



Revisiting Ecovillage as a Sustainable Settlement from a System's Perspective- A Case of Bandipur, Nepal

Bijay Singh ^{1,*}, Mahesh Shrestha ¹, Sushil Bahadur Bajracharya ¹, Martina Maria Keitsch ²

¹ Pulchowk Campus, Institute of Engineering, Tribhuvan University, Nepal

² Norwegian University of Science and Technology, Norway

Corresponding Email: bjlals@gmail.com

Abstract:

Many ecovillage advocates, especially from academic and grey literature, emphasise that intentional community like ecovillage (EV) represents a local level sustainable settlement of living as a response to the widely discussed unsustainability of modern lifestyles. From the researchers' point of view, theoretically, it bypasses existing planning policies and development processes that cover the broader area and includes stakeholders such as government, experts, and other authorities. Practically, EV focuses on short term local projects often developed separately in each dimension of sustainability. It often leads EV to be an oddity in broader surroundings. Based on a system perspective, the article aims to analyse EV as a sustainable settlement within a broader region. The approach considers that the dynamic regional structures and relationships influence the ecological, economic and social aspects at the local level. The article presents the historical development of Bandipur as a case example. The researcher assesses the system theory as a strong methodological framework for understanding EV concept in an integrative manner, spatially and temporally. The article starts with the literature review of scientific journals, narratives, conference papers on sustainability, ecovillage, and system perspective. The article uses observation and open-ended interviews with various stakeholders conducted in Bandipur and then triangulated with other secondary sources on Bandipur. The findings indicate that to broaden the spectrum of EV and SD, spatially, the components of EV are represented as sustainable interconnectedness and relationship and then scaled up to the regional level. Temporally, cultural values represent the relationship and interconnectedness that could be handed over to future generations. The article concludes that from a system's perspective, it seems that the EV strategies need to correspond to policies and vice versa for sustainable relationships.

Keywords: Bandipur, Ecovillage, Sustainability, System Perspective

1 Introduction

Even though sustainable development (SD) is firmly embedded in international policy and is widely referred to in strategies and plans prepared by developed and developing countries, SD implementation has proven difficult and continues to present major challenges for government, industry and the global community [1]. It often results in a lack of commitment to more sustainable practices from authorities because of their difficulties in decision making in the backdrop of compromises, and concessions that are continually made in response to the pressures from advocacy groups, affected interests, and other political powers who define sustainability as per their preferences[1-3]. In myriads of rules, procedures and political negotiations to frame and steer public policymaking, it seems difficult to integrate sustainability considerations in different strategies and actions. It appears that many sustainability initiatives are at risk to lose the ground of confidence on positive outcomes because of their alienation from context.

The task of facilitating sustainability gets surrogated to the local level, grass-root organizations like ecovillage (EV). According to Global Ecovillage Network (GEN), ecovillage aims to holistically integrate ecological, economic, social and cultural dimensions of sustainability in the whole system view to regenerate social and natural environments at a community level in participatory processes. From the researchers' point of view, theoretically, EV bypasses existing planning policies and development processes that cover a broader area and include stakeholders such as government, experts, and other authorities. Practically, EV focuses on short term local projects. EV's projects are often developed separately in each dimension of sustainability that avoid their integration in spatial and temporal aspects.

As such, a holistic integrated approach to sustainability is needed that incorporates practical implications without losing the sight of theoretical knowledge on sustainable development. It seems that the approach needs to allow scaling up practical implications at the local level into strategies and policies. It often asks for the place-based

interpretations of sustainability that forward practical solutions into the development of theoretical underpinnings for strategy and policy development for a given context (spatial), in a long run (temporal). Hence, the article attempts to develop a holistic view of sustainability in the context of EV by identifying and exploring its key aspects, approaches, vagueness, and dynamics of relationships in case of Bandipur that can be scaled up to develop theoretical knowledge for a sustained period.

