4. ANALYSIS OF EXISTING CONDITION

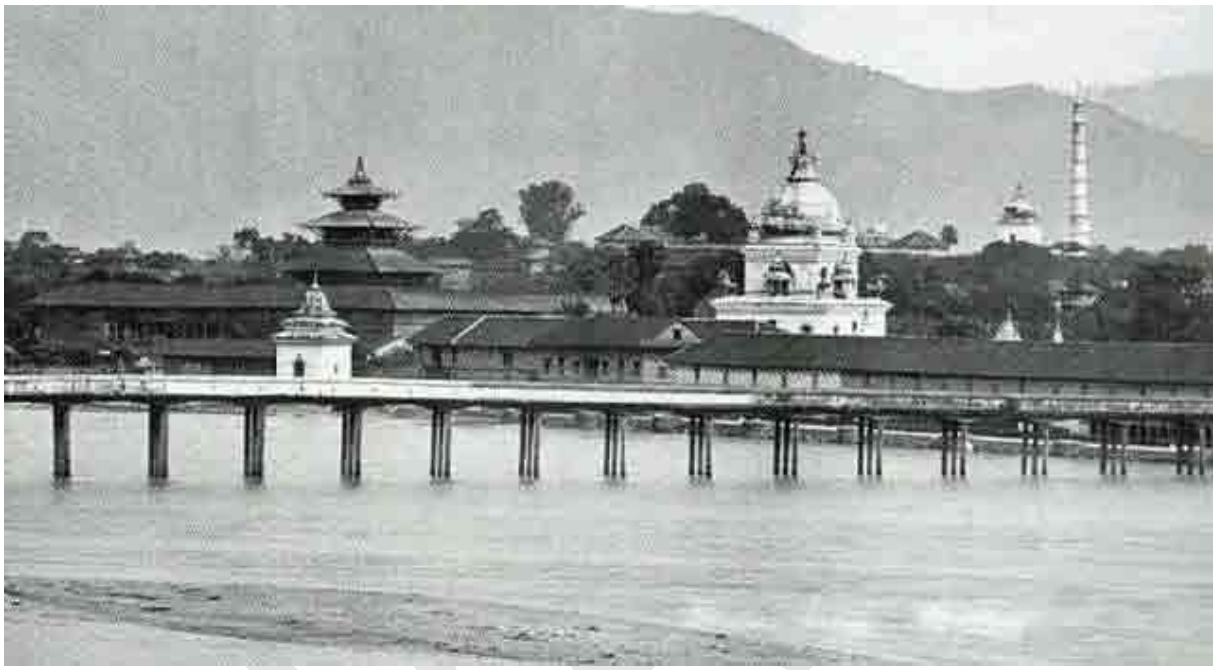

Figure 4-1 Image of Bagmati Riverfront spaces during 1880 AD (1937 BS)
Image Source: http://2.bp.blogspot.com/_bg0KcttZkeI/SieAimXef4I/AAAAAAAAADE/Fv8gDmWaw40/s1600/bagmati+bridge.bmp

Figure 4-2 Image of Bagmati Riverfront Spaces, Thapathali Area, during 2014 AD (2071 BS)
Image Source: Jeny Shrestha

Understanding of existing situation regarding urban pressures, infrastructure advancement and issues confronting the urban progress of Kathmandu Valley plays a major role in defining new pathways for the Valley's appropriate development. In this context, studies and analysis were done about the Valley's various aspects regarding physical and social infrastructure and services.

4.1.Analysis of existing condition

4.1.1 Physical Infrastructure

4.1.1.1 Water Supply

Water supply has become a serious problem for the people of the Kathmandu valley both in terms of quantity and quality. In Kathmandu Valley, the demand for water is around 360 million liters per day (mld) however, the supply from KUKL is only around 110 mld (154 mld during wet season and 95 mld during dry season). The Central Bureau of Statistics study carried out in the valley showed that 59% of the surveyed households did not have adequate water supply from the piped water line and on average. In addition, the water table is decreasing at the rate of 4 meters per year due to excessive ground water extraction (around 800 mld), which requires greater attention at present. The Melamchi water supply project, which started in 2000 with an aim to supply 170 mld of water supply to the valley by 2007, has been a major component to fulfill the water demand of the valley. However, the project alone cannot satisfy the increasing demand and the completion of the project cannot be anticipated sooner than 2016. Hence, there is a greater need to find out, preserve and develop water resource areas both in and around the Kathmandu Valley.

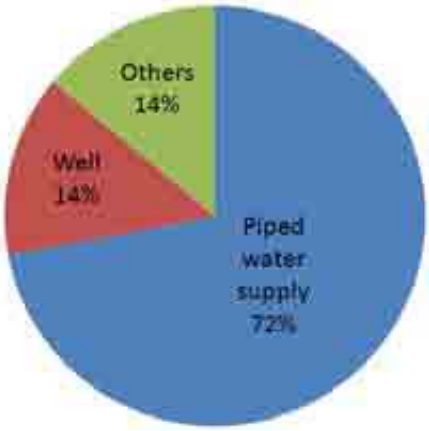

Figure 4-3Sources of drinking water in KV
Source: CBS, 2011

The quality of drinking water in Kathmandu Valley has become a serious public health issue because of the inadequacy of water treatment plants, and inefficient management of the piped water distribution system (MoEST, 2007). Recent evaluations of the quality of water from different sources (tap, stone spout, tube well and well) of Kathmandu Valley revealed an alarming risk to a water-borne disease epidemic and a serious threat to human health and environment (Prasai, Joshi, & Baral, 2007). In addition, there are budgetary difficulties in raising the substantial amounts required to improve the efficiency and safety of water distribution networks.

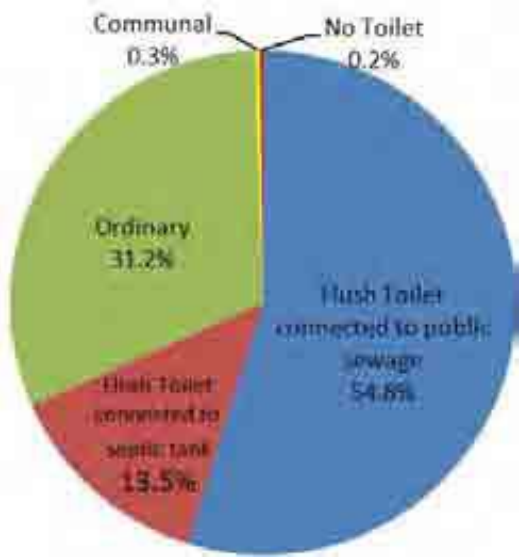

Figure 4-4 Distribution of Households by type of Toilet Used
Source: NLFS, 2008

Major issues:

- Grossly insufficient supply of water with respect to the increasing demand

- Unsatisfactory water quality
- Slow pace of Melamchi Water Supply project
- Depleting available water resources; ground water table
- Excessive ground water extraction
- Lack of land use regulation for sustainable ground water recharge and rainwater harvesting practices
- Institutional overlapping among agencies responsible for water supply and management within the Kathmandu Valley

4.1.1.2 Sanitation

Sanitation is measured in terms of availability of toilets and sewerage facilities. According to Nepal Labor force Survey (2008), 99.5% of total households have toilet facilities out of which 54.8% are connected to public sewage and 13.5% are connected to septic tank(CBS, 2008). In addition, a study highlights that more than 400 surface drainage channels with direct connection to river, have been used for transferring sewage. This issue is crucial as majority of Waste water treatment plants have malfunctioned due to lack of electricity, over loaded nominal flow, lack of technical expertise and lack of maintenance. The main responsible agency for sewerage management is Project Implementation Directorate (PID). However, its lack of coordination with KUKL and Department of Roads has been a major hindrance for building sanitary management network.

Figure 4-5Direct disposal of sewerage into Bagmati River
Image Source: www.nepalitimes.com

Major issues:

- Lack of 100% Household access to toilets and sanitary system
- Lack of segregation of domestic and industrial wastes
- Inadequate number of active Waste water treatment plants within the Kathmandu Valley
- Lack of clear responsibilities and coordination among the agencies responsible for sanitary system management
coordination wi

4.1.1.3 Solid Waste Management

Solid waste management is another major challenge in context of Kathmandu Valley. According to an estimate, around 1225.4 tons of solid waste is generated in Kathmandu Valley out of which only 40% of the waste is directed to Okharpauwa landfill site. The rest of the wastes are dumped only either on the road or riverside areas, thus, causing major environmental or health related issues. The weight of materials collected for recycling is less than one-fourth of the total waste generated in the Kathmandu Valley, which is about 450 tons. Thus, haphazard disposal of mixed solid waste is posing a real challenge to the environment, urban

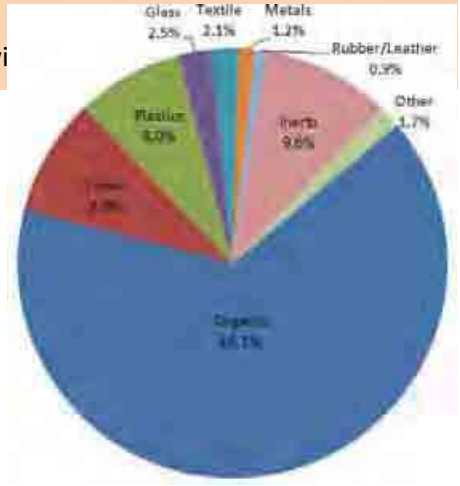

Figure 4-6Composition of Solid Waste Generation in Nepal
Source: (SCAEF, 2006)

governance and aesthetic value of the Kathmandu Valley, emphasizing an urgent need for systematic waste management practice (Manandhar, 2002).

Table 4-1 Average Waste Generation; **Source:***(SCAEF, 2006)*

Area	Population (CBS 2011)	Waste Volume/Day	Total Waste Volume/day
Nepal	26,620,809	0.34 kg	9051.08 tons
Kathmandu	2,510,788	0.50 kg	1225.4 tons

Figure 4-7Openly dumped Solid waste nearby rivers in Kathmandu

At policy level, the Solid Waste Management Technical Support Center (SWMTSC) under the MoFALD is primarily responsible for municipal solid waste management. At operational level, SWMRMC coordinates with local municipalities, which recently started to involve private sectors for door-to-door collection services in limited areas. While the Government has developed plans for segregating solid wastes effective from Chaitra 1, 2070, the plan has rarely been put into practice.

Major Issues:

- Open dumping of solid wastes
- Lack of clear cut guidelines for waste management
- Lack of Coordination between Municipalities (designated to manage solid wastes) and Solid Waste Management Research Centre (planning and regulating agency for solid waste management)
- Lack of waste segregation and waste recycling practice
- Increasing usage of non-biodegradable plastic materials
- Lack of management for E-waste, medicinal wastage
- Need for coordination among related agencies

4.1.1.4 Housing

In context of Housing in Kathmandu Valley, NLSS has classified the ownership into four types: Owner, Rented, Rent free and others. Comparing the NLSS 2004 and NLSS 2010, it can be observed that the owner households have declined from 62.5% to 48.1% while rental households have increased from 33.1% to 49.5% (CBS 2004, CBS 2010). This depicts an increasing trend of renting households in the present context. According to the NLSS 2010, the average dwelling size in Kathmandu Valley is 555 sq ft, while the average area of housing plots (CBS, 2010).

The housing and high rise buildings trend has slowly started to grow post the armed conflict. Until 2013, 72 housing and high rise projects have been identified within KathmanduValley, including 2 in Bhaktapur, 25 in Lalitpur and 45 in Kathmandu district(KVDA, 2013).

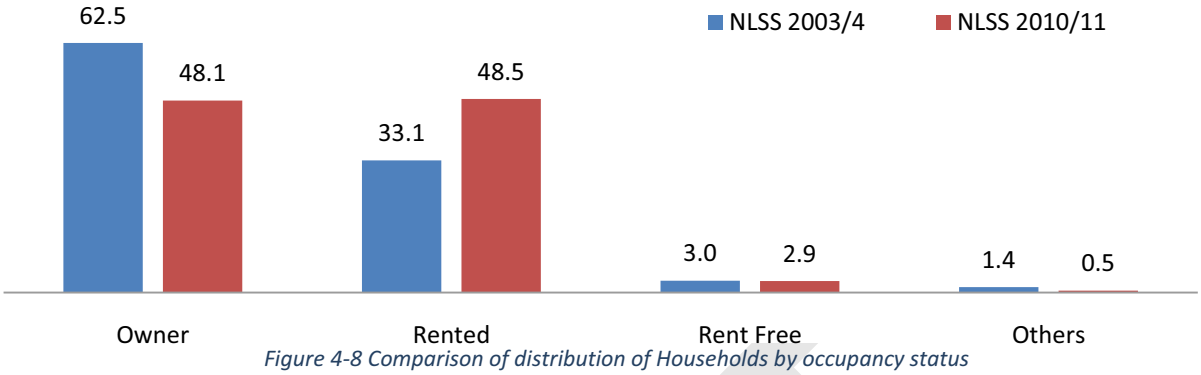

Figure 4-8 Comparison of distribution of Households by occupancy status
Image Source: (National Living Standards Survey, 2004)**&**(National Living Standards Survey, 2010)

The emergence of urban slums and squatter settlements in the valley is relatively new and still small in size compared with other cities in South Asia(ADB, 2006). Nevertheless, the number of squatters has grown since 1985. During the 2007-2008 period, two large slum neighborhoods appeared, comprised of 300 and 500 households at Thapathali and Balkhu, respectively (Tiffon, 2010). It was observed that between 1985 and 2008, the urban poor accounted for an almost 23% rise in the population of the valley. Urban poor people are involved in a variety of livelihoods; with most of them (90%) engaged in the informal sector.

Figure 4-9 Squatter settlements along the Bagmati River
http://blogstreet.files.wordpress.com/2012/02/pic-sukumbasi.jpg

Major Issues:
- Lack of affordable housing
- Increasing number of informal settlements and rental housings

4.1.1.5 Road Network Development

In 1956, the Kathmandu City had around 144 km of motorable road length while the total road length in the country was only 256 km, which increased to 561.9 km in 1970. The major roads were mostly concentrated within the city core area of Lalitpur and Kathmandu accounting one third of the total road network in the valley in 1970.

The total road network length within the Kathmandu Valley is 1594.67 km until 2014. Road network in Kathmandu Valley is classified into two groups:

1. **Strategic Road Network** comprising of Highways, Feeder Roads (both major and minor) and Strategic Urban roads are the responsibility of the Department of Roads
2. **Local Road Network** comprising of District, Urban and Village roads are the responsibility of the respective local institutions

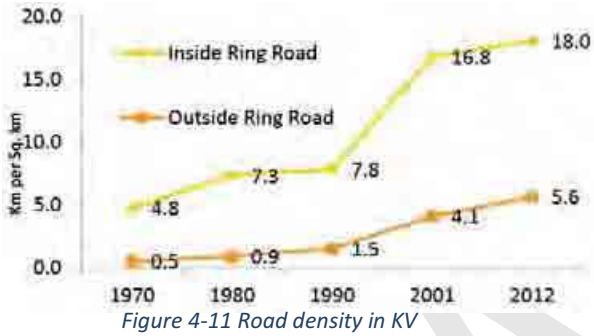

Figure 4-11 Road density in KV

Figure 4-10 Road Distribution as of 2012

The road distributions as of 2012 are given in Figure 4.9 and 4.10. Out of the total valley roads, only one third is paved and rest is either in gravel or earthen condition. There are approximately 600,000 vehicles registered in the Bagmati Zone which is almost half of the total vehicles registered in Nepal. The number of registered vehicles is rapidly increasing in Kathmandu, particularly, in the recent five years accompanied with the rapid increase of urban population and economic development. The share of motorcycle has increased at an alarming rate of more than 20% in the past five years. The motorcycle now constitutes around 74% of the total vehicle fleet in Nepal and in absence of effective public transport system; it is bound to grow more in future. Looking at the motor able accessibility, in 1970, out of the previous 99 VDCs (excluding municipalities: existing and proposed), 23 areas were unconnected with motorable road network:

Kathmandu: Alapot, Sankhu Bajrayogini, Baluwa, Bhadrabas, Chapali Bhadrakali, Chhaimala, Chhunikhel, Gagal Phedi, Indrayani, Jhor Mahankal, Lapsi Phedi, Matatirtha, Nanglebhare, Pukhulachi, Sankhu Suntol, and Naikap Puranobhanjyang
Lalitpur: Devichour, Ghusal, Dukuchhap and Godamchaur
Bhaktapur: Chitapol, Nagarkot, Nanghel and Sudal

In 1980, the unconnected areas dropped to 10 (not connected were same 4 of Lalitpur and six other areas of Kathmandu (Alapot, Bhadrabas, Chhaimale, Chunikhel, Matatirtha and Nanglebhare). By 1990, only Dukuchhap was not connected to the road network. In this study, proximity to road network was determined by calculating Euclidian distance to major road, minor road and ring road. The classification of major and minor road was based on SSRN 2010 where road was categorized as National Highway, Feeder Road Major, Feeder Road Minor and District Road. National Highway and Feeder Road Major are categorized as Major Road. It also includes planned major development such as Outer Ring Road and Fast Track. Remaining roads are categorized as Minor Road. The planned extensions and new

development, such as theplanned Outer Ring Road and the proposed Fast Track,also will likely influence the growth trend within their corridors.

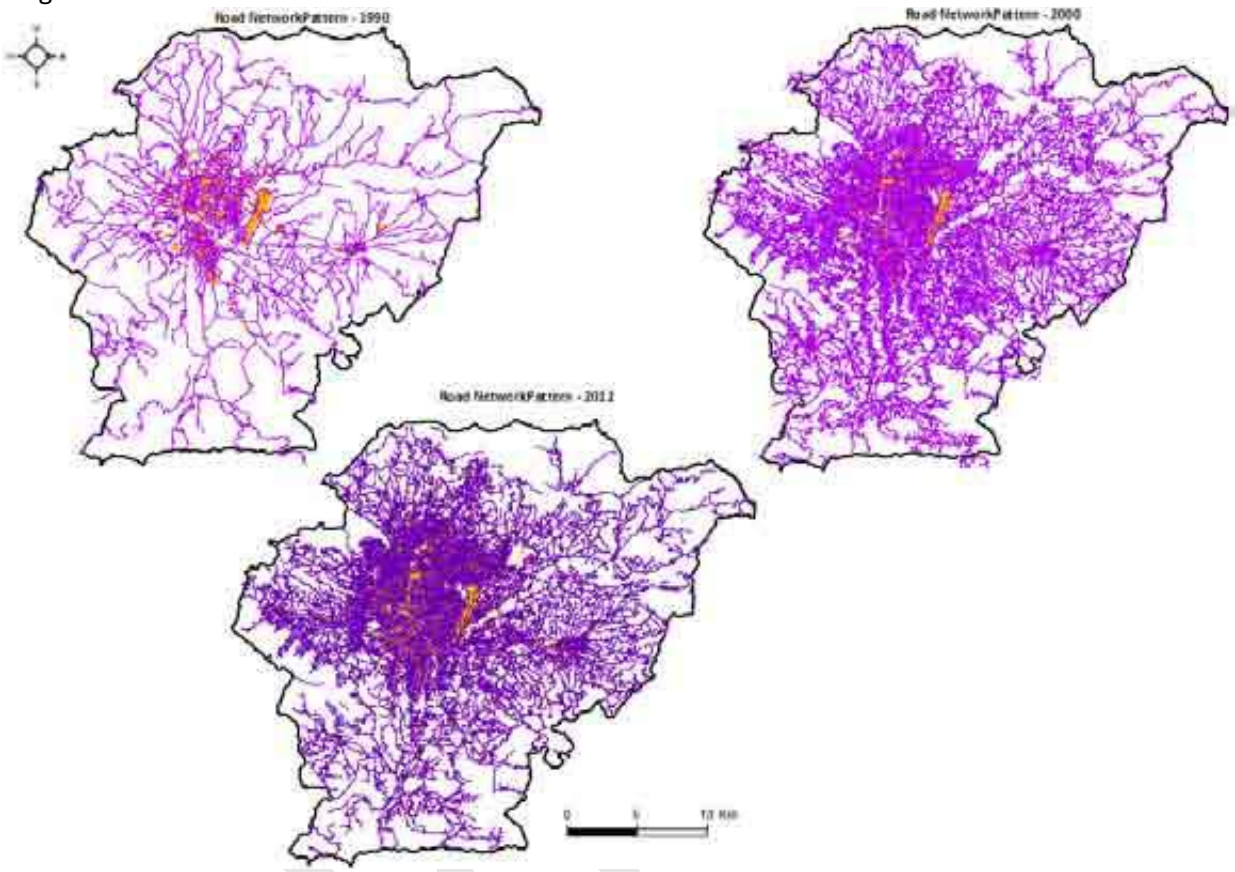

Figure 4-12 Road network pattern of KV (1990, 2000 & 2012)

On the analysis of the road pattern and development, following conclusions are pertinent to growth.

