# The Facts, Myths, and Narratives in Development and Environment: An Assessment of Population Growth *vis-a-vis* Soil Erosion in Nepal

***Rishikesh Pandey***

**Abstract**

*This paper discusses the environmental myths and narratives prevailing in Nepal in reference to the population growth and soil erosion. Soil erosion is taken as primary element of environmental degradation by the theory of the Himalayan Environmental Degradation (HED). Many myths and narratives were generated by the vested interest groups to develop the HED. Population growth and over exploitation of natural resource were considered as the prominent causes of soil erosion related environmental degradation. The myths and narratives based on the theory of the HED are still influential in development and environmental policy process in Nepal. In this background this paper highlights some of the research findings that are contrary to conventional belief i.e. population growth lead to soil erosion. The paper is based on literature review. The research evidences from both social and natural sciences are entertained. This paper generates alternative thinking to end the hegemony and unquestionable acceptance of the findings of research undertaken by 'Western, White men' as truth; and their recommendations as the 'blue print' solutions. Critics over orthodox environmentalism and neo-Malthusian accounts are made to validate the 'hybrid knowledge' generated in this paper. There are evidences that population pressure have promoted soil erosion. However, Himalayan environmental dynamism which is purely a natural process is far more responsible for soil erosion in the Himalaya. Hence, it is suggested that a critical assessment of any 'facts' obtained from research should be made before making them the narratives and reflecting them in policy process.*

***Keywords*:** Myths and Narratives, Environment, Soil Erosion, Population Growth, Himalaya, Nepal



## 1. Introduction

"What would you like the facts to be?" (Thompson et al., 1986)

Environmental degradation is probably the most discoursed concepts of the last five decades; however, no satisfactory solution to this problem is available yet. Research conducted during the 1970s and 1980s on environmental degradation have developed various environmental myths. These myths are yet to be eliminated from the policy narratives since they are deeply rooted on orthodox environmentalism and the interest of aid agencies. The orthodox environmentalism was a deliberate act of Western affluent communities and the environmental imperialism of Western governments over the periphery. The parasitic governments of developing world have unquestionably accepted the environmental myths and ensured sustained application of environmental myths in policies. Nepal is not an exception among such countries of the peripheries.

The emergence of environmental fallacies in the Himalaya were not just the coincidence with marking of the First Earth Day in 1970, organization of International Conference on Human Environment (Stockholm - 1972), the publication of book 'The Limits to Growth' (Meadows et al., 1972), the political and social upheaval in the late 1960s and early 1970s, publication of Eckholm's book describing Himalayan Environmental Degradation in 1976, and the first UN Conference on Desertification in 1977. All of these events further supported by the UNEP, IUCN, WWF, and other aid agencies

have intentionally contributed forming the Himalayan environmental myths. Developing countries because of their dependency status could not deny the concerns and agenda of these powerful agencies, Western politics, and of the oriental conservationist, which eventually have created scientific environmental orthodoxies in developing countries (Forsyth, 1998). Hence, purely a Western concept i.e. Himalayan Environmental Degradation (HED) is adopted in the environmental policy regime though the real concerns and agenda of local people in the Himalaya were very different.

The people in the Himalaya see no environmental degradation but dynamism in the Himalaya. For example, *Sherpas* of Khumbu regard certain hazards as the consequences of dynamic processes of the physical world (Bjønness, 1986), *Mustangi* of the trans-Himalaya see changed form of precipitation from snowing to rainfall with on-going climate change, and construction of road network as the leading causes of soil erosion in Mustang. Soil erosion in the Outer-Himalaya in recent years is encouraged by the uncontrolled query for boulder. However, the governments of Nepal, which is the imperialist-puppets of the aid agencies and donor countries, had elevated their master's environmental agendas in the name of solving the environmental problems. Some of the big examples are establishment of many National Parks and Conservation Areas in the Himalaya, which though claimed as 'managed through peoples' participation'; the park-people of Annapurna Conservation Area, Makalu-Barun Conservation Area, and Chitwan National Park have not get even the 'head shacking' or 'applauding' participation in park management (Pandey 1998, Pun 2004, authors field interaction in buffer-zones of these areas different years). Ultimately, the oriental conservationists have succeeded implementing their environmental agenda of detaching community people from wider ecological system. They have made 'human' apart from nature so the harmony between human and nature has been discontinued, which has further jeopardized the Himalayan environmental problems.



The oriental scholars always feel relaxed if they could blame to the poor and indigenous people of the third world for environmental crises to cover-up the environmental problem created by industrialization and modernization. Also, adoption of quantitative methods in Social Sciences by positivists and behavioralist who have judged themselves as 'the profound scholars of all time', though they do not know that they have made failed attempts of quantifying the unquantifiable human emotions and values. This transition of Social Sciences methodologies from interpretive to positivism has provided the playful ground for the positivist so they believe that 'whatever the facts their data or measurement say is the final truth that can easily be theorized'. Eventually, the theory of the HED is developed. In this context, the aim of this paper is to make critical assessment of the environmental myths created by positivist research in the Himalaya in reference to the concepts of facts, myths and narratives. Further, it explores the relationship between population growth and soil; and develops explanations to show how the environmental myths were generated and narrated in environmental policies.