2 Setting the scene: Ecovillage and System Perspective

Ecovillage considers two important aspects; the regional and the cultural. Regionally, the EV concept's challenge is to encompass sustainability beyond the comfort of local aspirations and relate to mainstream development for future generations. Culturally, EV's challenge is to integrate the practices into a sustainable lifestyle value. From systemic thinking, it relates EV to setting up a 'sustainable relationship' to achieve certain goals, which can transcend across space and time. The two issues are relevant. The first is to develop a conceptual scheme on how to sustain the interrelations across space and time. The second is to develop a methodological framework for developing tools and methods to understand the sustainable relationships among individuals in a certain situation and cultural context. The article applies systemic thinking for EV to address challenges associated with both aspects.

3 Methods

The study starts with a literature review of a system perspective. The article attempts to see three different kinds of system perspective based on how the system gets manifested spatially and temporally. The article carries out extensive keyword search on the internet, online sources and academic database with the term 'system theory', 'system thinking and sustainability' system thinking and ecovillage', and 'system thinking and society'. The search is open to scientific disciplines like planning, economic, development policy, environment, sociology, and design. The article reflects on the data collected by comparing with the EV scenarios.

The second part of the study makes a case study on Bandipur. Bandipur is not an authentic EV. However, the historical development of Bandipur shows that it is established as an intentional community for trading. Then, the article carries out extensive research on the internet, online sources and academic databases that have made a

study on Bandipur. The searches result in a master thesis, project report, newspaper articles, and scientific articles. Four sources are particularly useful for understanding the history of Bandipur [4-7]. The researchers derive main empirical materials from observations and interviews. The historical account and the findings are based on a reflection on triangulation between information derived from the secondary sources and data collected from observations and interviews.

In total, the article includes six in-depth interviews, five being residents and one being the project coordinator of Bandipur Eco-Cultural Tourism Project. The interviews are semi-structured, which allows the respondents to bring up issues of concern. The interviews cover three main topics. First, the history of Bandipur, second, the potentials of Bandipur and third, the plans of Bandipur.

4 Literature Review: System Perspective

The article considers three kinds of system theory, General system Theory (GST) by Ludwig van Bertalanffy, Autopoietic System Theory (AST) by Maturana and Varela and Social System Theory (SST) by Talcott Parsons. Interpreting GST, human settlement reflects a natural order. Ecovillage as a settlement assumes the characteristics of living systems, self-organising, self-maintaining, self-differentiating units with mutually beneficial relationships with other settlements. It seems that EV is a subsystem of bigger clusters of a region or other higher ecologically defined areas. The interpretations' base is an ecological reorganisation of the world. An ecological system does not relate to human configurations such as cities, states, and nations. It seems that their absence limits ecovillage to local-level projects. From the GST perspective, it seems that ecovillage can address the human configurations of space but entails the need to reconfigure them via ecological consciousness by limiting itself to physical eco-sensitive designs. Moreover, treating ecovillage from the GST perspective tends to ignore the social aspects and human actions[8].

Based on AST's interpretation, a settlement acts as a living organism with the core idea of self-producing and self-sustaining through social interactions. As such, the EV concept has separate and autonomous individual components interacting and communicating in a specific environment. The components act according to specific behavioural rules of interaction within the EV as a system. While GST assesses EV as an ecological space and connections with the ecological resources following the natural order of interactions, AST assesses EV as a fixed

territory, with participants interacting and communicating following certain strict rules. Ecovillage, as an autopoietic system, seems to avoid external influences and means for viability.

It seems that an ecovillage reasserts its social boundaries and voluntarily increase its cohesiveness among the members. The situation facilitates human participation and pursuit. It is the ideology of EV theoretically and practically analysed for the paper. Even if the EV concept understands ecologically focussed activities as the central priority, it attempts to maintain solidarity in the community. Even though ecovillage becomes a part of the broader biosphere as an ecological space, thereby maintaining its De facto integrity within the boundary, physically and socially. However, it is important to mark that an individual participant cannot limit itself to a single settlement and with a single objective without losing its discrete properties. As a result, ecovillage as a self-producing and autopoietic concept limits itself to specific actions in a single community and for that reason cannot become part of a broader spectrum of sustainable development.

