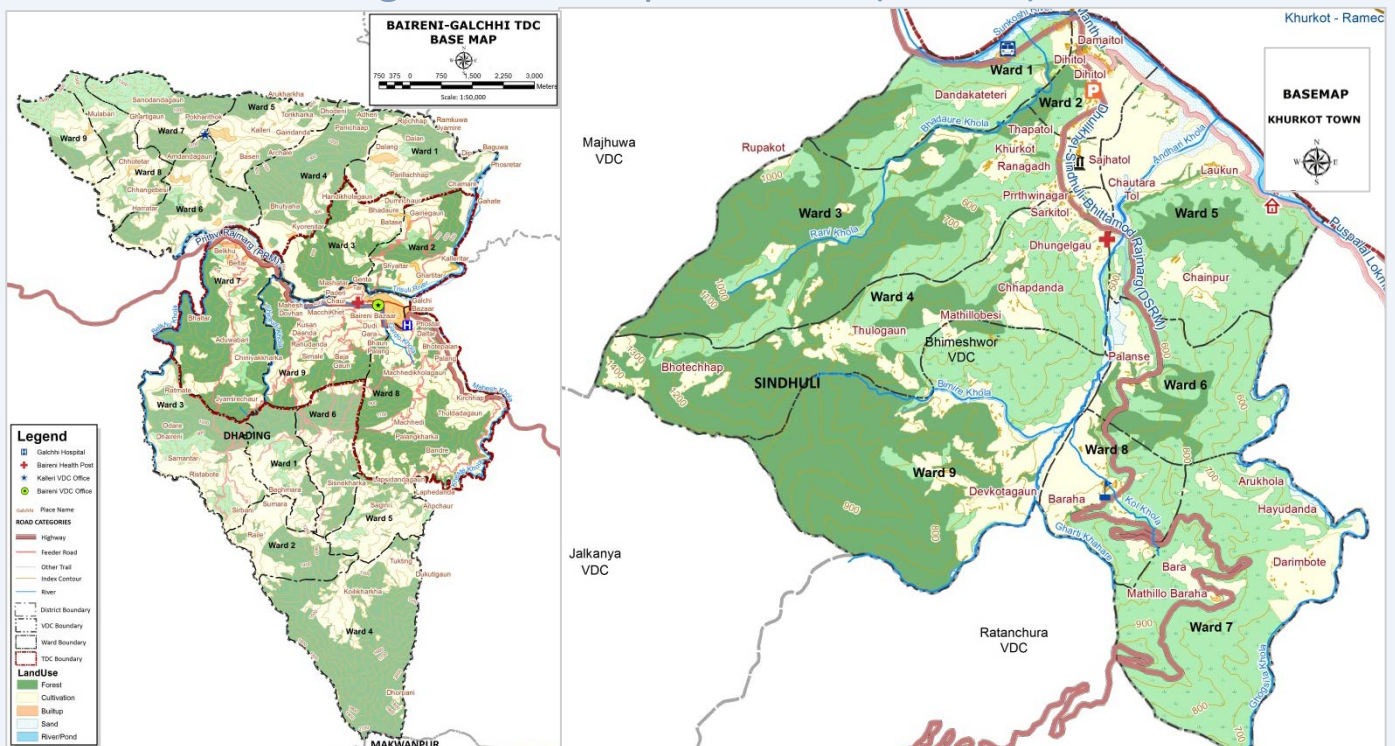




Preparation of Integrated Development Plan of Khurkot and Baireni-Galchhi New Town

Volume I: Main Report, Section A: Integrated Development Plan (Galchhi)



Final Report



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Study Team

Acronyms

ADB	Asian Development Bank
BDP	Bhaktapur Development Project
CBO	Community Based Organization
CBS	Central Bureau of Statistics
DER	Detail Engineering Report
DPR	Detail Project Report
DTMP	District Transport Master Plan
DUDBC	Department of Urban Development and Building Construction
EIA	Environment Impact Assessment
GIS	Geographic Information System
GLD	Guided Land Development
IAP	Integrated Action Plan
IDP	Integrated Development Plan
IEE	Initial Environment Examination
JICA	Japan International Cooperation Agency
KVMP	Kathmandu Valley Mapping Project
KVTDC	Kathmandu Valley Town Development Committee
LFA	Logical Framework Approach
MoFALD	Ministry of Federal Affairs and Local Development
MoUD	Ministry of Urban Development
NGO	Non-Government Office
NPC	National Planning Commission
NT	New Town
NTPCO	New Town Project Coordination Office
NTPO	New Town Project Office
NUP	National Urban Policy
PDDP	Periodic District Development Plan
PDP	Physical Development Plan
SDF	Spatial Development Framework
TDC	Town Development Committee
TLO	Tole Lane Organization
ToR	Terms of Reference
UNDP	United Nation Development Programme
VDC	Village Development Committee

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1 Introduction

1.1 BACKGROUND

Nepal has been undergoing the process of rapid urbanization since the last two decades. However, the growth trend has become increasingly an unbalanced one; it is concentrated mostly either on the Kathmandu Valley or on other larger cities of terai or on the fertile Valley of country. The unbalance growth is visible, either ecological region wise or development region wise. Instead of an industrial or economic growth induced urbanization, much of the urbanization in the country is rather induced by migration with limited economic base created by the community services and improved facilities in these urban areas and conversely caused by the lagging facilities of the rural areas.

Consequently, out-migration of the people from rural to urban areas or from small towns and municipalities to larger municipalities remains unabated causing a wider ramification for the economic development of the country. The problem is further compounding as haphazard urbanization is taking a toll on the fertile agricultural land of terai or the Valley, leaving behind most hinterlands of hills and terai in short supply of agricultural labor force. These areas show dwindled productivity and remain underdeveloped or undeveloped, while urban areas due to an increasing influx of new migrants are failing to cope up with the demand of infrastructure service and employment. The growing inability of urban centers to create new jobs is further accelerating out-migration of youths, especially abroad.

As a result, most urban centers still exhibit a rural ambience largely; large cities are increasingly reeling under the externalities of the haphazard urbanization. Environmental degradation, urban poverty, congestion, squatter settlements, unemployment and lagging provisions of infrastructure service have become increasingly visible phenomenon in these large cities. Hence, much of the economic gains acquired from urbanization have been eroded from its negative externalities. Despite non-agricultural sector being a major contributor to gross domestic product (GDP), urban centers in the country are yet to emerge as the engines of economic growth and contribute to reduction of urban or rural poverty alike.

Keeping in view of this context, the Government of Nepal has already enacted and implemented National Urban Policy in the year 2007. The policy is conspicuous by prioritizing investment to the lagging regions of the country, while fostering development of regional cities and intermediate towns as well. The government prioritization of the development of Mid-Hill Highway (MHH) and the recent policy intention through its budget speech for the development of new towns along the MHH comprising of significant economic base must be seen from this perspective.

Hence, the Government of Nepal, Ministry of Urban Development, Department of Urban Development and Building Construction (DUDBC) initiated a mega project in the history of Urban Planning in Nepal. The project is termed as New Towns, developing along Pushpalal Mid-Hill Highways across the intersecting nodal point of North-South Corridor. The 10 selected new town project sites is a result of detailed study, screened from 54 pre-selected towns/market centers. The screening project is an outcome of extensive study over pre-defined criterion like availability of land, water supply, vicinity to nearest towns, hinterland zone of influence, and so. The New Town project have grafted several stages like pre-feasibility study, feasibility study, preparation of urban base map, appraisal of land pooling, establishment of New Town project site, site development works and so. Government have recently restricted on land subdivision to regulate and control land speculation.

Therefore as a long-term policy initiative, GON is providing technical and financial support to facilitate the Integrated Development Plan preparation, urban base map and profile of base information, building bye-laws and to promote their planned development and improvement in the quality of life of the people of new towns located along mid hill highway (MHH).

In this stage, this report is an outcome of the project continuation and referred as the Draft Report for the Integrated Development Plan preparation for proposed New Towns namely, **Khurkot – Sindhuli and Baireni Galchi- Dhading**.

1.2 RATIONALE OF THE STUDY

The Project is focusing on forming urban centers, appropriate urban density to live, work and recreate with an aim of preserving the local environment. The attempt in a way will reduce the urban primacy and to certain extent will bring the regional urban balance as per NUP, 2007.

- Effective use of scarce resources
- The IDP will help the town to focus on the most important needs of local communities taking into account the resources available at local level.
- The town must find the most cost-effective ways of providing services and money will be spent on the causes of problems in local areas.
- It helps to speed up delivery
- The IDP will identify the least serviced and most impoverished areas so as to do investment in a rational way. Implementation is made easier because the relevant stakeholders have been part of the process.
- The IDP will provide deadlock-breaking mechanisms to ensure that projects and programmes are efficiently implemented. The IDP helps to develop realistic project proposals based on the availability of resources.
- It helps to attract additional funds

Also donor agencies and the private investors are feel safe to invest where GoN have clear development plans. It also strengthens democracy through the active participation of all the important stakeholders, decisions are made in a democratic and transparent manner which will help to integrate rural and urban areas and to extend services to the poor and will promote co-ordination between local and central government.

1.3 OBJECTIVES OF THE WORK

The main objective of the proposed assignment is to prepare Integrated Development Plan and Building Bye-Laws of all proposed ten new towns. However, the specific objectives are:

- To set out Long-term Vision and overall Goal, Objective and Strategies for new town development.
- To prepare Physical development plan, Land Use Plan, Social, Cultural, Economic, Financial, and Institutional Development Plan; Environmental and Risk Sensitive Land use Plan, Climate Change Perspective Plan, Multi-Sectoral Investment Plan (MSIP) etc on the basis of Sectoral Goal, Objectives, Output and Programs.
- To prepare building bye-laws to regulate development in the town integrating Land Use and road network plan and long-term vision of the town.

1.4 SCOPE OF WORKS

The scopes of work for the preparation of Integrated Development Plan & Building Bye-Laws are as follows:

1. The Vision of the town has been set. The Vision articulates the desires of Town and its citizens, and provides the guiding principles and priorities for the Plan's implementation.
2. Integrated Development plan of entire area including existing and future (5, 10 and 20 years) land use plan has been prepared. This is based on land use plan and followed by narrative description, analysis, facts and figures.
3. Additional study on local economy has been conducted and its activities based on the study completed by NTPCO that may also change in demographics and migration trend for 5, 10 and 20 years period.
4. Potential areas for urban development, based on land suitability and other factors, are identified. Present and future (5, 10, 20 years) housing needs/market, stock, conditions has been analysed and strategies for land acquisition, distribution of land and housing in future has been recommended.
5. Studies on present and future (5, 10 and 20 years) demand in infrastructures (such as transportation, communication, electricity, water supply and sewerage system) and their supply are conducted. Demand analysis are for different scenarios with facts and figures. The recommended complete street pattern, major and minor roads, highways, arterial roads, traffic circulation, truck yard, bus bays and bus parks has been worked out in details. Based on land use and other factors, road network plan prepared by NTPCO has been revised. The network plan of infrastructures, both existing and proposed has been shown in cadastral maps with other detailed drawings and unit rate cost estimates. Landfill site, treatment plant location has been identified and their detail drawings and cost estimate has been prepared. A management scheme of both water supplies, solid waste management system and landfill site has also been worked out.
6. Existing social infrastructure such as health/ education/ sports/ communication/ security centers and other community facilities have been carried out by addressing present deficiencies and future (5, 10 and 20 years) demands. The location and area of land required for all these infrastructures has been identified in cadastral maps.
7. Critical, sensitive and other natural resources including parks, green belts, and recreational areas are identified and assessed along with strategies for their protection, preservation and community ship against the adverse impact of future development and land use changes. The cost estimate on unit rate basis has been calculated for their preservation and protection. Locations and future requirements of such resources has been calculated.
8. Government, Guthi and Public Land identified by NTPCO are verified and the area required for future development and expansion of the town has been assessed including land required for government and public purposes. Appropriate plan and policy has been produced to protect such land from private/public encroachment and others.
9. Natural hazards, including how significant weather events have and will impact these assessments, which may cause a threat to the Vision of the Integrated Development Plan, has been identified and assessed , along with, strategies for avoidance/mitigation of such hazards in the course of future development and the cost estimate on unit rate basis has been calculated.
10. Proposed Land Use Plan for 5, 10 and 20 years has been prepared based on the existing cadastral maps (plans). The plans are based on: i) The policies enunciated for different urban

activities, ii) Population to accommodate minimum one hundred thousand; iii) Requirement of additional social and physical infrastructure, iv) Transportation and work centres, v) Parks, green belts, recreational areas, vi) Cultural and historic resources, vii) Others.

11. A detail study of following Land Use Zone has been provided and byelaws for the construction of building and other infrastructures has been recommended. The land use zones are i. Residential zone, ii. Institutional zone, iii. Industrial zone, IV Preserved zone, v. Airport zone, vi. Sport zone, vii. Urban expansion zone, viii. Stream/river banks zone, ix. Green zone, x. Apartment housing, xi. Petrol pump/ Electric line/Cinema theatres and xii. Others.
12. Building bye-laws that clearly spells minimum in the following areas regarding the construction of building has been prepared : (a) Minimum land area (b) maximum ground coverage (c) maximum floor area ratio (FAR) (d) maximum building height (e) maximum no. of floors (f) right of way of roads (g) set back in four sides of the building (h) minimum parking area (i) lift (j) minimum distance to be left in both sides of stream/river.
13. The building bye-laws of the towns has been prepared in accordance with "Bye-laws 2064, of Kathmandu valley" prepared by Kathmandu Valley Town Development Committee, model building bye-laws prepared by MoUD, NBC, Building Act and Apartment Act of Nepal.
14. An implementation strategy (including a suggested action program that generally describes the actions, costs, time frames, responsibilities, procedures and the Town's capacity to use them) necessary for implementing the Integrated Development Plan of the town has been recommended. Separate report by volume each Integrated Development Plan, Building bye-laws, infrastructures etc for each town, also investment and cost recovery Plan have been prepared.

2 Methodology

2.1 GENERAL APPROACH

The participatory approach has been adopted to identify the potential and problem in the existing scenario and accordingly the plans and projects has been identified to address the existing policies and city level plans.

Data gathering and analysis

Both primary and secondary data collection method have been used for the identification of the existing condition. Field survey, workshops, meetings and key informant surveys are used for the primary data collection. Similarly, all the relevant latest and updated published and unpublished data, information, maps and satellite images have been used for the thematic overlay of the existing scenario. Primary data especially related to land use pattern, extent of newly opened roads, their standards and quality, land values and environment problems are gathered through *physical mapping using digital base map, on the site observation, and interview*. Community-level problems and needs have been ascertained through *participatory rapid appraisal* by holding citizens gathering at the convenient location of the TDC.

Town level problems and development issues are identified through *opinion survey* of the prominent citizens, VDC and TDC officials, and officials of the government agencies and through the TDC/ City level meetings which include meetings of the sectoral (sub) committees. Data on physical, environmental, climate change, social, cultural, economic, financial, and institutional are gathered from sources such as office records or archives, TDC reports, VDC profile, published academic or professional reports, and data published by CBS. Analysis include SWOT, trend, spatial and financial analysis using GIS and interpretation of aerial photographs, SPSS and other relevant tools.

Latest GIS (Geographic Information System) techniques and modern Statistical tools are used for the geographical, economical, socio-cultural, physical and other analysis.

Planning process

Planning process is based on a participatory approach. TDC acts as a local level Steering Committee, guiding the whole planning process. Steering Committee needs to be ensured for the active participation of local bodies, community offices, government agencies, and political parties/leaders, civil societies such as NGOs, CBOs, TLOs, intellectuals, prominent citizens, professional bodies, marginalized groups, children, elders, physically disabled, women, business groups and planning team during workshops and meetings. Steering Committee will be the key body to formulate policies and guidelines related to plan preparation. This will meet to advise on various aspects of plan preparation including identifying problems and issues of the town, formulating and reviewing of vision, goals, objectives, and programs of the town. Steering Committee is the key especially to set the vision of the town.

The Steering Committee has formed a coordination committee, comprising political representatives of Town Development Committee, so as to expedite the planning proceedings. Such co-ordination committee works as a bridge between steering committee and sectoral (sub)-committees.

Planning team is responsible to present all necessary analysis in all stages of planning process and to facilitate necessary meeting and workshops. Planning team comprises of technical personnel from DUDBC, and the TDC/VDC, besides experts from the consultant firm. Community level meetings comprised of community office, citizens, NGOs, CBOs, and TLOs are held in all communities to determine the community level problems and needs. Accordingly, community-level issues are identified. To ensure adequate participation in the planning process of deprived groups

such as *Dalit, Janjati* and special groups such as women, children, (IDPs) and squatters also need to be duly included in the planning process.

Steering Committee has also formed a Sectoral Sub-Committee to facilitate the focus group discussion and enable the specialized input of the experts so as to prepare sector-wise plans and programs. The Sectoral Sub-Committee with the support of planning team formulates TDC sectoral plans and programs, using Logical Framework Approach (LFA). The planning team will also make elaborate consultation with the concerned Sub-Committee to formulate the development principles and guidelines for the preparation of the integrated development plan.

2.2 STUDY METHOD

The study method of the project has been described in the following phases.

A. INTEGRATED DEVELOPMENT PLAN (LONG TERM PHYSICAL DEVELOPMENT PLAN)

2.2.1 Preliminary Preparedness

Preliminary preparedness includes one day workshop for orientation, election and nomination of several different committees in each town.

A. WORKSHOP (1st Plenary)

The workshop has conducted an orientation program for citizens on the Integrated Development Plan Preparation. It mainly focuses on process, output of IDP and role of the various committees to be involved in IDP). The workshop is being participated by the Representatives of local political parties, key stakeholders including civil society, private sector, Dalit, Janajati, women, poor communities /slum and squatters areas, children, elders, physically disabled, business groups, TLO, district line agencies, education, health, tourism, environment sectors, user groups, journalist and other interested citizens who can contribute in city development activities, etc. It was conducted and facilitated by the planning team.

B. LITERATURE REVIEW

Plan Preparation starts with the collection of different literatures related to development plans for developing methodology for the planning process. The past experiences on plan preparation has been reviewed to revise methodology. Besides, discussions with DUDBC/NTPCO will also be held. In addition to the literature relevant to the past periodic planning experiences, physical development plan, local area action plan, regional development plan; IAP, other documents already available in DUDBC, TDC, VDC and other line agencies of similar socio-economical and geographical regions are studied in detail throughout the study period.

2.2.2 Data Collection and Interpretation

Both primary and secondary data collection method has been used for the identification of the existing condition of the town. Reconnaissance survey, mapping, interviews, meetings, and several discussions with locals and line agencies etc. have been conducted for primary data collection. The potentials, problems and development issues at town as well as community level have been thoroughly identified from the several workshops and meetings that are organized on local level. Secondary data are collected from different line agencies and institutions. Checklist and questionnaire are used for data collection. Different specific communities, which need to have separate consultation, are identified in this phase.

Secondary Data Collection

Data & information related to the socio-economic, revenue and expenditure, development budgets are extracted from the secondary sources like office records or archives, and published reports including CBS data. Similarly informations regarding physical, economic and social infrastructures of the town level data are collected from different line agencies and partner organizations. Similarly the respective plans, programs, fieldlevel work and their annual budget allocation in the TDC, VDC of each line agencies and organizations are also collected from the publications / bulletins. The information about number of organizations, NGO's and other agencies working in the project area are also collected. Base map is used to prepare the existing land use of the town. Land transaction and land value information are collected from different related institutions.

Primary Data Collection

Data mainly related to physical infrastructure and environmental sensitive/ disaster prone areas are gathered from field observation. Existing land use is verified through field observation. Key informant Survey with the concerned experts in the National level area done from the beginning of the data collection till the end Primary data especially related to land use pattern/ value, extent and status of physical and social infrastructures, their standards and quality, environment conditions are gathered through physical mapping using, field observation/ survey and interview. Community-level problems and needs are ascertained through Participatory Rapid Appraisal (PRA) by holding citizens gathering/ community level meeting at each of the community of the Municipality/ VDC.

2.2.3 Data Analysis - Potentials identification and prioritization

The integrated development plan preparation is designed to be a hybrid process constituting both participatory as well as data collection method. Participatory approach constitutes consultation from town level to community level. Potentials in the town and community level are identified through different level of consultation. These consultations are also used for collecting data and information in local level.

Focus Group Discussions with different partner organizations working in the TDC and VDC will be organized for the identification of potentials of the project area. Community level meetings are organized in each community .Depending upon the nature and size of the community, there may be a single meeting for number of communities or number of meetings in a single community .these meetings are organized based on PRA method. Community level informations and potentials are spatially located in the map. Potentials are identified in a sector wise basis and a contact group in each community are formed in order to update the information after the meeting.

Beside, community consultation for the special groups like indigenous, disadvantaged groups, squatters, physically disabled, women, children etc. are also organized to identify communal level issues.