This paper is based on the review of literature. Paper provides evidences that the population growth and soil erosion are not directly linked. Further, it demonstrates that despite the scholars have developed alternative knowledge in relation to the environmental problems of the Himalaya, policy regime still influenced by the HED. This paper consists four sections. The first section briefly introduces the issues of myths and narratives in the context of environmental degradation. In the second section, concepts of facts, myths, and narratives are discussed. In the third section relationship between population growth and soil erosion is discoursed. Finally, conclusions of the discussion are sketched.

## 2. Conceptualization

The concepts of the facts, myths and narratives are discussed in this section. The mainstream environmentalism, which is solely based on

neo-Malthusian accounts, is challenged through the alternative approach, which is termed as 'hybrid knowledge' here; a blend of Social and Natural Sciences.

### *The Facts*

The debate about human environment interrelationship varies with the schools of thoughts. Increasing academic capabilities and varieties of philosophical thoughts in the one hand and different researches and experiments conducted using different methodologies on the other hand often demonstrate counter or rival results. This form of contested knowledge makes either human or environment a winner and a loser. The 'winner' creates the 'myths' that is later translated in policy narratives. The 'myths' those are widely discoursed and also countered by contested knowledge may give better narratives to solve the environmental problems. However, the unquestioned 'myths' misleads the narratives and fuels the environmental problems further. Individuals' knowledge and the way of thinking is product of a person's experience in life-course. Human develops explanation based on own perception so the knowledge can be recognized as 'perception.' Hence, the perception is the fourth dimension of the abstract things, which is very flexible and varies in shape or understanding from different viewpoints. Consequently, facts are constructed.

A 'truth' is social construction. Truth changes with time, people, place and context. The truth seen from one angle can be false from others. Same applies in the case of environmental degradation. Degradation seen by particular actor not necessarily is seen by others. Truth in research context is associated with the mathematical distribution of the responses. The 'normal' is dominant distribution and the 'normal' is regarded as the truth / fact. The 'normal' or the 'fact' is a positivist concept. However, in Social Science researches, the 'truth' obtained from the positivism reflects the social choices of powerful actors (Forsyth, 1998), which may include researcher,



societies, time of research, selection of respondent, and structure of research question and research objectives. Thompson and colleague (as cited in Forsyth, 1998) have seen the facts suspiciously even in Natural Sciences since the facts are those 'what would one like the facts to be?' The statistical facts were never been able to tell the 'facts' in Social Sciences, though each scientific inquiry is socially constructed according to the political, economic, cultural needs of the time, and the resulting scientific laws coming from these inquiries reflect these agenda (Forsyth, 1998). Callon et al. (1986), Latour and Woolgar (1986), Latour (1987) also claimed that social and political agendas shape the 'facts' created in laboratories. Many scholars and their scholarships are on sale! They construct knowledge based on the agendas of sponsors of any kind: financial, political, ideological, philosophical or methodological, who determine what the fact should be.

Remarkable proportions of population in the US, the UK and in Australia are climate sceptics; this figure drastically changes when survey is conducted just after the hit of some extreme events like hurricane Mitch, Katrina, or Sandy in the US, heat wave and bush fire in Australia, and floods in the UK. A recent survey in Australia has justified this i.e. decreased proportion of climate sceptics (Reser 2013, as reported by Hannam, P in the Sydney Morning Herald dated 13.01.2013). Climate change knowledge under the IPCC is also constructed as required. The IPCC for its AR4 2007 has selected a subset of about 29,000 data series from about 80,000 data series and from 577 studies meeting the criteria ....i.e. *showing a significant change in either direction*... (IPCC, 2007, p.2). It reflects that if positivists want to produce the 'facts' they would just follow the sensitive time, group, place, methodology or ideology. Hence, positivism itself is the source of myths (neither it is false, nor it is true) but can be falsifies as well as justified as per the need.

### *The Myths*

Myths can be said that it is not a 'reality'. According to Forsyth (1998) myths may either mean a demonstrably false statement or a socially constructed repository of local wisdom. Batterbury et al. (1997) stated that myths are those popular talks, which have been accepted as 'truth' in common terms, but are not examined with reality. Metz (1989) too stated that 'myths' are those which could be falsified through the evidences collected in the field. Thompson (1989) adopted a perspective of Cultural Theory in conceptualizing the myths so 'myths' should not be seen as 'false' but instead as an elegant summary of local experience and wisdom. Environmental degradation is constructed concept so each society have own definition of degradation within its experience of the physical limits of uncertainty. Hence, 'myth' on environmental degradation may refer to the attempts to produce ever-more accurate statements on the one hand and it may also mean the ordering of environmental knowledge by society on the other (Forsyth, 1998).