- The growth of Road Network inside ring road is less as compared to the one outside Ring Road.
- In terms of the road density, outside ring road records a density one third of that of inside ring road. Between 1990 and 2001, road extension inside ring road was at the higher level with a growth of 7.8 km/sq.km to 16.8 km/sq.km (almost double). This is owed mainly due to defying of the legal restriction on opening access through ring road green belt.
- If the growth of road length is calculated in terms of road density, the growth generally matches for all the three districts: Kathmandu, Lalitpur and Bhaktapur with particularly Lalitpur on the lower side. Bhaktapur and Lalitpur although seems to have been discriminated in overall road length development but road density-wise, the status is comparable.

Major Issues:

- Trail Roads (developed organically as per the land parcel boundary)
- Several Institutions Involved (Department of Roads, Municipality)
- Road Density and Standards (Yet to be defined)

4.1.1.6 Transportation and Traffic Management

Transportation system in KV is dependent upon the road network of the Valley, which needs drastic improvement. In addition, motorization in the Valley has been increasing by 13% annually. With the rapidly increasing population and economic development, the number of vehicles registered in the Valley in 2014 reached 8,22,449[1] of which 79.71% was motorcycles, which is almost half of the total vehicles registered in Nepal. Public transport vehicle only represents less than 3% of total registered vehicle fleet but their travel mode share is almost equal to that of private vehicles, which constitute 92% of total vehicle fleet. The public transport service in Kathmandu Valley is fully operated by private sectors without any government subsidies (CANN/ CEN & UN-HABITAT, 2014a). The quality of the services is considered below satisfactory level. In absence of effective road hierarchy, the services are very complicated and most of these routes end in the central area of the city contributing to the chaotic traffic jam of the city road. Additionally, haphazard traffic management system and less sufficient traffic police force has further led to haphazard traffic system and traffic related accidents in the Valley.

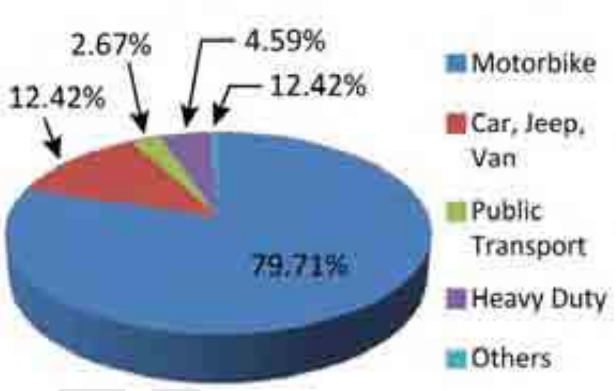

Figure 4-13 Composition of registered vehicle fleet in Bagmati Zone

Figure 4-14Trip Composition by Mode (Left) Increasing Trend of Registered Vehicles in Kathmandu (Right)
Right Image Source: http://nepalitimes.com/article/nation/political-will-for-public-transport-needed,1876 (1/21/2015)

Number of two wheelers has increased at an alarming rate of more than 20% in the past five years. Kathmandu Valley sees 3.4 million person/trips a day, nearly half the people commute on foot(JICA, 2012, pp. ES-10), there are 5,300 public transport vehicles such as buses, mini buses, micro buses, and tempos owned by 1,000 private operators plying on 200 routes (1876). Hence, providing high quality mass transit like metro, light rail and Bus rapid Transit (BRT) is essential to handle the continuous increase of traffic demand and to streamline the disparate and uncoordinated services.

As per a study report on air traffic demand forecast (INECO, PRONTEC & ERMC Pvt. Ltd., 2012) following is the maximum number of passengers predicted for arrival and departure from Tribhuvan International Airport in the following years to come during peak hours:

[1] As per the Information provided by Metropolitan Traffic Police, Kathmandu on 8.9.2015

Table 4-2 Traffic Flow in Tribhuvan International Airport

		Hour	2011	2015	2025	2035
Domestic Passengers	Arrival	5:00 AM - 6:00 AM	288	410	711	1012
	Departure	6:00 AM - 7:00 AM	276	393	681	970
International Passengers	Arrival	8:00 AM - 9:00 AM	790	1207	2092	2978
	Departure	3:00 PM - 4:00 PM	699	1068	1851	2635

Data collection of 2011 was used to predict the future number of passengers. The above data shows clear rise of passengers moving to and from Tribhuvan International Airport. This would increase the traffic movement in Kathmandu Valley to and from the airport and would demand for more vehicular movement. This indicates the need of appropriate infrastructure and services in the future.

Major Issues:

- Establishment of transport structure without proper transport master plan
- Lack of quality and mismanagement in public transport system
- Insufficient Traffic Infrastructures: Traffic light, overhead and on-the road crossings, Bus pockets
- Poor road network planning and up gradation -Haphazard crossings and intersections
- Increasing number of smaller vehicles due to less scientific vehicle import policy
- Issues related to coordination among various stakeholders involved
- Lack of awareness among general public – pedestrians, Drivers, conductors,passengers
- Need for intelligent Traffic System (ITS) for traffic management: Traffic lights, CCTV networking, Technology based traffic control room
- Land issues for on ground and multi-storey parking facilities; Long route bus terminals, heavy duty transport parking; Kanji house
- Haphazard establishment of transport companies, petrol pumps and vehicle workshops in city core \

4.1.2 Social Infrastructure

In past decades there has been a growing concern with the environmental sustainability of Kathmandu Valley, but a city is much more than its physical environment. Thus, to attain socially sustainable communities, social infrastructure such as health, education, social services, recreation and culture, etc. should also be carefully taken into consideration. Currently, the most pertinent social issues of Kathmandu Valley are transportation, open spaces and greenery, access to water and sanitation, housing conditions, public health, safety and security, cultural vitality and political efficacy, all of which are briefly described and explained below.

4.1.2.1 Heritage

International Union for Conservation of Natures (IUCN) declared over a decade ago that "the physical state of the cultural and heritage sites and the monuments in Kathmandu Valley is fast deteriorating." It identified the cultural and heritage sites along polluted rivers in Kathmandu Valley to be in the worst condition (GoN, 1999). Considering the unique identity, the potential tourism development scenario, the need for conservation of heritage sites and the essential requirement to make them disaster resilient, the GoN is collaborating with its partner agencies to conserve and revitalize these spaces.

4.1.2.2 Safety and Security

Rapid urbanization trend has a profound impact on the lifestyle of human beings, which further raise the issues of public safety, resource usage and public services that become an integral part of the urban

development process. The concept of 'urban safety and security' include a wide range of concerns related to crime, violence, impacts of natural disasters, tenure insecurity and security needs from road accidents (UN-Habitat, 2007; Li, Liu, & Sang, 2012).

Kathmandu Valley accounts for a significant majority of crime related activities in Nepal posing threat to public safety. As per the information provided by Metropolitan Police Commissioner's Office, crime rate has risen in 2013-14 by 24.14 per cent compared to previous fiscal year.The statistics for the Kathmandu Valley shows an incidence of serious crime far lower after the Comprehensive Peace Agreement between Maoist people and the state in 2006. However, safety in current situation is undermined by an increase in random targeted violence such as kidnapping, domestic burglary associated with violence, and occasionally leading to murder and insecurity during the night (especially due to electric load-shedding).

Another major concern is the issue of land impact on Security. In order to achieve the 'safety' aspect for Kathmandu Valley, development of standards guidelines is required to address the need for security personnel and land area for related infrastructure and services (eg. Police units, correction centers, Appropriate urban policy, planning and governance could have a major impact on addressing these issues and concerns to make sure that safety, security and Development goes hand in hand.

Table 4-3Number of crimes in KV from 2012 to 2014

CRIMINAL ACTIVITIES		
Offence type	**2012-13**	**2013-14**
Burglary	306	340
Organized and financial crime	570	609
Public offence	2715	3878
Violence against women, children	189	247
Cybercrime	16	34
TOTAL	**5,181**	**6,432**

Source: Metropolitan Police Commissioner's Office

4.1.2.3 Communication Technology

Cities are the commercial hubs and act as points of connection with the global market place. Information and communication technologies play an important role in sustainable development and contribute to urban development in the sectors of health, education, business, governance, environment and agriculture. Access to advanced telecom services can support enterprises to compete in the global economy and academic institutes to benefit from the wealth of on-line information. Furthermore, it can assist in e-governance as telecom applications can help city administrators to deliver citizen services as well as provide utilities that are accurately metered, billed and collected. Improved communications also result in reduced urban cutting pollution and time lost in travelling (Telecommunications & Urban Development). In addition to the telecommunications, other technologies such as audio (radio broadcasting), audio-visual (television broadcasting) and printed media are also mediums of communication to the public. Various government as well as NGO/ INGO agencies are making good use of radio and television broadcasting in order to create awareness and educate public about disaster risk minimization.

In Nepal, operation of telecommunication service started in 1970 B.S. (1913 AD). At present there are six telecom operators with broad range of technologies(Landline / Mobile / WLL) like PSTN, ADSL, GSM, CDMA, WCDMA, EVDO, NGN, SIP. Nepal Telecom (previously Nepal Telecommunication Corporation) is the incumbent operator, owned by government of Nepal being the only one landline operator and almost all services/technologies in all areas of the nation. In accordance with Telecommunications Act, 1997, an autonomous body – Nepal Telecommunications Authority (NTA) was established in February 1998 as the telecommunications regulatory body of Nepal. According to the latest figures, 8 companies have been licensed to operate voice based telephony services out of which 5 are heavily invested by foreign companies (Techsansar, 2014).

As per the Management Information system (MIS) report of Nepal Telecommunications Authority (NTA), 97.65 percent of 26.49 million people in the country have access to telephone service. The report includes data of up to mid-December, 2014. Telephone penetration increased by 12.88 percentage points in the one-year period. It stood at 84.77 percent in mid-December, 2013. Similarly, mobile phone penetration increased from 74.97 percent of mid-December, 2013 to 89 percent in mid-December, 2014. Likewise, Internet penetration stood at 38.09 percent in mid-December, 2014, registering a rise of 9.46 percentage point compared to mid-December, 2013.

Table 4-4Numberof households with various facilities related to communication in Kathmandu Valley (CBS, 2011):

District	Total Households	Radio	Television	Cable Television	Computer	Internet	Telephone	Mobile Phone
Kathmandu	435,544	244,554	325,621	284,890	154,522	84,354	121,513	395,183
Lalitpur	109,505	62,852	60,745	60,745	36,470	17,895	33,264	94,440
Bhaktapur	68,557	38,520	37,578	37,578	20,224	8,964	17,480	59,588
Total	**613,606**	**345,926**	**423,944**	**383,213**	**211,216**	**111,213**	**172,257**	**549,211**
Total in %	**100**	**56.38**	**69.09**	**62.45**	**34.42**	**18.12**	**28.07**	**89.51**

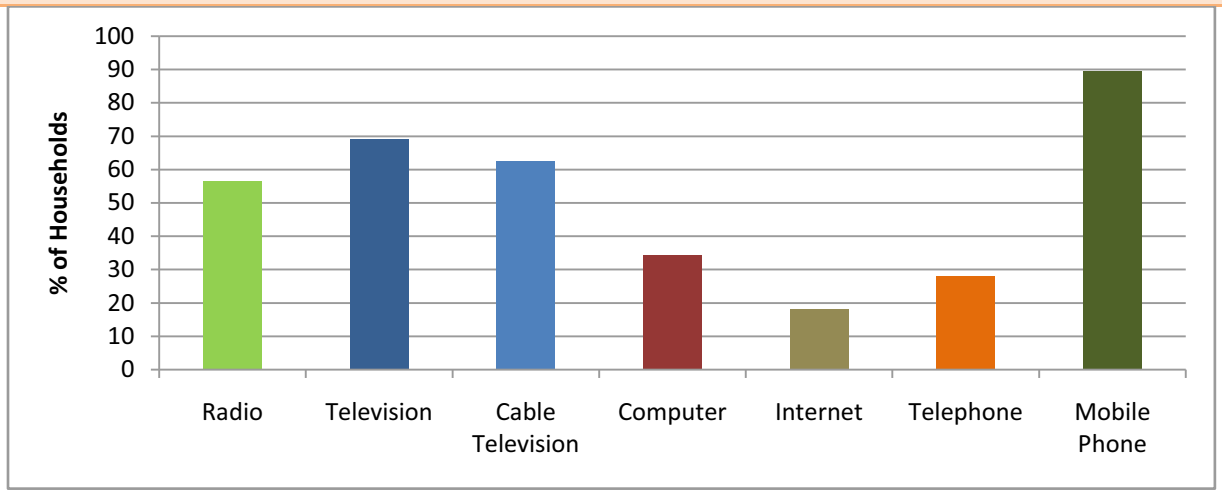

Figure 4-15Percentage of households in Kathmandu Valley with different communication facilities in 2011

It could be seen that access to internet is the service least sought for by many households in Kathmandu Valley, till 2011. About 56.38% households in KV have access to radio sets ensuring audio broadcasting to almost half of the population, which is one of the effective methods to create awareness before, during and after any disaster event. Although landline telephones are not dominant yet, 89.5% of households in KV have access to cell phones. Before the Gorkha Earthquake event, there were 900

telecom towers existing in Kathmandu Valley, among which more than 95% were operated on rooftops. More towers are expected to be erected in the future that may deteriorate the urban landscape of the Valley. The use of diesel generators in order to operate these towers has added to the already existing air and noise pollution. In the recent context of Gorkha earthquake, many residents in the Valley have requested the service providers, Nepal Telecommunications Authority (NTA), related Government offices and local agencies to remove the towers from their rooftops. This heeds the need of sharing of infrastructure tower by different service providers. In addition, the infrastructure and the network service need to be built disaster resistant to ensure resilient and uninterrupted communication system in times of disasters.

Another issue lies in the overhanging mess of wires that run through Kathmandu Valley. Various Internet/ Email Service Providers, Television Cable Service Providers, and agencies like Nepal Telecom have been catering their service through overhead cable wires. These overhead wires have not been properly managed and have created a messy urban-scape. Moreover, these messed up overhanging wires are creating dangers of accidents for the passersby. Hence, bye-laws need to be made for managing the wires in cooperation of different stakeholders such as Ministry of Information and Communication (MoIC), Nepal Telecommunications Authority, Internet Service Providers, Nepal Television Service Providers, Kathmandu Valley Development Authority, Nepal Telecom and Nepal Electricity Authority. Municipalities need to implement these bye-laws and NTA along with KVDA need to monitor it. Attention is needed towards e-waste management of the waste generated due to equipments used for information and communication technology. Telecommunications technologies can also be used for controlling cyber and telecom related criminal activities. NTA is preparing location tracking management system to control cell phone related criminal activities.

All of the above mentioned issues need to be solved hand in hand by various stakeholders such as NTA, service providers, local agencies with KVDA and supporting agencies and KVDA. As a prominent mode for collaborative works, in coordination with KVDA, NTA is more than willing to lay urban underground utility ducts during road widening time itself.Information and communication technologies can help integrate the information and statistics often used by planners and decision makers. It can also act as advocacy and evaluation mechanisms to spread the word about specific projects that may improve the quality of life of the citizens.

4.1.3 Urban Environment

The challenges and opportunities in Kathmandu Valley have attracted people from different parts of the country. One-third of total economic activities of the country is concentrated in Kathmandu Valley (NRB, 2012). Migration of qualified and better-off people has made it the most competitive city in the country, and has helped in its prosperity. However, the high rate of migration easily exceeds the rate of job formation in the formal sector. Since many migrants therefore cannot find decent employment in either the formal or informal sectors of the economy, they often turn to illegal jobs (Pant & Dangol, 2009). As a result, there is a chronic lack of employment opportunities for these migrants; they end up choosing illegal work such as flesh business or the drug trade to sustain their basic needs, which undermines the economic sustainability of the area.

4.1.3.1 Accessibility to open space

Excessive unplanned urban growth can lead to loss of natural open spaces that adversely impacts the urban environment. Therefore the preservation of open spaces has become an important topic in many regions around the world(Geoghegan, 2002). It has been associated with its many potential public

goods, such as aesthetic, recreational, aid on emergency situations etc. In this respect, LTDP 2002 proposed to preserve river banks and other unsuitable areas for urban development such as steep lands as open spaces for ecological balance of the nature.

However, it can be observed that built-up areas have tremendously increased along the river bank within the decade of 2000-2010. Moreover, both private and public open spaces such as residential or local open spaces, open areas in agricultural areas have been filled with new constructions. This has resulted in lack of green spaces and poor accessibility to open spaces for the people in that neighborhood. Nevertheless, to protect the remaining open spaces for humanitarian purposes, recently International Organization for Migration (IOM) in co-ordination with Government of Nepal has identified open spaces in 83 sites over the entire valley which can be seen in the map below. This information could also be well-utilized by the plan to preserve and utilize the spaces for recreational purpose and ecological benefits.

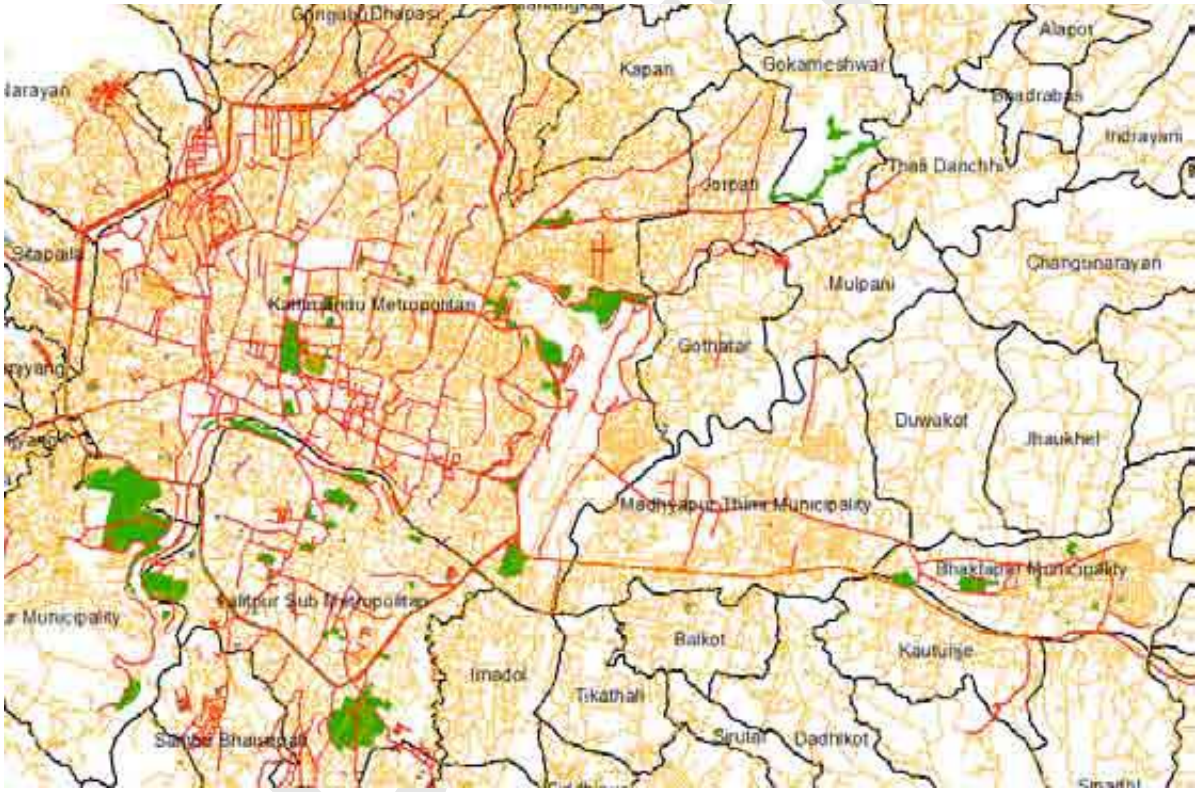

Figure 4-16 Open spaces and their connectivity

With recent effects of urbanization, most of the open spaces in Kathmandu Valley are being replaced by urban structures. In general, 5-10% of open space is needed for housing purposes; however, the unplanned housing schemes in the urban areas leave few open spaces. Also, the open spaces in town-like courtyards are slowly vanishing due to failing social control and a lack of legal backing policies. Several open space associated with cultural expressions have been ignored due to crumbling cultural and social processes. Moreover, due to high land prices, the private housing construction companies give less priority to open and green space. Thus, super densification in the valley creates immense needs for both more open space and greenery.

4.1.3.2 Urban Forest

Urban forest refers to greenery management in the urban area that enhances urban aesthetics, ecological balance, quality of public spaces for recreation, thus fostering the harmonious relationship between human and nature. Less prioritization of urban forest planning and management in the past has occasionally caused great damage along the inner roads and ring road of Kathmandu Valley, resulting in reducing urban forest coverage and tree-related accidents. Additionally, many existing urban parks and greenbelts are not maintained properly, thereby increasing vandalism and environmental stress. Hence, considering the aesthetical, psycho-social and environmental impact of urban forestry in Kathmandu Valley, urban dwellers are increasingly recognizing and articulating the importance of urban forest as a vital component of urban landscape, infrastructure, and quality of life.