1. Two days' workshop (2nd) on defining vision, role of town, development strategies and indicators

Two days workshop has been organized to identify the role of the town in the regional context and the vision of the town. A brief presentation about the existing condition of the town is given by the planning team. Similarly, the local leaders as well as intellectuals also present their respective vision for the town. All the participants, during the first workshop, are invited and the program is facilitated by the planning team. The vision of the town is finalized through organizing the group work consultations among the participants. Potential strategic projects having town level potentials and development issues are identified on the second day.

2.2.4 Plan, Program and Project Formulation

Several meetings with sectoral committee members has been organized in different phases for the plan preparation. One day workshop has been organized for the finalization of the plans and programs. Each committee has worked out for the plan preparation, which was facilitated by the co-coordinator and member secretary of each committee. The plan of each sector was presented by the coordinator and get comments from each committee. Logical Framework Approach has been used for plan formulation. Different subjective plans has been prepared with separate plan, policies, projects and programs so to form a master plan and MSIP for each proposed project. The plan and programs are located in the map with the help of GIS.

A seminar was organized to finalize the plan and programs. Comments and suggestions has been received and incorporated in the preparation of draft final report.

Integrated Plan with Land use plan, phase wise urban development plan, physical infrastructure plan, social infrastructure plan, cultural and tourism development plan, economic infrastructure plan, environment management plan, disaster management plan, climate change adaptation plan, financial development plan, institutional development plan are the standing outputs of this phase.

2.2.5 Project screening and TDC budget

Through the workshop, working sub-committee & the planning team will conduct the discussion on the town level programs, projects, TDC development budget, screening of identified projects. Similarly, prioritization of the projects are prioritized for Detail Feasibility Study of Prioritized Major Sub-Projects which may be limited to three in each town.

2.2.6 Formulation of Building Byelaws

As per the Zoning, Land-use Plan and Urban Development Plan for 5/ 10/ 20 years, Building Byelaws has been prepared for the delineated town area. The building byelaws includes the built control area viz. Forest, River, High Fertility Area, Environment Sensitive Area, Disaster Prone Area; buildable area, land-use for different uses viz. Residential, Commercial, Institutional, Industrial, Recreation, Transportation, Open Spaces, Special Conservation Area etc.; Future Urban Extension Area. Simultaneously, the building byelaws spell out the height restriction, Floor Area Ratio, Ground Coverage for the different building use.

2.2.7 Preparation of Implementation Strategy

For the master plan, programs and projects within the plan and the implementation Strategy will be recommended including a suggested action program that describes the actions, costs, time frames, responsibilities, procedures and the Town's capacity to use them. Moreover, the strategy will spell out the role of private, public and people.

B. DETAIL FEASIBILITY STUDY OF PRIORITIZED MAJOR SUB-PROJECTS

Detail feasibility study of 6 (3 in each NT) different sectoral sub-projects has been prepared. The ToR with detailed scope and deliverables of such sub projects probably including the followings are submitted to NTPCO for immediate approval after finalization of the list or before conducting the study. Necessary drawings, maps, economic and financial analysis, preliminary costing and other document has been submitted in different annexes.

A site visit have been done before proceeding the detail feasibility study consisting of the Team Leader, Engineers, architect with a view of enabling team members to observe and document firsthand information regarding the existing condition of Proposed Site and the area around as well as the local community of the proposed site. This has further helped the team to assess the data

obtained and in planning the details of the tasks to be undertaken. The observations are supplemented by photographs or sketches to show the functional and spatial planning of Town area, existing transportation network, the built environment (man-made and natural) around the site, the existing situation within the specified zone, geology of the site, environmental condition, different facilities area including state of the site and other infrastructure facilities.

3 Review of Policies & Planning Practices

3.1 MODERN URBAN PLANNING PRACTICES – INTERNATIONAL CONTEXT

Modern town planning movement evolves because of nineteenth century industrial revolution in Britain. It drastically changed the concept of city and city emerged as engine of economic growth where people flooded inside in search of economic opportunity.

The innovation of steam engine and introduction of mode of transportation changed entire paradigm of urban/ city. The people of medieval town had agro-based occupation, which later converted into processing based or what we call industrial. The innovation of automobile led expansion of urban area because of which, rapid urbanization occurred.

The invention of electric light, electricity and telecommunication was a major breakthrough in modern city planning. Consequently, in 1825 first electric railway and in 1897, underground railway started their movement. In 1885, first automobile yet another component came into existence, evolving the concept of transport planning in urban sector. Various experiments then after has been carried in planning sector so far. Today we stand in modern era, often cited as postmodern era or the hi-tech era, where urban sector is taken as engine of economic growth and tangle of opportunities.

Cities of Industrial Revolution

The industrial revolution started in British era later spread all Europe and even to America. This caused massive population growth and urbanization. The Industrial Revolution witnessed a huge growth in the size of British cities. In 1695, the population of Britain was estimated to be 5.5 million, by 1801, the year of the first census, it was 9.3 million and by 1841, 15.9 million. This represents a 60% growth rate in just 40 years. City of Manchester, as an example, experienced a six-time increase in its population between 1771 and 1831. Similarly, Bradford grew by 50% every ten years between 1811 and 1851 and by 1851 only 50% of the population of Bradford was actually born there. The increase in population was mainly due to augmented opportunities in urban area created by none other than industrial revolution.

The industrial cities consisted of dense dwelling units, often in unhygienic state. The increasing demand of housing in industrial sites generated congested township with shortage of minimum standard of living. Lack of proper pavements, drainage, sewerage, and water supply etc, a chaotic environment remained there. The depleting public health condition and poor living standard posed serious threat in public life, whereas in other side, the merchants and builder were more concerned on making money. The houses build were back-to-back and concern to open and recreational space were nearly zero.

The congested and offensive urban environment leads people in search for the ideal city in architectural terms and the social vision of the ideal communities. This led the creation of community buildings by Robert Owens, a philanthropist who planned a city which accommodates population of 800 to 1200. Later, a legislation on public health and housing enacted in Britain in 1840s, which set legal background and guided living standard for healthy living. The effect of this was seen in Ebenezer Howard's Garden City movement. He planned to create a well-integrated, socially balanced community (6000 acres of land 32000 persons) with town and country features. These townships were successful to create distinct impact on creation of new towns in Britain mostly after the Second World War. Ebenezer Howard proposed his garden city concept in his book "A peaceful path to social reform" where he elaborated the composition of garden city. Two garden cities built in United Kingdom using Howard's ideas were Letchworth Garden City and Welwyn

Garden City. The idea of the garden city was influential in the United States. Residence Park in New Rochelle, New York; Woodbourne in Boston; Newport News, Virginia's Hilton Village; Pittsburgh's Chatham Village; Garden City, New York; Sunnyside, Queens; Jackson Heights, Queens; Forest Hills Gardens, also in the borough of Queens, New York; Radburn, New Jersey; Greenbelt, Maryland; Buckingham in Arlington County, Virginia; the Lake Vista neighborhood in New Orleans etc. were some of the notable examples.

Cities after Industrial Revolution

Industrialization and population growth strongly encouraged migration and urbanization. Within industrial societies, migrants flocked from the countryside to urban centers in search of work. Industrial Britain led the world in urbanization. In 1800, about 1/5th of the British population lived in towns and cities of 10,000 or more inhabitants. During the following century, a largely rural society became predominantly urban, with 3/4th of the population working and living in cities. This pattern repeated itself in continental Europe, the US, Japan, and the rest of the world. The increasing size of cities reflected this internal migration. By the end of 1850, more than half of the population were urban based and there were numerous towns. The effect of industrial revolution was felt all over the world with some degree of inequality.

The positive aspect of industrial revolution was that, it created urban explosion and lead people live in urban areas. Although, urban at that time was merely filthy, later on the society created a livable township as a result of their intense need of healthy living. The garden city of tomorrow by Ebenezer Howard was an outcome of the same. People were aggressively searching livable environment, as a result, the core area started decaying and people started moving periphery. By the end of 1950, cities destroyed by World War II were rigorously reconstructed and regenerated. The advancement of automobiles, innovation of airplanes, transformation of rail ways and achievements in hi-tech knowledge, cities were more attractive place to live. The modern town planning process was gradually progressive after the garden city concept.

The academic course was also started in Urban Planning and the first academic program began in England, in the University of Liverpool, in 1909, and the first North American program was established in Harvard University, in 1924. Managed township was the primary concern until the beginning of World War II. The necessity of open space and recreational space was felt at high level. The recognition of recreation and areas that were set aside for recreational purposes became a standard part of modern urban planning in the later half of the nineteenth century. Architects Calvert Vaux and Frederick Law Olmsted designed New York's Central Park, which was conceived in the 1850s. This quickly became a model for other cities to follow, like providing lungs for a whole city to breathe, an area of wonderful greenery and open space in the midst of an unending urban sprawl.

After World War II, lots of European countries began re-constructing new towns as government enterprises; those cities were Germany, The Netherlands, The Soviet Union, and especially France. The government had several concerns such high density within urban areas, so they constructed towns with planned developments in spill out areas from those dense cities. In Sweden, the government successfully constructed new towns with mixed-income occupancy. In Asia, after the World War II the Chinese government constructed Pudong New Area which is a planned central commercial business district along with houses and factories.

Thus, it can be well understood that industrial revolution was a milestone of urban planning and development. The issue of planned urbanization and urban development is now in central foci. The migration and over population in city/urban area is no more taken as a problem. Rather, the core intention is handling the expanding population and managing the town as the people's objective is

progressive who flood inside the town in search of opportunities Thus, urban planning is a tool that manages cities undergoing change in population growth creating opportunities so as to make the the city safe in all context.

Contemporary Cities

By late 1960s and early 1970s, it was felt that modernism's cleanliness and lack of human scale sapped vitality from the community, blaming them for high crime rates and social problems. Modernist planning fell into decline in the 1970s when the construction of cheap, uniform tower blocks ended in most countries, such as Britain and France. Since then, many have been demolished and replaced by other housing types. Rather than attempting to eliminate all disorder, planning now concentrates on individualism and diversity in society and the economy and this is what we call the post-modernist era.

The contemporary planning practices incline to create inclusive and just cities. Unlike huge economic segregation of early modern cities, it is much more oriented in building livable environment to its dwellers. The basic issue of contemporary cities are enlisted here as,

- Sustainability
- Inclusivity and Justice
- Economic Opportunities
- Environment Friendly
- Good Urban Governance
- Recreational and Entertainment facilities
- Availability of Urban Infrastructures

And so.

Today, the concept of Smart City, IT city, Metro City, Green City and so are in practice. Recently, Government of India declared to create 100 metro cities, similar in Nepal, recent budget speech (072/073) of Finance Minister affirmed to create 3 smart and 3 green cities.

The improvement of internet and communication have relieved from excess time consumption. Modern transportation services and traffic system have increased mobility. Besides this, culture and heritage conservation is also central issue. With advance technologies and modern amenities, the concept of postmodern towns gently back to incorporate past heritage and culture.

3.2 MODERN URBAN PLANNING PRACTICES – NATIONAL CONTEXT

Whatsoever, Nepal has experienced some settlement planning attempts since 1944; the first city Rajbiraj was planned to resettle people from Hanuman Nagar. In 1956; first National Periodic Plan (Economic Development Plan) was originated. At present, 13th Plan is in implementation. During 1960s, many people from hill and mountain (especially displaced from natural disaster, national parks etc.) were resettled in Terai plains. In 1969, Preparation of Physical Development Plan of Kathmandu Valley was a turning point in urban planning sector of Nepal. After this, so many development plans of Kathmandu Valley were prepared but never implemented due lack of institutional/ legal mechanism and financial resources. In 70s, Regional Development concept was initiated in Nepal; master plan of four regional headquarters (Dhankuta, Pokhara, Surkhet and Dipayal) was prepared and implemented in some extent. In the late 80s, structure plan of all designated urban centres was prepared. Similarly, IAP was popular in 1990s before the self-governance act enacted by government of Nepal. In 2000, long-term concept of Kathmandu valley (vision 2020) was prepared. Currently, Periodic planning of urban centres (municipalities) is in practice. Despite these attempts were made, it provided neither approved land use plan nor

concrete physical plan implementation mechanism regarding the major urban centers in the country. Municipal plans prepared in the past employing integrated action planning technique or structure planning is found to focus mainly on physical aspects. Besides, IAP's overwhelming concentration on community level problems has also led to neglect of municipal level vision and desires. As a result, though several municipalities show some improvement in physical aspects, progress is still found lagging in several critical urban areas such as education and health. Issues such as social exclusion or deprivation, urban poverty, environmental conservation, economic development, financial mobilization and municipal capacity building have remained largely unattended in the previous planning efforts.

Keeping in view of this context, the Government of Nepal has already enacted and has been implementing National Urban Policy since 2007. The policy is conspicuous by prioritizing investment to the lagging regions of the country, while fostering development of regional cities and intermediate towns as well. Therefore, with an objective of reducing migration to capital and other larger cities, encouragement of planned development of potential hill cities and building infrastructure is necessary that can facilitate about one hundred thousand population in hilly cities. So, the Government of Nepal has initiated to develop ten new towns in the junctions of Mid-hill Highway and North-South road Corridors. Hence, the government prioritization in the development of Mid-Hill Highway (MHH) and the recent policy intention through its budget speech for the development of these new towns (NTs) comprises significant economic base of the nation development.

Urban Planning Attempts in Kathmandu Valley

The first attempt of urban planning comes after the Kathmandu Valley was complemented with a Physical Development Plan in 1969. The plan was designed by foreign team led by Karl Pursha but was not materialized due to lack of political commitment. In the succeeding year, around 1970's land use plan for all the five regional centers were prepared and detailed physical development plan of government's institutional area were made and implemented. Similarly, around same time, few towns were established in Tarai by clearing some forest lands.

After enactment of Kathmandu Valley Town Development Committee, it started planned development around Kathmandu valley. The work of KVDA was confined to Guided Land Development (Urban Development Implementation Act 1977 framed legal basis for road expansion through GLD), Land Pooling and Site and Services. As a product of its land development activities, more than 350 km of roads have been widened, 12 land pooling projects are already completed and 11 land pooling projects are in running phase. , Two no. of site and services schemes have been accomplished. Besides this, KVDA has been working in preparing and enforcing building regulations and byelaws. Recently, KVTDC has been transformed into Kathmandu Valley Development Authority under Ministry of Urban Development.

In 1988, Town Development Act came into force. It provides the legal basis for implementing town development plans. The Act has empowered both the central and local government agencies to carry out the land pooling projects. On the basis of GLD implemented in 1976, recently Kathmandu Valley Road widening program has undergone.

After revolution of 1990, the foreign expert Halcrow Fox under technical support form UN, drafted Kathmandu Valley Urban Development Plans and Programs. The plan was expected to control urban growth through planned infrastructure. It came up with containment and densification policies and performed comprehensive studies on infrastructural needs and its direction.

Planning Attempts outside Kathmandu Valley

First land pooling project implemented was the Chiple Dhunga land pooling project in Pokhara. Pokhara was the potential site for the urban development as its development begun centuries back before unification of Nepal. After, being linked with Kathmandu and India through Prithvi Highway (1971) and Siddhartha Highway (1969), the urbanization pace hiked. By census 1991, Pokhara was the 4th largest city, which is now second largest whose growth rate is nearly 7.4%.

Current Planning Trends

Nepal adopted various planning tools to institute balanced urban growth and planned towns. Basically, Nepal adopted problem oriented planning and came up with projects responding such problems. In this section, we have tried to mention various planning trends adopted so far in urban sector.

- Master Plan
- Strategic Planning
- Integrated Action Plan
- Physical Development Plan
- Periodic Plan
- Land Use Plan and Building Bye Laws

Beside this, Periodic District Development Plan (PDDP) and District Transport Master Plan (DTMP) is practiced in district level, whereas, Municipal Transport Master Plan is also being practiced in municipal level. The aim of these plans is to regulate balanced urban and regional growth. The planning effort in Nepal is shown chronologically in the table below,

Chronology of planning efforts in Nepal

Timeline	Urban Planning Efforts in Nepal
1944	Rajbiraj as first planned administrative town
1956	National level periodic planning started
1962	Kathmandu Beautification Program : Visual Beautification of Kathmandu valley on the occasion of Royal Visit of Queen Elizabeth under UN technical Assistance
1963	Town Development Committee Act, 1963
1965	Third National Plan (1965-70) divided country into 3 watershed, namely, Koshi, Gandaki and Karnali River
1969	Physical Development Plan of Kathmandu Valley prepared under technical assistance from UNDP, led by Karl Pursha
1973	1969 PDP of Kathmandu Valley revised by national professionals and land use plan for Kathmandu valley prepared
	Town Development Implementation Act
1975	Construction of Ring Road in Kathmandu Valley without prior study and planning
1974-1984	Bhaktapur Development Project (Successfully Implemented) with German assistance
	Conservation and economic generation was the main goal of BDP
1976	Comprehensive General Plan for Kathmandu 1969/73 revised again, provided minimum zoning proposal
1987-88	Structural plan for major urban centers including greater Kathmandu (20 years

	plan) was prepared with the support of GTZ/MSUD)
1990	Integrated Action Plan (IAP) preparation initiated
1991	Kathmandu Valley Urban Development plans and programs – Hal Crow Fox/DHUD/ADB
1993	The study of Kathmandu Valley Urban Road Development –JICA
1999	Kathmandu Valley Mapping Program (KVMP)
2002	Long Term vision for Kathmandu Valley development, widely known as Vision 2020, Approved by Government of Nepal
2005 Till date	Periodic Planning of Municipalities in Practice

Integrated Development Plan (IDP)

Emergence of IDP

The IDP is a medium-term town development plan linked to a five-year political cycle, although aspects of the plan, including the vision and the spatial development framework (SDF), have a longer-term horizon, normally 20-25 years. It was morphologically derived from South African post-apartheid period as a product of continued planning approach. The racially divided South African municipal towns had differential service delivery for the rich and the poor and clear demarcation prevailing between two racial groups. To end this unequal and biased situation, the post-apartheid period planning came up with comprehensive participatory planning approach best known as Integrated Development Planning. IDP is undertaken as the best planning approach that involves the entire local institutions and its citizens in finding the best solutions to achieve long-term development of the area.

An Integrated Development Plan is a plan for an area that gives an overall framework for the development. It aims to co-ordinate the work of local and other spheres of government in a coherent plan to improve the quality of life for all the people living in an area. It should take into account the existing conditions and problems and resources available for development. The plan should look at economic and social aspects for the overall development of the area. It must set a framework for the development viz; how land should be used, what infrastructure and services are needed and how the environment should be protected.

Once the IDP is drawn up, all town planning and projects should happen in terms of the IDP. The annual council budget should be based on the IDP. Other government agencies working in the area should take the IDP into account when making their own plans.

Rationale of New Town (NT) project Initiation

As a result of high rural – urban and Hill- Terai migration, the regional population balance is agitated. The difficult terrain and poor serviced rural towns is less attractive to the people to live in. If the migration continues, hill population shall drain out and overwhelming population in Terai might create congestion and urban chaos. Thus, to maintain inter and intra-regional balance, (development region and ecological region), Department of Urban Development and Building Construction under Ministry of Urban Development appraised a multi sectoral, high aimed project of creating 10 new towns along the stretch of Pushpalal Mid-hill Highway across the nodal junction of N-S corridor. Two towns are being developed at every development region.

The selection of sites was based on criteria such as availability of drinking water sources, land and possibility of future socio-economic development. The locations were chosen after three steps of filtration i.e., considering the current population, economic importance, and the road alignments

approved by the government and future expansion. In the first phase, 58 locations were selected, these were shortlisted into 20 numbers, and finally selected into 10 locations which is recognized by the Ministry of Physical Planning and Works, the Ministry of Finance and the NPC.

The selected NT project will create an overall urban environment with impressive economic opportunities. The strategic loci of project towns are its strength and the urban rural linkage of goods and services shall be taken as opportunities.

Since the site will develop as an urban center which attract goods and products from nearby hinterland, the selected NT project is expected to halt Hill-Terai migration and retain population of hills. The population threshold of the town is nearly 100 thousand.

The selected NT project is an exemplary attempt of creating designed and planned town to cater need of expected future population. It shall influence development of nodal towns along the mid-hill highway.

The selected NT project is an urban experiment, probably a new attempt in planning horizon of Nepal. The success of this NT project is expected to bring breakthrough in entire planning fraternity.

3.3 REVIEW OF ACTS AND POLICIES

1. Local Self Governance Act

The Interim Constitution of 2007 is the first Constitution of Nepal to include a separate section on local self-government (Part 17). Article 139 stipulates the election of local government and authorizing the power so as to practice devolution of power and devolution of authority. In its article 140, it talks about sharing of accountabilities and revenues between the Government of Nepal and local self-governance bodies. It is therefore a milestone in institutionalizing local governance in Nepal. In this pre-scene, the restoration of democracy in 1990 came up with a policy of strengthening decentralization. Eight years later in 1999 (2055 B.S), Local Governance Act was formulated which empowers local bodies. Basically, there are three hierarchies of local government, i.e, District Development Committee, municipality and Village Development Committee.