### *The Narratives*

'Narratives' in contrast to the 'myths' are more complex. 'Narratives' are a kind of assumptions and explanations that are primarily found in media and political debates. Narratives are connected to the myths so they are difficult to separate from myths. Both of the concepts i.e. myths and narratives often deal with the tales passed through generations, so both are simplistic in nature so are not developed through researching the complexity of causal mechanisms. Sometimes the 'myths' can be the product of the 'narratives' itself and the 'wrong narrative' is itself a myth. In general understanding, myths and narratives often seek a causal explanation so their natures depend on 'who have made such myths and narratives.' Narrative can be a chain of explanations that more often leads to a conclusion, which is used for policy formulation. If policy is designed on the basis of the



narratives; such policy does not solve the problems rather fuels them. Therefore, narratives countering each-other based on the provided explanations are important for appropriate policy formulation.

The narratives normally carry contrasting messages chronologically. For example, normally good situation is prevailing at the time which would be changed into the bad due to some emerging problems (climate change is eliminating some of the bio-diversity in the Himalaya). Such concrete events, which are structured by a set of archetypical actors like the victims, policy makers, researchers, politicians, activists… are narratives.

A narrative can be understood as a practical conclusion to solve problems. Therefore, narrative is both programmatic and normative assumption. The narrative assumptions are often developed by media, politics, activism, and sometimes by Science or research. These types of narratives often work for good end of the problems. For example community forestry in Nepal was lunched because the narratives in the 1980s were claiming that Nepal would turned out of forestland by 2000; agricultural/green road and bio-engineering policies in Nepal came to control soil erosion and land slide; establishment of national parks and conservation areas were to protect bio-diversity; invention and distribution of alternative energy sources were to reduce dependency on forest for firewood…so on. In this context, the narratives are kind of simple and the easiest way of understanding the problems and intervening through 'normal professionalism' (Chamber1986), which provides simple and the easy solution through policy intervention until the 'solutions' found to be 'wrong'. Therefore, every narratives need to be verified with adequate data to reach to the beneath of the problem before the policy decision are made.

The narratives are the lenses of viewing the world. Narratives may vary with the level of understanding of the problem. For an example, narratives about the flooding in Tarai, Nepal differ among the politicians, bureaucrats, environmentalist, geographer, social scientists, and geologists. Different societies/regions/countries in the

world have created various narratives about environment, weapons, development, and the problems of the world. All of these narratives are depending on how they want to see rest of the world. It means there are various stakeholders, or participants in the 'game' of constructing narratives.

The explanation and process of narrative is mediated by the politics, academic discipline, school of thought, and being the victim or offender of the problems. The narratives are also developed based on 'who will be benefited from it? Who will be satisfied or be calm down emotionally?' Moreover, politics and mass media has the strong role over making any narrative because they have the ability of presenting the issues and actor as 'good' or 'bad' without providing the grounded truth. The politics and media create various myths and narratives to maintain their power and influence. The general people often lack the true information at first, and the truth themselves are constructed so people suffer from the deprivation of independent thinking. Hence, the narratives are the amenities of simple professionalism. In following paragraphs, considering the concepts of facts, myths, and narrative, population growth and soil erosion in the context of the HED are discussed.

### 3. The Population Growth *vis-a-vis* the Soil Erosion

Population and its interaction with the environment is probably the most complex phenomenon. It is very difficult to state whether more people result more erosion or less. Human being is an active agent of the globe so struggles in the physical environment to create better way of life. While interacting with the environment, human has been seen as both a winner and a looser. The win or lose of human to nature is often derived on the basis of human actions to the environment. Particular action of human and the environmental reaction, and the impact of environmental reaction to human go in a complex cycle of winner-looser spiral. Hence, human's victory over environment or environment's invasion over human is mediated by space, time, and



specific action (knowledge) and capabilities, and associated reactions of both human and environment. The production of knowledge is a constructive process that is intimately linked to the social processes of negotiation in specific time and place (Cetina 1981). Therefore, the answer of the question whether more people result more erosion or less depend on the time, space and culture.

In environmental management, combined effect of pollution and erosion result resource degradation. Degradation implies a scientific and cultural view, a set of biological and physical processes, which are interpreted on the basis of the implicit views about how the environment should be used in terms of specific management objectives (Blaikie, 1995). The relation of population pressure and resource degradation/erosion is very complex because similar number of population can have very different impacts on environment. The human impact on environment depends on social institution, means of production, property rules and forms of governance (Marquette and Bilsborrow, 1997). Local environmental condition is another influencing factor that determines the interrelationship between human and environment so the research on whether more people result more erosion or less produces contested knowledge.