Efforts are being made to promote urban forestry as well as to preserve open spaces in public places, schools and even in private home gardens. Such initiatives, though the level of implementation has yet to be evaluated, are praiseworthy. For instance, with an effort to conserve forest areas, MoFSC has declared 'Ban Dashak' (Forest Decade) from the year 2071 -2080 BS (2015 – 2025 AD) to promote on forest and wild habitat management with the theme: "One house – one tree; one village- one forest; one city- one park". Kathmandu Metropolitan City has provisioned that all new households allocate space for at least two trees. The Planning Guidelines 2015 also has a provision to declare public and Government owned open spaces as "Green Areas" to promote urban forest in the Valley. Several tree plantation campaigns are underway in the Kathmandu Valley in view of beautifying and reducing environmental pollution in the city with the collective efforts of government agencies, private sectors and local communities. The plantation and maintenance of approximately 700 trees and shrubs along the 350 meter Maitighar –Tinkune road length is an example of urban forest management initiatives through the collaborative approach of public and private sectors.Among the government agencies, DFO has established two nurseries in Godawari and Bajrabarahi that have provision of free distribution of seedlings for plantation activities.In addition, with the concept of green economy[2] gaining attention at present, there is a huge potential for the promotion of urban forest to achieve the Vision and Mission of the 20 years SDMP (2015 – 2035).

Major Issues:

- Need for an integrated approach to promote urban forest management and conservation programs
- Land constraint for urban forest, animal habitation
- Low priority for urban forestry planning during the road expansion in Kathmandu Valley
- Insufficient coordination among stakeholders for urban forest management
- Risk of trees related hazard (Falling branches or the falling over of the entire tree; visual obstruction)
- Need for strict regulation and incentive mechanism to promote urban forest

4.1.3.3 Urban Energy

Kathmandu valley consumes 29.2% of the electricity distributed by NEA (NRB, 2012), however per capita consumption of the valley is around 400 Kwh (NEA, 2014), which is one of the lowest in Asia. The changing urban life style and population influx in the valley will increase the pressure on electricity demand. At present, hydropower is the major source of electricity, however vulnerability of the hydropower projects to frequent natural disasters like earthquake, landslide and flood underscore need of alternative source of electricity to increase redundancy, in other words resilience in terms of energy

[2]Green economy: An economic system "*that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities*" (UNEP, 2010)

security. This necessity was evident in the recent earthquake of April 25 and flood in Sindhupalchowk in 2014 that damaged the hydropower projects in the vicinity. Furthermore, the long-term plan of KVDA to integrate the concept of smart and green city in the development process also demands use of alternative and efficient sources of electricity, which will release pressure on hydropower to meet the demand. The alternative source of energy will not only help ease existing deficit but will also support national goal that is to deliver 15% of total energy supply from renewable sources by 2030, which at present is 4%.

4.1.3.4 Air Pollution

Kathmandu Valley is one of the fast-growing cities. Rapid and unmanaged urbanization in the Valley, along with the high emissions of pollutants has resulted in a significant deterioration of its air quality. In addition, the bowl shaped topography of the area restricts the wind movement and retains the pollutants in the atmosphere, which has a major negative effect, particularly during the winter season [See Figure --]

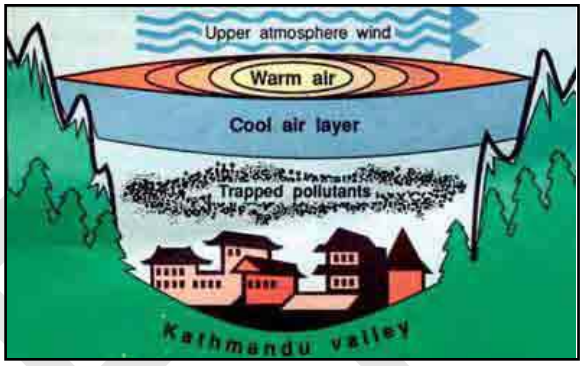

Figure 4-17 Atomospheric aversions in Kathmandu Valley
Source:(CANN/ CEN & UN-Habitat, 2014b, p. 2)

Studies show that the concentration of particulate matter less than 10 microns (PM10) in the Valley's ambient air is $106 ug/m^3$, which is remarkably higher than the WHO safer limit of $50\ ug/m^3$. According to a study, the volume of PM10 and CO_2 has increased by 4.5 and 5.2 times respectively in 2004 since 1989 (Dhakal, 2006). This suggests that the major sources of air pollution in the valley are the vehicular exhaust and suspended road dust from unpaved and poorly maintained roads (CANN/ CEN & UN-Habitat, 2014b). Black smoke plumes from brick kilns, refuse burning, chemicals used for agriculture, increasing use of diesel generators due to regular power cut etc. are additional sources of air pollution in the Valley.

As per Yale's 2014 Environment Performance Index, the air quality of Nepal ranks 177th out of 178 countries, better only than Bangladesh. The impact of air pollution also translates into public health and economic costs, particularly in context of major urban center like KV. The World Bank estimated that Nepal's annual health cost attributed to urban air pollution was USD 21 million in 2007, equivalent to 0.29% of the GDP and has further resulted in about 19,000 cases of respiratory diseases and almost 1600 premature deaths. According to a study, the annual welfare gain to a representative individual of the city from a reduction in air pollution from the current level to a safe minimum level is USD 2.24 as the mitigating cost saved per annum. The extrapolation of benefit estimates of a representative individual to the total population of the two cities, Kathmandu and Lalitpur, provides an estimate of monetary benefits of USD 3.55 million

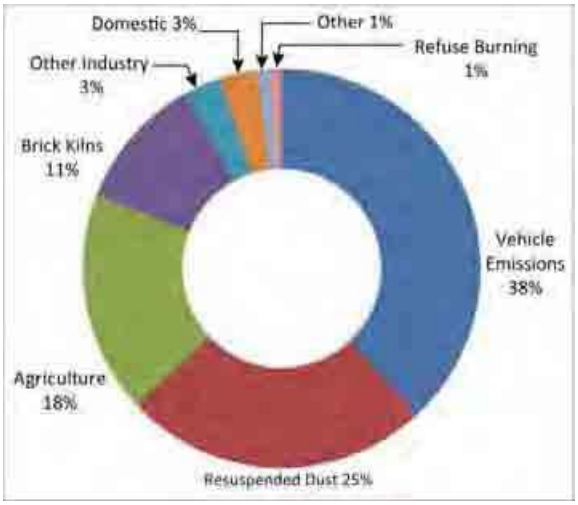

Figure 4-18 Sources of PM10 in Kathmandu Valley
Source:(CANN/ CEN & UN-Habitat, 2014b, p. 2)

per year (Adhikari, 2012).

Major Issues:

- Need for implementation of clear policies on road, transportation and other areas directly related to air pollution (such as the Environment Friendly vehicles and Transport Policy 2015)
- Need for clear policies and programs to address the issues related to control the level of dust particles in the atmosphere, along with pollution caused due to active brick kilns and unsafe disposal of unused batteries and electronic products.
- Insufficient number of Air Quality Monitoring Stations in the Kathmandu Valley.

4.1.3.5 Water Pollution:

Rapid urbanization in the valley has been happening at the cost of environment, which is evident in the state of rivers with nauseous smell and lifeless sludgy water. Some of the major causes of water pollution are: direct disposal of untreated sewerage from households, hospital and industries to river, dumping of solid waste along the river bank and reduced volume of water due to divergence for drinking and irrigation. Based on the study, out of 60 MLD (million liters a day) of wastewater generated from household in Kathmandu, 80% are directly channeled to the river and effluents from industries constitute 7 % of the total wastewater (Regmi, 2006). Desired level of Turbidity (NTU), Dissolved oxygen (mg/l) and Biochemical Oxygen Demand (mg/l), three criteria to measure water quality, are 20-50 NTU, 5-7 mg/l and 0-30mg/l respectively. However, sample taken on November 2014 at four places, namely Sinamangal, Minbhawan, Manahara-Bagmati river junctions range from 70-250 NTU, 0.0-3.55 mg/l and 90-193 mg/l respectively (HPCIDBC, 2014). Aggravated condition of Bagmati River and its tributaries are depicted by lifeless river with reduced flow, both visual and odor pollution and eroded heritage value, that once flourish around this river, which has direct impact on health and quality of urban life.

At the same time, there have been efforts in revitalization of Bagmati River. One prominent activity is 'Bagmati Cleaning Campaign' initiated by Chief Secretary Lila Mani Poudel. As of August 2015, the campaign is running in its 115 week, in which more than 250,000 have directly and 300,000 have indirectly participated in extraction of 3745 tons of solid waste from Bagmati Riiver. Also, High Power Committee for Integrated Development of The Bagmati Civilization (HPCIDTBC) has been actively engaged in implementation of two major projects: i) Bagmati Area Physical Infrastructure Project and ii) Bagmati River Basin Improvement Project. These two projects focus on layout of sewer line on the river banks, construction of sewerage treatment plants and rain water harvesting dams. At present, 20.7 km out of 28.2 km of sewerage line is already constructed or in the process of completion. Capacity improvement of Guheswori waste water treatment plant is under process, which will be followed by plants in Balkumari, Sallaghari, Dhobikhola, Gokarna and Khokana. Also, two rain water harvesting dam, 24m and 90 m high, have been proposed in Sudarijal area that will help in maintaining river flow during dry season.

Five objectives set by the Government of Nepal for Bagmati River are: i) Making Bagmati River system free of sewerage, ii) Managing solid waste along the river bank, iii) Making river banks free from informal settlements, iv) Increasing volume of water in the river, v) Focusing activities on improvement of environment at both policy and community level. KVDA can play a pivotal role, in collaboration with HPCIDTBC and local bodies, in addressing critical issue of land management that is vital for controlling informal settlements and establishment of Decentralized Waste Water Treatment System (DEWATS). KVDA can play an active role in development of riverfront spaces through spatial design and

revitalization of cultural assets for recreational and other public activities and assist in integration of disaster management component through implementation of Risk Sensitive Land Use Plan that consists of multi hazard maps specifying river flood plains.

Major Issues:

- Lifeless river with reduced flow due to water diversion.
- Visual and odor pollution mainly due to direct disposal of untreated sewerage from households, hospital and industries to river and dumping of solid waste along the riverbank.

4.2. Kathmandu Valley: Economic Analysis

Kathmandu Valley is the economic centre of the nation. Its contribution to national GDP is 31% (NRB, 2012) and the share of total Inland Revenue from the valley in the national context has maintained at around 21%.The valley has concentration of service sector and manufacturing industries with 82% of population engaged in non-farm employment as compared to 26% in national context, which shows its dominant urban characteristic. It holds 26% of the total banks and financing institutions and comprises 60% of the total deposits and 44% of the credits at the national level (NRB, 2012). The informal sector is estimated to account for 70% of the economy, which could further increase the importance of the KV. Considering the potential impact of the Nepal Constitution 2015 thatis likely to develop strong economic hubs outside of the Valley, there is a greater need to develop the economic strengths of the valley and promote the aspects (Economic activities, social activities and environmental components), which naturally give it a competitive advantage.

The analysis of Gross National Income[3] per capita of the Kathmandu Valley shows a mixed economy, with a strong inclination towards wholesale and retail trade, transportation and storage and real estate business. The tourism, education, health, manufacturing and service related industries are comparatively low. However, considering the socio-cultural identity of the valley, tourism is a major development potential of the valley. With the only international airport of the nation, the valley also enjoys its advantage as the main transit point for international tourists. According to a study by NRB (2012), 47% of the national revenue generated by 'export of tourism services' is from Kathmandu Valley. Kathmandu Valley is also the major centre of consumption as it consumes 29.23% of total electricity generated and 30.7% of total petroleum products, where it is important to note that it holds only 10% of the total national population. On the other hand, the valley also witnesses major inflow of remittance, where 30% of the total HH receives remittance, where the national average is 13.8% (CBS, 2008).

On the other hand, increasing poverty incidences is an emerging challenge. According to CBS data from 2013, the poverty rate in three districts, namely Kathmandu, Lalitpur and Bhaktapur is 7.6, 7.6 and 12.5 respectively, which is lower than the national average of 25.2. However, data also point toward increase in poverty rate, such as 2006 rate of the three districts were 4.4, 10.1 and 10.7 respectively. Also, alarming rate of unemployment in the valley, which is about 11% against the national average of 2.1%, has direct repercussion on poverty.

[3] Gross National Income (GNI) per capita is the Gross National Income divided by Mid-year population

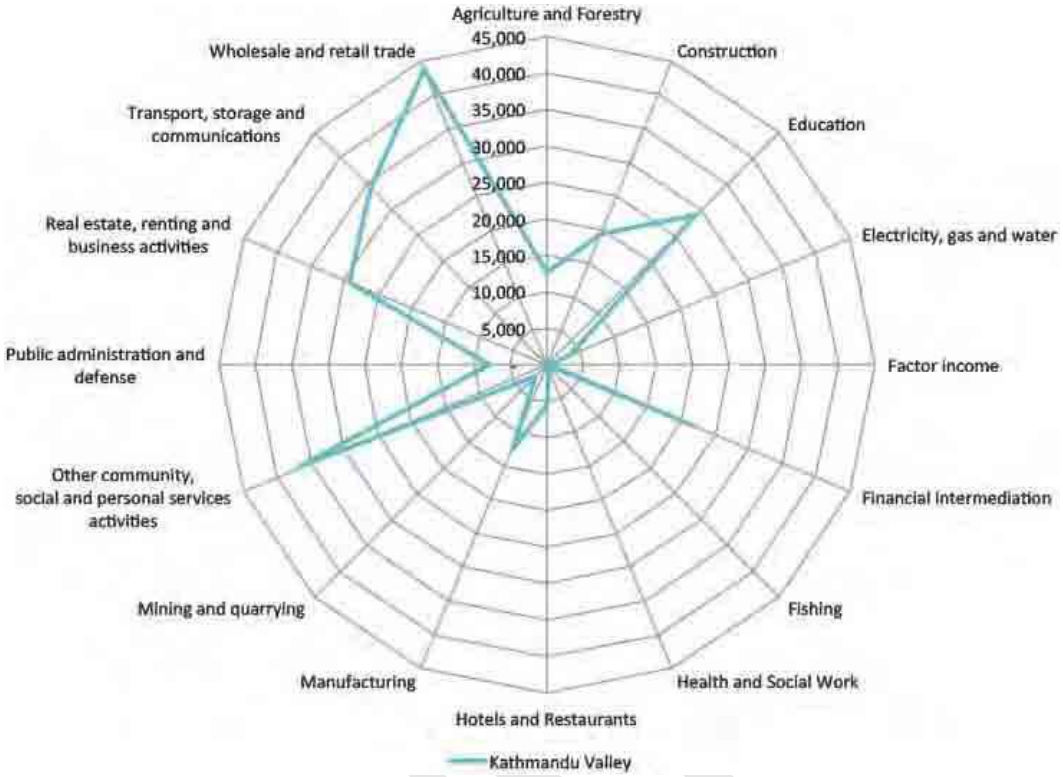

Figure 4-19Per Capita Gross GNI (2014) for Kathmandu Valley (NPC, 2014)

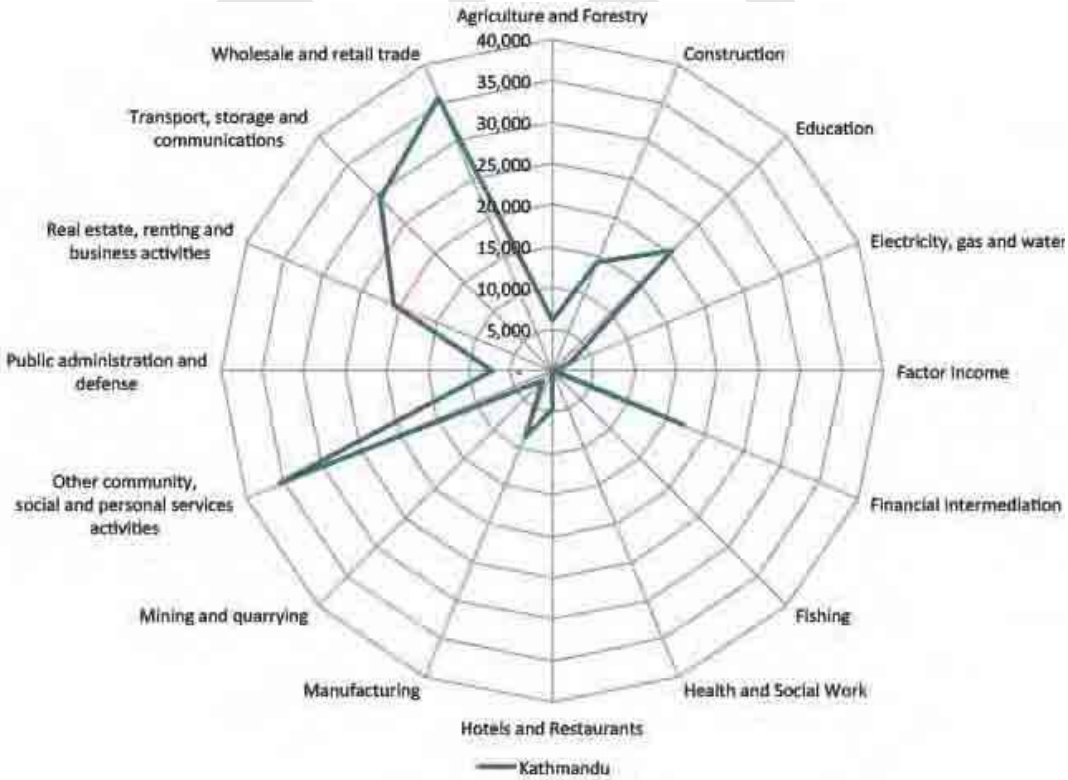

Figure 4-20 Per Capita Gross GNI for Kathmandu (NPC, 2014)

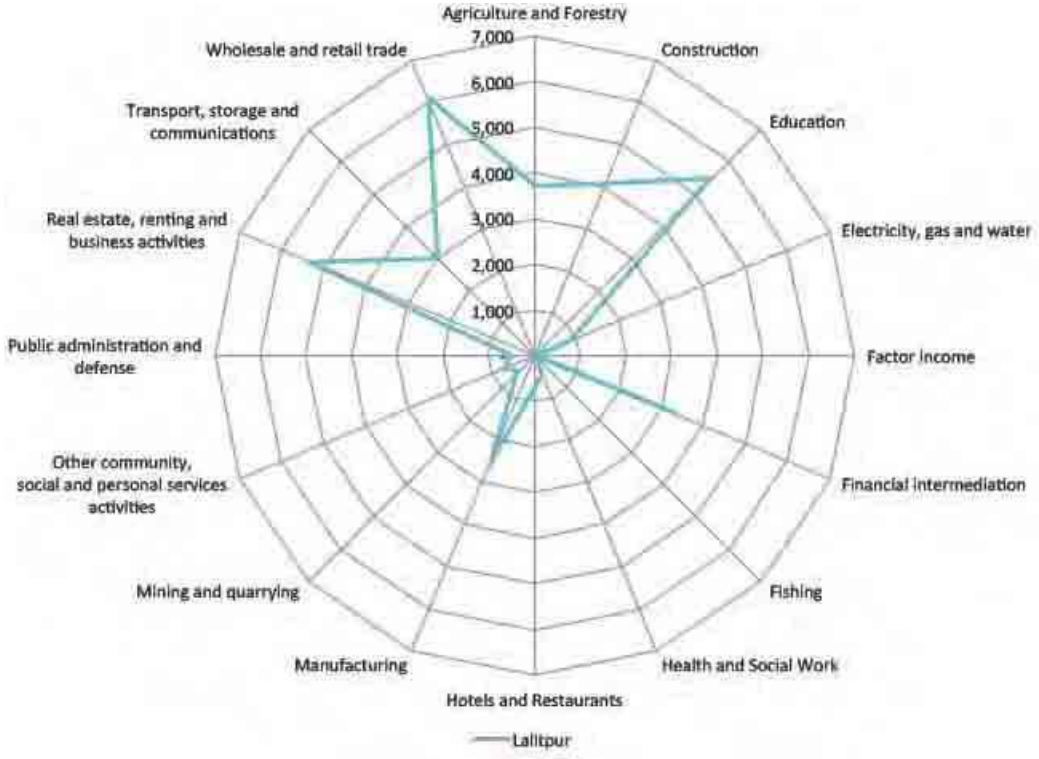

Figure 4-21 Per Capita Gross GNI for Lalitpur (NPC, 2014)

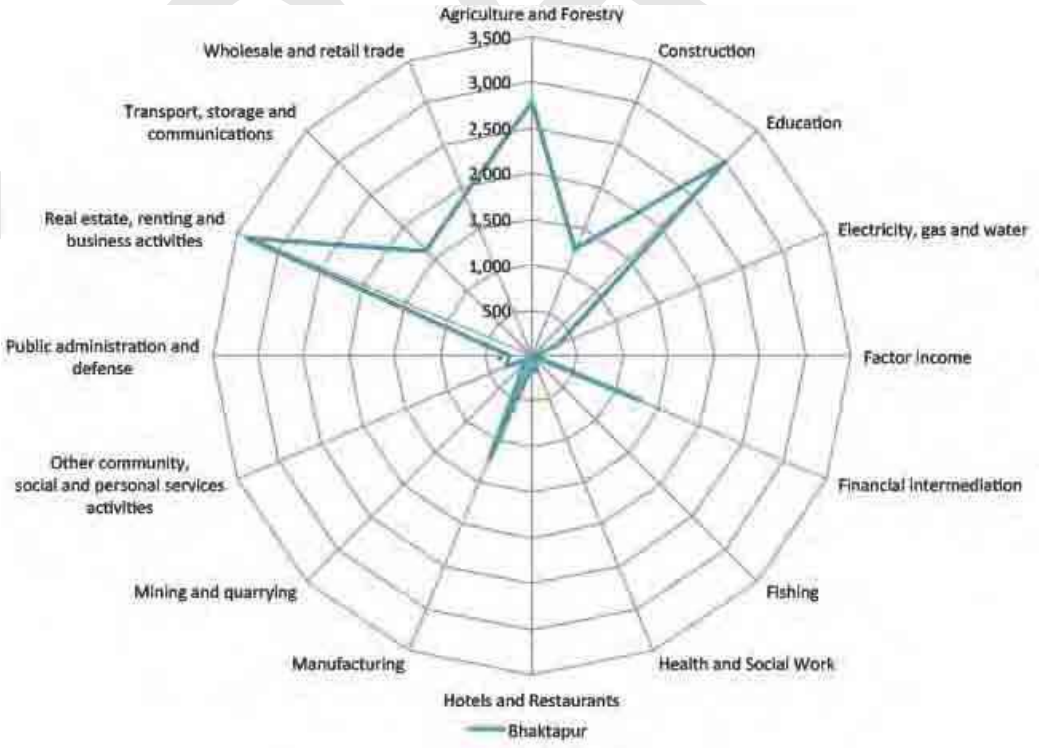

Figure 4-22 Per Capita Gross GNI for Bhaktapur (NPC, 2014)

4.3. Governance

4.3.1 Institutional Coordination

Until 2012, there were 114[4] bodies in the Valley, with the responsibility for land use plan preparation and implementation. Strategic infrastructure such as roads, drainage, water and electricity are managed by ministries through their respective departments or agencies. Departments operate through their 3 district offices of Kathmandu, Lalitpur and Bhaktapur. Moreover, there is a lack of mechanism for coordination between the existing municipalities, each of which operates independently, nor is there any clear liaison among the 3 DDCs. Apart from local roads and street cleaning, other development programs are prepared and implemented by the Central government departments and utility agencies. These operate according to their own mandates following programs independent of each other. Although the NPC and the respective ministries are required to coordinate programs, in practice this is not done at a spatial level.