In contrast to GST and AST, SST focuses on how individual orients itself in a given situation. Based on the given condition, the individual defines space. It seems that an EV does not limit to a fixed territory, but the boundaries vary according to the situations in which individual orients to oneself. The social organisation defines the boundaries, which are formed for the given situation to maintain the social order and also to attain the goal. The individuals working in the social organisation are provided with norms to act in a physical environment. It defines the EV as an open system, in which the environment that provides the situation and norms to act simultaneously becomes very active in any operations. It also guides the individual to act accordingly, as an ecovillager. Hence, an EV in this situation appears as a social relationship with different roles of acting individuals unified as a whole in the process of formation of an organisation. It means that rather than any physical boundary based on individuals' relationships, the EV boundary's base is the dynamic social relationship between the individuals.

It seems important to assess that EV is a part of broader sustainable development. Conceptually, it does not restrict to human-nature relationships (GST) or a single isolated community (AST). In either case, it limits an EV as a group of actions and goal-oriented projects. As such, it is a human-centric (anthropocentric) with the challenge to maintain the balance between the natural world

(ecological space) and the human-constructed world (social space). It means that EV as a sustainable development initiative pertains to different hierarchical levels created in a human-constructed world. Thereby, it seems that EV goes beyond a goal-oriented concept to a process-oriented approach in combining both worldviews. It means that any interactions seem to comply with the natural balance and at the same time is in accord with human values. Methodologically, it requires the ontological positions of actors to address both human values and natural necessity, in the human-constructed social space. The social space is dynamic in the nature that individuals decide their social space as per the social norms. It seems that the human-constructed world works in hierarchical levels of control regulated by the norms. An individual can orient oneself in different situations and act accordingly in norm bounded different levels or social spaces. It seems that both GST and AST lack the methodological demand for addressing human values in balance with ecological demands. Further, mainstreaming in development also demands the generality of the approach in providing tools and mechanisms to select the right means to establish the balance between the natural and human world.

5 Case Study: Bandipur

5.1 Background

Bandipur is a historical trading village that lies 8 km up the hill from one of the main country's highways connecting two of Nepal's most popular destinations-Kathmandu (about 135 km) and Pokhara (approx. 80 km). It is located at altitude 1000m above sea level. The case of Bandipur is a story of 'boom-bust-boom' development since its establishment in historic time [7].

5.2 Historical Development of Bandipur

The chronological development of Bandipur could be divided into four general phases [9]: Prosperity stage (before 1968), Decline stage (1968-1980), Revitalisation stage (1980-2007), Integration stage (2007-till now).

5.2.1 Prosperity stage (-1968)

Originally, Bandipur was a village of Magars, one of the agrarian ethnic groups of Nepal. The growth of Bandipur as a trading centre started with the influx of Newar traders from Bhaktapur around the beginning of the 19th century [4]. Geographically, it was on the India-Tibet trade route. Moreover, the Newar traders had a monopoly on the trade route which existed till 1950. It resulted in the

transformation of rural hill village into a thriving cosmopolitan trade centre [4]. Other reasons for the migration of Newar traders were its highly desirable climate and was naturally devoid of malaria [4,9].

After the eradication of Malaria in Chitwan (in Terai) in the 1950s, the Newar traders expanded their monopoly on trade southward by setting up a new business community called Narayanghat along the Narayani River [4]. It also opened up to create the network of trade further south. Families, who wished to open new businesses, send one son to manage a new shop in Narayanghat while the whole family stayed at Bandipur that resulted in two sources of income. The clearing of jungles and construction of dirt roads between Devghat and Bikna Thori facilitated the transport of goods to and from the Indian border. Subsequently, came various infrastructures like a pressurised water pipeline system, the Bandipur hospital and medical facilities [4].

Politically, for the first portion of the Rana rule (1846-1951), Bandipur was the zonal headquarter for the zone West No. 3. The political importance further increased the flow of traffic through Bandipur making it a convenient site for formal business transactions. It attracted more people for better economic opportunities. The development also saw the preferences given to formal education in the Bandipur community. The education development projects, which included a high school and the public library, got permission to resume after the Rana regime was ousted in 1951 [4].