The act has given local level authority to plan and implement local level planning and mobilize its resources. It is authorized to prepare periodic plan and other development plans like water supply and sanitation plan, agriculture development plan, transportation plan and so. The local bodies are authorized to collect and levy taxes, penalize and set-up policies for the implementation of local level plans and programs.

LSGA in the context of proposed new towns, Khurkot and Baireni Galchi, implicate in VDC level. The criteria for declaration of Municipality, Sub-Metropolitan city and Metropolitan city correspond these town attain municipal character. The projected population of these towns is below one lakh. Baireni, combined with Kalleri has total population more than 10,000 which is enough for municipal declaration although there are inadequate urban services. Both the town (VDC's) can fully utilize the authority provided by LSGA to prepare necessary plans and programs in consonance with Integrated Development Projects and formulate strategies and policies to implement IDP.

Limitations of LSGA:

The LSGA talks about the formation of local level bodies, area of authority, working area, power but the key issue is the dependence of local bodies to central government for resources and financial sources. The act talks about the formulation of municipalities but there is no clear-cut criterion of urban services and infrastructures besides revenue generation and population. The silent mention about the availability of urban services is inadequate. In addition, the local government is dependent on central government for approval of the project and its budgetary support. It is also

silent regarding the declaration of municipality of those VDC's whose population is more than 10,000/20,000 and, for this, only central government is empowered for the declaration. The clear cut regulation is necessary to regulate LSGA properly and criterion should be set for the self-declaration i.e. to declare itself as municipality/Sub-Metropolitan and Metropolitan city.

2. Town Development Act:

Town Development Act creates a legal basis for preparing and implementing urban development projects in any urban area. The act was introduced in 1988 in order to incorporate and manages increasing population and urbanization. It is established for reconstruction, expansion, development and development of new towns with basic infrastructures like water supply, sanitation, telephone, academic institutions, hospitals, administrative institutions etc.

As per the act, Government of Nepal can form Town Development Committee in any area, city, rural area, town area or regional development center as per necessity for the implementation of Town plans. The committee comprises of Chairperson, designated by the Government of Nepal, C.D.O. or representative 5 members (max.) from the district level offices of GoN, members from district level committee of each nationally recognized political parties, 5 members (max.) nominated by GoN among socially recognized local social workers, chief of the local body and a member-secretary as an office staff designated by GoN.

The TDC has provision for the formulation of sub-committees if smooth operation and facilitation of act and activities of the committee is needed. The project constituting subcommittee shall include local bodies, community offices, government agencies and political parties/ leaders, civil societies such as NGOs, CBOs, TLOs, intellectuals, prominent citizens, professional bodies and planning team. In the context of IDP, the TDC act at the point of departure shall be a guiding document. The sub-steering committee has been formed so as to guide the overall planning process. The plan preparation process may require formation of core advisory committee, comprising members of TDC, but small in size to expedite the planning proceedings. The core advisory committee will include its members among the members of TDC mentioned above. Similarly, the core advisory committee will be formed under section 7 and sub section 7.1 of TDA 2045. The core advisory committee is expected to work in lieu of TDC and work as a bridge between the TDC and sectorial sub- committees. Different sectorial sub-committees shall be formed to comply and speed the work.

Sub-Steering committee has been formulated in both the towns, Khurkot and Baireni Galchi, and delegate power to formulate sub-committees. The IDP planning team shall be working with formulated committees. So far, the TDC is concerned with the urban issues rather than VDC. The role of TDC in the present context of preparing IDP is realized to be vital but at the same time, it is unclear about the roles and responsibilities of TDC after declaration of Municipality. Baireni, Galchi has already crossed the threshold population for municipal declaration. The jurisdiction of TDC and municipality will be entangled if the municipality covers the VDC's beyond the TDC boundary. A clear cut framework is felt necessary to implement the IDP in this situation. LSGA and TDC may not complement each other and a situation may rise regarding the ownership and implementation of plan once the towns are declared as municipalities.

Limitations of TDA

TDA mainly focuses on the establishment of TDC and the roles and responsibilities of the committee personals. Besides, it talks about three planning tools; land pooling, guided land development and site & services. The latter two are no more in practice and was socially difficult to imply. Besides, the act doesn't talk about urban planning issues like providing services, infrastructures, social issues

like inclusion & equity, environmental aspects and so on. Thus, this act itself is not sufficient to address urban issues.

3. Land Acquisition Act (1977)

Land Acquisition Act introduced in 1977 is an important act for the effective and efficient urban development project implementation. This Act empowers the government, by notifying publicly in the specified places, to acquire private land for the well-being of the general public. This legally provides the right to use police power if anyone goes against the government's stand for acquiring land to be used for large public good. The acquisition of land provisioned under emergency situation empowers government to acquire land with a notice when required. This act has described the process of acquisition in detail however the general practice is that, CDO chairs the committee of acquiring land and providing compensations.

This act is sought to be vital during implementation of IPD in proposed new towns. The project proposed for the new towns shall have various private and public services including land pooling projects. For the implementation of IDP, Land Acquisition Act is guiding act to acquire needed chunk of the land for intended purpose. But at the time, it shall be taken in mind that the right of public to be in their land shall be protected and resettlement and readjustment has to be considered at the core. The planning tool such as land banking and land pooling can be easily implemented using this act, thus, it is expected to create more organized and planned new towns with abundance of government owned land to control price speculation.

Limitations:

The amount of compensation that need to be paid are less and the guidelines about paying compensation do not consider the value of improvement and displacement which create disputes and delays. It fails to require that land should be acquired in conformance with a clear site development plan. It does not contain any criteria that compensation paid should be within a certain time. Inadequacy of cadastral surveys and records are hindering the acquisition process.

4. Land Survey and Measurement Act

The Land Survey and Measurement Act came in force from 1963 A. D (2019 B.S) when the cadastral survey of whole Nepal was carried out. The act gives a legal basis for conduction of land survey, its measurement, and its classification according to different categories (*Ailani, Parti, Bhir, Pahara etc*). The land taxes have been assigned according to different land categories. It describes land position and defines public land, government land, land owner and tenant and sets provision for surveying and measuring all or any section of land throughout the country. The Ministry of Land Reform and Management is made responsible for land use planning.

Under the section 11C the Government of Nepal may make, or cause to be made, survey and measurement for the plotting or integrated development of any private, governmental or public lands. Thus, survey and measurement of the required land plots for the proposed new towns shall be the identified projects of IDP.

5. Environment Protection Act (2055 B.S)

This Act is proponent to conduct Environmental Assessment of the prescribed plans and programs before implementation and prohibits implementation of the proposal without approval. The Act empowers the government to give approval to the environmental assessment report without which project cannot be implemented. This act is concerned about the protection of the environment which restricts pollutions and authorizes government to declare Environmental Protection Area, where industrial development is restricted. It also has legal power to penalize the polluter or to raise compensation from the pollution caused.

This act is crucial to conduct EIA/ IEE for the dumping and landfill sites which shall be proposed during IDP formulation. Both the project sites is located at the bank of the river, thus the protection of river is crucial at this point and this act is supposed to guide planning team to plan a project environment friendly.

6. Solid Waste Management Act 2011

The Solid Waste Management Act -2011 regulates collection, recycling and disposal of solid waste generated in municipalities. This act has provision of construction of public conveniences, bath house, mobile public toilets and slaughter houses at appropriate places. This act empowers private sector involvement to collect and transport solid waste to the dumping site. It has penal provision, fine from 50 to 5,000 rupees for offense such as dumping solid waste in public places, throwing pieces of paper or cigarette butts, urination and excretion on public places, soiling roads or slaughtering animals.

In the context of proposed new towns, this act sets a legal basis for the management of solid waste NT's which are recently under new municipality. But, the act is not clearly defined for the towns which are not municipality but the issue of the SWM is crucial. The proposed towns of Baireni Galchi and Khurkot shall be planned accordingly with compliance to this act.

7. Guthi Corporation Act-1976

The act classifies Guthi into three categories: Private Guthi, State guthi and Exempted guthi. It legally provides continuity to the trusteeship corporation established under the Trusteeship Corporation of Guthi Sansthan. It supports to perform religious rites and festivals, preserves cultural heritage and monuments and other religious buildings, preserves ancient ornaments and articles of religious of and cultural importance. The act prohibits registration of land belonging to temples or spaces for public festivals and worships, thus it is necessary to identify the land belonging to Guthi to prevent planning and allocation of services in those land belonging under Guthi.

8. Ancient Monument Preservation Act (1956)

It empowers the government to declare any area where any ancient monument is located as protected monument Zone. It prohibits any development work without a prior approval from the department of Archaeology. This Acts states that findings of any archaeological excavation belong to the government property. The act will provide a clear legal framework during preparing IDP in the proposed towns if any ancient monumental or archeological sites are located within the boundary of project area.

9. Motor Vehicle and Transport management Act (1993)

For a city or an urban area, managing and regulating the traffic and providing convenient and effective transportation facilities to the public is important aspect. The urbanizing towns with shortage of land may face severe problem of congestion and traffic pollution thus it act has legal provision to prohibit driving of certain vehicles & in certain places for public security and welfare. The act has a provision for a Transport Management Committee headed by Chief District Officer and helps to regulate registration of vehicles, manage routes, fix the bus fares and perform other necessary works provisioned in the act.

In proposed NTs, the act supposed to guide us to locate the public vehicle route and inter connectivity of transport services (regional and sub-regional). When the town attain the projected population of one lakh, it is certain that the vehicular number and public vehicular route will rise. The regulation of vehicle and vehicular permit will be based on this act.

10. Public Road Act (1974)

The act prescribes rules for planned road construction; regulating road width and its boundaries within which no houses can be built. That means, it helps to determine the Right of Ways of the road to be constructed, proposed or existing road. The act has a legal provision to assign the road boundary and carry out road construction work with the approval from department of roads. The public road act has categorized road into National Highway, Arterial Road, District Road and Urban Road.

Basically in preparation of IDP, assigning the RoW and DPR work of road shall be guided by this act. The compensation of the land falling under the proposed road alignment during the preparation of IDP shall be made accordingly, as per the provision made by this act.

11. National Road Standard (2070)

The road standard was recently prepared by Department of Roads to guide the preparation of road with designated standard of designated use. This helps to design a road based on the vehicular occupancy, frequency, vehicular speed, type etc. This will help to prepare a road DPR during preparation of IDP of the proposed towns. It gives the design criteria for different types of road. Basically it will guide an urban road category and the design component has to be used accordingly.

12. Nepal Urban Road Standard prepared by DUDBC (2071)

It includes the conceptual diagram of urban structure and urban road network including hierarchy, which will serve as a guideline for planning and design of urban roads as well as land development projects, the systematic classification and standardization of urban road and its elements applicable to Nepal. The standard provided shall be used to plan and design the road network in the proposed new towns but at the mean time it shall be in compliance with National Road standard.

13. Nepal Urban Drain Standard prepared by DUDBC

It includes the systematic classification, standardization and planning of urban drainage and its elements applicable to Nepal, Serving as guide and reference in the planning for waste water collection, treatment and disposal system including designing and estimating, providing useful guide and reference for preparing drainage and sewerage network plan.

14. Town Development Fund Act 2053

The town development act was formulated in 2053 B.S to meet the following objectives,

- To provide necessary economic and technical support to the body related with the development of town.
- To carry out or cause to carry out necessary functions to make the town neat and clean.
- To operate or cause to operate social service and income oriented project of various types.
- To carry out or cause to carry out functional research in order to identify the way of solution for the problems seen in respect of possible reforms to be made for the development of town.

Thus to meet the following objectives, projects identified by IDP can be implemented through the financial and technical support from TDF.

15. Industrial Enterprise Act (1992)

It regulates the establishment, expansion and modernization of industries through licensing and registration systems. It has a provision of economic incentives to enterprises installing equipment to mitigate industrial pollution. It does not specify pollution control measures in industries as mandatory provision. This act is supposed to help to identify the industrial area in proposed NT's. It

also established a base for the industrial area determination and type of industries to be established.

16. Labor Act (1992)

The act came into force after the restoration of democracy as an outcome of protecting the right of the labors. It creates a healthy, safe and secure environment for workers and directs industries or any enterprise to arrange residence for workers. It also prohibits employment of non Nepali Citizens without permission from the Department of labor.

The labor act holds an importance in any urban area as the development process and urbanization course requires numbers of labors. IDP shall come up with a strong provision of protecting labors right provisioned in this act.

17. National Transport Policy 2001

The national transport policy is a guiding document which encourages local as well as central level government to prepare the transportation master plan and its implementation. The main objective of this policy is to ensure regional dispersion of road network and equitable distribution of road density. It also inspires the local as well as central level authority to manage organizational structure, to develop the self-reliance capacity for the arrangement of source of investment in the construction, repairing, maintenance and strengthening of the transport infrastructures and operate the same by providing required service. Its main objective is to provide equitable transport service to all citizens ensuring the access within 4 hours in Hills and 2 hours in Terai. The policy clearly states that the priority shall be given to connect all districts with national road system and north-south connectivity. The central level prioritization to N-S Connectivity has added importance in Baireni – Galchi new town. Thus, it can be assumed that the investment priority will be concentrated in the corridor passing through Baireni - Galchi.

The policy also states that the planning should be done to respond air and sound pollution in city level. The inner city transportation is another key factor that has to be considered in the proposed new-towns. The policy also directs to maintain the road safety, standards, quality, and involvement of private sectors. It has also categorized the road into central road system, local road system and urban road system. The urban road systems are under the TDC and VDC.

18. National Urban Policy (2064)

The national Urban Policy is a guiding document to respond the uncontrolled urbanization and urban problem. The issues of urban sectors like development of infrastructures, generation of employment, management of environment and balanced urban regional growth has been pointed in National Urban policy. The policy basically has three main objectives,

- To develop infrastructure services and direct investment to achieve balanced urban form
- To improve the livelihood of urban population through the creation of clean, secure and prosperous urban environment
- To make the local bodies capable of managing urban issues effectively through delegation of power, institutional strengthening and cooperation between agencies working in urban issues.

The policy has pointed our several strategies and working policies to achieve targeted objectives. The proposed NTs is an outcome of this policy and it is expected to create balanced regional development. The IDP of NT's shall be based on the national urban policy where plans and programs shall be formulated as per the strategies mentioned in National Urban Policy.

19. National Industrial Policy 2011

The Industrial Policy 2011 is a rationalized modification of the 1993 version, with mandatory changes. The drafting of Industrial Enterprise Act 1993 was an impulsion of this policy, which came up with several liberal policies to encourage industrial establishment. The main objective of this policy is to strengthen the economic development through industrial development. It also tends to encourage the investment in this sector so that it could generate scaled employment. In the context of New towns, the policy encourages promotion of the industries that use local resources, raw materials, skills, labor and technology. The town can be benefitted from the establishment of small scale and cottage industries, which shall be sustainable economic base for the future. The policy also talks about providing incentives, financial and technical assistance to those industries which uses green (pollution free and less carbon emission) technologies and are environment friendly.

The agro-economic base of the current towns could be taken as the basis for the establishment of agro-production industries. The National Industrial Policy has clearly mentioned under its section 9, the promotion of micro enterprise, small scaled and cottage industries shall be done through providing infrastructures and institutional organization. The local level plan for the industrial development shall be in consonance with district industrial development policy and in this context, the new towns are liable to have some sort of mechanism for the industrial development. For this, a separate industrial area may be identified in a project area.

20. Land Use Policy (2069)

The policy was drafted in 2069 to regulate and direct the use of land. The broader objective of this policy is to direct the use of land according to its classification. The policy is expected to protect, manage and use the land according to its use. The Policy is also expected to manage and guide the land subdivision to encourage planned urbanization. The policy also directs to prepare land use plan and states to conserve the environment sensitive, religious, cultural, tourism and other important sites.

The preparation if IDP of proposed NT's encounters with a proposal of Land Use plan and Zoning regulations. This shall be guided by land use policy to an optimum level. The Policy shall be referred to prepare a planned township.

21. National Urban Development Strategy 2015

The strategy formulated by the Ministry of Urban Development was published in 2015 and has been endorsed in ministry. Although it doesn't have any legal backing and institutional implementation mechanism, it is a guiding document for the urban development of Nepal. The growing urbanization and transformation of land use in non-rural has risen an issue of management in urban. The global population at present crossed 50% and Nepal's urbanization is also in a rapid pace, which accounts nearly 50% of total country's GDP. In this backdrop, the urban areas are the engines of growth and required strategic management of services and assurance of good urban governance. The strategy has been developed to promote different theme in the urban sector like urban infrastructures, system, transportation, housing, environment, energy, water supply and sanitation, economy, solid waste management, urban governance, urban finance, urban land management and so. NUDS suggests the promotion and effectiveness of these themes through urban investments.

The time horizon set for achieving desired urban scenario is 15 years and strategies have been conceived to achieve desirable condition in each major theme – infrastructure, environment, economy and finance. The strategies have been conceived to achieve desirable condition in each major theme – infrastructure, environment, economy and finance – also indicate the social, economic and cultural vision of urban areas reflecting the highest values of society. Each strategy is backed by a number of activities recommended for each lead and supportive agencies within the

different levels of the government, NGOs and the private sector The NT's shall also be guided by the strategies formulated and IDP should tend to correspond the activities and program to achieve the specific objective of NUDS.

22. Building Bye-Laws

The scope of work under IDP covers preparing building bye-laws proposal for the proposed towns. The review of the bye-laws shall provide the clear vision to set the criteria for building bye-laws proposal and help to prepare bye laws for the study towns. This review has covered study of Model Bye-Laws prepared by DUDBC, Bye laws of some cities like Kathmandu, Pokhara and so on.

23. Model Building Bye Laws (2070)

DUDBC has published a model building bye laws in 2070 to guide and regulate building construction process in those municipalities which does not have its own building bye-laws. It is not mandatory for them to implement and adopt the proposed building bye-laws but if any municipality or town intends to adopt the model bye-laws, they can use it. The criteria set in the model building bye-laws can also be useful in preparing bye-laws for the proposed NT's. Unlike bye-laws of other cities like Kathmandu, Pokhara, Dharan etc, this has set-up building criteria in more detail with a section explaining the process of municipal approval.

24. Bye-laws of other cities

The bye-laws of Pokhara and Madhyapur Thimi have provision of setting building height as per the use, whereas, Kathmandu uses the concept of FAR. The basic use of the bye-laws is to ensure development control and implement building code. However, it also ensures the right of the neighbor by provisioning light and ventilation standards. Bye-Laws of the Kirtipur Municipality has clearly mentioned the RoW of each road whereas in Pokhara, bye-laws states the setbacks of building in different locations.

The study of different bye-laws will help to draft better and integrated bye-laws for the proposed towns.

25. Planning Norms and Standards

The planning norms and standards prepared by DUDBC was released in its website in 2013 whereas published recently in 2015. It has set the planning guideline for the urban area of different population size. The norms has set the urban area with population size 40000 to 1 lakh as a city, thus the proposed NT's fall under the category of city. There are several criterias mentioned in the standards varying from the size of road, water supply and sanitary measures, electric supply, waste management, educational institutions, health institutions, stadiums, university, public library and so on. The provision of all the services and infrastructures has to be made during preparing the IDP for new towns.

4 Study Area

Among the ten towns selected for the new town development along the mid - hill highway, the study covers the preparation of integrated development plan of New Towns namely Baireni Galchi and Bhimeswor-Khurkot.