4.3.2 Role of KVDA in development of Kathmandu Valley

In 2012 the Kathmandu Valley Development Authority (KVDA) was established to replace the former structure of Town Development Committees. The Authority has the responsibility to prepare and implement land use plans for the entire Valley in accordance with the Kathmandu Valley Development Act of 1988. However the Act provides very limited powers, which in any event overlap with the legislation controlling the operations of municipalities, VDCs and other ministries and agencies. This was one reason why the Authority was not established since the Act was approved in 1988.

As per the KVDA Act 1988, the Kathmandu Valley Development Authority has the power to:

a) Impose by public notice a ban on any type of physical change in any property within the area prescribed for a period not exceeding three years;
b) Stop any action taken without prior approval or in violation of the given terms and conditions;
c) Undertake land development programs for planned and organized urban development;
d) Mobilize financial resources, upon approval of the Government in order to meet necessary expenses.

Organs of the Kathmandu Valley Development Authority include:

- The Kathmandu Valley Development Board whose functions pertain to the policy making and the evaluation of the progress achieved in the implementation of the plan,
- The Board of Directors for the direction, supervision and management of the operations of the Kathmandu Valley Development Authority.

One reason for establishing the Authority in 2012 was not a function of Valley wide planning but rather to implement the program of road widening within the city. Widening was started by the KVTDC but due to a legal challenge it was decided to continue the program by creating KVDA (which has the legal authority). With the addition of 17 new municipalities on December 2, 2014 (Mangsir 16, 2014) the total number of municipalities has reached 22. However, majority of the municipalities do not have a development plan and bye-law regulations that could be used as a basis to control land use and construction. As a result, the current situations of the areas do not accord with the Long Term Development Plan for the Valley. Urban growth has extended beyond municipal boundaries, spreading into adjacent VDCs which have neither the capacity nor legal powers to effectively control development.

[4] 1 Metropolitan City, 1 sub-metropolitan city, 3 municipalities, 3 DDCs, 45 urbanizing VDCs, 44 VDCs, 5 TDCs

4.4. National Development Projects and its Implication on Urban Growth

Kathmandu valley enjoys advantage of its central location in the national landscape and its access to international linkages. Also, the ongoing and proposed projects of national interests have direct impact on the valley and are expected to affect its position in the national setting. For example, China is preparing to extend its rail network from Shingatse to Kerung, a town at nearest proximity to Rasuwagadhi, which is emerging as one of the major transit points at the Nepal-China border on the northern side of Kathmandu Valley. The road under construction between Rasuwagadhi and Bidur has direct connection to Kathmandu Valley, which will open doors to enhance trade and tourism.

Figure 4-23Schematic map: Existing and proposed road linkages that have direct/indirect impact on the Valley (NUDS, 2015)

Also, planned Kathmandu-Terai Fast Track connecting the proposed international airport at Nijgadh with Kathmandu Valley can ease population influx into Kathmandu, which at present homes only international airport in the nation. The pre-feasibility study of Nijgadh airport was conducted in 1995, followed by feasibility study in 1996. As of 2015, GoN has authorized Civil Aviation Authority of Nepal to commence land acquisition for development of the airport. The pre-feasibility study for Kathmandu-Nijgadh Fast Track was conducted only in 2008, though the project was initiated in 1997. 2015 budget has addressed this fast track as a priority project. Kathmandu-Hetauda Fast Track is one of the anticipated projects, which introduces connectivity through tunnels. Concept of this fast track dates back to 1970's and its completion is still long awaited. Dhulikhel-Bardibas highway, which is already in function, also strengthens the urban system of the central region and will have demographic and economic impact on the valley. These major projects will impact the economy and population of Kathmandu valley, but due to the history of slow turnover of large-scale projects in Nepal; their possible impact is yet to be evaluated.

4.5. Urban Population- Carrying Capacity

According to CBS (2011), Kathmandu Valley holds about 10% of the total population of Nepal in less than 1% land area of the country. As per the CBS 1991 and 2011, population density in the valley grew from 1227 ppl/sq.km. to 4408 people per sq.km. in two decades, whereas the average density of the city core rose 3 times higher (13,225 ppl/sq. km). Within the twenty years, the valley has been through major congestion and haphazard development due to high population density thereby increasing gaps between demand and supply of urban infrastructure.

4.6. Land-use and Transport Inter-Relationship

According to LTDP 2002, a good co-ordination between transportation and its surrounding land use can help to guide better urban development in the future. Along with the change in land use pattern, development of new roads or extension/widening of existing roads can also increase the number of vehicles on the road. Therefore, allocation of different institutes, school, health facilities, airport etc. and their interconnection by the transport networks should be well planned.

However, the land use map of 2000 and 2012 reveals that the settlement is mainly clustered in the areas where there is presence of minor roads such as local roads, service roads and access roads without following any organized pattern and planned development. As distance increases away from these roads, the urban growth tends to decline. Many roads which might have been started as footpaths were converted into motor able tracts. This is because of the opportunities related to closer proximity to road-networks, which force the residents to locate their house near the transport facilities. Therefore locating closer to transport facilities is one of the important priorities to decide where to locate settlements in newly declared areas of Kathmandu Valley. In other words, households select the locations that reduce their travel time and hence concentration of settlement along the road networks.

4.7. Efficient Land Use Plan and Conservation of Agricultural Areas

Efficient land use plan not only guides the future shape of the city but also helps in sustainable development and management of urban development. In order to prevent the uncontrolled growth of the city and to protect the fertile agricultural land, LTDP 2002 has proposed the densification of existing city area by proper development of the vacant lands. It can be observed that due to the absence of land use plan, the city is expanding further out by consuming the prime agricultural land especially in the fringe area. Within the decade of 2000-2012, around 13.2 per cent of agricultural has been lost due to horizontal expansion of the city. If this trend continues, it can be assumed that within 2020 and 2030, huge amount of productive land will be developed into built-up area.

4.8. Formulation of plan based on easy transport linkage

Rapid urban expansion coupled with unmanaged settlement development has led to various problems such as pollution, congestion, loss of natural and cultural heritage, haphazard solid waste disposal, etc. In addition to growing urban population, it has also led to increasing demand for infrastructure and services. In this regard, transport linkage between different settlements can play a major role to reduce the size of services to be distributed for the increasing demand of population. LTDP 2002 has proposed the densification of settlements in different parts of the valley by enhancing interaction and easy accessibility between the settlements. This will be achieved by encouraging mix land use or generating employment opportunities at closer proximity to the residential zone which ultimately helps to reduce the traffic volume on the road. In addition, it will encourage people to commute to their workplace by walking or cycling and protect the environment from getting polluted.

4.9. Projection of Future Growth in KV 2020 & 2030

The projection of growth in Kathmandu Valley is based on the probabilistic growth pattern which relies on dominant drivers or catalysts for urban expansion witnessed over time in KV.

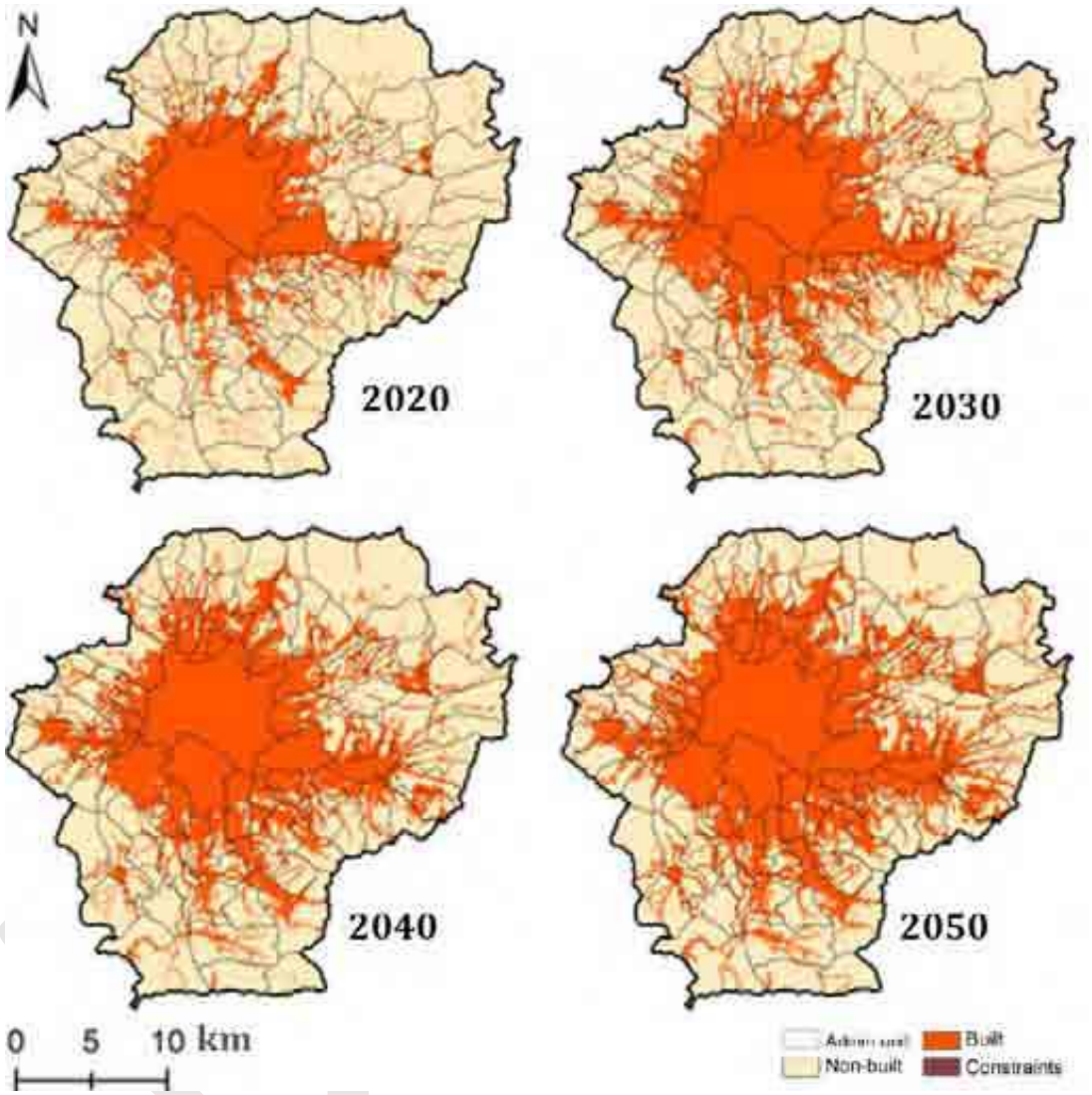

Figure 4-24 Projection of Built-up areas based on spontaneous scenario
Source: (Thapa & Murayama, cenario based urban growth allocation in Kathmandu Valley, Nepal, 2012)

It can be observed that built-up areas in 2012 land use map was 10,537 hectares would increase up to 17,199 hectares in 2020 and furthermore, the total built-up area in Kathmandu Valley would be 22,797 hectares in 2030, if the current trend of urban growth is left unabated. It is estimated that at each decade approximately 6000 hectares of arable land in Kathmandu Valley will be converted into the built-up area.

4.10. Multi Criteria Analysis

A multi criteria analysis has been carried out to have explicit picture of the existing situation. Two basic sources of information have been adopted for this purpose i.e. population census 2011 and the satellite imageries 2012. Since there is a difference of a year between the census and the image, some errors may prevail. While doing the analysis, four parameters as mentioned below were applied to each of the VDCs and wards of the municipalities.

Ward 16 (Nayabazar area) & 35 (Koteshwor area) of KMC, Jorpati, Gongabu and Kapan VDC are the most grown areas in last decade. Similarly, ward 12 of Bhaktapur Municipality, ward 2 of Madhyapur Thimi Municipality, Gundu, Nanglebhare and Ghusel are the least grown areas during the same periodwhich might have resulted due to their location, topography and weak accessibility.. The wards 12 and 2 of the municipalities did not grow much as the area is very small and had already reached the saturation level.

4.10.1 Growth Band:

As there has been vast difference in the population growth from one place to another, the negative growth of 2.5% or more to the positive growth 12.5% or more are considered for the growth spectrum. Each VDC or the wards of the municipalities are categorized to fit into seven different growth per cent with the division of 2.5% each. The areas having more than 12.5% growth are grouped in A and similarly the areas with growth less than -2.5% are grouped into G. The points ranging from 20 to 140 were allocated for each band.

4.10.2 Population Band

Seven different bands of population ranging from 8,000 to 80,000 are created to analyse the population size in the particular area. The difference of population in each band is 12,000. The points ranging from 20 to 140 were allocated for each band.

4.10.3 Population Density Band

Population density of less than 100 persons per ha to 1,000 persons per ha has been considered with the class difference of 150 each. The total categories and the points allocated are similar to the criteria mentioned above.

4.10.4 Road Density Band

Table 4-5Basis for Multi Criteria Analysis [Annex - 1.0]

Category	Criteria				Points				Total Points
	Growth	Population	Pop Density	Road Density	Growth	Population	Pop Density	Road Density	
A	12.50%	80,000	1,000	65	140	140	140	140	560
B	10.00%	68,000	850	55	120	120	120	120	480
C	7.50%	56,000	700	45	100	100	100	100	400
D	5.00%	44,000	550	35	80	80	80	80	320
E	2.50%	32,000	400	25	60	60	60	60	240
F	0.00%	20,000	250	15	40	40	40	40	160
G	-2.50%	8,000	100	5	20	20	20	20	80

The road density of 5 km per sq km to 65 km, with the class difference of 10 km per sq km, is grouped into seven categories. The points ranging from 20 to 140 were allocated for each band.

SUMMARY OF CHAPTER 4

Existing Condition:

The principal reason for haphazard development in the valley is lack of effective local level land use, zoning and land sub-division policy. Land use planning of all municipalities are non-existent, moreover building bylaws and building codes are weakly enforced, which have resulted in chaotic urban growth in the valley. Based on the probabilistic growth pattern, the total built-up area in Kathmandu Valley would be 22,797 ha in 2030, if the current trend of urban growth continues. It is estimated that in each decade, approximately 6000 hectares of arable land in Kathmandu Valley will be converted into the built-up area.

However, the population pressure has resulted in severe infrastructure deficit. The overall prosperity factor of the valley is weak, which is about 0.598, and it has major implication on the infrastructure services, both in terms of quality and quantity. Water supply is a serious problem in the valley, where the demand for water is around 360 million MLD, and supply from KUKL is only around 110 MLD. Melamchi water supply project aims to provide additional 170 MLD of water; however, it will not be sufficient to meet the increasing demand of the valley. Depleting ground water table, illegal connections, lack of meter analysis are some of the major issues related to water supply.

Although 99.5% of total households have toilet facilities; only 54.8% are connected to public sewage and 13.5% are connected to septic tank. Additionally, inadequate number of active waste water treatment plants, lack of segregation of domestic and industrial wastes at source, lack of clear guidelines and coordination for solid waste management are posing challenge to the environment, urban governance and aesthetical value of the valley.

Most of the development in the valley has been organic, which follows the past foot trail road, rather than a transport master plan, that is inefficient and haphazard. Almost half of the national registered vehicles are concentrated in the valley, however, share of public transportation is only 3% and the service provided is very poor. Due to the lack of scientific vehicle import policy, number of smaller vehicles is increasing, which has resulted in congestion.

Land management is a major issue due to which haphazard development of infrastructure and utilities are taking place. Therefore, it is important that land related policies are handled for sustainable development. Social sustainability is also equally important, the valley lacks public parks and socializing environment apart from the squares in old towns, and issues of safety and security are also increasing.

At present there are six telecom operators providing services, however they have posed risks to the urban population due to the telecom towers installed on the rooftop of the houses and dangling wire mesh. After the Gorkha earthquake in 2015 more than 80 towers have been removed for the safety purpose.

Similarly, the rivers flowing in the valley are highly polluted due to direct disposal of household and industrial waste. To improve natural environment of the Bagmati river and its tributaries, “The Bagmati Cleaning Campaign” is under execution. Additionally, High Power Committee for Integrated Development of The Bagmati Civilization has been actively engaged in projects that focus on improving the Bagmati river basin with physical infrastructure such as sewage treatment plant along the river.

Kathmandu Valley is the economic centre of the nation. Its contribution to national GDP is 31% (NRB, 2012) and the share of Total Inland Revenue from the valley in the national context is maintained at around 21%. According to a study by NRB (2012), 47% of the national revenue generated by ‘export of tourism services’ is from Kathmandu Valley. Kathmandu Valley is also the major centre of consumption as it consumes 29.23% of total electricity generated and 30.7% of total petroleum products, where it is important to note that it holds only 10% of the total national population.

Increasing poverty incidences is an emerging challenge. According to CBS data from 2013, the poverty rate in three districts, namely Kathmandu, Lalitpur and Bhaktapur is 7.6, 7.6 and 12.5 respectively, which is lower than the national average of 25.2. However, data also point toward increase in poverty rate, such as 2006 rate of the three districts were 4.4, 10.1 and 10.7 respectively. Also, alarming rate of unemployment in the valley, which is about 11% against the national average of 2.1%, has direct repercussion on poverty.