'More people result more erosion' is a narrative supported by the neo-Malthusian theory of environmentalism. The positivist research evidences, oriental and well-off environmental conservationist, and the supporters of deep ecology believe in this argument. The theory of the HED has given the strongest backup to this narrative in the context of the Himalaya. World population growth shows over 95% of population growth of the planet take place in developing world. The alarming rate of population growth in the third world has resulted north-south inequality and conflict for resource control. The richest 10 percent of the world own 85 percent of global household wealth (WIDER, 2005) and are the citizen of the north, which shows poverty in the south is caused by the north. The earth itself is unstable and exceeded numbers of never resting human population has created further instability and uncertainties. The neo-

Malthusian account hence, believes that wars, racial, religious, and ethnic conflicts, and environmental disasters, which are mostly located in the south and show statistically significant while adopting positivist methodology; are the outcome of population growth. They also believe that famine, drought, climatic vagaries, disasters and mass killing diseases, which are also the problems of the south, are checking the population to establish environmental balance.

Alternative to neo-Malthusian account, the notion i.e. more people result less erosion is 'hybrid knowledge'. According to Forsyth (1998), the combination of information from both social and natural sciences in order to provide alternative glimpses of 'externally-real' environmental processes (see also in Murdoch and Clark, 1994; Price, 1995; Forsyth, 1996; Batterbury et al., 1997) is a process of creating alternative knowledge. This form of hybrid knowledge allows researchers to test and expand new research agendas identified by local inhabitants or those who are not previously represented in the positivist research process. In this process, the human ability of transferring the natural landscape to the cultural is seen as a protector of natural environment that reduces erosion.

All of we know that each mouth in this earth comes with a pair of hands and a creative mind. Therefore, human knowledge and efforts is the mother of all resources. The coal is nothing rather than the black rock until human knowledge made it possible to generate the energy from it (Zelinsky, as cited in Chandana, 1994). Human knowledge that gives the 'meaning and values' to particular matter of the environment makes the matter an environmental resource. E. Boserup's thesis also states that people innovate the new ways to adjust with the situation. This innovation is possible through the interactions between the environments and human. Therefore, the resource is a constructed idea. Hence, it is irrational to see human especially, the people of survival economies as the agent of environment degradation.

The right to live after birth is natural and is universal so the acts performed to be alive are rationale even though such acts may



destroy the environment. Therefore, soil erosion is not promoted but controlled by population growth if human has found that the soil erosion is challenging their ways of life. The subsistence farmers of the Himalaya often lack alternative livelihood options (Subedi and Pandey 2002, Subedi et al. 2007). The lack of alternative livelihood options encourage them to protect their life giving resource i.e. soil.

However, the conventional policies blame population growth as the agents of soil erosion everywhere. The Kathmandu Valley is densely populated and has the highest level of population-land ratio (CBS, 2001); however, probably is among the places experiencing the lowest rate of soil erosion. Contrary, downstream of Bagmati River, which is sparsely populated is one of the watersheds in Nepal that have the highest rate of soil erosion. Many small watersheds in the Mountain and Hilly regions of Nepal are experiencing severe level of soil erosion despite the watershed being poorly inhabited. The National Sample Census of Agriculture, Nepal 2001/2002 (CBS, 2003) has demonstrated that out of total cultivable land, only 1.2% has become uncultivable due to soil erosion and flooding. The land that has experienced excessive rate of erosion is not the places dominated by human population. However, as orthodoxy scholars do not want to look for an alternative knowledge so they failed to recognize these facts. The reality is that with population growth, the value of land resource increases and inhabitants conserve the valuable resource by controlling soil erosion.

The major agents of soil erosion reported in Nepal are water, wind, chemical and physical; among them role of water is exceptionally high. Out of the total area of Nepal, water related erosion has affected 45.4% of land, followed by wind (4%) (MoES&T 2008 as cited in CBS, 2011). This data clearly demonstrates that not the higher population density but active natural forces in the Himalaya are leading to soil erosion. Accordingly, many road construction projects, mining and querying activities, small irrigation schemes in the Himalayan are promoting soil erosions and landslides, though research in these fields is lacking.

Ever advancing modernization process demands exploitation of distant resources. Modernization process requires expansion of infrastructures like road, hydropower, large irrigation schemes, and operation of highly vibrating equipment and technology. These activities encourage soil erosion in the dynamic Himalaya, Nepal. The evidences show that Nepal experiences 400 to 700 cubic meters of landslides per km per year in general along the roads in the Hills and Mountains even after slope stabilization. The erosion becomes profound during the road construction and following years. The report of the Government of Nepal has demonstrated exceptionally higher rate of land slide i.e. 3 to 9 thousand cubic meter per km occur every year during the year of the road construction in the Hills (MoPE, 2000). Some 10% to 25% of Hill roads following river banks are completely washed out in every four to five years (MoPE, 2000). The Trans-Himalaya, Mustang is been severely exposed to this form of soil erosion since last one decade and is to continue at least for next one decade or more. The district is already prone to wind erosion, and climate change induced erosion (increased rainfall and surface runoff in loose soil structure) and poor vegetation cover there, further recent construction of road has accelerated soil erosion.