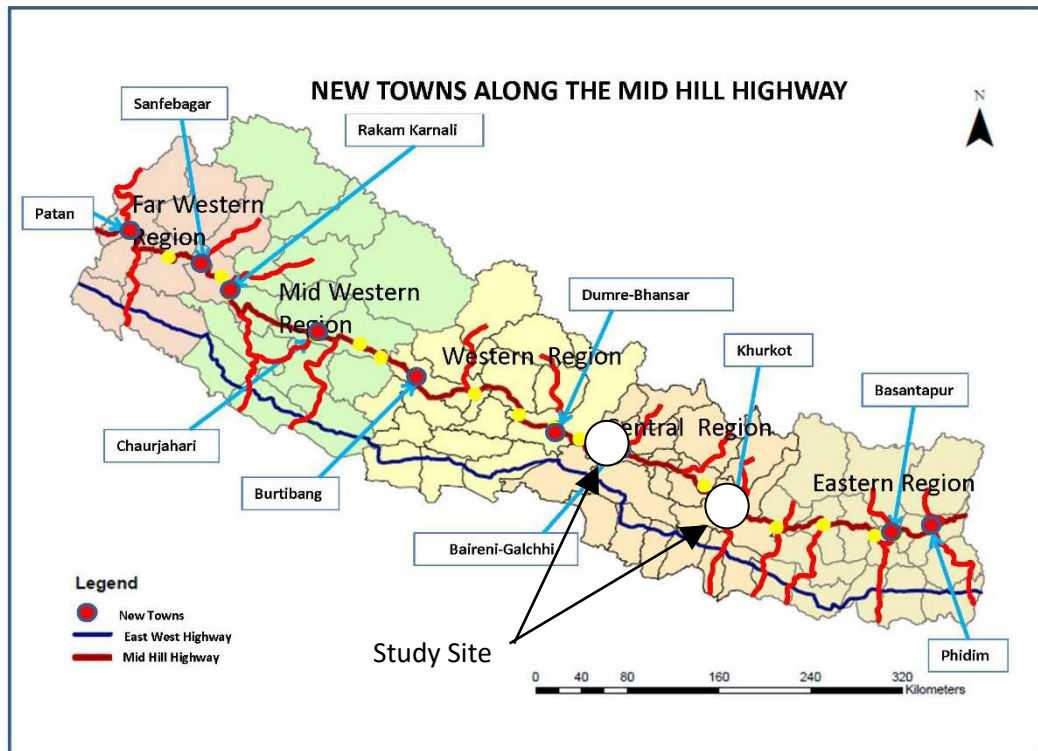


Figure 1: New Towns along the Mid-Hill Highway

4.1 ADMINISTRATIVE AND GEOGRAPHIC STATUS

4.1.1 Administrative Division

Baireni-Galchhi New Town lies in Central Development Region, Bagmati Zone of Dhading District. This Town comprises of ward 2 and 3 of Kalleri VDC and ward 7, 8 and 9 of Baireni VDC.¹ The total area of new town covers 34.25 sq.km including 5 wards. Baireni-Galchhi New town is bordered by Goganpani VDC in the East, Pida VDC in the west, Baireni of ward 1, 3, 5, 6 in the South, and Kalleri of ward 1, 4, 6 in the North. (Refer Map- 1)

4.1.2 Topography

The spatial extent of Bireni-Galchhi New town is between 85°1'30" East 84°56'30" West 27°49'40" North and 27°45'40" South. It has diversified geographical plane which varies from elevation 400m to 1280 m above MSL. It has low to high hill mountains, Rivers, fields and tar (flat areas). Tar area in new town like Kalleritar, Ghartitar, syaltar, Daltar, Khantar, Mashtar, Mastar have gentle slope which are suitable for settlement development In these tars, people are migrating from surrounding slope areas for safety and services. After tar, there is slope land covered within forest. Houses can

¹ The study area covers the whole VDCs while the planning area is focused to the New Town area.

be seen scattered in these slopes but there is a trend of immigration to tar. The picture shows the varied land features of new town in which Mountains, tar, rivers, fields can be seen.



Photo 1: Satellite image of Baireni-Galchhi New Town

It has very steep slopes with limited flat areas (tar). Total of 89.78% of total land of Baireni-Galchhi new town has slope greater than 30 percent. (Refer Map- 5) Most of the forest are subtropical and contain Sal and Katus species. The details of slope and its area are shown in table below.

Table 1: Available land area with respect to the slope

Slope (%)	Area (Hectare)	Percent
2	20.17	0.58%
5	19.2236	0.56%
10	39.0877	1.13%
15	72.1197	2.08%
30	203.3559	5.87%
>30	3109.47	89.78%

Source: NTPCO, 2014

4.1.3 Climate

The sub-tropical monsoon climate is found in Baireni-Galchhi New town. It has varied temperature due to low and high hill mountains. Temperature of this area during summer season varied from 20^o to 36^o. The rainfall in rainy season in this area is due to the blow of monsoon air. The average annual precipitation is 2120 mm and the rainy season is from mid-June to September. (Source: District Profile, Dhading)

4.1.4 Water Shade and Water Bodies

Baireni-Galchhi new town is rich in water sources. There are 6 major rivers and many rivulets within New town. Major Rivers are Trishuli River, Kheste Khola, Gardo Khola, Chiraudi Khola, Belkhu Khola and Mahesh Khola. Trishuli River flows through the center of town, is the boundary of Baireni and

Kalleri VDC which passes all wards of New town. These water source are the sources of irrigation as well as the beauty of the town. Kheste khola and Belkhu khola flow at east and west boundary of New town. Besides, many rivulets and Arteries flow within new town. Arteries and rivers are the main source of drinking water of new town. (Refer Map- 6)

4.2 DEMOGRAPHY

4.2.1 Population Distribution

The male population in the year 2011 is 5344 and the female population is 5553 such that the sex ratio is 1000 i.e. the number of male in 1000 female. The density of population in the town is 2 persons per hectare.

Table 2: Wardwise Population Distribution of Baireni-Galchhi New Town

VDC	Ward	Area (h)	Households	Total population	Male	Female	Population Density ppha
Baireni	7	818.02	445	2179	1074	1105	2.66
	8	1015.92	688	3381	1751	1630	3.33
	9	707.54	671	2793	1366	1427	3.95
Kalleri	2	417.33	257	1226	573	653	2.94
	3	465.97	293	1318	580	738	2.83
	Total	3424.78	2354	10897	5344	5553	3.18

Source: CBS- 2011

Table 3: VDC level Households and sex wise distribution of population of Baireni & Kalleri VDCs

VDCs	Households	Population			HH member size	Sex ratio
		Total	Male	Female		
Baireni	2795	13369	6630	6739	4.78	98.38
Kalleri	1921	8852	4059	4793	4.61	84.69

Source: CBS- 2011

4.2.2 Age-sex Composition

The table below shows the age group (15-59 years) accounts the highest number of population in both the VDCs of Baireni-Galchhi.

Table 4: Age groups and population

VDCs	Sex	0 to 14 yrs	15 to 59 yrs	+ 60 yrs
Baireni	Male	2353	3699	578
	Female	2366	3835	540
Kalleri	Male	1515	2041	503
	Female	1634	2679	480

CBS- 2011

4.2.3 Population by ethnicity

Tamang is the highest population ethnic group found in Baireni and Magar in Kalleri. Brahmin and Chhetri are the second and the third highest population group in Baireni. Similarly, Magar and Brahmin are the second and third highest in population of Kalleri.

Table 5 : Baireni, Kalleri -population by ethnicity

VDCs	Chhetri	Brahmin	Magaar	Newar	Tamang	Kami	Damai	Sarki	Bhujel	Others
Baireni	2700	2394	482	701	4509	738	322	590	435	498
Kalleri	558	2005	2034	1086	0	520	269	1430	302	648

CBS-2011

4.2.4 Population by mother tongue

The ethnic composition in Baireni VDC shows presence of Indigenous population is nearly half of the total population. Majority of population speaks Nepali followed by Tamangs.

Table 6: Baireni, Kalleri-population by mother tongue

VDCs	Nepali	Tamang	Newar	Magar	Other	not stated
Baireni	9061	3968	44	37	206	53
Kalleri	8804	0	30	15	3	0

CBS-2011

4.2.5 Literacy

Based on the Census data 2011, out of total population, 73.70% male and 59.85% female are literate in Baireni and 70.39% male and 58.85% female are literate in Kalleri.

Table 7: Literacy rate- Bairen- Galchhi

VDCs	Sex	Can read & write	Can read only	Can't read and write	Literacy not stated	Literacy rate
Baireni	Male	4459	129	1459	3	73.70
	Female	3693	118	2358	3	59.85
Kalleri	Male	2591	75	1012	3	70.39
	Female	2598	95	1709	13	58.84

CBS-2011

4.2.6 Working Age-Group

The economic activity of the whole country, according to National Population Census is 67.60% (CBS, 2001). Regarding the Dhading district, considering the age group 15 to 24 as the economically active population, the total economic activity rate is 69.11% in which the male activity rate is 71.37% and female activity rate is 67%. So, the ratio of female to male economically active population is 1%. (CBS, 2001). In the whole Dhading district, people engaged in different economic activities is given below:

Table 8: Economic Activities of involvement percentage in Dhading District

S.N.	Activities	Percentage
1	Manufacturing	10.55
2	Trade	35.12
3	Transport	2.79
4	Service	30.36
5	Others	21.17

Source: CBS, 2001

If the age group below 10 and above 59 is considered as the economically inactive group, the given table below shows the economically active and inactive population the given area.

Table 9: Economically Active Population Group in Baireni-Galchhi New Town

VDCs	Economically Active			Economically Inactive		
	Female	Male	Total	Female	Male	Total
Baireni	4787	4681	9468	1952	1949	3901
Kalleri	3397	2651	6048	1396	1408	2804

Source: CBS, 2011

4.3 REGIONAL CONTEXT

Prithivi Highway connects Baireni-Galchhi new Town with Kathmandu, Pokhara and southern part of Nepal. Galchhi Bazar is just at 50 km far from Kathmandu. Nuwakot, Rasuwa and Kerung/China is also directly connected with Baireni-Galchhi New town through Galchhi-Nuwakot-Rasuwa-Kerung Feeder Road. Galchhi is main gateway to Nuwakot. Nuwakot is just at a distance of about 19 km away from Galchhi Bazar. Dhading Besi, headquarters of Dhading District, is the main market center of the all VDCs, is about 30 km from Baireni-Galchhi new town. Gajuri Bazaar is also major market center of six VDCs which is located in the western part of the town. Similarly Malekhu and Naubise are also other a grade market centres situated nearby the baireni –Galchhi Newtown. (Source: DTMP, Dhading)

4.4 PHYSICAL INFRASTRUCTURE

4.4.1 Road and Transportation

In Baireni-Galchhi new Town, only Prithivi highway and Galchhi – Trishuli - Rasuwa Road are black topped. Almost all of the other roads are earthen, which needs immediate maintenance and upgrade. Most of the Roads in Baireni-Galchhi new town radiates from Highway to the surrounding areas. It has radial road network pattern. 10.8 km of Prithivi highway pass through Baireni-7, 8 and 9. Galchhi chowk is the nodal point of Galchhi–Trishuli-Rasuwa Road of which 0.6 km of road passes through Baireni-8. There is no any highway or feeder road towards Kalleri of Baireni-Galchhi new town. Due to the lack of motorable bridge in Trishuli River, people of kalleri are facing difficulty in transportation and transporting goods. There are only 3 suspension bridges to connect Baireni with Kalleri. Motorable bridges are only in Prithivi highway at Kheste khola, Mahesh khola, Gardo khola and Belkhu khola. Many new earthen tracks are planned to open in near future.

The total length of existing road within the Baireni-Galchhi new town is around 189 Km out of which 11.4km of road is Black topped, 81.6 km of road is earthen, 1.8 km of road is graveled and 94.3 km of road is major Trail (Earthen) as shown in the chart below.

Table 10: Road length by surface type

SN	Road Surface	Length(km)
1	Black Topped	11.4
2	Gravel	1.8
3	Earthen	81.6
4	Trail(Earthen)	94.3
5	Total	189.0

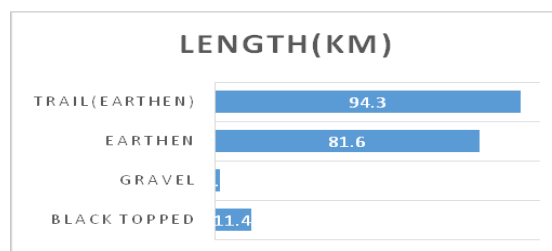


Figure 2: Road length by surface type - Galchhi

According to DUDBC, standard the minimum ROW for class A, B, C and D class Roads are 30, 22, 14, and 10 m. Every household should be in 1 km distance to Motorableroads. But in context of Baireni-Galchhi New Town, the average minimum and maximum road width within Baireni-Galchhi new town is 3 to 6.5 m in earthen roads and 5.5 to 7.5 m in case of Black topped Roads. Road inventory survey shows 50% of total road surface is major trail and other 50% of total Road is motorable in Baireni-Galchhi New Town. Only the households nearer to highway have good access. Most of the others use trail road to go to their destination.

Public Transportation service is only within Prithivi highway and Galchhi-Trishuli-Rasuwa Road. Thousands of vehicles pass daily through new town from Kathmandu and different parts of country. However, there is no specific public transportation operated within new town area. So, people usually travels on foot up to highway to get access of public vehicles. Some people use Motorbike to go to their destination. Use of bicycles is rarely found in Baireni-Galchhi new town. Lack of motorable bridges in Kalleri is one of the main obstacles to public vehicles. Within Kalleri, a tractor provides services of transporting goods to upper belt of Kalleri 2 and 3. Details of Public vehicles that travel through baireni-galchhi new town in Prithivi highway and Galchhi-Trishuli-Rasuwa road are shown in annex table.

Development and economic activity was quite low till the construction of Galchhi-Nuwakot-Rasuwa feeder road. This feeder road linked new town not only by road but by trade and business.

Linkage of area to Kathmandu through Goganpani-Dwepipal-Sitapaila (Kathmandu) and Dhading Besi, an administration center of Dhading district through Khate will make area richer in road linkage. Beside these strategic roads, Earthen roads help to connect the area with its hinterland.

Table 11 : Road Density

Ward	Road Length(km)	Area(sq.km)	Road Density(km/sq.km)	Population	Road Density (Per Thousand Population)
2	16.708	2.393	6.982	1226	13.628
3	8.565	2.523	3.394	1318	6.498
7	12.976	3.302	3.929	2179	5.955
8	33.204	5.887	5.641	3381	9.821
9	30.759	4.539	6.777	2793	11.013

Note: Road lengths do not include Major Trail and area is calculated after deduction of forest, water and sand.

4.4.2 Water Supply

In the context of Baireni Galchhi- new town safe and adequate drinking water supply is not yet sufficient and well managed. However, in comparison to other District VDCs, water supply system in Baireni-Galchhi new town is relatively good, but still water supply system is in its rudimentary stage. Service is not provided to whole area. So there is a need to extend its supply in order to meet the present and future demand of water.

Table 12: Water supply for household towards Kalleri

Ward	Water supply project	No of household
5 and 7	Kalleri water supply project	207
6	Belinitar water supply project	65
4	Kewarita water supply project	68
2	Kalleritar water supply project	176
1	Forsetar water supply project	40
2 and 3	Dumre chaur water supply project	159

Source: VDC profile 2068

Main water source in Baireni Galchhi New town are rivers, Arteries or well. About 120 houses in ward-7 use Mul Dhara as a main source, source serves to Baireni-8, Galchhi and Chiso pani khane pani source of ward-9 serves for about 100 household, similiary Baireni khane pani (Kali Khola source) serves for about 100 household in ward-9, Baireni Thul dhara serves almost all household of Baireni Bazar, ward-9. Bahun palang (kalo dhunga source) serves for about 50 household of Baireni-9, there are about 65 taps installed in Baireni-9. Janghare khola water source serves to Kalleri-2 and about 20 household of kalleri-3 and Dumre chaur water supply project serves to Kalleri-2 and 3.

Water supply is community based and public tap is common rather than private tap. Most of the water source named kal dhara, kathan dhara, kapre pani, were dried up due to earthquake of 2072/01/12 and 2072/1/29.

Table 13: Present situation of water supply in Baireni-Galchhi New town

S.N.	Name	Location	Service
1	Chiraudi Khola	Baireni, W-7	No
2	Machhedhi Khola	Baireni, W-8	No
3	Gardo Khola	Baireni, W-9	No
4	Judi Khola	Baireni, W-9	No
5	Kali Khola	Kalleri, W-3	100 Household
6	Jangare Khola	Kalleri, W-3	Kalleri-2,3
7	Anderi Khola	Kalleri, W-2	No
8	Trishuli	New Town	No
1	Mul Dhara	Baireni, W-7	120 Houses(Meter System)
2	Kal Dhara	Baireni, W-7	Dried up due to Earthquake
3	Kathan Dhara	Baireni, W-7	Dried up due to Earthquake
4	Kapre Pani	Baireni, W-9	Dried up Due to Earthquake
5	Chiso Pani	Baireni, W-9	About 100 Household
6	Baireni Thul Dhara	Baireni, W-9	Baireni Bazar Area
7	Baireni Khane Pani(Source-Kali Khola)	Baireni, W-9	About 100 Household
8	BahunPalang(Source-kalo Dhunga Mul)	Baireni, W-9	About 50 Household
9	Judi Khola Source	Baireni, W-9	60-70 Taps
10	Janghare Khola Mul	Kalleri, W-3	Serve to Ward-2 Kalleri, and about 20 household of ward-3

4.4.3 Sanitation /Sewerage System

There is no sewerage and proper drainage network in Baireni-Galchhi. Side drain is constructed only alongside of the Prithivi highway. Due to lack of side drain as well as proper management of existing side drain, roads generally could not function properly during all seasons.

People use pit latrine for sewage disposal. Due to earthquake of 2072/01/12 toilets of majority peoples are damaged so the sanitation system of Baireni-Galchhi new town is not satisfactory. Waste water from Baireni bazar is directly disposed to Trishuli River.

With expansion of settlement, quantity of waste increases which may pollute the River and it directly affects Rafting tourism in Trishuli River, which is the second vision of Baireni-Galchhi new town. Treatment plant for waste water is another important project for Baireni-Galchhi new town.

4.4.4 Electricity Supply System

Electricity service for Baireni-Galchhi new town is governed by Electricity authority, from Gajuri sub-station. All area of Baireni-Galchhi new town is facilitated with electricity. Both 2 phase and 3 phase lines are available for household and for Small Scale Industry. High tension electric wire passes from ridge of Baireni parallel to highway. From public level, Mahesh khola hydropower project was initiated but at present, no further progress can be seen in this project. Besides, streams of Baireni has potential of many Micro Hydropower Project.

4.4.5 Information and Communication

Almost all household of Baireni-Galchhi new town uses some means of communication. Most common means are Mobile Phone, television and Radio. There is a facility of PSTN line only within Baireni-7, 8 and 9 with total capacity of 144 of which 143 lines are already used (*source: Nepal Telecom, Dhading*). There is mobile network service of NCELL, GSM mobile of Nepal Telecom and CDMA within all area of new town but network signal of NTC is very low in the Galchhi area. So, network towers of NTC needs to be extended for Galchhi. There is a presence of Telecom tower in Mude Danda, Kalleri. Internet service of web surfer and ADSL is available only within Baireni-7, 8 and 9. There is also facility of cable network which is also available only within Baireni-7, 8 and 9. Since, it is near to Kathmandu Valley, almost all Newspaper is available here in early morning. The existing scenario shows that communication facility is quite good in Baireni-7, 8 and 9 however people of Kalleri have to depend on Baireni for newspaper and internet service. There is also post office at Baireni-9 which is another means of communication.

4.5 SOCIAL INFRASTRUCTURE

4.5.1 Education

There are 2 campuses, 3 higher secondary schools (one private), 2 secondary schools (one private), 1 lower secondary school and 8 primary schools, in Baireni-Galchhi New Town. There is no higher secondary school and campus in Kalleri VDC. Details of schools, number of students, location are shown in annex.

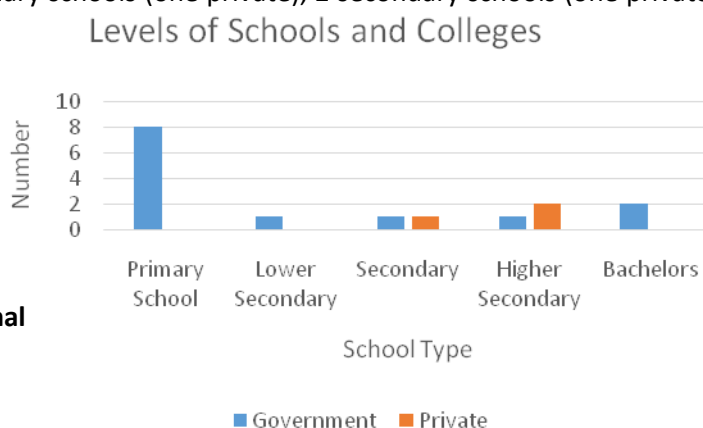


Figure 3: Number of educational institutions by ownership

Table 14: Wardwise distribution of Educational Institution in Baireni-Galchhi

Ward	Number of school					Ward Population (CBS:2068)
	Primary	Lower Secondary	Secondary	Higher Secondary	Campus	
2	2		1			1226
3	1					1318
7	2			1	1	2179
8	1	1	1			3381
9	2			2	1	2793

Source: Field Survey, 2015

There is only one primary school in ward-3 for 1318 population, 2 in ward-2 for 1226 population, 2 in ward-7 for 2179 population, 1 in ward-8 for 3381 population and 2 in ward-9 for 2793 population shows that there is very less number of primary schools though population is more and more than 50% of students have to walk more than 2 km for primary level education. Higher level education school is only located within the highway i.e in ward 7 and 9, most of the students from Kalleri and remote areas of baireni comes to study here by walking an average distance of 4 km. The students

who seek to study Science, Management or other faculties apart from education in the higher secondary level have to go Kathmandu.

4.5.2 Health Institution

At Present, total Population of new town is 13981 (*VDC Earthquake Victim Records, 2072*) but, there is only one hospital with 6 bed capacity and only one healthpost and 1 clinic with few medicals which is incapable of providing good health services. There is no appointment of Doctor in Healthpost. The private hospital is appointed with 9 staff includes only one doctor and nurse. There are 1 clicnic and 3 medicals along the highway side of Baireni-Galchhi New town. There is no any health care center towards kalleri of baireni-galchhi new town. People of kalleri have to depend on baireni bazar for health services. So people usually go to Kathmandu and Gajuri Bazaar for the service. Besides, people still believe in traditional health care technique like dhami, lama and jhakri due to lack of sufficient and quality health service and awareness in people.

