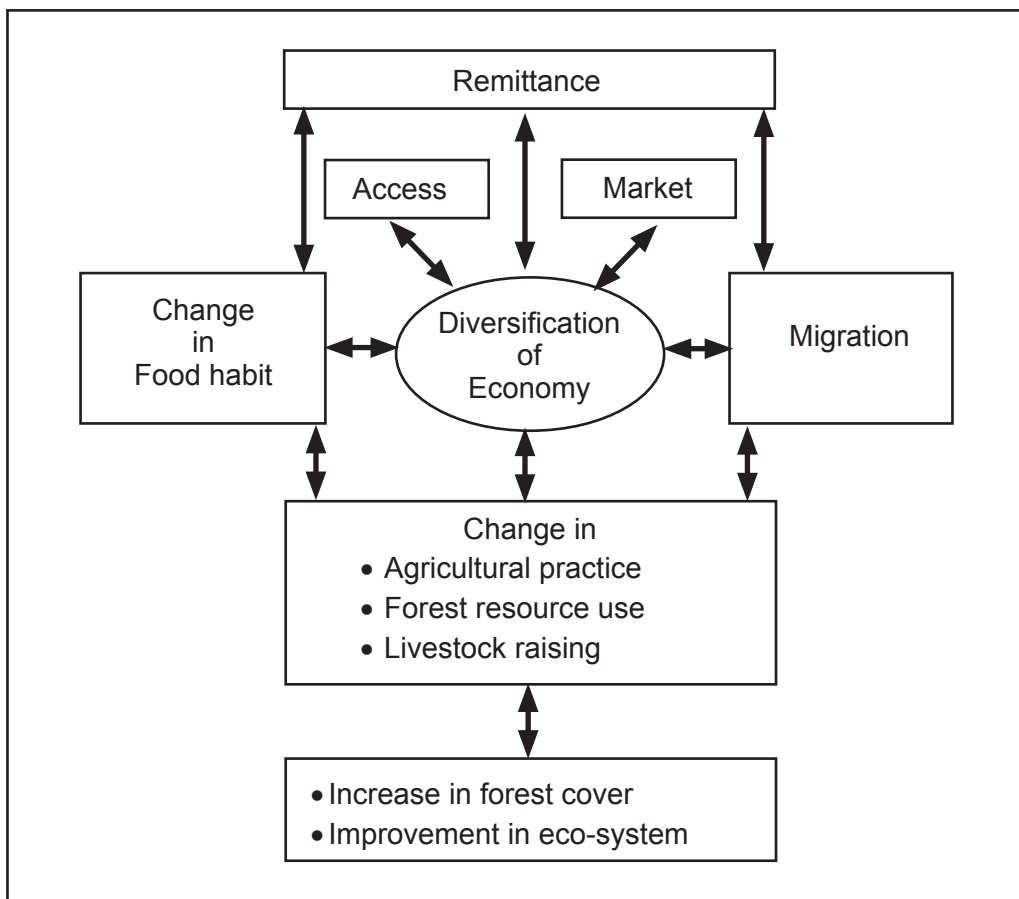


Figure 1. Factors shaping present rural landscapes in Nepal