Carson (in Blaikie, 1995) described that the slope instabilities near young rivers, combined with frequent earthquake associated with mountains building, and naturally highly erosive climatic regime were responsible for the more spectacular landslides in the Himalaya. The author further stated that most of the sediment reaching rivers came from the source of mass wasting and not from agriculture field. Stewart et al. (2008) also found that despite rapid soil erosion in the Brahmaputra System, sediment analysis has demonstrated that ~50% of the vast accumulation at the front of the Himalaya comes from only ~2% of its drainage. It shows that more people in the basin of Brahmaputra are controlling erosion so only some of the naturally dynamic sub-watersheds are experiencing heavy soil erosion. More people have directed their efforts to conserve soil for better productivity in the Brahmaputra Basin. The people of the Himalayas



are struggling against natural forces of soil erosion. Local knowledge on terracing, mulching, ground covering through intercropping and crop rotation, channelling the runoff are scientifically appropriate technologies of checking soil loss.

Contrary to the discussion above, some of the researcher also claimed that population pressure on cultivated land in Nepal is the greatest in the Mountain area where population density is the least. In the early 1970s, agricultural density was as high as 1100 people per sq. km; a concentration similar to highly fertile Asiatic deltas where climate allows two to three crops in a year (IBRD in Seddon, 1995). Seddon (1995) blamed the upland (shifting) cultivators of Nepal for soil erosion. The IBRDs was intended to blame the peasant farmer for soil loss so used the concept of agricultural density wrongly here. The subsistence agriculturalist of the Himalaya who hardly produces enough for self-consumption cannot be compared with the semi-commercial Agriculture of Asiatic deltas. The IBRD would have got better answer if it had analyzed the level of poverty and food security, and use of alternative livelihood options adopted by the people of these two regions. Though the people of the Himalaya report agriculture as their primary occupation, they entertain many supplementary occupations like crop-livestock integration along with seasonal labour migration, remittance, collection and sell of medicinal / aromatic plants, and collection of jungle foods for self-consumptions to make their livelihood sustainable (See Furer-Haimendorf, 1975; Bishop, 1990; Ephrosine, 1994; Subedi and Pandey, 2002; Subedi et al., 2007). The mythologists of environmental degradation seldom look upon the climatic uncertainty, farm size, types of crops/cropping patter, agricultural input and adoption of other off-farm activities, which have great influence in productivity as well as in soil erosion.

There is no any relation with population pressure and declining productivity or erosion (Umezaki et. al, 2000). Declining productivity is not necessarily the result of deforestation and soil erosion. Productivity may decline due to other factors i.e. physical environment, people's efforts, external factors as well as environment

change overtime. A study in Arun Valley in Nepal showed that Makalu VDC is highly suffered from chronic food shortage despite having higher soil fertility and low population pressure than that of Sitalpati VDC because of heavy crop and livestock damage by wildlife encroachment, frequent hailstorm and limited growing season in Makalu (Pandey, 1998). Due to natural processes and inappropriate government policy of declaring the area as National Park and Conservation Area Makalu encountered by such food deficiency. It is clearly observed that the parks and conservation areas in Nepal are established not to control soil erosion; but to control people and their livelihoods, and maintain the politics of orthodox environmentalism (Pandey 1998, Pun 2004).

For the farming community, impacts of soil erosion are more severe. A study in Nigeria showed that 75% of maize yield lost with the only 1cm of soil loss (Lal in Stoking, 1996). The human survival challenge due to the impact of that 75% decrease in yielding is more severe than that of the environmental degradation due to loss of 1cm topsoil. Therefore, farming communities are eager to control soil erosion so they could protect 75% yielding being lost. To ensure the production threshold, Hill farmers in Arun Valley are deliberately reducing soil erosion through transforming *Khoriyas* (shifting cultivations) to slopping terraces, and slopping terraces to level terraces (Subedi and Pandey, 2002). Forsyth (1996) also found that upland farmers in Thailand deliberately avoid erosion by increasing frequency of cultivation in flatter slopes rather than steeper slopes though they are blamed for causing lowland sedimentation by lowland communities. The up-hill farmers were not lacking the knowledge, rather equipped with the adaptability and knowledge of erosion control, indeed.

Contrary to the evidences discussed above, the theory of the HED stated that cutting of agricultural terraces on steeper and more marginal mountain slopes has led to a catastrophic increase in soil erosion and landslides, which ultimately resulted to the disruption in normal hydrological cycles (Ives, 1987). It is not clear that how transferring slopping land into level terrace using human labour would increases soil erosion. If it is so farming communities of the Himalaya as well as of the Andes would never transformed slopes into level terrace since ancient period.

Further, the soil nutrient depletion and soil loss due to precipitation related erosion are high in rain-fed farmland in Nepal. The monsoon precipitation in the Nepali Himalaya, which is characterized by intense seasonal rainfall, is concentrated in summer two months (over 80% of annual rainfall occurs in July-August). The nature of summer monsoon rain is becoming ever erosive; farmers of Nepalese Mountain have to plough new unfertile soil every year because monsoon rain of previous year washes fertile top soils. The detail rainfall intensity (hourly rainfall) and associated soil erosion data are not available for Nepal to see the interaction between rainfall and soil erosion. However, a study made in Fewa Watershed, Nepal reported that erosive rainfall (defined as more than 1.5 mm in 30 minutes or 72mm/day/24 Hours) was as high as 39 percent of the total rainfall in the watershed (Kemp, 1984) therefore, in the monsoon period, the soil erosion rate exceeds 10 ton/hectare/year (MoPE, 2000).