Table 15: Major health institutions in Baireni-Galchhi New town

Name of Health Institution	Location	No.	Service	Ownership
Baireni Health post	Baireni-9, Baireni Bazar	1	Simple Treatment	Government
Galchhi Hospital (Bed Capacity-6)	Baireni-8, Galchhi	1	Operation, OPD, ENT, ECG, Ultra Sound, X-Ray, Patho lab	Private
Clicnics	Baireni-8, Galchhi	1	Simple Treatment	Private
Medicals	Baireni-7,8,9	3	Medicine	Private

Source: Field Survey, 2015

4.5.3 Open Space

Open space refers to the areas of land without human built structures which are left open for the use of public, such as parks, courtyards. In the Baireni-Galchhi New Town, apart from Medium scale playground in ward 7 at Janakalyan Higher Secondary School, there is no any other playground. Small playgrounds are only within the schools of new town. There is no any neighborhood parks, local parks, community parks within the New town. Though present population does not feel the need of open spaces, open spaces should be proposed for future population.

4.5.4 Community Buildings (Library, Community halls etc.)

Community buildings are the public buildings where members of a community tend to gather for group activities, social support, public information, and other purposes. In context of the New Town, there is a community building established in Baireni-7, Mashtar. However due to the lack of proper maintenance, the building has got several damages by the earthquake of 2072/1/12. Local People are using it to conduct meetings and gatherings in this building. There is no any community library within new town.

4.5.5 Fire Stations

There are no fire brigade facilities in the new town.

4.5.6 Religious Institutions

There are many religious temples in Baireni-Galchhi New town. Among them Amleshwor Mahadev Mandir at Baireni-9 and Changeshwor Mahadev Mandir of Goganpani are famous. Every temple has its own religious significance and are a source for touristic attraction. Such religious places may be developed as the major attraction for internal tourists from neighboring VDC's and promote internal tourism.

At present, the areas near the banks of Trishuli are used as cremation areas. Different places are being used by different castes and cultures for incineration/cremation. But, managed and fixed cremation areas are not identified yet. Amleshwor Temple, Mahesh Dovan are the areas proposed for Cremation.

4.5.7 Recreational Buildings (Cinema Hall, Museum, Art Gallery)

No recreational buildings like cinema halls, museums, art galleries are present in the New Town.

4.5.8 Social welfare (Old age home / Orphanage/Centre for Differently able Person)

According to CBS 2011, 266 people in Baireni and 191 people in Kalleri bear different types of disabilities. VDC provides some amount of money as disability allowance. However, there are no social welfare centers such as elderly homes, orphanage or centers for differently able persons.

4.5.9 Security

As baireni-galchhi new town lies in Prithivi highway which is main entry route to capital city, Kathmandu, 6 Number Bahini of Nepal Army is located in Baireni-9. There is also police station in Baireni bazar which provides security services to Baireni-Galchhi new town. Compare to other VDCs, Baireni-Galchhi new town is considered as safe and secure place. Except general conflict, there is no serious type of criminal activities in Baireni-Galchhi new town. Most of the conflicts are solved within community level. In Kalleri-2 and 3 there is no any station and agency related to security. Some part of kalleri is under illaka police station of Baireni and other under illaka police station of sunaulo bazar of Nilkantha VDC.

4.6 ECONOMIC SERVICES & INFRASTRUCTURE

4.6.1 Economic Linkage

Baireni is centre for market to both Baireni and Kalleri VDCs. It is a potential center for agriculture, commercial market, and agro-based cottage industries. It is a supply market of green vegetables to Kathmandu. It is developing as a wholesale market to the area north of it. Industrial goods are imported from different parts of country like Kathmandu, Birgunj, and Butwal and even from India. These market products are supplied to the north through Galchhi-Nuwakot-Rasuwa road as Galchhi is the main gateway to Nuwakot and Rasuwa.

The Prithivi highway and Galchhi-Nuwakot-Rasuwa road are the main road linkage for trade and services in Baireni-Galchhi new town which has made a very strong economic linkage with southern part as well as northern part of the country. A proposed two lane road of Galchi-Nuwakot-Rasuwa-Kerung Road within 2 year will further lead to agglomeration of whole sale market in new town and will also establish better trade with China resulting into economic linkage to whole country. This border has already been opened by China for trade with Nepal in January 2012. From East-West Highway, it is the shortest road to the China and new town can act as a mediator of trade between China and India.

Linkage of area to Kathmandu through Goganpani-Dwepipal-Sitapaila (Kathmandu) and Dhading Besi, an administration center of Dhading district through Khate will make area richer in road linkage. Besides these strategic roads, project area is linked to its hinterland by earthen roads.

4.6.2 Agriculture

Upliftment of Farmers livelihood by adopting appropriate methodology to agriculture business is the main vision of Dhading District.

Main crop cultivated in Baireni - Galchhi new town are paddy, maize, barley, and wheat. People are engaged in traditional agriculture. People along highway are engaged in business activities as well beside agriculture. Now, people are attracted to vegetable production and cash crops. Mainly cauliflower, potato, tomato, cabbage are produced in commercial manner and supplied to Baireni bazar and Kathmandu. But due to lack of technicians, fertilizer, seed, irrigation and other services, production could not be as per its capacity. With availability of these services, farmers can increase their living standard and economic condition through commercial vegetable production. With the provision of easy loan from agricultural development bank, will attracts the farmers to live stock farming as market for livestock is within easy access i.e Kathmandu. Dairy business is also other important small trade in Baireni – Galchhi new town which has a very good market. Upliftment of dairy business in large scale can contribute a good economic resource to Baireni-Galchhi new town. There is no agriculture service center in Baireni-Galchhi New town. Agriculture service center of Gajuri and Sunaulo Bazar provides service to the new town area. To meet the long term vision of the area District Agriculture Development office, in 2055/66, established a pocket area for silk worm farming in Baireni 7 and 9 at Palchwok and Maheshfant. Pragatisil resham, Panchakanya resham, Bageshwori resham are the groups established in that area. There is also pocket area of food crops and vegetables in Baireni-8 and Kalleri-2 of New town area which have annual production of 471 MT of food crops from Baireni-8 and 11975 MT of vegetables from all wards of Baireni. Pocket number its type and production are described below.

Table 16: Pocket number its type and production

S N	Pocket name	Pocket area location	Pocket number	Pocket type	Household	Pocket area	Yearly production (MT)
1	Food Crops CIMASP	BAIRENI-8	1	Normal	509	352	471
2	Food Crops Ka block	Kalleri-2	1	-	-	-	-
3	Vegetables Gajuri pocket	All wards of Baireni	1	Bussiness	1060	2390	11975

Source: DAO, Dhading 2016

There are still many other possible potential pocket areas available for food crops (maize, rice) in Kalleri, tropical type of fruits in Baireni and Kalleri, vegetables, potatoes, silk worm farming in Baireni.

There are different farmer's group registerd in District Agriculture Development Office whose main objectives are vegetables, food crops, some are integrated, and some are of mixed type. There is neither any small scale irrigation project in fiscal year 2070/71 in Baireni-Galchhi new town nor there is any training based programs for farmers in Baireni-Galchhi new town.

4.6.3 Industry

There is gradual development of industries in first starting decades whereas the pace accelerated from 2060 B.S. and rapid development is seen in the year (2068-2072) B.S.

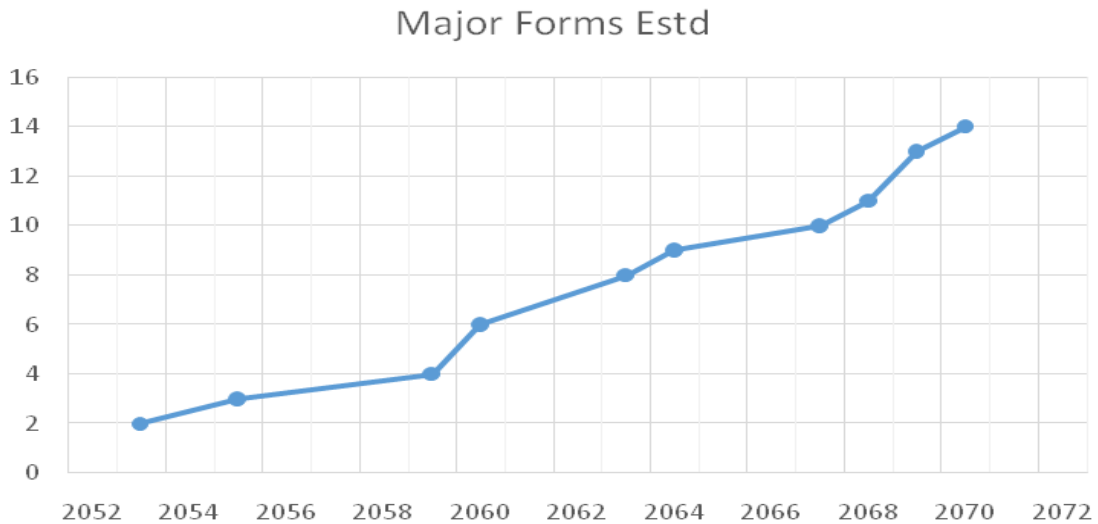


Figure 4: trend of industrial development of Baireni-Galchhi new town from 2052 B.S. to till date

The construction material industries found in the project area basically include the industries of sand mining, sand washing, stone crusher, slate and concrete blocks. Sand mining is extensively undergoing in Mastar area. There are about 40 manual sand washing industries locally called as "ferfere" and 1 automatic sand washing machine. Total of 1800 cubic feet or 4 tripper of sand can be washed in a day in *ferfere* which produces about 1350 cubic feet of washed sand whereas from automatic sand wash, about 60 trippers can be washed in a day. A tripper of sand cost Rs 6500 in mine and it cost about 16000 in Kathmandu. Baireni VDC is paid only Rs 150 as a tax for every 1 tripper of sand. This industry can be a major economic source of Baireni-Galchhi new town. But, in present context only people within the town are benefited from this business. So government should implement a strict rule in this business so that the economic status of New town will be uplifted. There is also one crushing industry running in Trishuli river bank at Mahesh Dovan named as Panchakanya Crusher industry which produces about 10 tripper aggregate which is supplied to Kathmandu. It cost about Rs 6000/trippper in Baireni whereas in Kathmandu it cost about Rs. 15000 per tripper. There is also two concrete block industries in Baireni and Galchhi Bazar. Slate stone is extracted in local level in Kalleri-2 and 3 which is extracted for four months during dry season. About 2400 pieces of slate, cost Rs 20 per piece, is brought in Baireni. Stone Extraction is not being operated in professional scale.

There are four petrol pumps in New Town located at Mashtar, Baireni Bazar, Galchhi Bazar and Bhaltar, 1 Namaste gas industry at Mahesh dovan and 2 saw mills. Petrol pump are established focusing to Highway vehicles. Namaste Gas industry supplies gas mainly to Baireni, Adamghat, Gajuri, Malekhu, and Dhading Besi. These are medium scale industry with investment more than 10 lakhs. Another gas industry is under construction at Mashtar.

Agro based industry is also another main important economic source for Baireni-Galchhi new town. Vegetables from Kalleri and surrounding area of Baireni are collected in 15 different places and are supplied to Kathmandu. Transaction of about 10 lakhs occurs in Baireni area every day. In peak season, this transaction doubles. There is also 3 small scale and 1 large scale dairy industry in

Baireni-Galchhi New town. Small scale dairy collects milk from surrounding area of town and supply dairy products within Baireni bazar while large scale supplies to Kathmandu. In the case of animal husbandry, goat is the main livestock in surrounding of New town area. Small scale pig and poultry farming can also be seen within the project area.

4.6.4 Trade & Services

Baireni is center for market to both Baireni and Kalleri VDCs. It is potential center for agriculture, commercial market, and agro-based cottage industries. It is a supply market of green vegetables to Kathmandu. The main transactions seen are of daily consumable fruits, vegetables and cereal crops. The market center is transforming day by day into big market. It is developing as a wholesale market to the area north of it. Industrial goods are imported from different parts of country like Kathmandu, Birgunj, and Butwal and even from India. These market products are supplied to the North through Galchhi-Nuwakot-Rasuwa Road as Galchhi is the main gateway to Nuwakot and Rasuwa. Goods, after being directly imported from Kathmandu and India, are retailed in the surroundings. Vegetables, sand, stones are directly supplied to Kathmandu whereas Goods like pipes, iron rods, galvanized sheets, chemical fertilizers, food crops etc are supplied to Nuwakot and Rasuwa. Linkage of trade and services with hinterland is mainly based on exchange of agricultural products from surroundings to Baireni bazar and urban services from Baireni bazar to surroundings. Sand washing center, Saw mill, small scale block industry, milk dairy, petrol pumps, hotels and lodges, grocery and tea shops are major business trade established in Baireni-Galchhi New town and schools, colleges, Galchhi hospital, health post, veterinary office, police station, Army Barrack, post office, banks, co-operatives, NGOs, clubs are the major service affiliated institutions in New town.

The Prithivi highway and Galchhi-Nuwakot-Rasuwa road are the main road linkage for trade and services in Baireni-Galchhi new town which has made a very strong economic linkage with southern part as well as northern part of the country. A proposed two lane road of Galchhi-Nuwakot-Rasuwa-Kerung Road within 2 year will further lead to agglomeration of whole sale market in new town and will also establish better trade with China resulting into economic linkage to whole country. This border has already been opened by China for trade with Nepal in January 2012. From Mahendra Highway, it is the shortest road to the China and new town can act as mediator of trade between China and India.

Development and economic activity was quite low till the construction of Galchhi-Nuwakot-Rasuwa feeder road. This feeder road linked new town not only by road but by trade and business.

Linkage of area to Kathmandu through Goganpani-Dwepipal-Sitapaila (Kathmandu) and Dhading Besi, an administration center of Dhading district through Khate will make area richer in road linkage. Beside these strategic roads, project area is linked to its hinterland by earthen roads.

4.6.5 Banking & Finance

There are one commercial bank, one development bank, one micro-finance bank and eight co-operatives in Baireni-Galchhi New town. Most of these financial institutions are focused on agriculture, business and other personal loans. Among these total financial institutions, only one co-operative is located at Kalleri.

4.6.6 Tourism

Baireni-Galchhi New town has huge potential of tourism development. Rafting in Trishuli River is the main attraction of Baireni-Galchhi new town. In previous years, more than 6000 tourists visit Baireni for rafting annually, as Maheshdovan is starting place of rafting. But due to the cutting of river in maheshdovan bank, rafting service has been closed these years. Besides rafting, Galchhi and Maheshdovan has been establishing as a picnic spot. Local people and people from Kathmandu visit here during Kartik to Baisakh that is during low river flow. About 12-13 thousands of people from Nuwakot, Pida, Kalleri, Baireni visit Amleshwor Mahadev Temple during Kartik Purnima and about 1000-1200 peoples from Kalleri, Baireni, Nuwakot, visit to Changeshwor Mandir during shivaratri and Purnima. There are also other many religious places like Kalika Mandir, Siddheshwor Mandir, Mahankal Mandir, Panchakanya Devi Mandir etc which have touristic significance.

Restaurant business is one of the booming businesses in Baireni area along highway. River top café, Hamlet Restaurant, Highway Fulbari Resort are some of the restaurants that provide good services to highway travelers and tourist vehicles but still good Hotels and Resorts are lack in Baireni-Galchhi new Town. Moreover, there is not any culture and tourism related Organizations. The active functioning culture and tourism related organizations if established can and will surely enhance the living condition of the people in the New Town Area.

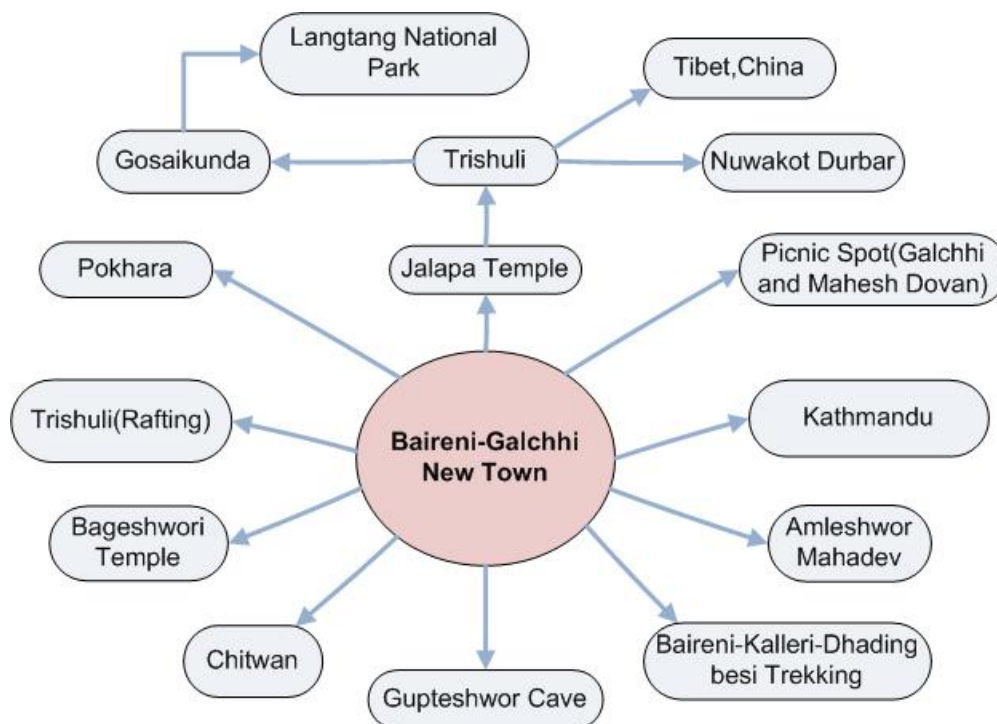


Figure 5: Regional & Local level Tourism Linkage of Baireni-Galchhi

4.6.7 Culture & Religion

Festivals

The major festivals of people in Baireni-Galchhi are Dashain, Tihar, Chath, Janaipurnima, Maghe Sankranti, and Buddha Jayanti.

Rituals

There are not any major changes perceived in the celebration of festivals and rituals in past and present times in the New Town.

Neither any investment nor works are made for strengthening the natural and culture heritage, nor there local skills of people at Baireni- Galchhi New town.

Religious Institutions

There are few Guthis established for the conservation of religious institutions. They have farmland as their financial resource. However, all of them are inactive in the present context.

Table 17: Description of Guthi at Baireni-Galchhi

S.N.	Name of Guthi	Present Status	Resource
1	Kalika Guthi	Inactive	Khet,Bari
2	Amleshwor Guthi	Inactive	Bari
3	Pashupati Nath Guthi	Inactive	Khet

Source: Field Study, 2015

4.7 ENVIRONMENTAL AND ECOLOGICAL STATUS

4.7.1 Forest

About 49% of total landcover in Baireni-Galchhi New town is covered by forest. There are different types of herbs like Amriso, Nigalo, Pauleniya, sisau, Bans, Khayer etc are found in the forest of New town. Animals like Rabbit, Deer etc. are the main habitants found over there.

Table 18: Community Forest in Baireni Galchhi

Name	Location	Area(Ha)	Households
Barahi	Kalleri-2	181.8	182
Kalikaasthan	Kalleri-3	419.5	267
Charaudi Nundheke	Baireni-7	14.25	75
Indrayeni	Baireni-7	103.6	68
Meghlade	Baireni-7	152.5	117
Thulodaanda	Baireni-8	16.06	63
Setikamari Mai	Baireni-8	54.88	43
Bageshwori	Baireni-8	47	95
Panchakanya	Baireni-8	28.45	55
Khalte Khola	Baireni-8	77.08	71
Thulachaur Raktakali	Baireni-8	47	21
Dhulechaur	Baireni-8	12.34	50
Machhedi Kalika	Baireni-8	86.6	84
Balkumari	Baireni-8	27.75	144
Jay Bageshwori	Baireni-9	21.18	22
Sutkeri Dhunga Deurali Daanda	Baireni-9	98.43	161
Jana Kalyan	Baireni-9	13.8	73
Bajhgaun	Baireni-9	21.72	27
Total		1423.94	

Source: DFO- Dhading, 2015

4.7.2 Air Pollution

Air pollution is not a threat in Baireni-Galchhi New town in the present context. There is no huge settlement developed within new town however natural events like forest fires, wind erosion sometimes may cause air pollution. Human activities, that results in air pollution like emissions from industries (Namaste Gas, Stone Crusher), smoke, vehicular smoke are the major cause of air pollution in Baireni-Galchhi. Air Pollution is more within the highway due to large number of vehicle movements (burning of fossil fuels) though it is not a big issue at present.