5.2.2 Decline stage (1968-1980)

Among many, there are two reasons for Bandipur's decline, removal of the District headquarters and construction of Prithvi Highway[4,7,9]. In 1968, as a part of a reorganisation of political and administrative systems of Nepal by King Mahendra, Bandipur was no longer, the geographical centre of the district and hence removed as the district headquarter. The removal of headquarter slowed down the traffic and directed to Damauli, the new headquarter. It resulted in a suffer from business and people started to move into Damauli along with the government officers and their families.

About the same year of moving district headquarters, the planning for the construction of a road linking Kathmandu and Pokhara begun under China's aid. Unfortunately for Bandipur, the road was planned to be built along the river valley, 2000 feet below Bandipur, virtually bypassing it. It slowed down the trade traffic and drawn away from Bandipur to Damauli focussing on the bus transportation in spite of several requests by local committees for

rerouting. After discussions in Bandipur among local people, they decided to construct a motorable dirt road between Bandipur and the new highway.

The highway was completed in 1973. However, the construction of Bandipur access road was not effective in keeping a large number of families from moving out of Bandipur down to the highway, nor it was effective in drawing trade up to Bandipur. In a rushed attempt to save their businesses, two small settlements, Dumre and Bimalnagar were quickly constructed to create a trading stop along the highway road. Trading in Bandipur was local while most major through trade from the North-South is diverted via Dumre through motor transportations. It also impacted the small outlying communities around the market centre which loss their skills in farming because of trading [4].

5.2.3 Revitalisation stage (1980-2007)

According to Iltis [4], some of the potentials for the revitalisation of Bandipur were slate mining, medicinal herbs, tourism, and expansion of educational facilities. Since the early 80s, the local people have developed various strategies for this new identity, which was 'T.H.E.(Tourism-Health-Education) Bandipur' [9,10].

Tourism was a major aspect because of its scenic values, Newars' rich cultural heritage, and good climatic condition. The marketplace was quiet and non-hecktic, water was readily available, and it could make a good overnight stop on the route between Pokhara and Kathmandu. One of the residents built the first notable hotel in 1980. The major turnaround was in 2005, the initiation of Bandipur Eco-cultural Tourism Project (BECTP). The overall objective of BECTP was 'to develop Bandipur as a sustainable eco-cultural tourism centre by building on the existing programmes and infrastructure of Bandipur. The project aimed at building a network of similar hill towns to revitalise, protect and promote their cultural and natural resources through programmes that have replication values [5]. The project was divided into three major activities. The first was on restoring and adaptive reusing of some private houses for eateries and accommodations, tourist sites, and repaving of the main market area. The second was on improving human resources and capacity building focussing on three topics: natural and cultural heritage conservation, environment and tourism. The third was on promoting Bandipur as a new tourist destination in domestic and international markets through publications [5]. The project period was from 2005 to 2007.

The second sector was health facilities. There was a district-level hospital. The local people expected that developing medical facilities might bring livelihood opportunities. However, the signs of progress were not so significant. It was hard for Bandipur to maintain full-time doctors [11]. According to Sharma [11], there were also few enquiries about the availability of land for building a modern hospital in the region, which did not go further.

The third sector was on revitalising through the continued expansion of its educational facilities. The first school established was Bhanu Higher Secondary school in the 1950s, which was the only education institution offering higher education till the 1980s. In 1985, the 'School Sisters of Notre Dame', a Catholic missionary organisation, established Notre Dame School. The school is one of the most popular schools in Nepal till now. In 1980, Bandipur also got one public graduate college 'Bandipur Campus' affiliated to Tribhuvan University, offering bachelor's in education Programme. Many adults in Bandipur were schoolteachers. As such, the operation and maintenance of expanded educational institutes provided new sources of a reliable income. Further, students from surrounding, as far as from three days walking distance, attended schools in Bandipur. They rented rooms with friends and families in the vacant houses.