परिच्छेद ४ को सारांश

सुन्दर भविष्य निर्माण गर्न लागि योजना निर्माण गर्दा विद्यमान भौतिक तथा सामाजिक पूर्वाधारहरुको अवस्था, सहरी वातावरणका अतिरिक्त सहरी ऊर्जा, प्रदुषण, र काठमाण्डौ उपत्यकाको आर्थिक अवस्था जस्ता महत्वपूर्ण सवालहरुलाई बुझ्नु जरुरी हुन्छ । विद्यमान भौतिक पूर्वाधारको अवस्थाका सन्दर्भमा, उपत्यकामा खानेपानीको वितरण गुणस्तर र माात्राको हिसावले एक गम्भीर समस्या बनेकोछ । काठमाण्डौमा खानेपानीको माग करीव तीन कारोड ६० लाख लिटर प्रतिदिन (३६० एमएलडी) छ । हाल काठमाण्डौ उपत्यका खानेपानी लिमिटेडले गर्ने खानीपानीको वितरण भने १ करोड १० लाख लिटर प्रतिदिन (११० एमएलडी) मात्र छ । मेलाम्ची खानेपानी परियोजनाले अतिरिक्त १ करोड ७० लाख लिटर प्रतिदिन (११० एमएलडी) उपलब्ध गराउने लक्ष्य राखेको छ । तथापी, यो परिमाण काठमाण्डौ उपत्यकाको बढ्दो माग धान्नका लागि पर्याप्त हुने छैन । रित्तिदै गरेको भूमिगत पानीको स्रोत, वितरण प्रणालीमा पानीको चोरी, मिटर विष्लेषणको अभाव आदि खानेपानी वितरणसँग जोडिएका जटिल सवालहरु हुन् ।

९९.५% घरहरुमा शौचालयको सुविधा भएतापनि, जम्मा ५४.८% घरहरु ढलनिकास प्रणालीसँग र १३.५% घरहरु मात्र सेप्टिक टैङ्कमा जोडिएका छन् । यसका अतिरिक्त, खेर गएको पानीलाई शुद्धीकरण गर्ने सञ्चालित प्लान्टहरू पर्याप्त नहुनु, स्रोतमा नै घरायसी र औद्योगिक फोहर छुट्याउने कार्य नहुनु र ठोस फोहरलाई व्यवस्थापन गर्ने कार्यमा प्रष्ट मार्गदर्शन नहुनु र नगरपालिकाहरु बीचमा सहकार्यको अभाव रहिरहनु, ठोस फोहर व्यवस्थापनको विषयमा अनुसन्धान नहुनु, नसड्ने प्रकारका प्लाष्टिकजन्य पदार्थहरुको प्रयोग, विद्युतजन्य फोहरको व्यवस्थापनको अभवाले वातावरण, समग्र सहरको शासन व्यवस्था र काठमाडौं उपत्यकाको सुन्दरतामा आँच पुऱ्याएका छन् । तसर्थः सुव्यवस्थित फोहर व्यवस्थापनक अभ्यास जरुरत रहेको कुरामा जोड दिइएकोछ । यी सबैका अतिरिक्त, किफायती भाडाका घरहरुको अभाव पनि खड्किरहेकोछ ।

आधारभूतरूपमा, काठमाडौं उपत्यकाको विकास जैविक प्रकृतिको रहेकोछ । यसलाई पैदल मार्गहरुले सघाएका छन् । संस्थागत रुपमा कार्यक्षेत्र बाझिनाले विकास तथा योजना कार्यान्वयन अलमलमा परेका छन् । यातायातको गुरुयोजना विना नै मोटर बाटोको सञ्जाल विस्तार गरिएकोछ । देशभरमा दर्ता भएका मध्ये करिब आधा सवारी साधनहरू काठमाडौं उपत्यकामा मात्र चल्छन् । जबकी सार्वजनिक यातायातको हिस्सा जम्मा ३% रहेको छ,। तिनीहरुले पुऱ्याउने सेवाको अवस्था पनि दयनीय छ । सवारी साधन आयात सम्बन्धी आधुनिक वैज्ञानिक नीतिको अभावमा साना सवारी साधनको संख्या बढ्दैछ । ट्राफिक पूर्वाधारहरुलाई अद्यावधिक गर्ने तथा ट्राफिक पुलिसको संख्या वृद्धि गर्ने कार्य नितान्त आवस्यक भइसकेको छ । यसका अतिरिक्त, पैदलयात्री, ड्राइभर, सहचालक र यात्रुहरुलाई सडकको अनुशासनका बारे सचेत गराउनु पनि आवस्यक छ । भूमि-व्यवस्थापन अर्को प्रमुख समस्याको विषय हो । जसले गर्दा अव्यवस्थित पूर्वाधारहरू र उपयोगका सरचानाहरूको निर्माण भइरहेका छन् । तसर्थ दीगो विकासका लागि भूमिसँग सम्बन्धित नीतिहरूको प्रबन्ध गरिनु महत्त्वपूर्ण छ । उपत्यकाले सामाजिक दीगोपन पनि प्राप्त गर्नु पर्छ । पुराना बस्तीहरूमा रहेका डबलीहरू बाहेक काठमाडौंमा सार्वजनिक पार्कहरू र सामाजिकीकरणका अवसरहरू उपलब्ध छैनन् । सुरक्षा र निर्भयता बारेको चिन्ता पनि बढिरहेको छ । साँस्कृतिक जीवन्तता पनि उत्तिकै आवस्यक छ ।

सञ्चारले विश्वको अर्थतन्त्रसँग प्रतिस्पर्धा गर्न, ज्ञानको सशक्तीकरण गर्ने, यात्रा घटाउने र अन्य बाह्य समस्या समेतलाई समाधानका लागि ठूलो शक्ति प्रदान गर्छ । नेपालमा दूरसञ्चार सेवा विक्रम संवत् १९७० (ई.सं.१९१३) मा शुरुवात भयो । हाल नेपालमा विशिष्ट प्रविधियुक्त ६ वटा दूरसञ्चार सेवा प्रदायकहरु कार्यरत छन् ।

टेलीफोन टावर र बिजुलीका खम्बाहरूमा झुन्ड्याइएका तारहरूले गर्दा दूरसञ्चार क्षेत्र सहरमा बस्ने नागरिकहरूका लागि खतरा बनिरहेका छ । गोरखालाई केन्द्र बनाई सन् २०१५ मा आएको भूकम्पपछि सुरक्षाका कारण ८० टावरहरू हटाउनु परेको थियो । तसर्थ, यो असुरक्षाले नीति नियमको निर्माण र सम्बन्धित निकायबाट कार्यान्वयन तथा अनुगमन गर्नुपर्ने कुराको आवस्यकतालाई संकेत गरेको छ । नेपाल दूरसञ्चार प्राधिकरणले मोबाइल फोनसँग सम्बन्धित आपराधिक क्रियाकलापलाई पछ्याउने (Tracking) व्यवस्थापन प्रणाली निर्माण गर्ने लक्ष्य राखेको छ । नेपाल दूरसञ्चार प्राधिकरणले सहरी भूमीगत utility duct विछ्याउने सोच पनि राखेको छ । हाम्रो समाजले नयाँ

प्रविधि तथा विद्युतीय सामग्रीहरुको प्रयोग तर्फ झुकाव बढाउँदै गएको परिप्रेक्षमा विद्युतजन्य फोहरको व्यवस्थापनका लागि पनि हाम्रो ध्यान जानु आवस्यक छ ।

सहरी सामाजिक वातावरणका सन्दर्भमा, उपत्यका देशको राजधानी क्षेत्र भएकाले, देशका विभिन्न क्षेत्रका व्यक्तिहरुका लागि वृहत क्षेत्रको अवसर प्रदान गरेको हुन्छ । तथापी उपत्यका भित्र उच्च दरमा हने जनसंख्या स्थानानन्तरणले गर्दा औपचारिक क्षेत्रले मात्र रोजगारी उपलब्ध गराउन सक्दैन । यसले गर्दा त्यो जनसंख्या गैरकानूनी कार्यमा सम्लग्न हुन जानाले उपत्यकाको आर्थिक दीगोपन तथा वातावरणमा चुनौती सिर्जना हुन्छ ।

त्यसैगरी, उपत्यकाको प्राकृतिक वातावरणका सन्दर्भमा बागमती र यसका सहायक नदीलाई पुनर्जीवित गराउने प्रयासका रुपमा "बागमती सफाई अभियान" सञ्चालन गरिएको छ । यसका अतिरिक्त, बागमती सभ्यताको एकीकृत विकासका लागि उच्च स्तरीय समिति, नदीको वहाव क्षेत्र (river basin) र नदीको आसपासमा रहेका ढल सुद्धीकरण प्लान्ट जस्ता भौतिक पूर्वाधारको सुधारको प्रयत्न गर्ने परियोजनाहरुमा सक्रिय रुपमा लागी परेकोछ ।

देशको राजधानी भएकाले, काठमाण्डौ उपत्यकाले राष्ट्रको केन्द्र र अन्तराष्ट्रिय सम्बन्धको कडीको रुपमा केन्द्रीय भूमिका निर्वाह गरेको छ । सञ्चालनमा रहेका र प्रस्तावित राष्ट्रिय चासोका परियोजनाहरुले उपत्यकामा प्रत्यक्ष प्रभाव पार्छन् र राष्ट्रिय परिस्थितिमा यसको अवस्थामा परिवर्तन ल्याउने अपेक्षा गरिएको हुन्छ । तथापि, नेपालमा ठूला परियोजनाको कार्यान्वयनमा हुने ढिलाईको इतिहासका कारण, काठमाण्डौ उपत्यकामा यी परियोजनाहरुको सम्भावित आर्थिक प्रभाव चाहिँ अझै मूल्यांकन गरिनु पर्ने हुन्छ ।

सहरी क्षेत्रको उचित विकासका लागि, यसको भौतिक वातावरणको योजना बनाउनु अनिवार्य हुन्छ । यसै सन्दर्भमा, दीर्घकालीन विकास योजना २००२ ले, उपयुक्त सहरी विकासका लागि पूर्वाधार तथा सामाजिक सुविधाहरु उपलब्ध गराउनुपर्ने कुरा प्रस्तवित गर्‍यो । तथापि, २०००-२०१२ को अवधिमा सहरी विस्तार, व्यवस्थित (Planned) क्षेत्रबाट यस्ता सुविधाहरु उपलब्ध नभएको वरपरको कृषिक्षेत्रमा फैलियो । खासगरी बढ्दो जनसंख्याको चाप, अति जनघनत्व, मध्य सहरी क्षेत्रको प्रदुषण, तुलनात्मक रुपमा सस्तो जमिनको उपलब्धता र लोकमार्ग, बस टर्मिनल, धार्मिक तथा साँस्कृतिक महत्वका क्षेत्रहरुसँगको निकटताका यसका प्रमुख कारण हुन् । यसका अतिरिक्त, लचिलो भवन निर्माण सम्बन्धि नीति नियमले गर्दा पनि मानिसहरुको आकर्षण त्यता तर्फ बढेकोछ ।

२०११ मा काठमाण्डौ, ललितपुर, भक्तपुर, मध्यपुर थिमी, र कीर्तिपुरको जनसंख्या वृद्धि जम्मा क्रमशः १९७, १४६, १२५, ७७ र ४४ जनसंख्या प्रतिहेक्टर थियो । जबकी, सबैभन्दा बढी जनघनत्व काठमाण्डौमा ११८१ जनसंख्या प्रतिहेक्टर थियो छ । यदि अहिले वृद्धि भइरहेको सहरीकरणको क्रम यही रफ्तारमा कायम रहने हो भने वृद्धिको सम्भाव्य प्रवृत्तिलाई आकलन गर्दा काठमाडौं उपत्यकाको संरचना निर्मित क्षेत्र (Built up area) सन् २०३० सम्ममा २२,७९७ हेक्टर पुग्न अनुमान गर्न सकिन्छ । प्रत्येक दशकमा काठमाडौं उपत्यकाको उपलब्ध जग्गाको करीव ६,००० हेक्टर जमिन विभिन्न प्रकारका (आवास तथा अन्य) संरचना निर्मित इलाकामा परिवर्तन हुने प्रक्षेपण गरिएकोछ ।

5. URBAN GROWTH SCENARIO AND FORECAST

(BUSINESS AS USUAL SCENARIO)

Figure 5-1 Looking far out to the East from the top of Dharahara

Image Source:
http://meropost.com/getfile/pid:public_4629811/tp:image/575447_415654518445596_225983994079317_1619025_1345079581_n.jpg

Figure 5-2 Looking far out to the East from the top of Dharahara- 2014

Image Source: KVDA

While chapter 4 provides a backdrop about the Valley's current situation, this chapter analyses about the urban growth trend in the future for Kathmandu Valley in 'Business as usual' scenario. Hence this study plays a major role in defining what needs to be done to avoid future discrepancies with the Valley's progress and development.

5.1. Population Projection

According to the population census 2011, the population of the valley was 2.43 million. The population growth as compared to census 2001 was observed at 4.5% per annum. The decade of 2001-2011 was exceptional chiefly because of the political instability in the country and the urban areas experienced phenomenal in-migration trend in the period. The same situation may not arise in future and it's expected that the growth rate gradually reduces till it reaches to the tune of 3.5%. The extent of growth in areas such as Manamaiju, Kapan or Gothatar may not be the same in coming years, as the value of land becomes expensive with the increase in demand. The new population would explore some other areas where the land is cheap and has some infrastructure provisions.

The population projection has therefore been made for all wards of the municipalities and VDCs on the basis of following procedures and assumptions:

a) All the administrative units have been grouped under seven categories as mentioned in the Table 4 with the growth slab of 2.5% in each category.
b) Similar growth of about 4.5% would be observed till 2015, 4.0% during 2016 to 2025 and 3.5% during 2026 to 2035.
c) The minimum growth in the particular area would be zero and no negative growth would be observed with the presumption that the in-migration and natural growth would be offset by the out-migration.

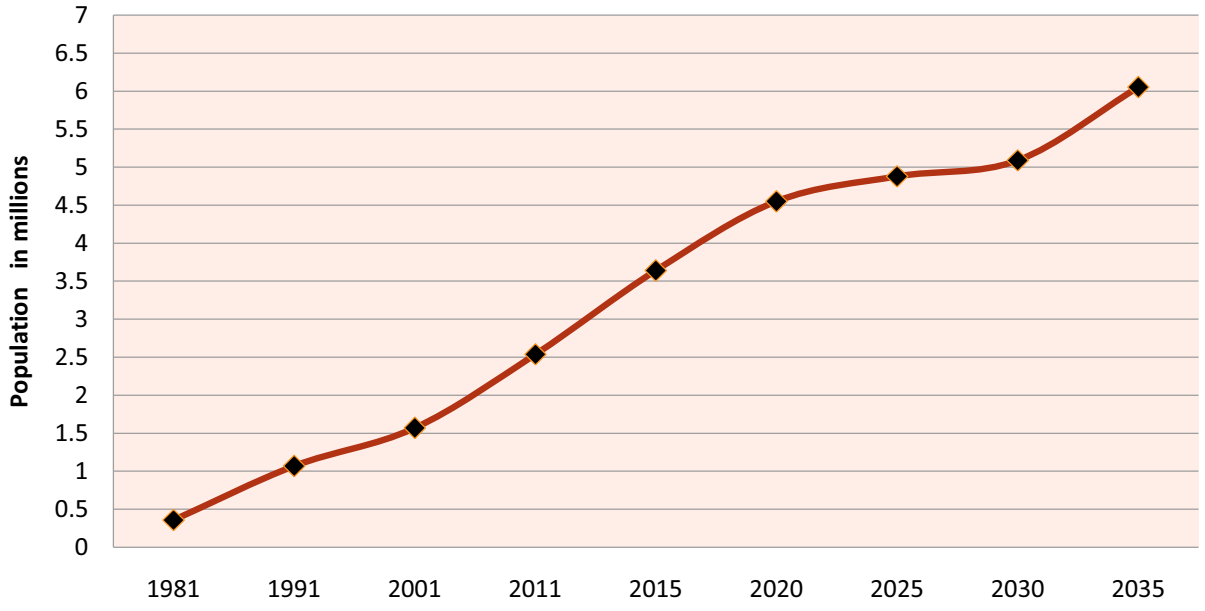

Figure 5-3 Projected populations with 5 year interval till 2035

The gross density of Kathmandu Metropolitan City is expected to reach around 260 ppha in 2020 and 367 in 2035 from current 197 ppha. All the municipalities in the valley would cross the density 100 ppha

by 2035. The urbanizing VDCs (now a part of Newly declared municipalities) of Kathmandu would be more compact than Kirtipur Municipality.

Following tables show the projected populations with 5 year interval till 2035 :

Table 5-1 Basis for Population Projection

Growth Category	Basis	Projected Growths				
		2012-15	2016-20	2021-25	2026-30	2031-35
A	>12.5%	8.5%	8.0%	8.0%	7.5%	7.5%
B	>10%, <=12.5%	7.5%	7.0%	7.0%	6.5%	6.5%
C	>7.5%, <=10%	6.5%	6.0%	6.0%	5.5%	5.5%
D	>5%, <=7.5%	5.5%	5.0%	5.0%	4.5%	4.5%
E	>2.5%, <=5%	4.5%	4.0%	4.0%	3.5%	3.5%
F	>0%, <=2.5%	3.5%	3.0%	3.0%	2.5%	2.5%
G	<=0%	0.0%	0.0%	0.0%	0.0%	0.0%
Average Growth		**4.50%**	**4.00%**	**4.00%**	**3.50%**	**3.50%**

Table 5-2 Population Projection before the declaration of New Municipalities (2015- 2035)

	Area	Census	Density	Projected Population					Density
	Ha	2011	2011	2015	2020	2025	2030	2035	2035
KMC	4,945	975,453	197	1,163,246	1,415,266	1,721,888	2,045,063	2,428,893	491
LSMC	1,515	220,802	146	338,596	502,656	389,764	462,917	549,800	363
BM	656	81,748	125	111,944	154,180	144,303	171,387	203,554	310
KM	1,476	65,602	44	108,436	173,876	115,802	137,536	163,350	111
MTM	1,076	83,036	77	141,958	238,993	146,577	174,087	206,761	192
Urbanizing VDCs	18,850	706,202	37	1,314,324	2,377,002	1,246,601	1,480,571	1,758,454	93
Kathmandu	11,750	507,969	43	961,621	1,768,300	896,676	1,064,970	1,264,851	108
Lalitpur	3,766	122,043	32	217,218	375,796	215,433	255,866	303,889	81
Bhaktapur	3,335	76,190	23	135,485	232,906	134,492	159,734	189,714	57
Rural VDCs	43,662	296,436	7	456,036	683,305	523,274	621,486	738,130	17
Kathmandu	23,190	150,265	6	232,098	347,903	265,251	315,035	374,162	16
Lalitpur	13,263	88,441	7	128,725	179,301	156,118	185,419	220,219	17
Bhaktapur	7,209	57,730	8	95,214	156,101	101,906	121,032	143,749	20
Total	**72,181**	**2,429,279**	**34**	**3,634,540**	**5,545,279**	**4,288,209**	**5,093,047**	**6,048,942**	**84**
Growth Rate				**4.50%**	**4.00%**	**4.00%**	**3.50%**	**3.50%**	

Note: The above table has been prepared before the declaration of the 16 new municipalities. It is the summary sheet of the population projection of VDCs and each ward of the municipalities. The detail projection sheets are enclosed in the Annex 2.0.

5.2. Land Occupied by the Household

The total area available for the built up in Kathmandu Valley is around 46,000 ha, which is around 64% of the total area of 72,187 ha. However, not all the area could be developed due to the constraints factors like slope, monument zone, historical ponds and ecological constraints. The analysis shows that the constraint free area is around 31314 ha only (68% of the agricultural and built up area).

Following table shows the historical changes of buildable area and the projected scenario.

Table 5-3 Historical & Projected Built-up Area

Area in Ha	Actual			Projected			
	1990	2000	2012	2021	2031	2041	2049
Agricultural Area							
Hectare	42,160	39,412	34,204	29,996	23,435	13,139	8350
Percent to Total	92%	86%	74%	65%	51%		
Residential Area							
Hectare	3,809	6,654	11,862	16,067	22,628	32,927	45,231
Percent to Total	8%	14%	26%	35%	49%		
Total (Hectare)	**45,969**	**46,066**	**46,066**	**46,066**	**46,066**	**46,066**	**46,066**
Net Increase in Residential Area (Ha) from 2011				**4,205**	**10,766**		
Population	1,073,422	1,569,923	2,429,279	3,753,678	5,820,147	9,038,510	12,853,670
Net increase in Population from 2011				**1,324,399**	**3,390,868**	**5,284,832**	**7,033,524**
Gross Density	15	22	34	52	81	125	178
Net Density	23	34	53	81	126	196	279
HH Size	5.00	4.50	4.00	4.00	4.00	4.00	4.00
Households	214,684	348,872	607,320	938,420	1,455,037	2,259,627	3,213,418
Area used by one household	177	191	195	127	127	128	129
Aana/ Household	5.58	6.00	6.14	3.99	3.99	4.02	4.06
Note :							
Gross Density	*Population/ Total Area*			***Net Density**: Population/ (Agriculture + Residential Area)*			

If the current Low density sprawl continues with the net density of only 129 ppha, the built up area becomes almost same as the agriculture area by the year 2035 and 11560 ha land will be required to accommodate the increasing 1.3 million population

The residential built up area as compared to agriculture land in 1990 was 8% which has been increased to 26% in 2012. About 8,000 ha of agriculture land was transformed to residential built up during the period, which is 11% of the total area of the valley. The area used by one household has increased from

106 sq.m. to 164 sq.m. in the last two decades. However, NLSS 2011[1] estimates the average size of the plot in urban Kathmandu to be around 114 sq.m. and in the rural area is 151 sq.m. The plot of 4 aana (127 sq.m.) has hence been estimated for the future projection. The expected increase of 3.6 million people by 2035 would require additional 11,560 ha of land that would make the built up area 51% from the current 26%. The projected scenario reveals that the population of Kathmandu Valley would be 1.55 times in 2021 and 2.5 times in 2035 from the current situation. In this case, two dilemmas seem to arise:

1) According to the density analysis, the valley appears to take the increased population without significant implications as the average population density would just be 129 ppha.
2) But As the population is going to get increased by almost 2.5 times in 25 years, the pressure on the infrastructure and environment would be enormous. Their compound effect in the event of disaster would be even more.
   It is hence become pertinent to put the constraints to identify the area that are not suitable for further development.