4.7.3 Water Pollution

Human health is directly and indirectly related to availability of quantity and quality of water, and also indicated the affluence and sanitation of any society. Water pollution is caused mainly during monsoon season due to the mixing of rain water and mud with drinking water at the source. There is no any water treatment plant. Water source (arteries) is directly consumed for drinking purposes. Discharge of waste water from restaurants and household alongside of the highway into river and streams is also other factor that causes water pollution in Baireni-Galchhi New Town. There is also degradation in water quality due to the washing of sand near Trishuli River.

4.7.4 Noise Pollution

Noise Pollution is mainly along the highway due to the movement of vehicles. Small scale industries like saw mill, rice mill, stone crusher, sand washing machine etc also produces noise, though it is not a big issue in present context. But with increase in urbanization, noise pollution may be a major problem in New town. Greenery along the roads, open spaces, policies for industry must be incorporated to reduce the noise pollution in the New Town.

4.7.5 Integrated Solid Waste Management System

Baireni youth club collects waste from household in tractor and dumps in Sutkeri dhunga, however, it is not well managed. Dumping waste in Sutkeri dhunga alongside of Prithivi highway has affected the aesthetic appearance of the highway as well as it can accumulate the diseases to surrounding settlements.

4.8 DISASTER STATUS

4.8.1 Landslide

Total of 78.27% of total land of Baireni-Galchhi new town has slope greater than 30%. So, the new town is vulnerable in terms of Landslides. Some of the areas like Jaljale, Sikharkateri, Mastar (Near Kalika PS) are mostly affected by landslides. Frequently landslides also occur in the areas of Kalleri-2 Jagire Bhanjyang to Balaute Khola Dovan and Sandhi Khola to Judi Khola. These landslides can be controlled by using Gabion wall and wires. Besides, other landslides occurring areas are Kalleri-2, Chamere Ratochaur, sourroundings of Fedi Chautaro Kholi Gharti Bari Kholi and near of Chuhe Aap Bot. Landslides due to sand extraction is found in Mashtar Kalika Road, Dhungentar Road which can be controlled by using Bio-Engineering Techniques.

4.8.2 Flood

Gardo Khola of Baireni-8 sometimes brings flood and big stones at Galchhi (Turning Area) causing huge damages in that area. The streams between Bhattachaur and Paderichaur also brings flood with sand, disrupt Prithivi Highway. There are many other areas in New Town which have potential

risk in terms of flood, landslide and erosion so necessary engineering and Bio-Engineering techniques should be applied in such Areas.

4.8.3 Earthquake

Natural Disaster like Earthquake may also be a threat to New Town. Most of the houses in NT is made of Mud and very less number of houses are made with Modern Engineering Techniques. As, Dhading District is one of the worst affected district in time of 7.8 earthquake that struck Nepal on 2072/1/12 and 2072/1/29 and its subsequent aftershocks, it has killed many peoples, livestock's and damage Buildings in Dhading District including NT.

Table 19: Destruction of Buildings

Ward	House Type	Full Destruction	Partial Destruction	Nomal Destruction	Approx. Destruction Amount(in Thousands)
Kalleri 2	Kachhi	497	4	0	77690
	Pakki	0	14	6	
Kalleri 3	Kachhi	553	11	0	96718
	Pakki	9	46	79	
Baireni 7	Kachhi	402	11	4	264366
	Pakki	16	9	55	
Baireni 8	Kachhi	625	71	121	328983
	Pakki	0	0	2	
Baireni 9	Kachhi	607	44	7	327121
	Pakki	0	1	7	

Table 20: Destruction of Livestocks

VDC / Ward	Deaths		Injured		Cattles				Approx. Destruction Amount ('000)
	Male	Female	Male	Female	Buffalo	Cow/ Ox	Goat/ Sheep	Pig	
Kalleri 2	0	0	0	2	3	4	33	0	435
Kalleri 3	0	0	1	0	5	6	75	20	979
Baireni 7	1	0	1	0	1	0	6	1	155
Baireni 8	0	0	0	0	0	4	1	0	358
Baireni 9	0	0	0	0	2	1	72	2	1856

Source: VDC, 2016

4.8.4 Man made Disaster – Road Accident, Fire Hazards etc.

Besides Natural Disaster and Geological Hazard, Road accident and fire are also Potential Disaster in New Town. There is, neither any traffic signs nor signals, Footpath, Zebra Crossing alongside of the Highway nor there any Fire Brigade within new town. Electric Transmission line is also not systematically managed. This might cause fire disasters.

4.9 LAND USE

Owing to the varied land structures, the land use pattern of the area is diverse. It is classified into forest, barren, cultivated, shrub, and built up areas. In the study area, conversion of the Cultivable land into built up is found to be accelerating due to population growth. Cultivated land is found to be extensively distributed in the Kalleri part whereas built up area is found alongside the Highway. Other parts of the area are covered by forest and Bushes land. Tar area in new town like Kalleritar, Ghartitar, syaltar, Daltar, Khantar, Mashtar, Mastar have gentle slope which are suitable for settlement development.

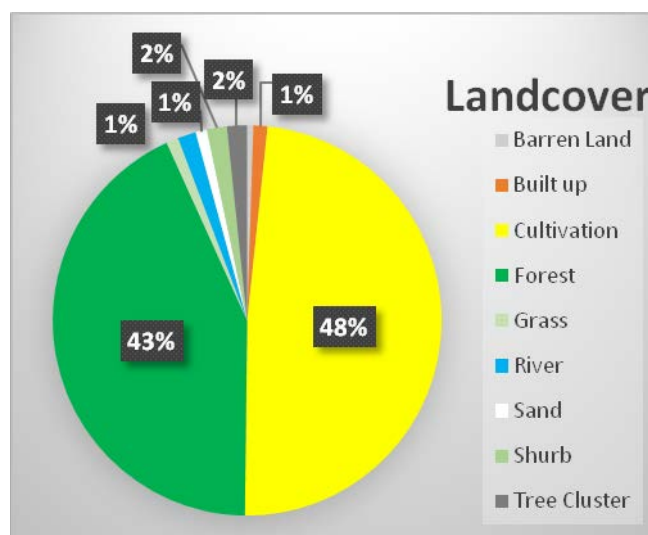


Figure 6: Land use Composition-Baireni, Galchhi

Land use pattern affect Development planning to large extent. Future development of Baireni-Galchhi New Town is largely depend on the present land use pattern. The land use distribution of Baireni-Galchhi New Town shows that nearly 49% of land is cultivated. Around 45% is covered with forest and water bodies. Around one tenth area is built up at present context. Due to present legislation and rules, forest can't be destroyed so as to provide settlement. Similarly, water bodies are also non-buildable area, i.e. can't be used for settlement development. Hence, only option that exists is built up area that can be used as the areas of cultivable land in future.

Table 21: Area of Land cover in Baireni-Galchhi

S.N.	Landcover	Area(Hec)	Percent
1	Barren Land	17.36	0.51
2	Built up	39.98	1.17
3	Cultivation	1661.73	48.52
4	Forest	1473.75	43.03
5	Grass	34.20	1.00
7	River	52.10	1.52
8	Sand	31.80	0.93
9	Shurb	56.68	1.66
10	Tree Cluster	57.17	1.67
	Total	3424.77	100.00

Source: Digital Base Map, 2014

4.10 URBANIZATION

There is rapid pace in urban development only along the highway of Baireni-Galchhi New Town. Baireni and Galchhi are developed as a market centre for surrounding settlements like Kalleritar, Ghartitar and the remote areas of Baireni. Most of the people from Kalleri, remote areas of Baireni and from neighbor VDC migrate to Bazar area for Business purpose. Because of all service center and infrastructure being centrally located alongside the highway, urbanization trend in Bazar area is

rapid but is in unbalanced condition as urbanization is concentrated mainly in Bazar areas. As a result, bazar areas are failing to cope the demand of infrastructure services and job opportunities, and are increasingly reeling under the externalities of the haphazard urbanization. Environmental degradation, congestion, squatter settlements, unemployment and lagging provision of infrastructure services have become increasingly visible phenomenon in the Bazar areas of Baireni-Galchhi New town. Immigration to emigration ratio of new town is 3. It means urbanization is going in rapid pace so further development of infrastructure in new town will accelerate the urbanization trend.

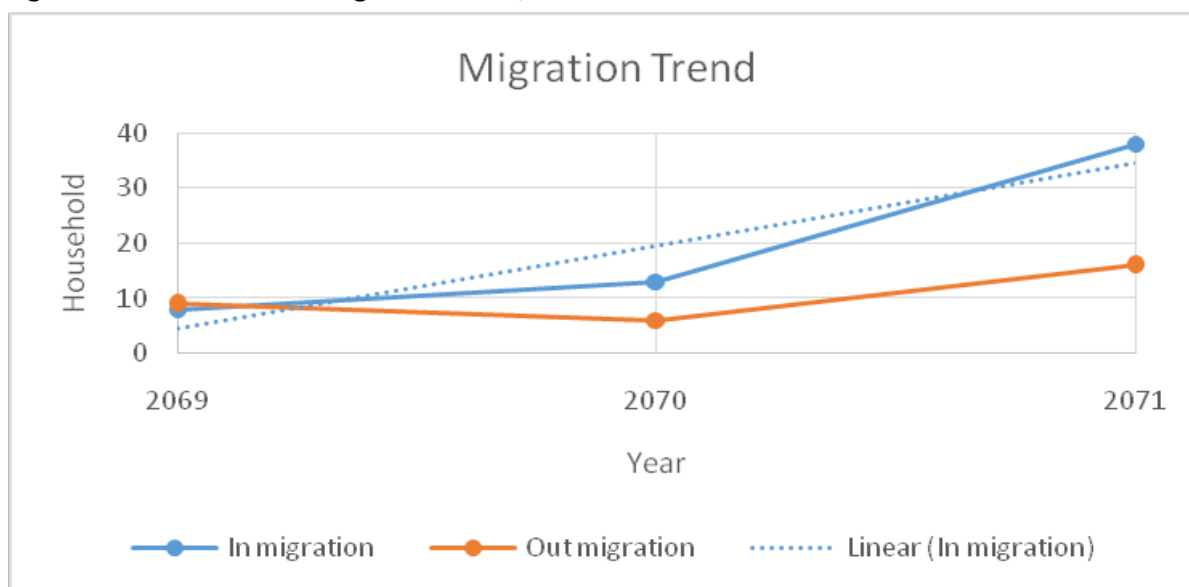
5 ANALYSIS

5.1 TREND ANALYSIS

5.1.1 Migration

Rapid pace of urban development seems only along the highway of Baireni-Galchhi New Town. Most of the people from Kalleri, remote areas of Baireni and from neighbor VDC migrate to Bazar area for Business purpose. Among total in-migration population, about 33.7% of household are migrated from Nuwakot, 25.5% from Bhumisthan VDC, 21% from Pida VDC, 12.8 % from Kiranchowk VDC in the year 2070 and 2071. Rest of the people migrated to Baireni from Thade, Thakre, Naubise, Tanahun, Goganpani and Makwanpur. Because of the availability of all service center and infrastructure being centrally located alongside of the highway, migration trend to Bazar area is rapid. The graph of migration trend below shows there is a high percentage of in migration comparative of out migration. In Migration rate is accelerated from the year 2070 to present days. The ratio of in migration to out migration of new town is found to be 3. It means urbanization in the study area is going in rapid pace. So, further development of infrastructure in new town will accelerate the in migration trend.

Figure 7: Household level Migration Trend, Baireni-Galchhi



Source: VDC Office, Vital Registration Section

5.1.2 Population Projection

The natural growth rate of the less compared to the national urban growth rate, so the projected population for the year 2030 is 17537 only. The new town is assumed to carry the population of one lakh within 20 years, so the pulling factors should be induced in the area for the increment of the growth rate.

Table 22: Population Projection-Baireni-Galchhi New Town

Ward	Population (CBS & VDC)			Growth Rate (%)	Present Year Population (2015)	Population Projection		
	2001	2011	2015			2020	2025	2030
2	1124	1226	1729	0.872	1269	1326	1385	1510
3	1471	1318	1752	-1.092	1365	1425	1488	1624
7	1866	2179	2606	1.563	2318	2505	2707	3161
8	2650	3381	4374	2.466	3727	4210	4755	6067
9	2160	2793	3520	2.603	3095	3520	4003	5175
Total	9271	10897	13981	1.629	11775	12986	14338	17537

5.2 GAP ANALYSIS

5.2.1 Infrastructure Development

Educational Institution

Education is the most vital base for the development of an individual, society, community, village town and consequently the whole country. From the study it is seen that the area is very much deprived from the basic requirements the local residents should get. The presence of very few numbers of schools shows the very poor condition of the education sector. The relevant fact that 50% of the students have to walk more than 2km for primary level education shows the harsh and panic conditions the small children are facing to get education. And this will definitely lead to many problems regarding their health, irregularity, punctuality and interest to join the school will definitely be a step behind. In this modern era, the era of technologies and services, it is the worst condition. So to improve the living way and easy life for small kids many schools with all the basic requirements must be built and run by the people having good educational background and good attitude towards the children, the future of our nation.

Similarly in the context of higher level education also, the few number of schools confined in the highways and the distance to be covered by the students, average of 4km living in the remote areas shows the very poor development in the education sector of this area. So, to raise the number of schools and the quality of schools with all the necessary physical infrastructures like water (taps), toilets, playground, library, lab is the immediate work to be done.

According to the physical condition of the area and as to be developed as a new town and the privilege of free basic education,(1-8) facility being provided by the government, the basic education hereby should also be made free and be provided with all the basic facilities required.

Whereas in the context of campus, the presence of very few campuses with limited faculties (education only) shows the need of gradual improvement in the education sector. To prevent the college level students from moving to big city like Kathmandu for further education, the colleges

with all the basic requirements should be established and run by the good management to produce the intellectual citizens.

For the development of employment capacity and skill, there should be technical institutes established.

As per Planning norms and standards, it is stated that there should be 1 primary school for 300 population within the distance of 0.4 to 0.8 km and 1 higher secondary school per 7500 population within a distance of 30 minutes by public vehicles. Similarly, there should be at least 1 Campus per 25000 population within a distance of 45 minutes by public vehicles and 1 University per 40,000 population should be within distance of 1 hour by Public Vehicles.

Baireni-Galchhi new town is expecting a population of 100000 within 20 years so, it will demands for about 34 primary schools, 13 higher secondary Schools, 4 Campus and 2 to 3 universities.

Table 23: Gap Analysis of Educational Institutions

Education Level	Number of Schools at Present	Required Number Within 20 years
Primary School	8	34
Higher Secondary	3	13
Bachelors	2	4
University	0	2-3

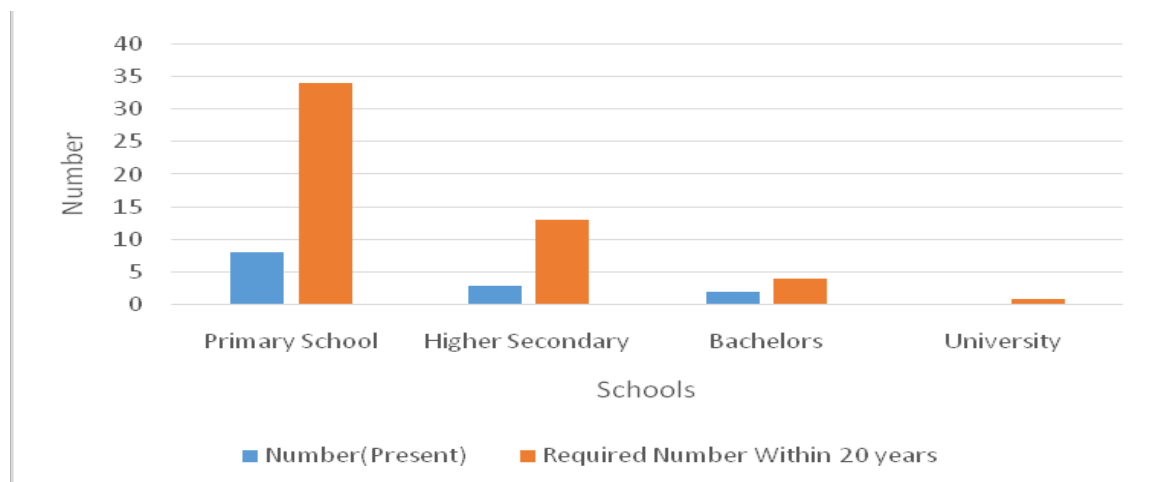


Figure 8: Gap Analysis of Educational Institutions, Baireni-Galchi

Health Institutions

As per Planning Norms, there should be 1 Primary Health Center (PHC) with 5-15 bed capacity per 20,000 population, and 1 district level hospital with 25-50 bed capacity. As, town is expecting population of 1, 00,000 within 20 years. So there must be at least 5 PHC and 2 Hospitals within the new town. Hospitals should be within easy access of people.

Water Supply

The statistical analysis shows total demand of water in the year 2015/20/25 and 2030 are 1.1, 1.2, 1.3 and 1.6 mld. i.e. water demand increased to a higher extent. Water source need to be identified and existing water source should be preserved. New water supply project should be launched by the concerned agencies for Baireni-Galchhi new town to meet the present and future demand of water.

Table 24: Water Deficit Analysis of Baireni-Galchhi

Water Deficit	2015	2020	2025	2030	Unit
	0.9	1.1	1.2	1.5	ml/d

Environment Management

In Khurkot, it is found that 47.2 % of household dump their waste in the river whereas rest do composting. 61.1% of inorganic wastes are burnt and remaining is thrown in the river.

Land for Sanitary land fill site has to be decided by concerned agencies. About 125 ropani will be required for sanitary land fill site where about 5475 MT solid waste per year for 10 years can be managed.

Community Services

For the New Town, according to the standards for a city, provisions a community level Library 1 per 10,000 population and Central Level Library 1 per 15,000 population is required. The present total population of Baireni Galchhi New town is 13981 (Source: Details Study of Earthquake destruction 2072/1/12) and that of Khurkot is 2298. This statistics shows there is need of a community level library in present context in Baireni Galchhi New Town. The expected total population of both the new towns within 20 years is 100000 so there will be demand of 10 community level libraries and 7 central level libraries in the New Town.

5.3 SWOT ANALYSIS

Strength

The new town Baireni Galchhi has ease in accessibility which passes through stretch of Prithivi highway (10.8 k.m). The district headquarters of Dhading and Nuwakot lie within 20 to 30 km range. Besides, it has Motorable Road with 67.7 K.m.long. Transportation is made easier through Galchhi-Trishuli-Syafubesi-Rasuwegadhi road network.

It has Tar land which can be developed for urban development purpose within Short-term and Mid-term period. Mastar, Jinttar, Padarichaur, Daltar Khnatar, Serafaat, Dhartitar, kalleritar, Suntar, Mastar, Dharenitar, Syaltar etc. are various tar land available in the NT areas.

Public land is comparatively more in this area.

Besides, Social infrastructures like Multiple campus, six bedded Galchi Hospital, Football ground of Jana kalyan higher secondary school are available in the area. Active participation of Non – government organization is also found there.

In agriculture sector, potential of commercial vegetable farming (forest area and grazing area), dairy production and cold storage is found in the study area. Besides, availability of sand mine, Remittance, Trishuli River, Forest and healthy Environment are the potential factors of the study area.

Opportunity

Baireni Galchi new town project concept is one of the ten new town development project as proposed by Nepal Government.

The road stretch, Galchhi- Trishuli- Syafrubesi-Rasuwegadhi, in Kerung Border is in the state of being made into four lanes. Since it is situated along Highway, it possesses development opportunities.

Educational opportunities like CTEVT, Agricultural opportunities like agriculture processing, wood and industrial development, commercial vegetable farming and livestock, Housing Industry, stone mines (especially quartz mineral) are opportunities of the study area.

Besides, source of investment for urban infrastructure development and various efforts made for planned settlement development are opportunities of the study area.

Weakness

The various factors like deficit of public transportation, Absence of Motorable Bridge in Kalleri VDC, Jurisdiction of source utilization, development of limited urban infrastructure, and dependency on others for urban infrastructure development are the weak factors that hinder the development of the Baireni –Galchi new town.

Threat

The various factors found in the study area like landslide, soil erosion, solid waste management issue, lack of urban expansion areas, land and water pollution, sufficient integrated water supply to cope demand of population of newtown, brain-drain threatens the development of baireni-Galchi newtown project.

5.4 SPATIAL ANALYSIS

5.4.1 Land suitability Analysis

The land with high percent slope is extensively more in overall town. 86% area of ward 8 of Baireni has slope greater than 30% .Similarly, 38% area of ward 2 of Kalleri has slope less than 30% showing ward 2 has more flat areas in comparison to rest of other wards of Baireni. In order to prevent geological hazard, slope less than 30 % i.e only 21.73 % of total area can be used for urban expansion.