5.2.4 Integration stage (2007 - till now)

After 2007, local people still consider BECTP as the main pull-factor for the growth of Bandipur as a tourism destination by local people. After a decade of project completion, people have realized that development cannot be constrained around the market square only. The growth of tourists demands better and more infrastructures as well as maintenance of the ambience in the existing environment. One of the hotel entrepreneurs who have been running the hotel for the past 25 years shares his experience by saying, 'Tourism is a kind of entrepreneurship which cannot be successful by single person effort. It is the combined effort and various individuals have to share knowledge and success. Further, in the long run, even the single community alone cannot continue the success and development, but other surrounding communities also have to collaborate in the overall process [10].' The statement expresses the concern for the longevity of the development because of the tourism industry. As such, the locals based on their experience believes that the overall region could develop

if the local government develops long term policies based on BECTP initiatives, tourism, and education.

The concerns seem to be in a way addressed in Municipal Transport Master Plan (MTMP) for Bandipur rural municipality, which was prepared in October 2015, and approved in August 2016. According to Mishra and Magar [6], the major purpose of MTMP is to integrate various development areas (health, education, communication, tourism) with the help of municipal roads.

The MTMP is one of the major plans of the Comprehensive Town Development Plan (CTDP) and has expected development in five focus sectors. The first is physical development that includes the development of 8 m ring road and construction of view tower, museum, children park, water purifying system, cable car, and picnic spot. The second is social development, focussing on promoting educational centres for quality education, forestry, agriculture, tourism-related training centres and service centres like hospital and health centres [6]. The third is economic development that focuses on the development of tourists' destinations, tourist service centres that can generate a greater large scale of employment. The fourth is institutional development that expects to focus on more public participation that can tie up the local government to various stakeholders in Bandipur. The fifth sector is environmental development. MTMP has a provision of a buffer zone surrounding the existing and potential forest areas such as Raniban, Thanimal community forest, Silthok, and Baralthok community forest, where no industries and hotels get established. Further, within the ring road, there is a restriction of vehicles to maintain the historic architectural characters of the old town.

6 Findings and Discussion

6.1 Positioning Bandipur in a broader regional dynamic

In any settlement, many livelihood activities' base is the available resource that may be both natural or artificial or a mix of both. For Bandipur, it seems important that certain groups of Newar at early times were well reputed or trading as an independent mean of livelihood¹. Bandipur has a good geographic situation that promotes trade-based livelihood. From the SST's perspective, the availability of trading as a resource, its utilisation, and the

¹It is important to note that many authors generalise Newar people as traders by occupation. However, Newar is a group by language but not profession. There are different castes as per occupation within Newar. Itis [4] seems to have generalised Newar people like traders. However, the authors of this research assume that only certain groups of Newar are traders.

location determine the kind of Bandipurians livelihood activities and lifestyle. Bandipur illustrates resource-based livelihood development that helps to direct their values, lifestyle, and identity of the place.

The establishment of Bandipur as a trade center can be explained from three pulling conditions, geographic, economic and political. The geographic condition determines the climatic suitability of living and access to resources for livelihood activities. A well habitable place should be climatically suitable to settle in and should be devoid of vulnerability to disease and natural calamities. There was access to basic needs like food, water, and shelter. For Bandipur, geographically, the area has neither warm nor cold climate and is a malaria-free area. It is on the flat top of the hill making it safe from landslides, river flood and human threats (war at that time). The geographical condition still makes it highly desirable to live in and is also one of the major pulling conditions to settle in.

From the economic aspect, it seems that the settlement has potentials that can provide access to livelihood opportunities. In the earlier time, the livelihood opportunities were from their natural resources like agriculture, or mining. or man-made resources like trading. Newar traders had a monopoly on the trade route that allowed easy access to the opportunities of trading. Based on their previous experience and skill in trading, it was easier for Newar traders to use trading as the primary means of subsistence. The trading factors resulted in the influx of Newar traders, who identified the opportunity to use the potential to get access to trading. It marked the beginning of Bandipur's growth and establishment of the identity as the trade centre.