Population growth itself is not a problem since population pressure might drive farmers innovate new landuse practice and mitigate resource degradation (Boserup in Umezaki et al., 2000). In spite of increasing population over time, agricultural change in the Western Himalayan Region in India has reasonably consistent with sustainable management of natural resource, which advises that people have responded environmental changed overtime by technological improvement like terracing, drainage channels, and mixed cropping (Holden and Sankhyam, 1998). This demonstrates rapid population growth can accompany by technological change to protect the soil resource.

The IBRD, Seddon, and Stewart et al., Laben (as cited in Seddon 1995) showed that 50-75% of landslides in Eastern Hills and Mountain in Nepal are purely geological in origin. Ramsay (1987)

found the consensus among the literature that erosion rates in the Himalaya are naturally very high. Exceptional rains, earthquakes and glacial-lake-outburst flooding in the high Himalayas are common factors promoting soil erosion in Nepal Mountains (Shrestha, 1997). Many monsoon rainfall events are characterised by torrential shower, and the extreme rainfall events are increasing with ongoing climate change (Pandey and Bardsley, 2013); annual erosion rates increase with runoff and an average erosion rate increases with discharge and precipitation across the watershed (Gabet et al. 2008). Hence, it is rationale to recognize monsoon rain as prominent determinant of soil erosion in the Himalaya.

Further, Shrestha (1997) and Garzanti et al. (2007) have noted exceptionally high level of erosion on the wetter south facing sub-watershed during the monsoon and extreme rainfall events. Garzanti et al. (2007) stated that neither the altitude nor the relief but tectonically-lower zones with the highest summer monsoon intensity (over 200 cm/year) are the principal factors of erosion in the Nepali Himalaya. Their study in Marsyangdi Basin demonstrated that slopes greater than 30 degrees have a greater effect of mass movement, which is responsible for the soil erosion in the Himalaya. Garzanti and associates (2007) further stated that coupling between erosion and peak monsoonal rainfall along the southern front of the Greater Himalaya is consistent with both channel-flow models of tectonic extrusion and tectonic uplift above a mid-crustal ramp, which are encouraging soil erosion in the Himalayas. Hofer (as cited in Forsyth 1998) also stated that the so-called environmental degradation in the Himalaya was the result of long-term biophysical processes resulting from tectonic uplift and precipitation.

Based on above discussions, it is clear that erosion in the Himalayas is not caused by population growth; rather it is a natural process. The environmental dynamism in the Himalaya has made the Himalayan ecosystems vulnerable to minimum human intervention. Therefore, there are very little possibilities that human or increased population contribute for soil erosion in the Himalaya. Nevertheless,



the oriental environmentalist are blaming population growth as a primary agent of soil erosion and forcing the government of Nepal to implement the environmental agendas of western affluent groups. Through this form of environmental racism, oriental environmentalists have developed myths and narratives in development and environment.

## 4. Conclusion

Discussion above has demonstrated that population growth in the Himalaya is not the vital force of soil erosion though some of the literature contradict to this notion. As the facts are constructed and are contested; they should be carefully entertained in policy translation to reduce the use of myths and narratives in policy process. Discussion also showed that truthfulness of 'facts' depends on the lenses from which one wants to see the world. By using different lenses the existing facts can be falsified, which is the process of creating hybrid knowledge. The claims made by the theory of the HED and associated researches are falsified through the facts generated using hybrid methodology that triangulates the theories, data, methods and actors. The strategy of disseminating created facts widely is the process of generating myths and transforming them into narratives. The policy actors, aid agencies and governments shape the image of crisis so act as advertising agencies to create a fashion or make other believe over their agendas. To minimize this creation of alternative facts using integration methodology of Natural and Social Sciences is essential. Hence, acceptance of environmental 'myths' uncritically in policy process could be avoided and policy process could be laid in epistemologically realist basis.

The Himalayan communities do not see environmental problems of the Himalaya as degradation. Rather they perceive them either as the act of super-natural power (like the God) or as Himalayan dynamics (natural process), with which they have to interact as a routine process. Many literature reviewed above have

supported this notion. The Himalaya is still under active mountain building process. Therefore, dynamic nature of new fold mountain is causing higher rate of soil erosion there. Heavy rain in monsoon, higher degree of slope, and high infiltration rate in the Himalayas have been resulting higher rate of soil erosion and landslides. Nevertheless, many of the oriental conservationists have not considered these facts, but eagerly blame local people for environmental degradations.