Table 25: Wardwise Slope and its area for Baireni-Galchhi

Slope (%)	Area (Hec)					Grand Total	Percent
	W-2	W-3	W-7	W-8	W-9		
<2	3.57	1.07	2.37	1.61	5.29	13.90	0.41%
2–5	15.58	2.86	7.54	3.47	11.51	40.97	1.20%
5–10	35.55	6.56	30.30	9.40	24.79	106.60	3.11%
10–15	27.80	10.20	26.86	21.31	30.44	116.63	3.41%
15–30	76.97	57.97	110.57	105.43	115.18	466.13	13.61%
30–45	65.29	109.72	181.96	210.87	179.98	747.81	21.84%
>45	192.57	277.59	458.41	663.82	340.34	1932.74	56.43%
Grand Total	417.32	465.98	818.02	1015.92	707.54	3424.77	100.00%
Slope Greater than 30%	62%	83%	78%	86%	74%	78%	
Slope Less than 30%	38%	17%	22%	14%	26%	22%	

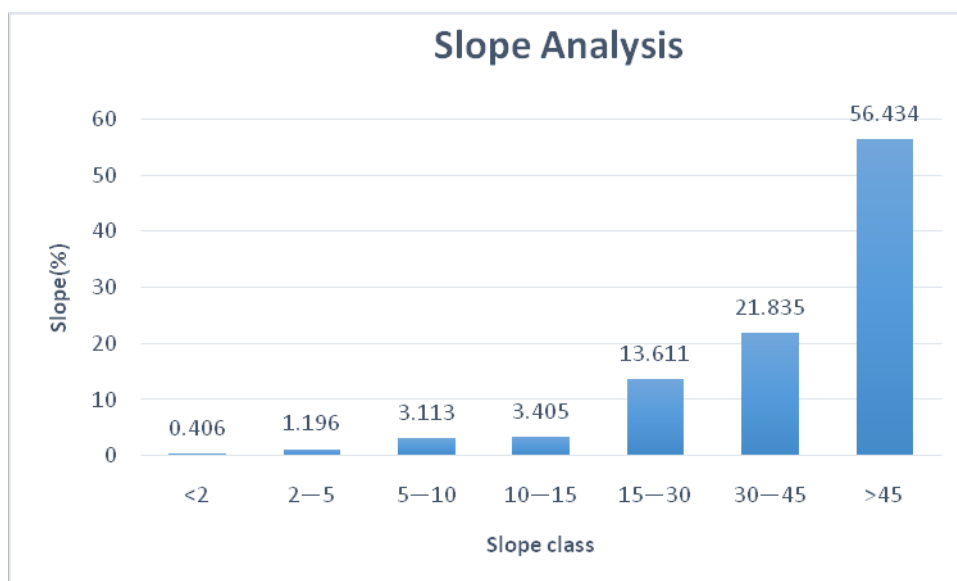


Figure 9: Percent of slope and availability of land

Table 26: Settlementwise available developable land and their potential use

S.N.	Settlement	Area(Hec)	Ward	Potential use
1	Mashtar	71.032	Baireni-7	Residential+Commercial
2	Ghartitar	42.453	Kalleri-2	Agriculture
3	Khantar	39.409	Baireni-8	Residential
4	Mahesh Fant,Kusan Danda	39.370	Baireni-9	Residential
5	Kalleritar	37.759	Kalleri-2	Agriculture
6	Mastar and Kyorinitar	26.827	Kalleri-3	Residential
7	Baireni Bazar	23.567	Baireni-9	Commercial
8	Suntar	17.208	Kalleri-2	Residential
9	Paderi Chaur	16.084	Baireni-9	Residential
10	Syaltar	13.973	Kalleri-3	Residential
11	Machhedi	13.700	Baireni-8	Residential
12	Dumrichaur	12.689	Kalleri-3	Residential
13	Galchhi bazar	11.428	Baireni-8	Commercial
14	Palang	11.060	Baireni-8	Residential
15	Jinthetar	9.249	Baireni-9	Residential
16	Gairigaun	8.299	Kalleri-2	Residential
17	Bandre	5.320	Baireni-8	Residential
18	Fostar	5.310	Baireni-8	Residential
19	Daltar	3.735	Baireni-8	Residential
20	Batase	1.948	Kalleri-3	Residential

6 LONG TERM DEVELOPMENT PLAN OF TOWN

6.1 VISION OF THE TOWN

*व्यापार, पर्यटन र शिक्षाको विस्तार ।
समृद्ध र आधुनिक शहरको आधार ॥*

Targetted population in Baireni-Galchhi can be achieved only through the extension of possible economic sectors viz. business, tourism and education. These potential economic sectors are the main basis for the prosperous and modern town.

6.2 GOALS & OBJECTIVES

To develop a well connected town with efficient distribution of infrastructure and services thereby providing opportunities to all.

6.3 LEAD SECTORS

1. Trade

Baireni-Galchhi is a potential center for agriculture, commercial market, and agro-based cottage industries. It is a supply market of green vegetables to Kathmandu. The market center is transforming day by day into big market. It is developing as a wholesale market to the area north of it. Industrial goods are imported from different parts of country like Kathmandu, Birgunj, and Butwal and even from India. These market products are supplied to the north through Galchhi-Nuwakot-Rasuwa Road as Galchhi is the main gateway to Nuwakot and Rasuwa. Goods, after being directly imported from Kathmandu and India, are retailed in the surroundings. Vegetables, sand, stones are directly supplied to Kathmandu whereas Goods like pipes, iron rods, galvanized sheets, chemical fertilizers, food crops etc are supplied to Nuwakot and Rasuwa. Linkage of trade and services with hinterland is mainly based on exchange of agricultural products from surroundings to Baireni bazar and urban services from Baireni bazar to surroundings. Sand washing center, Saw mill, small scale block industry, milk dairy, petrol pumps, hotels and lodges, grocery and tea shops are major business trade established in Baireni-Galchhi New town and schools, colleges, Galchhi hospital, health post, veterinary office, police station, Army Barrack, post office, banks, co-operatives, NGOs, clubs are the major service affiliated institutions in New town.

The Prithivi highway and Galchhi-Nuwakot-Rasuwa road are the main road linkage for trade and services in Baireni-Galchhi new town which has made a very strong economic linkage with southern part as well as northern part of the country. A proposed two lane road of Galchhi-Nuwakot-Rasuwa-Kerung Road within 2 year will further lead to agglomeration of whole sale market in new town and will also establish better trade with China resulting into economic linkage to whole country. This border has already been opened by China for trade with Nepal in January 2012. From Mahendra Highway, it is the shortest road to the China and new town can act as mediator of trade between China and India. This feeder road linked new town not only by road but by trade and business.

Linkage of area to Kathmandu through Goganpani-Dwepipal-Sitapaila (Kathmandu) and Dhading Besi, an administration center of Dhading district through Khate will make area richer in road linkage. Beside these strategic roads, project area is linked to its hinterland by earthen roads.

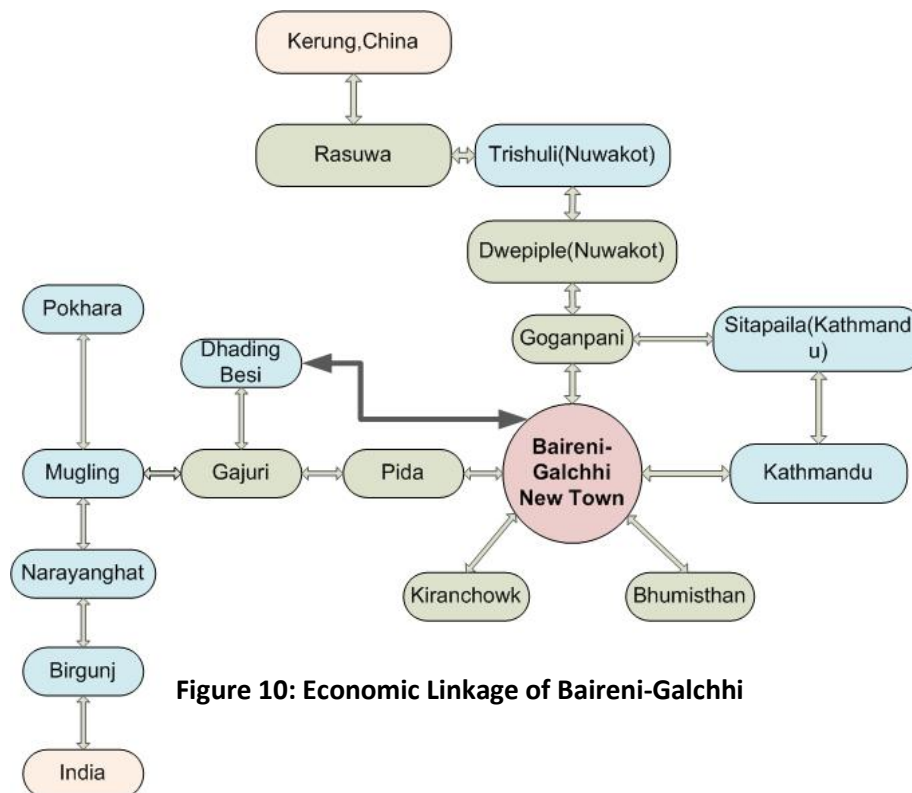


Figure 10: Economic Linkage of Baireni-Galchhi

2. Tourism

Baireni-Galchhi New town has a huge potential for the tourism development. Rafting in Trishuli River would be the main attraction of Baireni-Galchhi new town. Besides adventurous tourism, it has a high potential for religious tourism. About 12-13 thousands of people from Nuwakot, Pida, Kalleri, Baireni visit Amleshwor Mahadev Temple during Kartik Purnima and about 1000-1200 peoples from Kalleri, Baireni, Nuwakot, visit to Changeshwor Mandir during shivaratri and Purnima. There are also other many religious places like Kalika Mandir, Siddheshwor Mandir, Mahankal Mandir, Panchakanya Devi Mandir etc which have touristic significance.

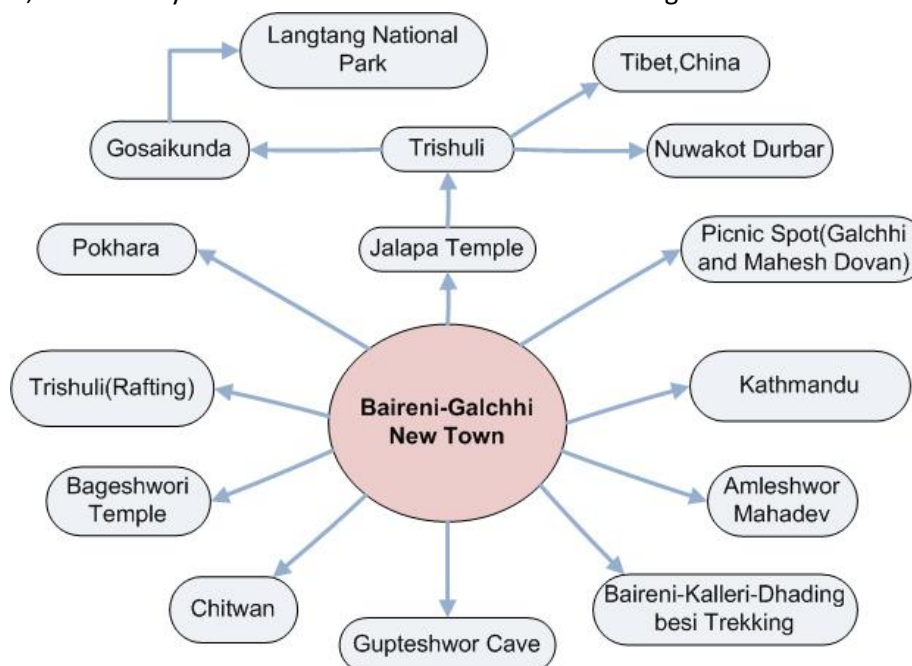


Figure 11: Tourism Potential Areas via Baireni-Galchhi

3. Education

Dependency of other adjacent VDCs on Baireni-Galchhi for the education shows high potentiality for the educational infrastructure development in the town. Besides, proper linkage and access with them will further enhance the sustainability of the educational institute. Moreover to achieve the target population in the new town, the retaining factor as well as the pull factor should be introduced and the educational infrastructure could be one of the elements.

6.4 PLANS & PROGRAMS

6.4.1 Long – term Physical Development Plan

Settlement Development

For the ease in infrastructure development, the concept of compact settlement development would be appropriate for the new town. Due to limitation in availability of buildable land area in low land, the settlement expansion should be focused on the uplands, like in the traditional Newari Settlement of Kathmandu Valley. The land along the highway is proposed for the commercial use however, the commercial activities along the whole Highway stretch is discouraged as it might interrupt the character of express way.

The targeted population for the next 20 years in the new towns is 1 lakh. The topographical analysis for the new town shows the carrying capacity of Galchhi and Khurkot to be 61562 and 43454 respectively with population density 150 ppha. The phase wise development in the new town is proposed as below:

Table 27: Phasewise Settlement Development & Carrying Capacity (Baireni-Galchhi)

Phase	Settlement	Available Area (Ha)	Carrying Capacity
I	Mashtar, Baireni Bazar, Galchhi Bazar	106.03	15904
II	Maheshphant, Kusandaanda, Mastar, Kyorinitar, Paderi Chaur, Syaltar, Jinthetar	105.5	15826
III	Ghartitar, Kalleritar, Suntar, Dumrichaur, Gairigaun, Batase	120.36	18053
IV	Khantar, Machhedi, Palang, Bandre, Fostar, Daltar	78.54	11779
	Total	410.43	61562

Since the compact settlement is proposed in the area, mixed land use is preferred within the settlement. However, specific zones are proposed in new towns with dominant use as shown in the table below: (Refer map)

Table 28: Proposed Zoning (Baireni-Galchhi)

Zone	Dominant Use	Settlement	Proposed Density (ppha)
A1	Commercial	Galchhi Bazar, Khantar	200
A2	Institutional and Commercial	Baireni Bazar, Bahunpalang, Jinthetar, Mastar, Kyronitar	200
B	Residential	Mashtar, Beltar, Belkhu, Sandhi, Fedi Chautara	300
C	Agriculture	Padhero, Bhotepalang, Machhedikhola gaun, Thade, Kirtichaap, Machhedi, Daltar, Fostar, Padhero, Palangkharka, Bandre	100
D	Residential	Syaltar, Ghartitar, Kalleritar	300
E	Low Dense Settlement	Suntar, Batase, Dumrichaur, Hadikhologaun, Chiuri thumka, Aduwabari, Chihankharka, Jyamire Chaur, Simale, Rahudanda, Kusan Danda, Palangkharka, Bandre	100
F	Army Barrack	-	

Road & Transportation

Every settlement should be well connected with the urban services through the road network. Besides, the linkage with other nearby settlements is also necessary for the development of New Town. So to provide motorable roads to every household, on the basis of field survey, discussion with Physical Development Sub-Committee different Roads of class A and B are finalized and its detail description are shown below:

Table 29: Proposed Road Category in Baireni - Galchhi

SN	Road Name	Nodal Point	Class	ROW
1	Kheste-Kageshwori Road	Kheste	A	30
2	Chisapani-Bahunpalang-Palchowk Road	Baireni	A	30
3	Sutkeri Dhunga-Rahu Danda-Karki Danda-Rayele Road	Sutkeri Dhunga	A	30
4	Mashtar-Ranakalika-Chiraudi Bhanjyang Road	Mashtar	A	30
5	Kalleritar-Ratochaur-Suntar Maidan Road	Judi Khola Dovan	A	30
6	Kalleri-6,Belinitar to Kalleri-1,Fostar Road	Keurenitar	A	30
7	Thade sole-Bhate to Machhedi Gaun Road	Near Thade	B	20
8	Padhere to Tallo Gaun Road	Near Baies Killa Bhote palang	B	20
9	Machhedi Khola-Suwara Ghimire-Thumka Road	Machhedi Khola	B	20
10	Baies Killa-Fostar-Bhotepalang Road	Baies Killa	B	20
11	Daltar-Khantar-Bhalukhop-Banjhgau Road	Galchhi	B	20
12	Fedi Chautara-Sandhi Khola-Chari amile-Ratmate Road	Fedi Chautara(about 1km from Mashtar)	B	20
13	Shree no. 6 Bahini Addako Gate to Amleshwor Mahadev Mandir	Mahesh Dovan	B	20
14	Padaari Chaur-Kusum danda to Rahu danda Road	Near Paderi Chaur	B	20
15	Ghartitar Bhanjyang Janghare-Batase-Chiuri thumka-Handi Khola Road	Judi Khola Dovan	B	20
16	Janghare-Diuni pokhari-Suntar Maidan Road	Janghare	B	20
17	Machhedi Khola(Baireni)-Valtar-Baies Killa-Daltar-Bageshwori-Dudegaira-Padari chaur-Mahesh Fant-Majhi Khetl-Chiraudi Khola-Mashtar-Belkhu Khola to Dhairenitar(Kalleri)-Mastar-Syaltar-Ghartitar-Kalleritar-Gagate to Kalleritar-Ghartitar-Goganpani-1,Galchhi-Valtar-Machhedi Khola Ring Road	Machhedi Khola	A	30

The transportation network should be developed along with land development process. In Baireni-Galchhi New Town, ring road along the possible settlement developable area is proposed as urban-rural boundary delineation. Since two Highways meet at the New Town, both regional and local level bus parks are required in the town. Regional level bus park is proposed in Daltar, Khantar and the feasibility study is also in the progress. While the bus bays are proposed near to the settlements.

6.4.2 Social Development Plan

Being near to the capital city and district headquarter and because of the unavailability of services and facilities, most of the working age groups are out migrated for higher education and health services. Hence in order to retain the population in the area, basic facilities of education and health should be available within the town. Private investments on the health and education should be encouraged. Besides, integrated community building with resource centre and training hall should be established so that different trainings focusing women, children, disadvantaged groups can be organized and the regional level conference can also be organized.

Education Development Plan

As per Planning norms and standards, it is stated that there should be 1 primary school for 300 population within the distance of 0.4 to 0.8 km and 1 higher secondary school per 7500 population within a distance of 30 minutes by public vehicles. Similarly, there should be at least 1 Campus per 25000 population within a distance of 45 minutes by public vehicles and 1 University per 40,000 population should be within distance of 1 hour by Public Vehicles.

Baireni-Galchhi new town is expecting a population of 100000 within 20 years so, it will demand for about 34 primary schools, 13 higher secondary Schools, and 4 Campus and 2 to 3 universities.

Table 30: Logical plan for educational progress and development

Plan	Indicator	Verification Base	Hindering Aspects
Objective 1:			
To provide facilities of education to all the people residing and improve the quality of education			
Result:			
i) Increase in literacy rate	<p><u>Baireni-Galchi</u></p> <ul style="list-style-type: none"> • Present literacy rate (73.70% male and 59.85% female) will be increased to 100% <p><u>Kalleri</u></p> <ul style="list-style-type: none"> • Present literacy rate (70.39% male and 58.84% female) will be increased to 100% 	<ul style="list-style-type: none"> • D.E.O report • DDC information centre • NGOs report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
ii) Increase in old literacy rate due	<ul style="list-style-type: none"> • Establishment and start of Adult literacy Class in each and every ward 	<ul style="list-style-type: none"> • D.E.O report • DDC information centre • NGOs report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
iii) Retain of working age groups	<ul style="list-style-type: none"> • Establishment of good and facilitated school and colleges within easy accessibility 	<ul style="list-style-type: none"> • D.E.O report • DDC information centre • NGOs report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
iv) Decrease in variation of male female educational attainment	<ul style="list-style-type: none"> • Increased female literacy rate 	<ul style="list-style-type: none"> • D.E.O report • DDC information centre • NGOs report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
v) Special	<ul style="list-style-type: none"> • Certain budgets allocated for 	<ul style="list-style-type: none"> • D.E.O report 	<ul style="list-style-type: none"> • Political

scholarships provided for women, poor and disadvantaged groups	providing scholarships to poor, disadvantaged group and women	<ul style="list-style-type: none"> • DDC information centre • NGOs report 	<ul style="list-style-type: none"> • instability • Support from gov.agencies
vi) Regulation of informal primary classes in each and every area.	<ul style="list-style-type: none"> • Regulation of number of informal primary classes according to the population density and participation ratio in each area 	<ul style="list-style-type: none"> • D.E.O report • DDC information centre • NGOs report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
	<ul style="list-style-type: none"> • Number of qualitative educational institutions established 	<ul style="list-style-type: none"> • D.E.O report • DDC information centre • NGOs report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
Ojective no.2:			
Raise in number of qualitative educational institutions			
Result			
i) Educational institutions with basic facilities will be established	<ul style="list-style-type: none"> • No. of educstional institutions will be increased • Arrangement of libraries and IT based learning activities and facility of technical education as well. 	<ul style="list-style-type: none"> • D.E.O report • DDC information centre • NGOs report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
ii) All the teachers will be trained	<ul style="list-style-type: none"> • Arrangement of training for all the teachers • Develop a provision of recruiting only trained teachers for qualitative education 	<ul style="list-style-type: none"> • D.E.O report • DDC information centre • NGOs report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies

Dependency of other adjacent VDCs on Baireni-Galchhi for the education shows high potentiality for the educational infrastructure development in the town. Besides, proper linkage and access with them will further enhance the sustainability of the educational institute. Furthermore, the unavailability of services and facilities has compelled the determining youth to move towards capital city for better opportunities. Hence, in order to retain the youth, private investments on education should be encouraged which will definitely improve the educational as well as existing situation of the New Town Area.