From the system's perspective, if Bandipur settlement is a system, the resources are highly influenced by external factors, with the condition of interdependences. Trading is not internal. As such it seems unlikely that Bandipur is acting as an autopoietic system. Further, the trading interdependences' bases are human relationships, that is, Newar traders' relationship and role within the trade route. It brings Bandipur as a social system. It makes the trade as the major mean of subsistence, with agriculture as a secondary enterprise for the incoming Newar traders. Trading becomes a supplement to the aboriginal farmers.

Political conditions are often directly related to the policies, decisions, and interventions that associates economic developments. The political attention comes as soon as there is the availability of resources. The resource is not only a pull factor but also has an impact on development through policy implementations. For

Bandipur, the establishment of governmental district headquarter, army barrack and service centres like hospitals and schools, is the result of policy interventions. In one way, the policies check control over the growth of development, while at the same time also facilitates the growth and the positive impact of Bandipur. For a social system, the policies are from the external environment and concern the availability and allocation of resources.

It is also interesting to note that there is an amalgamation of two different kinds of lifestyle, the indigenous Magars, whose identity was an agrarian community, and the Newars, who were prolific traders. As a social system, the case of Bandipur illustrates that the change in resource type or allocation triggers the values and induces it for evolution into new or improvised values. The altered-values' base is the new resource, but at the same time, it also respects their original values. For example, in Bandipur, the development of interdependencies based on common resource, trading made it possible for the coexistence among Magar farmers and Newar traders. Considering Bandipur as a social system, the evolution of trade-based value in Bandipur is highly influenced by the dynamic functional relationship and interdependencies in allocating and sharing a trade-based resource. The interdependencies are managed and maintained through various roles, for example, labour (porter) management for transportation, exchange of local products through community organisation and knowledge sharing among individuals within a broader region.

6.2 Translating local practices to mainstream development policies

From the planning perspective, the process of integration of tourism and educational values in development policies in Bandipur appears as scaling up local actions into long term strategies for sustainable development. The people appear to realise that the initiatives have to broaden to surrounding regions as well. They are lobbying for local government interventions, who can develop long-term strategies so that all surrounding communities can coordinate and collaborate for regional development. From the sustainability perspective, the development becomes sustainable if the actions and strategies cover the broader region based on their interactions. From the SST perspective, Bandipur as a social system interacts with surrounding communities regionally. Considering tourism as a resource, it seems important that the surrounding communities also share tourism as a resource, not necessarily only as a hotel entrepreneur, but through other

roles like providing organic agricultural products to a hotel or becoming tourist guides.

The case of Bandipur illustrates the sustainable development from planning and methodological perspective. Like many sustainable debates, from planning perspectives, it is important to have coherence in both policies and actions irrespective of the top-down or the bottom-up approach. For example, BECTP is a local level action that connects livelihood strategies to their resource/potentials (architectural heritage and ecological setting). It is a scenario of many sustainable development projects, a short term, solution and target-oriented, often connecting only to livelihood strategies. But sustainability is a long-term process through time (next generations). In Bandipur, even though the project has completed, and individual targets have been achieved, it seems that the process of eco-cultural conservation is continuing. The project team and the local people continue to follow up on the process of promoting tourism through the cultural landscape [12]. Tourism through heritage conservation is a hidden value for any planning policies. Tourism through heritage conservation is a hidden value for any planning policies. The development of MTMP focusing on tourism development seems to be a long-term policy that covers the regional dynamics based on this hidden value. Methodologically, it seems that next-generation people share the concern and knowledge of hidden values. For example, in Bandipur, currently, people are involved in tourism and education-based entrepreneurship. The Bandipurians hope that young people shall get the hotel based practical education through them. People hope that young people follow their footsteps based on their experience. Practically, the social environment in Bandipur consists of various community organisations, education centres, planning policies, and activities focusing on heritage conservation. The environment facilitates the participation of young people, who not only contribute to providing labour works in the current form of entrepreneurship, but they also learn about various community values and norms. The environment seems to facilitate the establishment and iteration of cultural values, based on heritage (both tangible and intangible) and ecological conservation. The future generation seems to be following eco-culturally based sustainable development. It is one of the key characteristics of sustainable development, a balanced development (contrast to economic pursuit-based development). It seems that local people of Bandipur are managing their resources (natural and artificial) for their future livelihood strategies through community participation, commitment,

and equity in well-being by maintaining and evolving their values.