5.3. Constraint Analysis: Restricting Factors for Urban Growth

The LTDP 2002 plan mainly focuses in the urban growth control through the demarcation of the urban and rural boundary as well as the preservation of prime agricultural land in order to control the unmanaged and uncontrolled land development system of the valley by eating up the fertile agricultural lands. Taking certain factors into consideration like the environmental management, habitable community and a good living condition, various concept plans for urban growth management have been prepared. Apart from LTDP 2002 concept plan, there are few other factors which have to be considered for sustainable urban growth of the valley like- Multi-hazard risk assessment, ecologically sensitive areas and some physical constraints.

Therefore this study has incorporated following constraints/restriction for further analysis of urban growth in the valley:

5.3.1 Land use restrictions

5.3.1.1 World Heritage Sites (WHS Seven monument zones)

The seven monument zones of Kathmandu valley which were inscribed as World Heritage Sites in early 1979 by UNESCO is taken as constrains for future urban expansion. The sites consist of three ancient Royal Palaces (Hanumandhoka Durbar square, Patan Durbar square and Bhaktapur Durbar square) and four religious complexes (Pashupatinath, Swayambhunath, Baudhanath and Changu Narayan). According to (UNESCO, 2013) these zones have their unique historical, cultural and social value and they should be shielded from the effect of urban development. The designated area of WHS is referred from Department of Archaeology, Kathmandu [Fig 5.4].

[1] (NLSS) 2011; Average number of rooms in one HH in urban Kathmandu Valley is 4.8, average size of dwelling unit is 555.4 sqft. and the average area for housing plot is 1,224 sqft. Similarly in rural hills in Central Development Region, the number of rooms per HH is 4.3, dwelling unit is 705.4 sqft and the housing plot is 1,640 sqft.

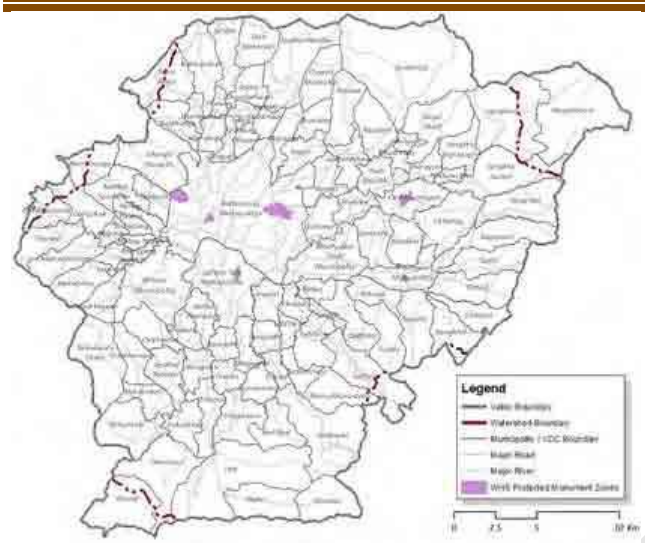

Figure 5-4Location of World Heritage Sites in Kathmandu Valley

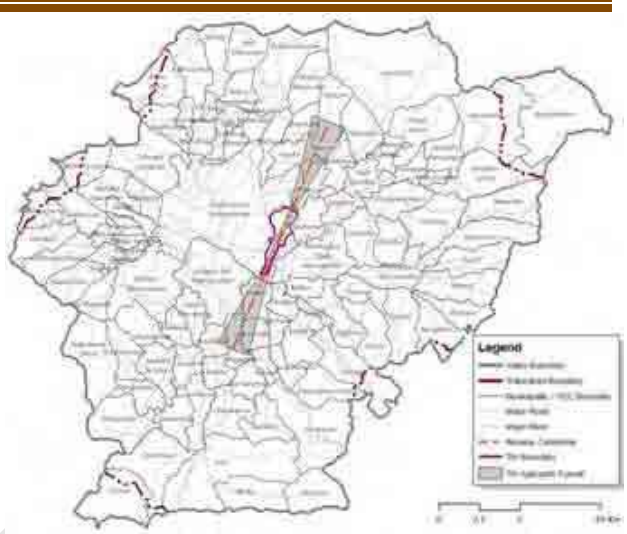

Figure 5-5Location of TIA and runway approach funnel

5.3.1.2 Airport

Tribhuvan International Airport is the only international airport in Nepal. In general, urban development is not permitted near airport. Therefore, the area around the international airport has been taken as area of restriction for future urban growth. Airport area is extracted from recent land use map of the year 2012 [Fig 5.5].

5.3.2 Physical constraints

5.3.2.1 Historical Ponds

In the past, historical ponds were built to maintain water flow even during dry season to recharge the aquifers. Besides they also served as water reservoirs to fight fires. Although there were once numerous ponds in the valley, today only few of them are surviving due to encroachment as a result of urbanization. If the remaining historical ponds are conserved, they can offer the cities a better chance to breathe because of the open space they provide in the midst of concrete structures. Moreover they can boost tourism as well to enhance the local economy. In this respect historical ponds are also considered as restricted areas for future urban development.

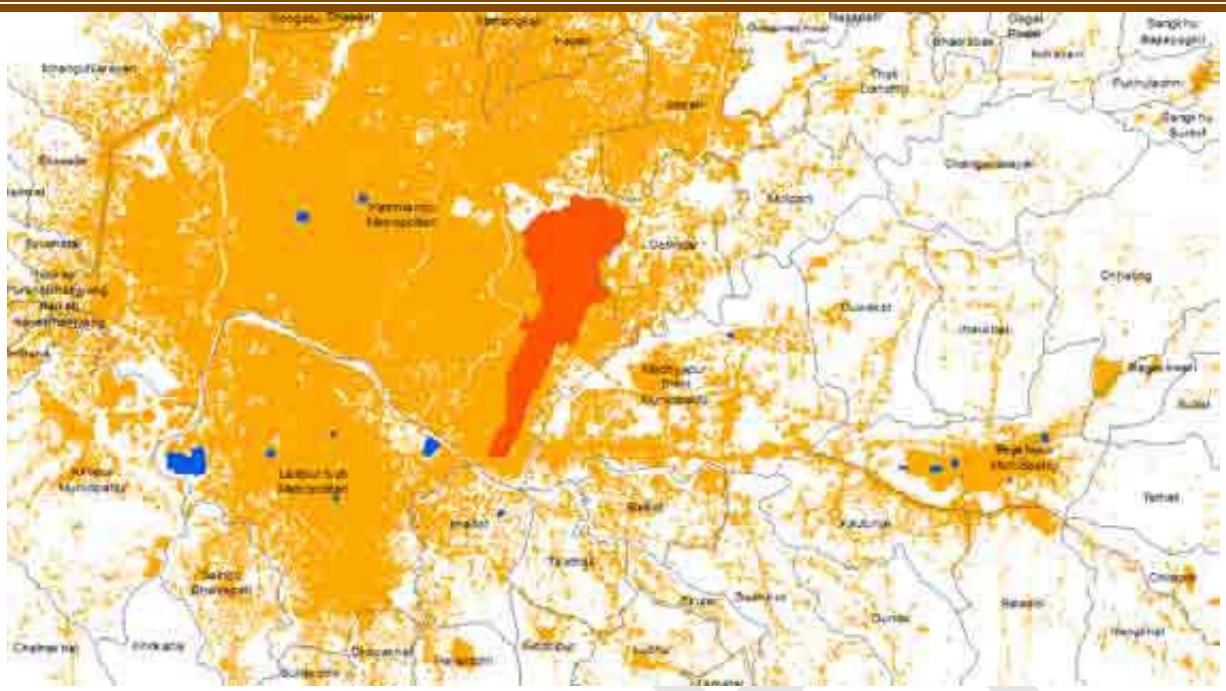

Figure 5-6 Historic ponds in Kathmandu Valley

Figure 5-7Historic Ponds: Nagdaha and RaniPokhari within the Kathmandu Valley
Image Source: KVDA

5.3.2.2 Slope greater than 30 degrees

Development on steep slopes (slope greater than 33 % i.e. 30 degrees) poses a high risk of erosion and increases the risk of landslides both during and after building construction (County, 2013). Therefore steep slopes are considered as restrictive areas for future urban development.

Steep slopes are extracted from slope map which was prepared from DEM with 20m resolution.

Figure 5-8 Areas with slope greater than 30 degrees in kV

5.3.3 Environmental constraints

5.3.3.1 Forest

For promoting sustainable forest management and restoring forest condition in Kathmandu valley, a concrete action should be undertaken. It will help to contribute towards addressing environmental and socio-economic problem by mitigating climate change and promoting the livelihood of forest dependent communities. In this regards, forest area is taken as constraint for future urban development so that valley can maintain its greenery for long term. Forest area is extracted from Land use map of 2012 that was prepared from geo-eye image of 0.5 metre resolution.

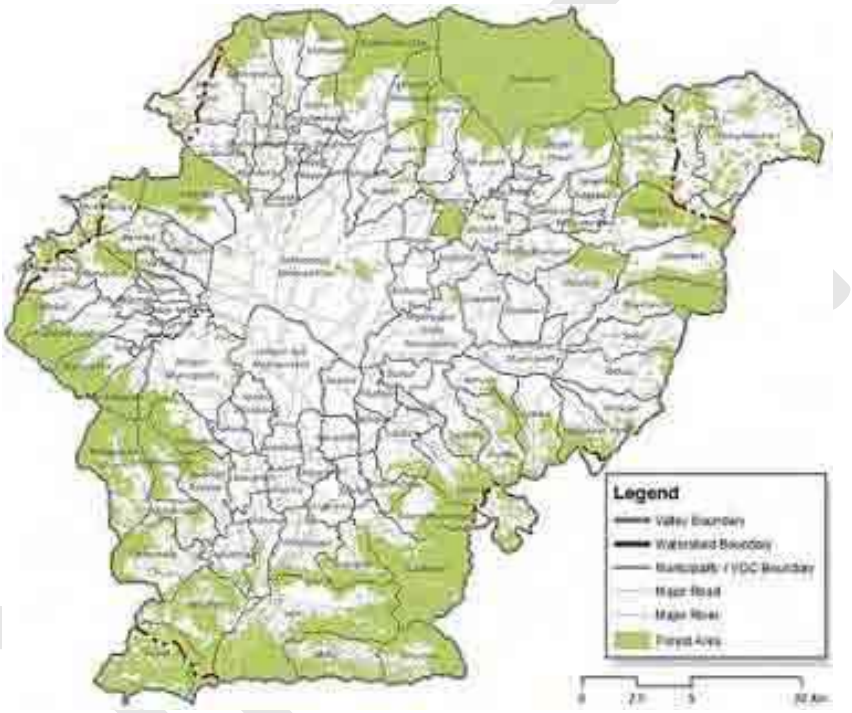

Figure 5-9 Forested areas in KV

5.3.3.2 Public Parks and Open spaces which could be used for humanitarian purposes

Kathmandu valley is situated at high risk zone of a major earthquake. Most of the people in valley are living in sub-standard housings which means if a major earthquake (9 Richter Scale) is ensued, it is expected to have a disastrous consequences living 60% of building destroyed and 40,000 dead(MoHA, 2013). Therefore under the leadership of Ministry of Home Affairs (MoHA), the International Organization for Migration (IOM) undertook a study to identify open spaces within Kathmandu valley which could be used for humanitarian purposes in the event an earthquake occurred. All the locations of these open spaces are used as restrictive areas for urban development.

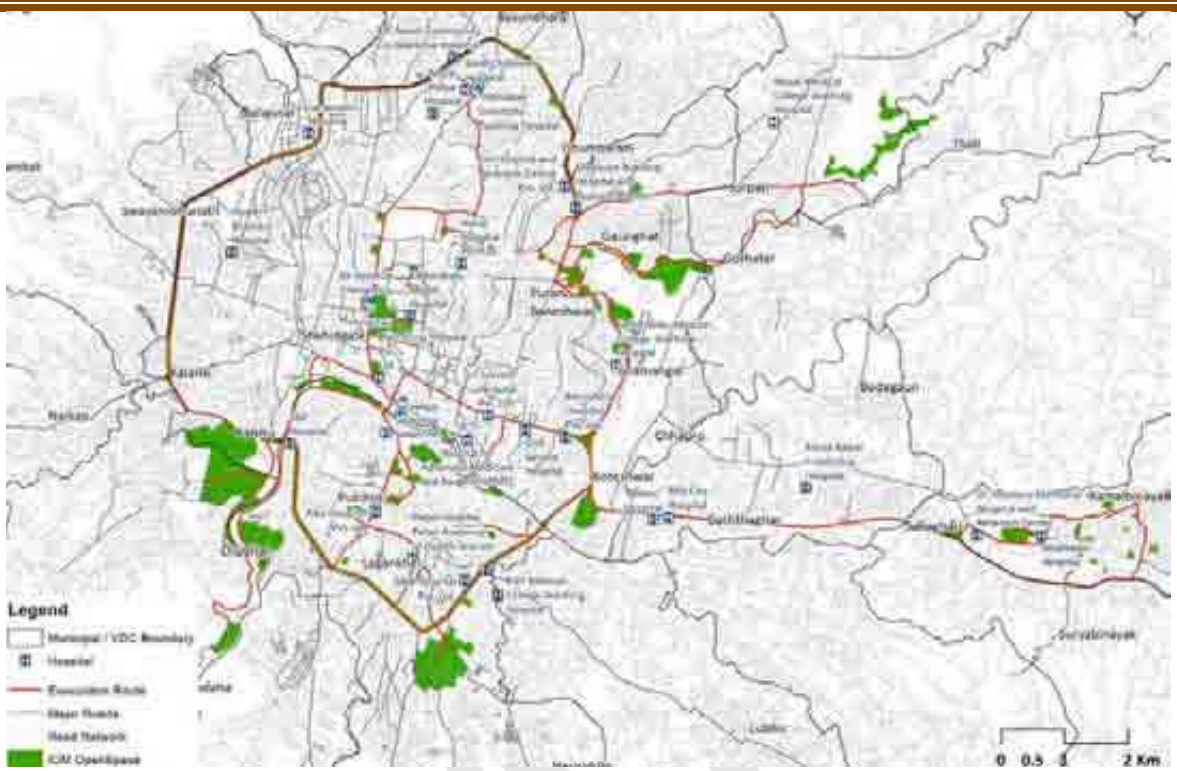

Figure 5-10 Designated open spaces for humanitarian relief

5.3.3.3 Risk and hazardous areas such as- Flood prone areas and high liquefaction areas

Kathmandu valley is surrounded by hills on all sides and is drained by only Bagmati River on south. The other major rivers that flow through Valley are Manohara, Hanumante, Kodku, Dhobi, Vishnumati, Mahadev Nakkhu, Balkhu and Godavari River. Due to rapid urbanization, most of the surfaces in urban areas have been shielded resulting low infiltration capacity of soil and high surface run-off. Also, intense rainfall pattern further intensifies the river water flow generating flood situation. Thus, a study was made to predict the flood situation in extreme case at 50 years return period (50 YRP) and the flood inundation map was generated. All the areas that are expected to inundate by 50 YRP are considered as risk areas and are restricted for future urban development.

Another hazardous susceptibility is liquefaction associated with an earthquake when it occurred in a non-consolidated sediments dominant of sand and silt. Liquefaction is caused by earthquake shaking in the loose sediments. Since, Kathmandu valley is filled up with unconsolidated and semi-consolidated sediments, liquefaction hazard assessment is very crucial. Therefore a detail study was carried out to identify the spatial location of potential liquefaction zones and liquefaction susceptibility map was prepared. Those areas which have high liquefaction potentiality are extracted from the map and considered as restricted areas for further urban development processes.

Figure 5-11 Potential inundation areas in 100 YRP flooding

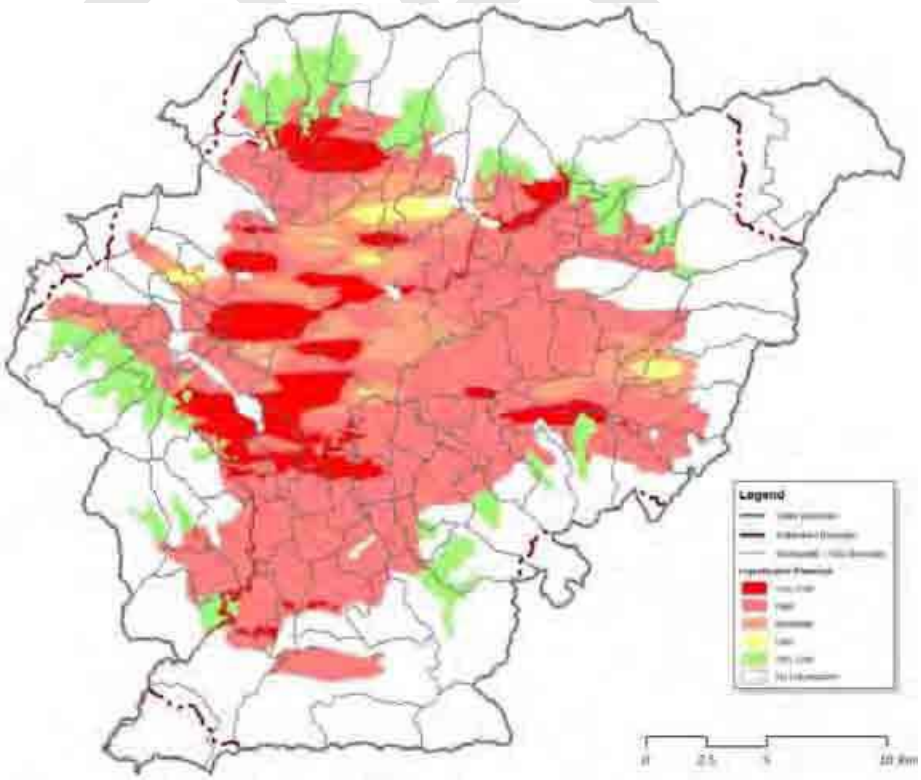

Figure 5-12 Liquefaction susceptibility map (for local earth quake scenario)

5.3.3.4 Ecologically sensitive areas such as- Potential water recharge zones

Kathmandu valley has been suffering from a shortage of drinking water since a long time and the situation is getting worse nowadays. The valley's current water demand is about 280 million litres per day (MLD), but Kathmandu Valley Water Utility (KUKL) can only supply about 86 MLD during dry season and 105 MLD during the wet season. Therefore to meet the supply-demand gap, the groundwater from both shallow and deep aquifers is being extracted nowadays forming an alternative source of drinking water in many parts of the valley.

A recharge area is a place where water is able to penetrate into ground and refill an aquifer[2]. They can form significant natural water reservoirs from where large proportion of water can be used for drinking purposes. Shallow aquifers can be locally recharged and are distributed throughout the valley but deep aquifers are confined into foothills on the north and south part of the valley. The location and extent of recharge zones and aquifers are dependent upon the physical conditions of underlying rocks and soil, topography and micro-drainage pattern. Based on these characteristics the potential water recharge zones for deep aquifers are delineated and considered as restricted areas for future urban development.