Table 31: Health Reforms and Development Plan

Plan	Indicator	Verification Base	Hindering Aspects
Objective 1:			
To improve health condition of the local people by providing regular and qualitative health service.			
Result:			
i) Hospitals and health centres with all the facilities will be established	<ul style="list-style-type: none"> Establishment of Primary Health Centre with 5-15 bed capacity and District level hospital with 25-50 bed capacity 	<ul style="list-style-type: none"> D.H.O report DDC information centre NGOs report 	<ul style="list-style-type: none"> Political unstability Support from gov.agencies
ii) Clinics, Medical Stores and Health post will be in easy access	<ul style="list-style-type: none"> Health facilities will be in reach of all the local people within the half an hour distance 	<ul style="list-style-type: none"> D.H.O report DDC information centre NGOs report 	<ul style="list-style-type: none"> Political unstability Support from gov.agencies
iii) Health Service of infant and mother will be increased	<ul style="list-style-type: none"> Decreased mother death rate, infant mortality rate, increase in average living age Decrease in occurrence of general diseases 	<ul style="list-style-type: none"> D.H.O report DDC information centre NGOs report 	<ul style="list-style-type: none"> Political unstability Support from gov.agencies
iv) Awareness about long-term diseases and treatment	<ul style="list-style-type: none"> Regulation of awareness programs related to diseases like asthma, diabetes, T.V, Cancer, Polio, Rheumatism, AIDS in regular basis 	<ul style="list-style-type: none"> D.H.O report DDC information centre NGOs report 	<ul style="list-style-type: none"> Political unstability Support from gov.agencies
v) Awareness about importance of vaccination	<ul style="list-style-type: none"> Regulation of vaccination programs time and again 	<ul style="list-style-type: none"> D.H.O report DDC information centre NGOs report 	<ul style="list-style-type: none"> Political unstability Support from govt. agencies

Table 32: Security Development Plan

Plan	Indicator	Verification Base	Hindering Aspects
Objective 1:			
To develop the condition to live respectfully in the context of Old Age People, Disabled and Helpless people of the society			
Result:			
i) Old age people will be facilitated with easy health facilities along with economic security as well.	<ul style="list-style-type: none"> • The service related to Old Age People, Disabled and Helpless people will be added • All the old aged people will be provided basic health treatments 	<ul style="list-style-type: none"> • V.D.C report • DDC information centre 	<ul style="list-style-type: none"> • Political unstability • Support from gov.agencies
ii. Old aged people will have easy life	<ul style="list-style-type: none"> • With the provision of identity card, old aged people will be provided free health as well as transport facilities 	<ul style="list-style-type: none"> • V.D.C report • DDC information centre 	<ul style="list-style-type: none"> • Political unstability • Support from gov.agencies
iii) Differently able people will be provided skillful trainings and opportunity to related jobs and social respect	<ul style="list-style-type: none"> • Regulation of special educative program for differently able people • With the provision of identity card, differently able people will be provided free health as well as transport facilities 	<ul style="list-style-type: none"> • V.D.C report • DDC information centre 	<ul style="list-style-type: none"> • Political unstability • Support from gov.agencies
iv) Assurance of Social Security to all the general people	<ul style="list-style-type: none"> • Continuation of consideration as safe and secure place 	<ul style="list-style-type: none"> • V.D.C report • DDC information centre • NGOs report 	<ul style="list-style-type: none"> • Political unstability • Support from gov.agencies

Table 33: Social Inclusion Plan and Program

Plan	Indicator	Verification Base	Hindering Aspects
Objective 1:			
To involve marginalized group in each and every development plan			
Result:			
i) Provision of social inclusion in the development program.	<ul style="list-style-type: none"> Establishment of User group with certain percentage of women, ethnic group and marginalized group All the old aged people will be provided basic health treatments 	<ul style="list-style-type: none"> V.D.C report DDC information centre 	<ul style="list-style-type: none"> Political unstability Support from gov.agencies
ii. Increase educational attainment in dalits	<ul style="list-style-type: none"> Special scholarship arrangements for dalits and marginalized people 	<ul style="list-style-type: none"> V.D.C report DDC information centre 	<ul style="list-style-type: none"> Political unstability Support from gov.agencies
iii. Increase in women's involvement in development program and job placement with equality	<ul style="list-style-type: none"> Both male and female will have same wage Increase in budget related to women and child development 	<ul style="list-style-type: none"> V.D.C report DDC information centre 	<ul style="list-style-type: none"> Political unstability Support from gov.agencies

6.4.3 Cultural and Tourism Development Plan

The new town has lots of potential potential for the tourism development in different sectors like religious, adventurous, agro-tourism etc.

Table 34: Cultural development plan

Plan	Indicator	Verification Base	Hindering Aspects
Objective 1:			
To promote and conserve the cultures and rituals of the new town area			
Result:			
Preservation of specific cultures and rituals of the area.	<ul style="list-style-type: none"> Involvement of youth in cultural development and different traditional festivals Construction, Conservation and reconstruction of the religious temples <p>Baireni-Galchhi:</p> <ul style="list-style-type: none"> Construction of cremation areas in, Ward no. 1 beneath present buspark, Ward no. 2 Thulo Khahare, Ward no. 5 Laukun. 	<ul style="list-style-type: none"> D.D.P report DDC information centre Report on Cultural development 	<ul style="list-style-type: none"> Political unstability Support from gov.as well as non.gov.agencies

Table 35: Tourism development plan

Plan	Indicator	Verification Base	Hindering Aspects
Objective 1:			
To establish and promote tourism as a leading business developing all the related infrastructures and improve the area as tourism centre thus increasing economic activity.			
Result:			
Development of tourism industry with all the basic infrastructures and manpower related to tourism.	<ul style="list-style-type: none"> • Involvement of youth in tourism sector generating economic stability. • Establishment of Hotels, Lodge and Resorts according to the national norms • Establishment of organized restaurants, cafes <p>Baireni-Galchhi:</p> <ul style="list-style-type: none"> • Restart of rafting in Trishuli river with Maheshdovan as starting place. • Fulfillment of all the basic facilities in picnic spot of Galchhi 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • Report on tourism 	<ul style="list-style-type: none"> • Political unstability • Support from gov. as well as non.gov.agencies

6.4.4 Economic Development Plan

Business

Different hierarchial business centres should be established in the new town. Being located on the highway hub and being on the route to Nepal-China trade route (to be), regional level business centre should be established. Hence Integrated Urban Service Centre (Shopping Mall, Theatre etc) is proposed at Galchhi. Besides, the adjacent VDCs have sufficient agriculture products collected at Galchhi. So, the agriculture collection centre is proposed for the collection, storage and distribution of the products as well as the agriculture information centre is also proposed so that the brokers could not fix the rate as per their wish.

Table 36: Logical plan for economical progress and development

Plan	Indicator	Verification Base	Hindering Aspects
Objective 1:			
To recognize local skills, resource and job opportunities to increase the economic condition of the local people			
Result:			
i) Local skills and resources along with job opportunities will be identified	<p><u>Baireni-Galchi</u></p> <ul style="list-style-type: none"> • Studies carried out for the recognition of employment opportunities and studies related to possibility of specific production of each ward <p><u>Kalleri</u></p> <ul style="list-style-type: none"> • Studies carried out for the recognition of employment opportunities and studies related to possibility of specific production of each ward 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • D.A.O. report 	<ul style="list-style-type: none"> • Political unstability • Support from gov.agencies
ii) Increase in self-employment and small scale industry	<ul style="list-style-type: none"> • Regulation of small scale industry related to agricultural production 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • D.A.O. report 	<ul style="list-style-type: none"> • Political unstability • Support from gov.agencies
iii) Modernization in agricultural sector and increase in market-oriented production	<ul style="list-style-type: none"> • Facility of trainings related to modern technique of agriculture along with initiation for regular production of cash crops , vegetables and live stocks 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • D.A.O. report 	<ul style="list-style-type: none"> • Political unstability • Support from gov.agencies
iv) Increase in rural as well as eco tourism	<ul style="list-style-type: none"> • Involvement of youth in tourism sector generating economic stability. 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • D.A.O. report • Report on tourism 	<ul style="list-style-type: none"> • Political unstability • Support from gov. as well as non.gov.agencies

Agriculture

Communal farming should be promoted for the commercialization in the agriculture sector. Different Pocket areas for the agriculture should be defined. Training programs should be organized through District Agriculture Office for the non-seasonal and cash-crops products. Most of the flat land at Kalleri is still being used for the massive agriculture, so it would not be appropriate immediately to convert the use of the land. For that land pooling could be used for the preservation of the agriculture land. Besides the concept of Transfer of Development Right can be introduced for the preservation of agriculture land.

Table 37: Logical plan for agricultural development and marketing

Plan	Indicator	Verification Base	Hindering Aspects
Objective 1:			
To increase agricultural as well as livestock productivity and organized market enhancing the economic condition of the local farmers			
Result:			
i) Increase in agricultural as well as livestock productivity and availability of market enhancing the income of the local farmers	<ul style="list-style-type: none"> • Availability of technicians, fertilizer, seed, irrigation and related facilities like easy loan increasing the living standard and economic condition of the local farmers • Availability of technicians, fertilizer, seed, irrigation and related facilities like easy loan increasing the living standard and economic condition of the local farmers • Promote cultivation of Sajiwun in the area above Ward 2,3 of Kalleri for bio-fuel 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • D.A.O. report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
ii) Facilitation of agriculture service centre and seed storage centre	<ul style="list-style-type: none"> • Establishment of agriculture service centre • In Baireni-9, Jintetar • ii) Seed Storage center in Baireni-9 Bhattatar 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • D.A.O. report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
iii) Increase in pocket areas leading to increase in agriculture production	<ul style="list-style-type: none"> • Increased pocket areas for food crops (maize, rice), tropical fruits, vegetables and silk worm farming 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • D.A.O. report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies

iv) Increase in irrigation facility	<ul style="list-style-type: none"> Establishment of irrigation projects thus increasing production 	<ul style="list-style-type: none"> D.D.P report DDC information centre D.A.O. report 	<ul style="list-style-type: none"> Political instability Support from gov.agencies <ul style="list-style-type: none"> Hilly topography
v) Increase in livestock farming and its proper management	<ul style="list-style-type: none"> Provision of easy loan for live stock farming due to easy access to market i.e. Kathmandu Establishment of slaughter house in Baireni-9 Mahesh Phant 	<ul style="list-style-type: none"> D.D.P report DDC information centre D.A.O. report 	<ul style="list-style-type: none"> Political instability Support from gov.agencies as well as non-gov.agencies
vi) Promotion of Diary industry	<ul style="list-style-type: none"> Establishment of Large Scale Diary Industry in Galchhi, Vultar, Ghartitar, Suntar Establishment of Refrigeration store in Baireni-8 Daltar 	<ul style="list-style-type: none"> D.D.P report DDC information centre D.A.O. report 	<ul style="list-style-type: none"> Political instability Support from gov.agencies as well as non-gov.agencies

Industry

Due to topography, large scale industries are not feasible in the new town. Industrial village is proposed in order to attract the privates to establish small scale industries there. Agricultural processing industries should be established in order to provide employment to the locals.

Table 38: Logical plan for industrial progress and development

Plan	Indicator	Verification Base	Hindering Aspects
Objective 1:			
To establish and promote both small as well as large scale industries mainly focusing on the available resources			
Result:			
i) Establishment and promotion of small as well as large scale industries using natural raw material.	<p><u>Baireni-Galchhi</u></p> <ul style="list-style-type: none"> Promotion of construction material industries with the strict provision of tax payment to government for using natural resources and increased gov.income which will be utilized for the development of local people. 	<ul style="list-style-type: none"> D.D.P report DDC information centre Small Local Industries Development Committee 	<ul style="list-style-type: none"> Political instability Support from gov.agencies

<p>ii) Increase in self-employment and small scale industry</p>	<p><u>Baireni-Galchhi</u></p> <ul style="list-style-type: none"> • Regulation of small scale industry related to agricultural production • Establishment of grinding industry in Baireni 7,8 • Establishment of Wood cutting and Furniture Industry in Mashtar, Galchhi, Kalleritar 3,5, Suntar • Establishment of Traditional Metal Industry (Aaran) in Dumrichaur, Bhaltar, Maheshdovan • Establishment of Sewing and Knitting industry in Dumrichaur, Suntar, Aduwabari, Raudanda, Bodra, Wajha Gaun 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • D.A.O. report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
<p>iii) Modernization in agricultural sector and increase in market-oriented production</p>	<ul style="list-style-type: none"> • Facility of trainings related to modern technique of agriculture along with initiation for regular production of cash crops , vegetables and live stocks in both areas. 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • D.A.O. report 	<ul style="list-style-type: none"> • Political instability • Support from gov.agencies
<p>iv) Proper utilization of forest product and increase in economy</p>	<p><u>Baireni-Galchhi</u></p> <ul style="list-style-type: none"> • Establishment of resin(Salla) collection centre in Kalleri-3, Batase and Baireni market centre • Establishment of research centre of medicinal herbs in Gintetar • Establishment of Leaf plate (Tapari) in Kalleri -3 Mashtar • Production of Bricket industry in Kalleri-3, Baireni-7,8 (Excessive availability of Banmara jhar in the area) • Establishment of Plywood industry in Kalleri-2,3 	<ul style="list-style-type: none"> • D.D.P report • DDC information centre • D.A.O. report 	<ul style="list-style-type: none"> • Political instability • Support from gov. as well as non.gov.agencies

Objective 2			
To increase remittance collection and reuse collected amount in agro-based industry			
Result:			
Increase in remittance and its proper utilization	<p><u>Baireni-Galchhi:</u></p> <ul style="list-style-type: none"> Establishment of Foreign job training and Service Center in Baireni-8 	<ul style="list-style-type: none"> D.D.P report DDC information centre Report related to foreign job placement 	<ul style="list-style-type: none"> Political unstability Support from gov. as well as non.gov.agencies
Objective 3			
To develop agro-based industry as a main economic source			
Result:			
Establishment of agro-based industry	<p><u>Baireni-Galchhi:</u></p> <ul style="list-style-type: none"> Establishment of diary industry, animal husbandry, processing industries in Baireni-Galchi 	<ul style="list-style-type: none"> D.D.P report DDC information centre D.A.O. report 	<ul style="list-style-type: none"> Political unstability Support from gov. as well as non.gov.agencies

6.4.5 Environment Management Plan

In order to develop new town in sustainable manner, the environment management should be considered. For the solid waste management, the area should be categorized into urban and rural sector since character of waste is different according to the context. The land fill site for Galchhi is proposed in Mahesh Dovan while for Khurkot. Public-Private Partnership concept should be adopted for the waste management.

For wastewater management, separate drainage system is proposed. Domestic wastewater will be collected only after septic tank provision in each household, offices, and other. In Khurkot, three sectorial collection systems will be designed for collection of domestic, commercial and other wastewater. About 3.6 km length of 30cm dia pipe is required for sanitary sewage and 5.5 km length of 1.5m dia or equivalent size sewer line for both side in highway is required to manage storm water. Combination of decentralized and centralized system will be beneficial for wastewater treatment system. Communal Composting system should be developed in the rural area.

For the management of the forest, users committee should be encouraged to do conservation activities in close co-ordination with District Forest Office. In order to stop the encroachment of the forest, boundary delineation of the forest should be prioritized.

IEE/ EIA should be performed before the establishment of the industry related to sand extraction.

6.4.6 Disaster Management Plan

An inventory of risk sensitive areas should be prepared along with mapping. A buffer zone is created along the river corridor and settlement development is restricted in that area. Control & preventive measures should be taken for the landslides in Bhote Chhap, ward no. 4 and landslide above Kol khola, ward no. 8 in Khurkot. Green areas are developed in high slope land. Different awareness programs should be launched for the conservation of the forest.

6.4.7 Climate Change Adaptation Plan

Different awareness program related to the climate change issues and adaptation, should be conducted. Data should be collected regularly by the concerned agencies to know the effect of the climate change.

6.5 MAJOR STRATEGIC PROJECTS

6.5.1 Prioritized Projects

The prioritized projects are identified based on the rank gained through scoring (Refer annex)

Table 39: Projects Finalized by Physical and Institutional Sub-Committee

SN	Project	Priority	Remarks
1	Goganpani-1 to Ghartitar,Kalleritar (RCC Bridge)	1	Brige Construction
2	Baireni-8, Baies Killa-Daltar-Khantar-Mastar-Trishuli River-*(RCC Bridge)*-Dharenitar-Syaltar-Ghartitar-Kalleritar-Goganpani-1 to Baies Killa (Ring Road)	2	Road + Bridge Construction
3	Chisapani-Bahunpalang-Palchowk-Koili Kharka Road	3	Road
4	Water Supply by Lift System to Dumrichaur,Suntar,Ratochaur	4	Drinking Water
5	Daltar-Khantar-Valukhop-Bajagaun Road	5	Road
6	Water Supply from Rukum Khola Source to Baireni-8 and 9	6	Drinking Water
7	Kalleri-6,Belinitar to Kalleri-1 Fostar Road	7	Road
8	Buspark, Baireni-8,Baies Killa	8	Bus Park
9	Mastar-Ranakalika-Chiraudi Bhanjyang Road	9	Road
10	Jinthetar to Syaltar (RCC Bridge)	10	Bridge Construction
11	Kalleritar-Ratochaur-Suntar Maidan-Kalleri Road	11	Road
12	Hostel	12	Hostel
13	Kheste-Kageshwori-Birta Danda Road	13	Road
14	Sutkeri Dhunga-Rahudanda Road	14	Road

Table 40: Project finalized by Disaster Management, Environment and Climate Change Sub-Committee

SN	Project	Priority	Remarks
1	Solid Waste Management Dumping Site: Kalleri-2 Adheri Khola Side	1	Solid Waste Management
2	Bio-Gas Plant Construction Kalleri-2,Thulo Chaur Baireni-8,9, Mahesh Dovan Baireni-7, Belkhu	2	Construction of Bio-Gas Plant
3	Control of Flood and Landslides	3	Flood and Landslides
4	Build Open Space Baireni-7,Mashtar Baireni-8, Daltar Baireni-9,Mahesh Dovan Kalleri-3,Maidan,Dhainenitar Kalleri-2,Suntar,Kalleritar	4	Open Space
5	Preservation of Community Forest Indrayeni Community Forest Sutkeri Dhunga Community Forest Balkumari Community Forest Barahi Community Forest Kali Devi Community Forest	5	Community Forest Preservation
6	Climate Change Greenery Management/Afforestation in Jaljale Community Forest	6	Green City/Afforestation
7	Animals/Bio-Diversity Preservation of Animals and Bio-Diversity in Sutkeri Dhunga Communigy Forest	7	Preservation of Bio-Diversity
8	Road Accident Construction of Footpath alongside of Prithivi Highway Traffic Lights,Street Lights Management	8	Prevention from Road Accident
9	Fire Prevention Fire Fighting Equipment(Damkal) Water Storage Tank for Emergency Electric lines to be Underground	9	Prevention from Fire

Table 41: Project finalized by Economic, Financial, Tourism and Cultural Sub-Committee

SN	Project	Priority	Remarks
1	Agriculture Collection Center with Cold Storage Facility Location: Baireni-8,Daltar	1	Agriculture Collection Center
2	Industrial Village, Location: Baireni-7 Mashtar	2	Industrial Village
3	Integrated Urban Service Center Location: Baireni-8 warate,Galchhi	3	Integrated Urban Service Center
4	Tourism Area Amleshwor Mandir,Baireni-9	4	Tourism Development
5	Floral Garden & Medicinal Herbs Research Center	5	Research Center

Table 42: Project finalized by Social Development Sub-Committee

SN	Project	Priority	Remarks
1	Hospital with Bed Capacity of 200 Purchasing Required land Near Baireni Health Post	1	Hospital
2	Building for College Technical College Namuna Bageshwori College Dhading Bahumukhi College	2	College Buildings
3	Community Building Near of Namuna Bageshwori College Area Police Office, Malpot, Area Forest Office, Irrigation, Napi,	3	Community Buildings
4	Building for Orphanage	4	Buildings for Orphanage
5	Security Area Police Office-Baireni Police Checkpost-Galchhi Police Checkpost-Mashtar,Kalleri-3,Maidan	5	Security Buildings
6	Facility of Modern Information System	6	Information Technology
7	Ethnographic Regional Level Museum , Daltar	7	Museum
8	Local Level Play Ground Location: Ghartitar,Daltar	8	Play Ground
9	Protection Center for Orphanage or for needy people at Amleshwor Temple	9	Protection Center
10	Crematorium Mahesh Dovan Changeshwor Kalleritar Syaltar	10	Crematorium