From an SST perspective, the implementation of MTMP reflects Bandipur's commitment to the maintenance and evolution of the values. MTMP represents a norm that facilitates the development of favourable education and tourism conditions as the primary resource for Bandipur and its surroundings. With this, Bandipur consciously discusses on how any of the activities or decisions will impact their landscape, which they think need sustenance for future generations rather than only thinking how their problems get solved. As a system, Bandipur is adding value to its landscape. As a social system, Bandipur defines sustainable development not only by linking their livelihood strategies to their resources but also linking to future generations on how they can continue on resource management and community organization, through knowledge generation and exchange. Sustainable development has to be understood spatially in regional dynamics and temporally considering intergeneration transfer.

7 Conclusion

As the Bandipur case illustrates, reflecting regional and cultural values and interconnectedness from a system's perspective is useful in several ways. For example, various government policies and plans that cover broader regions for the sustained period in the future can be considered. The unsustainable condition can be the result of policies that do not comply with regional interaction dynamics. The article also emphasises the need to represent interconnectedness spatially, relating to landscape, and temporally, in relation to cultural values and discusses challenges and need for further research on this topic. It seems to illustrate how strategies in the ecovillage approach correspond with policies and align with sustainable systems of interconnectedness and vice versa.

Acknowledgments

The authors are thankful to M.Sc. Architecture in Energy for Sustainable Social Development (MSESSD) program, a collaboration between Institute of Engineering (IOE) and Norwegian University of Science and Technology for providing fund for conducting this research as a part of the Ph.D. programme. Energy and Petroleum (EnPe)-Norwegian Agency for Development Agencies (NORAD), funds this program.

References

- [1] B. Dalal-Clayton and B. Sadler, "Introduction," in *Sustainability Appraisal: A sourcebook and reference guide to international experience*, S. B. Barry Dalal-Clayton and Barry Sadler with contributions from James Baines, Annie Dufey, Maryanne Grieg-Gran, Emma Wilson, Ed. London & New York: Routledge, 2014, pp. 3-11.
- [2] S. M. LeLe, "Sustainable Development" A Critical Review," (in English), *World Development*, vol. 19, no. 6, pp. 607-621, 1991.
- [3] R. B. Gibson, "Sustainability Assessment: Criteria and Processes," in *Sustainability Assessment-Criteria and Processes*, R. B. Gibson, S. Hassan, S. Holtz, J. Tansey, and G. Whitelaw, Eds. First ed.: Taylor & Francis, 2005, pp. 38-65.
- [4] L. L. Iltis, "An ethnohistorical study of Bandipur," (in English), *Contributions to Nepalese Studies*, vol. 8, no. 1, pp. 81-145, 1980.
- [5] J. Joshi and M. Rajopadhyay, "Sustainable rural tourism and local communities in Nepal," 2007.
- [6] A. K. Mishra and B. R. Magar, "Implementability Of Municipal Transport Master Plan Of Bandipur Inner Ring Road, Tanahun, Nepal," (in English), *INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH*, vol. 6, no. 08, pp. 306-313, 2017.
- [7] E. n. Ruska, "The Road to Recovery and Rebirth: The Social Construction of Tourism Development in Bandipur, Nepal," Master Leisure Tourism and Environment (MLE), Environmental Sciences, Wageningen University and Research Center, Wageningen, SAL-80433, 2012.
- [8] B. Borsos, "Systems theory and ecological settlement design: a pilot project in rural Hungary," *Hungarian Studies*, vol. 23, no. 2, pp. 175-194, 2009.
- [9] B. Pia, "Historical Development of Bandipur," B. Singh, Ed., ed, 2017.
- [10] P. Pradhan, "Historical Development of Bandipur," B. Singh, Ed., ed, 2017.
- [11] L. Sharma, "Historical Development of Bandipur," B. Singh, Ed., ed, 2017.
- [12] M. Rajopadhya, "Bandipur Eco-cultural Tourism Project (BECTP)," B. Singh, Ed., ed, 2017.