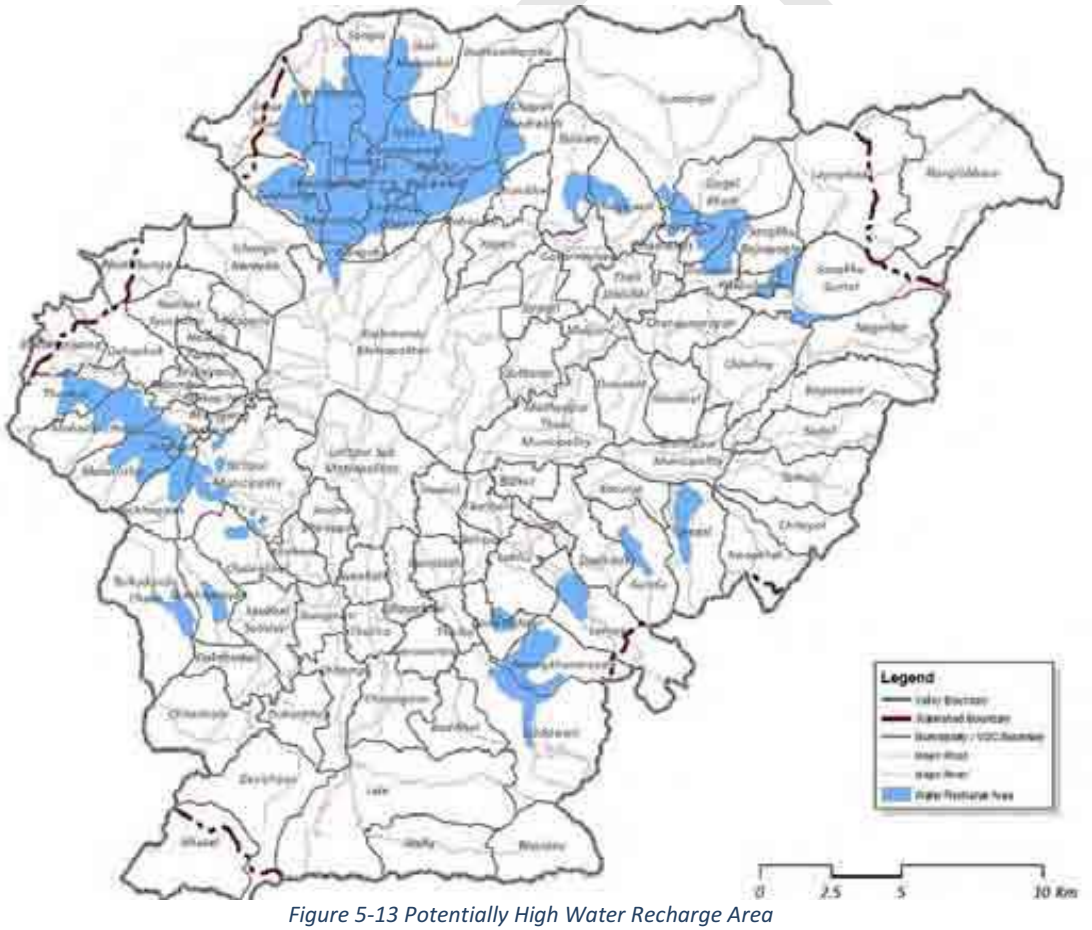

Figure 5-13 Potentially High Water Recharge Area

These constraints are put in the map and the composite constraint polygon was created by eliminating the overlaps. The area remained after deducting the constraints from the total area is the potential built up area.

[2]Aquifer is an underground layer of unconsolidated rock or soil that is saturated with usable amounts of water.

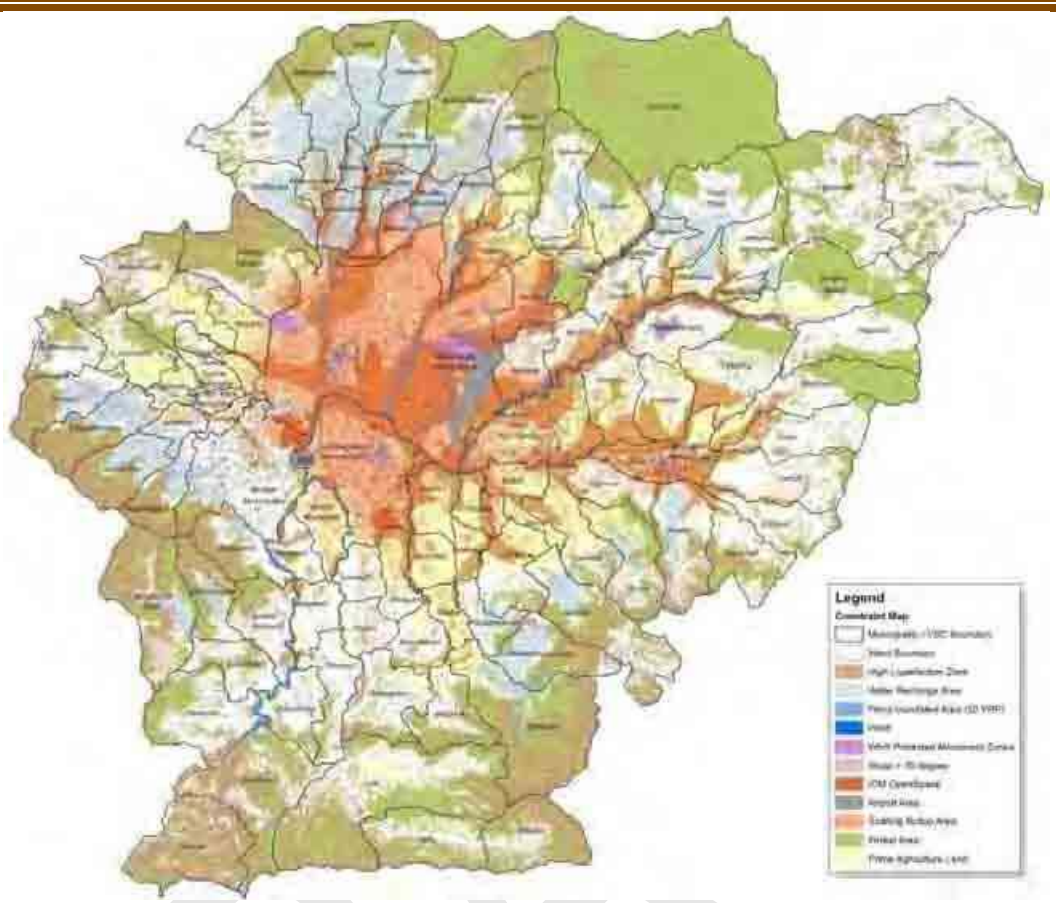

Figure 5-14 Urban Expansion: Constraint Analysis

The detail constraint analysis is given in the Annex - 3.0, summary of which is given hereunder:

Table 5-4 Summary of Constraint Analysis

Constraint Free Area on the Total Area	Constraint Free Area	Total Area	Percent to Total Constraint Free Area	Percent to Total Area	Constraints Free to Total Area
< 20%	2,547	30,775	18.9%	42.6%	8.3%
>=20% to <40%	3,954	12,303	15.2%	17.0%	32.1%
>=40% to < 60%	6,536	12,987	23.6%	18.0%	50.3%
>60%	12,085	16,123	42.3%	22.3%	75%
Total	**25,122**	**72,187**	**100%**	**100%**	**34.8%**

The total constraint free area available is 25,122 ha only which is 34.8% of the total area of Kathmandu Valley or 54% of the aggregate agriculture and built up area. Hence it can be inferred that the if the growth of the population takes place as envisaged above then it would consume 44% of the constraint free area of the valley in next 20 years. This situation is observed to be inevitable, however, it's difficult to say whether this would happen in next 15 years or 30 years. The long term development concept for the period till 2035 should be able to devise specific intervention tools so as to regulate and manage the growth.

5.4. Impact of Possible Population Growth Rate on Kathmandu Valley after Federalism

At the time of finalization of this document, in the year 2015, Nepal has adopted a new constitution that delineates new states. As a result, one very important question has been raised - *With the federalism and restructuring of political boundaries, will the importance of the Kathmandu Valley decrease?* However, Kathmandu Valley will be the national as well as the federal capital region of Nepal.

Establishing new federal states and capital cities in context of the Constitution of Nepal 2015 could lead to positive development of a planned city. However, study shows that the primacy index[3] of old capital cities are high compared to new capitals. Table 5-5 shows the comparative analysis of the few former capital cities with respect to their present capitals. Although the capitals were moved from one place to other its importance does not change suddenly. For example formal capital of Tanzania, Dar-es-Salaam lost its status as the nation's capital to Dodorma in 1974; however, it remained as the focus point of the permanent central government bureaucracy. Most decisions made by people in power within the city of Dar-es-Salaam affect the entire nation of Tanzania. To reduce the primacy of Dar-es-salaam a comprehensive program was taken by the government beginning in 1969 (Sawers, 1989). However, cities get stronger with time; it took Moscow almost 9 decades to become a primate city.

5-5 Primacy Index of different cities

Rank	City	Country	Year	Population	Primacy Index	Capital shift
1	**Karachi**	Pakistan	1998	9339023	17.65	**1960**
10	**Islamabad**			529180		
2	**Rio de Jeneior**	Brazil	2014	6,453,682	2.26	**1960**
4	**Brasilia**			2,852,372		
1	**Dar es Salaam**	Tanzania	2012	4,364,541	10.62	**1974**
4	**Dodorma**			410,956		
2	**Saint Petersburg**	Russia	2010	4,879,566	0.42	**1918**
1	**Moscow**		2010	11,503,501		

Table 5-6 is the indicative of an immoderate concentration of population in the primary city, Kathmandu. City primacy computed for major cities of all five development regions shows that the primacy index (both 2-city and 4-city) in all regions has been steadily declining except for Kathmandu in the central development region (MoUD, 2015).

Table 5-6: Primacy Index of Kathmandu

Urban Primacy of Kathmandu 1981-2011		
Year	**Two City Index**	**Four City Index**
1981	2.51	1.06
1991	3.26	1.24
2001	4.03	1.38
2011	3.79	1.19

Additionally, the neighboring country India has been establishing new states since 1950's. New states were established in 1950's, 60's, 70's, 80's and 2000 except for 90's. Taking the case of Delhi the capital

[3] Urban primacy indicates the largest city in a country. Such a city is called a primate city. In other words, urban primacy can be defined as the central place in an urban or city network that has acquired or obtained a great level of dominance. The level of dominance is measured by population Higher population will result in higher dominance.

of India - in the 1985 enactment of The National Capital Region (NCR) took place with Haryana, Rajasthan and Uttar Pradesh as the participating states. NCR contains about 7.6% of the urban population and 2.1% of the total rural population of India. About 4.4 % of the India's urban population resides in National Capital Territory (NCT Delhi) alone. Table 5-7 shows the population growth rate of four major metropolitan cities of India - Mumbai, Kolkata, Chennai and Delhi. These cities account for 15.4% of the urban population and population growth rate of NCT- Delhi is higher compared to any other big cities of India.

Table 5-7: Population Growth in Four Mega Cities of India (Source: Census of India from 1951 – 2011)

City	Mumbai		Kolkata		Chennai		NCT-Delhi	
Year	Population	Decadal Growth Rate(%)	Population	Decadal Growth Rate(%)	Population	Decadal Growth Rate(%)	Population	Decadal Growth Rate(%)
1951	29,66,902		4,669,559		15,42,333		17,44,072	
1961	41,52,056	40	59,83,669	28.1	19,44,502	26.08	26,58,612	52.4
1971	59,70,575	43.8	74,20,300	24	31,69,930	63.02	40,65,698	52.9
1981	82,43,405	38.1	91,94,018	23.9	42,89,347	35.31	62,20,406	53
1991	1,25,96,243	52.8	1,10,21,918	19.9	54,21,985	26.41	94,20,644	51.5
2001	1,63,68,084	29.9 1	1,32,16,546	19.9	65,60,242	20.99	1,38,50,50	47
2011	1,84,14,288	12.5	1,41,42,536	7	86,96,010	32.56	1,67,53,23	21

Share of urban population in NCR has been rising from 45.9% in 1981 to 62.5% in 2011 and the rural population has declined in the same proportion. In NCR excluding NCT-Delhi the share of urban population has increased from 16.9% in 1981 to 27.0% in 2011 (ref Table 5-8). This indicates the urban growth in surrounding agglomeration such as Gurgaon, Noida, Faridabad,Meerut (ref Table 5-9)

Table 5-8: Urban- Rural Composition of Population in NCR (Source : Census of India 1981- 2011)

Urban-Rural Component/Year	Percent Share%			
	1981	1991	2001	2011
Urban NCR	45.90%	50.20%	56.40%	62.50%
Rural NCR	54.10%	49.80%	43.60%	37.50%
Urban NCR excluding NCT - Delhi	16.90%	19.30%	21.60%	27%

Table 5-9 : Population of Urbanizing Cities in NCR [Source: (GEOHAVE, 2015)]

Cities	Population		
	1991	2001	2011
Meerut	753,778	1,068,772	1,305,429
Faridabad	617,717	1,054,981	1,414,050
Gurgaon	135,884	172,955	876,969
Noida	146,516	305,058	637,272

Additionally, population density in the NCR has more than doubled from 657 persons per sq.km in 1981 to 1349 persons per Sq.km in 2011 in the last three decades; however, population density in rest of NCR excluding NCT Delhi is 912 persons per Sq.km. Analysing these data has provided an understanding that creating federal states or new capital does not necessarily mean that cities will grow overnight. It takes time for infrastructure, social, economic development; hence, it might take a few years to several

decades to fully function as a city which is economically vibrant, environmentally sustainable and politically stable. However, the existing capitals will not decline easily rather will grow with time.

Keeping these facts aside, we need to take in consideration ground realities of Kathmandu valley to analysis where might KV stand after the federalism and the restructuring process. This might be easier to understand through the rate of accomplishment of projects. In a country like ours where the project of national pride that has direct impact on social, economic and political stability of the country exceeds its deadline by several years. Nijgadh Airport, Kathmandu-Nijgardh, Kathmandu-Kulekhani-Hetauda Tunnel Highway are some of the projects having a direct effect on Kathmandu valley. The second international airport to be constructed at Nijgardh has been facing uncertainty due to Tribhuvan International Airport (TIA) expansion. TIA has been in operation with the capacity of 4.8 million passengers per year and aims to cater 920 million passengers per year after completion of expansion works in 2018. Together with the expansion of TIA the government has started construction of the Gautam Buddha Regional International Airport in Bhairahawa and the construction of an airport of similar nature will also start in Pokhara from 2015. These projects have increased the degree of uncertain of airport at Nijgardh, although its pre-feasibility and feasibility study for construction was carried out in 1995 and 1996 respectively (Dahal, 2015) .

Fast track connecting Kathmandu and Nijgardh is being constructed. It is the shortest route connecting Kathmandu and mid Tarai compared to 200 km long Kanti Highway, 275 km long Tribhuvan Rajpath and 133 km long Prithavi Highway. Kathmandu to Nijgardh will take 1.5 hours of travel time. However, construction work has been suffering from delays due to the failure in distribution of compensation to people in the process of land acquisition. However, pre-feasibility study for Kathmandu-Nijgadh Fast Track was conducted only in 2008, though the project was initiated in 1997 (Kathmandu Today, 2015). Similarly, Kathmandu-Kulekhani-Hetauda Tunnel (KKHT) Highway is one of the most anticipated projects. It's a unique project where road sections are connected by tunnels. KKHT is reasonably shorter compared to Prithivi Highway and Tribhuvan highway; travel time of KKHT is expected to be 0.75-1 hour which is extremely shorter compared to travel time of 6-8 hours of existing highways. This can result in a saving of around 6 lakh liters of petrol which is equivalent to NRs 63 million per day. The concept of KKHT dates back to 1970's and its completion is still long awaited (Nepal Infrastructure Development Company Limited , 2014). The cross-border petroleum pipeline construction is another long awaited project with national interest which has been finally realized after 20 years. The proposed pipeline is expected to save Rs 700 million per year in transporting fuel from Raxaul to Amlekhganj. This project is also expected to ease out congestion at the Raxaul-Birgunj custom which will intern support in import of other goods from India.

There are many more such delayed projects; timely realization of such project is very important for the development of any city whether its capital or any other cities. Kathmandu has been capital for centuries; with all the economic, social, cultural richness and moreover political willingness and the international support it has been struggling to achieve its targets. At this point of time federalism seems almost inevitable with these political change new states and its capitals will be established; however, it is important to understand that it might take several years to gain momentum in the development of those cities.

SUMMARY OF CHAPTER 5

Based on the population projection, that categorizes administrative units in the valley into seven classes; average growth of about 4.5% will be observed till 2015, which will gradually decline to 4.0% between 2016 to 2025 and 3.5% between 2026 to 2035. The gross density of Kathmandu Metropolitan City is expected to reach 260 ppha in 2020 and 367 in 2035 from 197 ppha as of 2011. All the municipalities in the valley will cross density of 100 ppha by 2035.

With the estimated plot area of 4 aana (127 sq.m.) per household, it is expected that the increased population of 3.6 million by 2035 would require additional 11,560 ha of land that would increase the built-up area to 51% from 26%, as observed in 2012. The projected scenario reveals that the population of Kathmandu Valley would be 1.55 times the population of 2011 in 2021 and 2.5 times in 2035.

The total buildable area in Kathmandu Valley is 46,000 ha, which is around 64% of the total area of 72,187 ha. However, due to the constraint factors like slope, monument zone, historical ponds and ecological constraints, only 43% that is 31314 ha can be developed for settlement purpose. According to the density analysis, the valley will take the increased population without significant implications. But, it is also equally important to identify constraint area for development of safe and sustainable settlements.

Building-up on the restricting factors for urban growth that are underscored in LTDP 2002, SDMP also incorporates three majors constrains that are essential for sustainable urban growth of the valley. They are:

- Land use restrictions such as World Heritage Sites, Airport
- Physical constraints –such as Historical Ponds, Slope greater than 30 degrees
- Environmental constraints such as forest, public parks and open spaces which could be used for humanitarian purposes, Risk and hazardous areas such as- flood prone areas and high liquefaction areas, ecologically sensitive areas such as- Potential water recharge zones.

While Nepal is in the transitional phase of federal restructuring and decentralization, a very important question is being raised "*With the federalism and restructuring of political boundaries, will the importance of the Kathmandu Valley decrease?*" However, considering the current socio-political and economic scenario of the country and study of similar case studies from around the world, it can be concluded that Kathmandu Valley will be the national as well as the federal capital region of Nepal.

Establishment of the federal states and their capitals is the crux of the federal structure. The study of similar past federal restructuring and relocation of old capitals indicates that the primacy indexes of old capital cities are high as compared to new capitals. That is, although capitals are relocated their importances do not change suddenly. It is also indicative of a consistent immoderate concentration of population in the primary city, Kathmandu.

As a national capital region, Kathmandu Valley enjoys its central position in the national context as well as its access to international linkages. However, ongoing and proposed projects of the national importance will have direct impact on the valley and are expected to affect its position in the national setting. Nonetheless, the possible economic impact of these projects on the Kathmandu Valley and its position in the national landscape is yet to be evaluated due to history of slow implementation of the large-scale projects in Nepal.

परिच्छेद ५ को सारांश

जनसंख्या प्रक्षेपण अनुसार, २०१५ सम्ममा ४.५%, २०१६ देखि २०२५ सम्ममा ४.०% र २०२६ देखि २०३५ सम्ममा ३.५% को वृद्धि हुने देखिनेछ। हाल १९७ रहेको काठमाण्डौ महानगरपालिकाको कूल जनघनत्व, २०२० सम्ममा २६० जनसंख्या प्रतिहेक्टर र २०३५ सम्ममा ३६७ जनसंख्या प्रतिहेक्टर पुग्ने अनुमान गरिएको छ। उपत्यकामा रहेका सबै नगरपालिकामा जनघनत्व २०३५ सम्ममा १०० जनसंख्या प्रतिहेक्टर भन्दा माथि पुग्ने छ।

काठमाण्डौ उपत्यकामा निर्माणका लागि उपलब्ध जमीनको जम्मा क्षेत्रफल ४६,००० हेक्टर छ जुन कूल जमीन ७२,१८७ हेक्टरको ६४% हुन आउँछ। भिरालो जमीन, स्मारक क्षेत्र, ऐतिहासिक पोखरी, र पर्यावरणीय सीमितताका कारण सबै क्षेत्रलाई विकास गर्न सकिँदैन। जनघनत्व विश्लेषण अनुसार, उपत्यकाले कुनै खास प्रभाव विना नै बढ्दो जनसंख्यालाई ग्रहण गर्न सक्ने देखिन्छ। सुरक्षित तथा दीगो विकासका लागि सीमायुक्त (constriant) क्षेत्रको पहिचान गर्नु जरुरत छ।

रणनीतिक विकास गुरुयोजनाले १) भूमि उपयोगका लागि प्रतिवन्धित जस्तै विश्व सम्पदा क्षेत्र, एयरपोर्ट २) भौतिक सीमायुक्त- जस्तै ऐतिहासिक पोखरीहरु, ३० डिग्री भन्दा बढी भिरालो जमीन ३) वातावरणीय सीमायुक्त क्षेत्र जस्तै जंगल, सार्वजनिक पार्क र मानवीय उद्देश्यका लागि प्रयोग गर्न सकिने खुला ठाऊँ, ४) जोखिम तथा संकटयुक्त क्षेत्र जस्तै- बाढीको सम्भावना भएको क्षेत्र, उच्च रुपमा तरलीकृत हुने क्षेत्र (liquefaction area), ५) पर्यावरणीय रुपमा संवेदनशील क्षेत्र जस्तै- सम्भावित पानी पुर्नभरण गर्न सकिने क्षेत्र लाई उपत्यकाको सहरी वृद्धिको विश्लेषणका सन्दर्भमा सीमायुक्त क्षेत्रका रुपमा ग्रहण गरिएको छ।

6 . STRATEGIES AND ACTIONS

Figure 6-1Aerial view of Swayambhu area taken in 1965 by Ganesh Man Chitrakar
Image Source: http://photos1.blogger.com/blogger/710/1313/1600/73_Swayambhu%20Stupa2.jpg

Figure 6-2Aerial view of Swayambhu area taken in 2014
Image Source: http://c4.staticflickr.com/8/7437/16397778636_d5c98f134d_c.jpg

As shown in chapter 4 and chapter 5, if Kathmandu Valley is left to grow in business as usual scenario, the built-up area will equal to agricultural land in 20 years. To ensure that the further development of Kathmandu Valley will be in a planned manner, strategies and actions are proposed in this chapter.