Many development and environmental policies in Nepal are also based on the myths and narratives created by orthodox environmentalist. The aid agencies and governments have been pouring money into protected area management, reforestation, and resettlement and urbanization projects to control the environmental degradation. Many upland farmers have been targeted by land-management policies, many lands that were under the entitlement of local inhabitants were converted into protected areas, and forest and fertile land of Kathmandu Valley and Tarai is destroyed in the name of resettlement, urbanization, and industrial estate. The country has ratified almost all international environmental agreements and conventions, and protocols available for ratification. However, all these were done to promote the agenda of orthodox environmentalist and aid agencies. What is the meaning of Nepal's signature on Kyoto Protocol 1997 to control global environment problems if the country like the US does not sign it? Nepalese government and senior bureaucrats do not have the answer of this question. Nevertheless, they are following half-century old environmental myths and narratives in policy process.

## References

Batterbury, S., Forsyth, T., and Thomson, K., (1997). Environmental transformations in developing countries: hybrid research and democratic policy. *The Geographical Journal*. Vol. 163, No. 2, pp. 126-132.

Bishop, B.C. (1990). *Karnali under stress: Livelihood strategies and seasonal rhythms in a changing Nepal Himalaya*. Chicago: University of Chicago.

Bjønness, I.M. (1986). Mountain hazard perception and risk-avoiding strategies among the Sherpas of Khumbu Himal, Nepal. *Mountain Research and Development*, Vol. 6, No. 4, pp. 277-292.

Blaikie, P. (1995). Changing Environments or Changing Views? *Geography*, Vol. 80, No.3, Pp. 203-214.

Callon, M., Law, J., and Rip, A., (1986). *Mapping the dynamics of science and technology*. London: Macmillan.

CBS 2001. National Report of Population Census Nepal. Kathmandu: GON/NPC/CBS.

CBS 2003. National Sample Census of Agriculture, Nepal 2001/2002. Kathmandu: GON/NPC/CBS

CBS 2011. Environmental Statistics of Nepal 2011. Kathmandu: GON/NPC/CBS

Cetina, K.K. (1981). *The Manufacture of Knowledge - An Essay on the Constructivist and contextual Nature of Science.* Oxford: Pergamon Press.

Chamber, R. (1986). *Normal professionalism, new paradigms and development.* Brighton, England: Institute of Development Studies, University of Sussex

Chandana, R. C. (1994). *A Geography of Population* . New Delhi: Kalyani Publishers.

Ephrosine, D. (1994). Jungle resource use: adaptive strategies of *Rai* and *Sherpas* in the Upper Arun Valley of Eastern Nepal. In Allen M (Eds.) *Anthropology of Nepal: Peoples, Problems and Processes.* Proceedings of an International Seminar on the Anthropology of Nepal: Peoples, Problems, and Processes, September 7-14, 1992. Kathmandu: Mandala Book Point, pp. 49–63.

Forsyth, T. (1998). Mountain myths revisited: integrating natural and social environmental science. *Mountain Research and Development*. Vol. 18, No. 2, pp. 107-116.

Forsyth, T. (1996). Science, myth, and knowledge: testing Himalayan environmental degradation in northern Thailand. *Geoforum*. Vol. 27, No. 3, pp. 375-392.

Furer-Haimendorf, C.V. (1975). *Himalayan traders: Life in high land Nepal*. London: John Murray Ltd.

Gabet, E.J.; Burbank, D.W.; Pratt-Sitaula, B.; Putkonen, J.; Bookhagen, B.; (2008). Modern erosion rates in the High Himalayas of Nepal. *Science Direct, Earth and Planetary Science Letters.* Vol. 267, pp. 482–494.

Garzanti, E.; Vezzoli, G.; Andò, S.; Jérôme Lavé, J.; Attal, M.; France-Lanord, C. and DeCelles, P. (2007). Quantifying sand provenance and erosion (Marsyandi River, Nepal Himalaya). *Science Direct, Earth and Planetary Science Letters.* Vol. 258 pp. 500–515.

Holden, S. and Sankhayan, P.L. (1998). Population pressure, agricultural change and environmental degradation in the Western Himalayan Region of India. *Forum for Development Studies.* No.2, pp. 271-300.

IPCC (2007). *Climate Change 2007: Impacts, Adaptation and Vulnerability, Summary for Policymakers.* Working Group II Contribution to the Intergovernmental Panel on Climate Change, Fourth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva.

Ives, J.D. (1987). The Theory of Himalayan Environmental Degradation: its validity and application challenged by recent research. *Mountain Research and Development.* Vol. 7, No. 3, Proceedings of the Mohonk Mountain Conference: The Himalaya-Ganges Problem, International Mountain Society, pp. 189-199.

Kemp, H., eds. (1984). *The Changing Himalayan Landscape in West Nepal.* Berlin: Dietrich Reimer Verlag.



Latour, B. (1987). Science in action: how to follow scientists and engineers through society. USA: Harvard University Press.

Latour, B. and Woolgar, S., with Salk, J. (1986). Laboratory life: the construction of scientific facts. Princeton: Princeton University Press.

Marquette, C. and Bilsborrow, R. (1997). Population and environment in developing countries: A selected review of approaches and methods. In *The Population, Environment, Security Equation.* Vol. 13, editors B. Baudot and W. Moomaw. New York: MacMillan, pp. 611-38.

Meadows, D.H., Meadows, D.L., and Randers, J. (1972). *The Limits to Growth*. New York: Universe Books.

Metz, J. (1989). Himalayan political economy: more myths in the closet? *Mountain Research and Development.* Vol. 9, No. 2, pp. 175-181.

MoPE (2000). State of Environment. Kathmandu: HMG, Ministry of Population and Environment, pp. 20-25.

Murdoch, J. and Clark, J. (1994). Sustainable knowledge. *Geo-forum*. Vol. 25, No. 2, pp. 115-132.

Pandey, R. and Bardsley, D.K. (2013). Human Ecological Implications of Climate Change in the Himalaya: Pilot Studies of adaptation in Agro-ecosystems within two villages from Middle Hills and Tarai, Nepal. *Proceeding of Impacts World 2013, International Conference on Climate Change Effects, Potsdam, May 27-30. Available at:* http://www.climate-impacts-2013.org/files/wism_pandey.pdf

Pandey, R. (2007). *Peoples' Agenda for Peace: Conflict Transformation, Constitutional Assembly and Restructuring the State*. Research under the EC funded European Initiative for Development and Human Rights Project, implemented by Informal Sector Service Center INSEC, Kathmandu

Pandey, R. (1998). Adaptive strategies in Mountain Environment: A comparative study of *Rai* communities in different ecological zones. Kathmandu: Unpublished MA Dissertation, CDG, TU.

Price, M. (1995). Mountain research in Europe: an overview of MAB research from the Pyrenees to Siberia. Carnforth, UK: UNESCO and Parthenon.

Pun, D.P. (2004). Rural landscape change: landscape values and meanings: A case study of Jagaatpur VDC. Trondheim: M. Phil. in Geography Thesis. Norwegian University of Science and Technology. (Available at http://www.diva-portal.org/ntnu/)

Ramsay, W.J.H. (1987). Deforestation and erosion in the Nepalese Himalaya - is the link myth or reality? *Forest Hydrology and Watershed Management Proceedings of the Vancouver Symposium*. August 1987, No.167. pp 239-250.

Reser, J. (2013). *Climate-change denial feels the heat.* (Reported of Hannam, P. in the Sydney Morning Herald dated 13.01.2013, Available at: http://www.smh.com.au/environment/climate-change/climatechange-denial-feels-the-heat-20130112-2cmhu.html. Accessed on 13.01.2013)

Seddon, D. (1995). *Nepal A State of Poverty*. New Delhi: Vikas Publishing House Pvt.Ltd.

Shrestha, D.P. (1997). Assessment of soil erosion in the Nepalese Himalaya: a case study in Likhukhola valley, Middle Mountain Region. *Land Husbandry*. Vol. 2, No. 1. Oxford & IBH Publishing Co. Pvt. Ltd, pp.59-80.

Stewart, R.J.; Hallet, B.; Zeitler, P.K.; Malloy, M.A.; Allen, C.M. and Trippett, D. (2008). Brahmaputra sediment flux dominated by highly localized rapid erosion from the easternmost Himalaya. *Geology*. Vol. 36, No. 9, pp. 711–714; doi: 10.1130/G24890A.

Subedi, B.P. and Pandey, R. (2002). Livelihood strategies of Rai communities in Arun Valley: continuity and change. *Vegetation and Society: Their Interaction in the Himalayas.* In R.P. Chaudhary, B.P. Subedi, O.R. Vetås, and T.H.Åse eds.), Kathmandu: Tribhuvan University Nepal and University of Bergen Norway, pp.157-170.



Subedi, B.P.; Subedi, V.R.; Dawadi, P. & Pandey, R. (2007). *Livelihood at risk: finding from Mid-western Nepal.* Kathmandu: Informal Sector Service Centre (INSEC).

Thompson, M. (1989). Commentary: from myths as falsehoods to myths as repositories of experience and wisdom. *Mountain Research and Development.* Vol. 9, pp. 182-186.

Thompson, M.; Warburton, M. and Hatley, T. (1986). Uncertainty on a Himalayan Scale: An institutional theory of environmental perception and a strategic framework for the sustainable development of the Himalayas, Ethnographica. London: Milton Ash Publications.

Umezaki, M; Kuchikura, Y; Yamauchi T; and Ohtsuka, R. (2000). Impact of population pressure on food production: An analysis of landuse change and subsistence pattern in the Tari Basin in Papua New Guinea Highlands. *Human Ecology*, Vol. 28, No.3, pp.359-381.

WIDER (2005). Personal assets from a Global perspective, WIDER, UN, viewed on 17.01.2013 at http://www.wider.unu.edu/research/projects-by-theme/poverty-inequality/en_GB/personal-assets-from-a-global-perspective/