Major Strategies recommended

In context of the current situation and the expected scenario of the development of Kathmandu Valley, the following ten strategies have been devised as a combination/ integration of:

- Urban planning approaches
- Urban development/ Land pooling
- Financing
- Industrial/ Agricultural Support
- Organization
- Climate change and Disaster Risk Resilient approach
- Promote Private Sector's role as a positive key player in urban development process

Table 6-1 List of Major Issues and Strategies

Issues	Major Strategy
- Distant, Dispersed, and Disconnected Settlements (High population concentration in city core areas and Low density of urban expansion) - Lack of consolidated laws to manage and control land use	**1. Undertake Planning at two Levels: Macro (Valley Level) and Micro (Municipal Level)**
- Unprecedented change in land use - Lesser Constraint Free Area in KV (34.8%) due to Land use restrictions, physical constraints and environmental constraints - Need to move from 3D to 3C through linking of infrastructure, land use and transport	**2. Analyze Constraints and sensitivity based zoning to guide urban expansion and RSLUP of Kathmandu Valley**
- Inequitable urban infrastructure and services to accommodate the increasing population - Need to link coordinated investment in infrastructure development and urban planning	**3. Develop Urban Pressure and Risk Resilient Urban Infrastructure**
- Increased vulnerability of earthquake, flood, landslide, fire - Need to integrate disaster risk mitigation approach and preservation of natural environment from planning	**4. Environmental Friendly and Resilient Planning Approach**
- Need to preserve historic, cultural and social assets of Historic city core areas and heritage sites - Structural problems, high occupancy resulting in lesser access to critical facilities in settlements of city core areas	**5. Urban Regeneration of Historic City Core and Traditional Settlements**
- Inequality of economic opportunities to promote local economy - Inadequate capital investment in public goods and services	**6. Promotion of Economic Opportunities through identified Growth areas**
- Need to mainstream gender equity and social inclusion in all decision making and activities	**7. Promotion of Gender Equity and Social Inclusion**
- Inadequate emphasis on safety, security and risk resilience in urban development	**8. Promote Safety and Security in urban development**
- Inadequate effort to ensure private sector participation as	**9. Promote Private Sector**

key stakeholder in comprehensive and planned urban development	**Participation in urban development activities**
- Need to establish accountability of KVDA's actions	**10. Emphasize on Information, Communication and Advocacy**
- Need to involve youth in urban development activities and decision making process	**11. Youth Mobilization and Participation in Urban decision making processes and development activities**

6.1 Strategy 1: Undertake planning at two Levels: Macro (Valley Level) and Micro (Municipal Level)

Major Issues to be addressed:

- Distant, Dispersed, and Disconnected Settlements (High population concentration in city core areas and Low density of urban expansion)
- Lack of consolidated laws to manage and control land use

Kathmandu Valley Development Authority has adopted the best land-use options and translate the assessment into appropriate location of land uses, functions, facilities and into land use regulations and policies. Applying land use planning techniques in DRR include a comprehensive analysis of the land use behavior and translation of those risk assessment into location of land uses, functions, facilities and into land use regulations and policies. Land use planning offers a wide range of techniques and tools that can help mitigate and prevent adverse impacts of seismicity and other disasters and enhance the resilience of urban areas to disasters. Some regulatory and non-regulatory planning tools involves location and structural approaches, e.g. land subdivision regulations, design of critical facilities and lifelines, zoning, building code implementation, and taxation. KVDA has taken the lead to prepare the 20 years Strategic Development Master Plan based on Kathmandu Valley as a single planning unit. KVDA would conceive the planning in two stages: at Macro level and at Micro Level.

a. Macro Level Planning

Macro Level planning addresses development plan based on Kathmandu Valley as a single planning unit. The strategic development plan contains broad land use zones to:

- Protect areas deemed not suitable for urban development (at this point in time, or in perpetuity)
- Control/ restrict development to within certain categories or classes. This is an absolute necessity for effective land use planning
- Develop strategies and action plans for planned urban expansion based on available opportunities and constraints

Table 6-2 Opportunities and constraints for the development of planned urban expansion in Kathmandu Valley

Opportunities	**Constraints:**
• Good accessibility (Outer Ring Road, Fast	• Risk factors: Earthquake, Flooding,

Tracks) • Short distance from established business centres to Kathmandu Valley • Availability and possibility of providing basic infrastructure and services (water, electricity, sewerage etc) • Land Pooling (Land Readjustment) and Real estate projects (Participatory urban land development)	Increasing possibility of Landslides, Liquefaction, Fire Hazards • Land Use Restrictions: World Heritage Sites, Airport, Forests and Conservation areas • Physical Constraints: Historic Ponds, More steep slope areas, • Limited constraint free area

b. Micro Level Planning

Micro Level Planning would provide a strategic framework to guide:

- Land use plan
- Major infrastructure projects

It is KVDA's responsibility to perform regulatory actions while coordinating with the municipalities for provision of building permits and land subdivision. In order to develop micro level planning at municipal and ward/VDC level, KVDA would adopt 8 staged planning processes:

1. Identify Built up areas
2. Identify Semi-Built up areas (Sparsely Populated)
3. Identify constraints and risks
4. Identify Infrastructure Provision
5. Identify Development that is inevitable using GLD
6. Plan ultimate development using Land Pooling (Land Readjustment)
7. Identify Remote Areas as low priority for development
8. Phasing of Urban Expansion

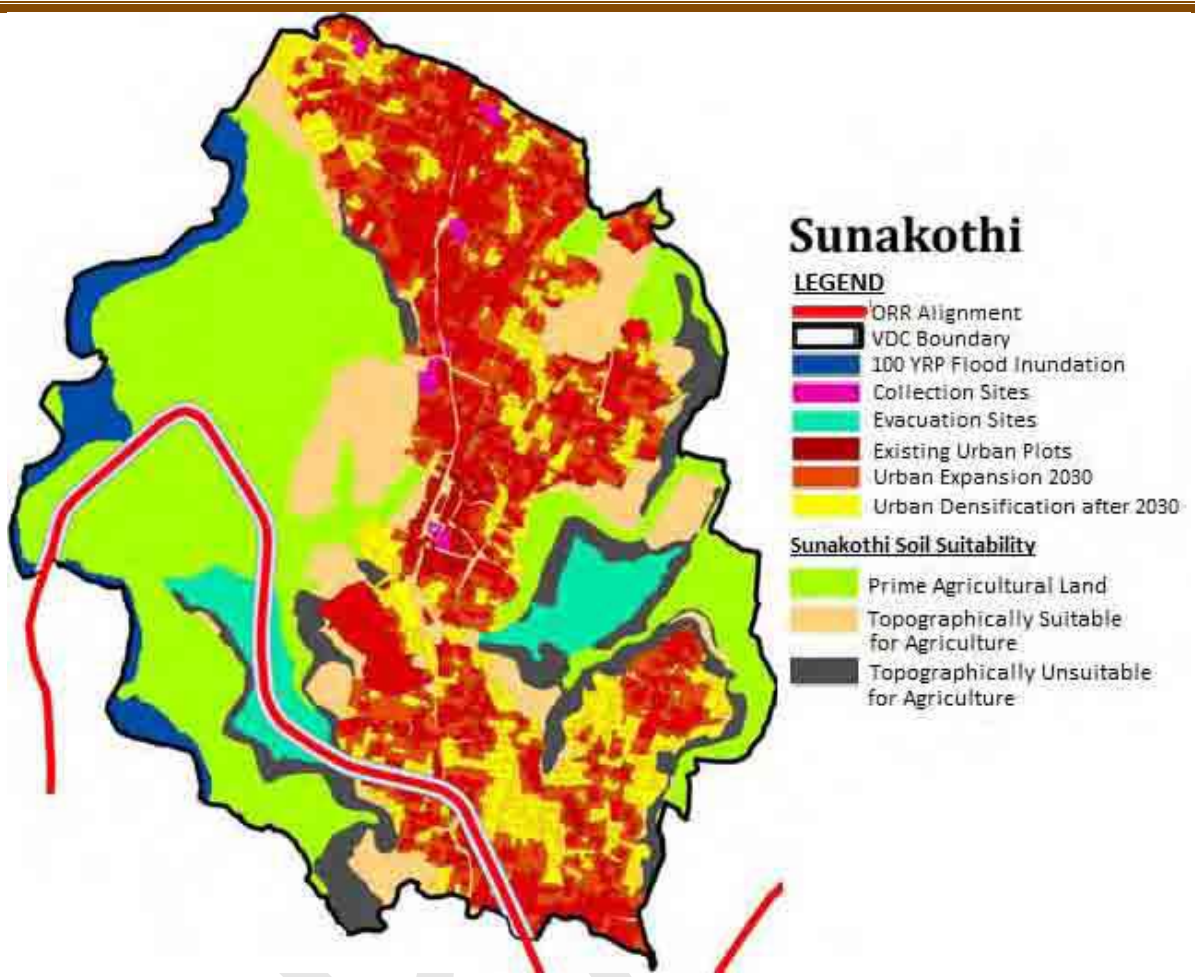

Figure 6-3 Typical Example of Micro Level Planning Sunakothi, Lalitpur

Desirable Condition	Indicators
Strengthened urban development within KV	Growth of Planned Satellite cities with higher socio-economic functions: Health, education, Wholesale, Manufacturing
	Development of short term, mid-term and Long Term planning guidelines for each municipality
	Urban Primacy Indicator for cities within Kathmandu Valley
	Quality of connectivity standards –(Inter-regional and Intra-regional Level)
	Citizen report card on physical, socio-cultural and economic aspects of urban areas within the Kathmandu Valley
	Level of enforcement for Land Use Plan and Policies within KV
	Availability of web based Land Information System
	Number of GLD and Land Pooling projects

Table 6-3 Objectives and Action Plans for Strategy 1: Two Levels of Planning

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[1]
Obj. 1. Review	Prepare Comprehensive Physical	KVDA		O,P,E

[11] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[1]
and revise existing regulations, plans, tools and guidelines to implement SDMP 2015-2035	Development Plan **(Refer 6.1.1) –**			
	Prepare Kathmandu Valley Resilience Plan	KVDA	Partner agencies	O,P,E
	Prepare Kathmandu Valley Land Use Plan in consonance with the National Land Use Policy 2015	MoUD, DoS, DLR	KVDA, Municipalities	O
	Review and revise the existing Building Bye laws; Introduce Peer Review of Building Design, Permit Process and compliance with Building Codes	KVDA	MoUD, Municipalities	S,O
	Prepare Large Scale GIS Database of Urban Infrastructure and Land Information System of KV to be used for Land Management, Development Planning, Infrastructure development and Disaster Mitigation **(Refer 6.1.2)**	KVDA, DoS, DLR	Local bodies	O
	Develop policies for preparation of Tax based Incentives/ Disincentives mechanism as a Base for Land Use Plan Implementation; to demarcate buildable and protected land; discourage land fragmentation; regulate minimum plot size	KVDA, MoUD		O
	Develop and implement GLD, Land pooling and Land subdivision guidelines **(Refer 6.1.3)**	KVDA, MoUD, DLR, DoS	Municipalities	O
Obj. 2. Guide related line agencies/authorities for major land development, re-settlement plans in KV in compliance to eco-friendly standards	Carry out periodic impact study of land development and management mechanisms, Road widening Programs in KV for any directional procedural shift as necessary (Analysis of livelihood change, rental status, Change in usage of buildings, Land use change)	KVDA		
	Introduction of land banking system **(Refer 6.1. 4)**	KVDA		O
	Devise policies for Government subsidy in land pooling and subsidized interest from financial institution for planned urbanization	NPC, MoF	KVDA, MoUD	O
	Develop Land Valuation guidelines for KV	MoLRM	Municipalities	O
	Coordinate for developing and enforcing infrastructure standards and threshold for land use control	Line Agencies, KVDA	Municipalities	
	Develop Digital Metric addressing system encompassing all municipalities of KV	KVDA, MoUD, MoFALD	Municipalities	O

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[1]
Obj. 3. KVDA to coordinate with local bodies for development and implementation of Local Level Development Plans in strict compliance to the Kathmandu RSLUP	Prepare Local Level Development Plans at the municipalities and VDCs level, based on the strategic development plan and urban development guidelines while coordinating with related organizations and experts to	KVDA, Municipalities	Development Partners	SCOPE

6.1.1 Preparation of Comprehensive Physical Development Plan of Kathmandu Valley

Based on the strategic development plan, KVDA will take the lead in the preparation of comprehensive physical development plan including the following components:

1) Regeneration of Historic Core & Compact Settlement Area
2) Management of Urban Sprawl with the up-gradation and expansion of urban infrastructure
3) Development of New Towns (Urban Extensions) with the provision of new urban infrastructures
4) Preservation of Natural Resources, Cultural and Religious Heritages, Agricultural Land
5) Development of Integrated Urban Services Center
6) Environmental Protection and Management
7) Management of Open Spaces, Parks, Barren Land
8) River Basin Protection and Management (be a part of HPCIDBC – High Powered Committee for Integrated Development of the Bagmati Civilization)
9) Disaster Risk Reduction and Management
10) Public Private Partnership in Infrastructure Development and Management
11) Promotion and Utilization of Renewable Energy
12) Solid waste management (with SWMTSC, Municipalities)
13) Kathmandu Valley Resilient Plan

Table 6-4 Stages for the Preparation of Comprehensive Physical Development Plan

Description	Responsible Agencies
Preparatory works for the development of Physical Development Plan	KVDA, MOUD, Stakeholders
Conduct a Study on Present and Future Growth Pattern	KVDA, MoUD, Development Partners
Preparation of Multi Hazard and Risk Assessment Map	KVDA, MoUD, Development Partners
Development of 20 years Strategic Development Plan, 5 years and 10 years list of Programs and Activities	KVDA, MoUD
Approval of the Framework of PDP	GoN
Start Implementing identified high priority Programs and Action Plans	KVDA, GoN, MoUD
Preparation of Existing and Detailed Land Use Map of KV	KVDA, MoUD, MoFALD, MoLR

Description	Responsible Agencies
Preparation and approval of Risk Sensitive (RSLUP) and Environmental Sensitive Land Use Plan	KVDA, Development Partners
Overlay of Broad Land Use Zoning on Existing Land Use Map of KV (NLUMP Prepared)	MoLR, MoUD, MoF, KVDA
Translate Land Use Zoning into existing cadastral map	MoLR, MoUD, MoF, KVDA
Start issuing' Lalpurja' as per as per Land Use Plan's Zoning categories	MoLR, MoUD, MoF, KVDA
Preparation of Urban Transport Master Plan for KV	DoR, KVDA, Development Partners
Update Urban Transport Master Plan based on RSLUP	KVDA, MoUD
Consolidation of final Physical Development Plan for KV	KVDA, MoUD
Institutional and Capacity Building	KVDA, MoUD, MoF
Approval of Physical Development Plan	GoN, MoUD, KVDA
Initiate Implementation of various activities of PDP	KVDA, Stakeholders

In order to prepare the development plan, KVDA shall coordinate with various organizations and experts. Based on the strategic development plan, it will also assist the municipalities to prepare their respective Local Area Plan. These plans are more detailed and prepared with satellite imageries or cadastral maps on the background.

6.1.2 Develop Information Database for Land and Urban Infrastructure

In order to put the envisioned development roadmap of KVDA for the overall development of the Valley into practice, the initiative requires comprehensive information system that models the human and natural environment. An integrated spatial information system and other information pertaining to human settlement, human activities, land resources, environmental resources, environmental hazards and bio-physical parameters are considered mandatory for planning purposes. To support preparation of development plans, KVDA requires relevant supporting information and map products which are prioritized as:

a. Digital Cadastral map containing land parcel information with integrated land records of entire Kathmandu Valley. Digital land parcel and associated land records is pre-requisite for any planning and development process, therefore properly geo-referenced and accurate land parcel GIS data along with associated land owners' record is prioritized.
b. Parcel level land use categories, as prescribed by the National Land Use Policy, is imperative for land use planning and zonation for further development. Therefore, large scale (per-parcel) land use GIS database is prioritized
c. Spatial database of existing road infrastructures, utilities - water supply and sewerage is also prioritized for planning and development initiatives by KVDA.

KVDA will play the following roles for successful development and sustainability of the system

- In the initial stage of the development of information system, KVDA can act as a steering body coordinating with all the stakeholders and line agencies to support development of this system.
- In the later stage, KVDA seeks to establish and implement KV Spatial Data Infrastructure as a pilot of an autonomous SDI initiative and administer and manage the information system.

6.1.3 Land Pooling (Land Readjustment) & Land Sub-division Regulation

KVDA will prepare Land Pooling and Land Sub-division Regulation and get them endorsed from the ministry. Different minimum plot size will be proposed based on the land use category and proposed densification. The individual private developers will be regulated to control indiscriminate land sub-division. The minimum road width of 6m will be proposed in any new development and the existing narrow roads will be widened to at least 6m wherever applicable through community participation. In case of building subdivision, the regulation would strictly prohibit vertical subdivision of buildings, and promote the concept of horizontal subdivision and House pooling, particularly in densely populated city core areas. House Pooling would be promoted by the concept of five storey walk-in apartments.

6.1.4 Introduction of Land Banking System

One of the most crucial issues that hinder the project execution has been the difficulty in land acquisition, as the public land is either too limited or not available. Obtaining private land is not only too expensive but also socially unacceptable. Moreover, the valley possesses a number of risks, the most prominent being the seismic risk as the process of preparing to respond to these risks and the vulnerabilities of exposed communities, their social and economic susceptibilities, and their ability to cope with or recover in the event of disaster is a long term process with sustained commitments and actions. In this context, KVDA will undertake the feasibility of land banking system in Kathmandu by the study of land ownership system of Nepal. The basic objective of the land banking system is to preserve the land for future building or infrastructure investment, be it from private or public sector. Various options of land banking approach would be studied and existing legal provisions would be explored. The involvement of insurance companies, financial institutions, citizen provision fund etc. will also be explored in this regard.

6.2 Strategy 2: Analyze Constraints and sensitivity based zoning to guide urban expansion and Risk Sensitive Land Use Plan of KV

Major Issues to be addressed:

- Unprecedented change in land use
- Lesser Constraint Free Area in KV (34.8%) due to Land use restrictions, physical constraints and environmental constraints
- Need to move from 3D to 3C through linking of infrastructure, land use and transport

The Gorkha Earthquake of April 25, 2015 (7.8 magnitude) showed that damage and destruction was not evenly spread across Kathmandu Valley. Some areas such as Gongabu, Sitapaila, Dhapasi and Ramkot saw considerable more impact compared to others. While building types and technical measures played an important part, a major influencing factor was the underlying land conditions, due to which damage were experienced the most. An assessment of land conditions in the Kathmandu Valley, including availability of the agricultural land, identification of risk sensitive areas, availability of the net buildable area and the carrying capacity of the valley was conducted to inform future land use planning decisions. The map in Fig. 6-4 shows the various constraints that are prevalent in Kathmandu Valley at ward level. Though, the constraint free area is 34.8% (25,122 ha) of the total area of the valley; the range of

availability of the constraint free area within the administrative boundary of the particular wards may vary from 0% to 83%. Some of the wards within Kathmandu Metropolitan City are totally occupied and there is no scope of further development without introducing new modality.

The land use plan in Kathmandu Valley would be based on the availability of the agricultural land, identification of risk sensitive area, availability of the net buildable area and the carrying capacity of the valley. Hence, this strategy focuses on demarcating land based on natural hazard, climate change risks, environmental constraints, and guiding future development towards areas with lesser risks. The strategy recognizes the importance of food security, Ground water table – water scarcity, particularly during a disaster, and hence seeks to protect prime agriculture land through RSLUP implementation in the valley from the pressures of urban development. It also recognizes that some climate change impacts are likely to affect the Kathmandu Valley and would also be considered in the long term land use planning. Three different color zones are proposed based on the availability of the constraint free spaces, as below:

Table-6-5 Three different color zones proposed based on the availability of the constraint free spaces in KV

Colour Zone	Area in Ha							
	Built-up on Constraint	Non-Built-up on Constraint	Total Constraint Area	Built-up on Constraint Free	Non Built-up on Constraint Free	Total Constraint Free Area	Grand Total	Non- Built up Constraint Free Area Percent
Red	4,116	20,612	24,728	4,746	**8,017**	12,763	37,491	21.4%
Yellow	800	12,334	13,134	1,549	**10,852**	12,401	25,535	42.5%
Green	59	2,287	2,347	561	**6,253**	6,815	9,162	68.3%
Total	**4,975**	**35,234**	**40,209**	**6,856**	**25,122**	**31,979**	**72,187**	**34.8%**

The **RED** Color zone is designated as the High Alert Zone, which has limited constraint free space available for further development. It requires managing the activities that may potentially escalate risks and prevent development to avoid exposure of lives and assets. The area may not be suitable for high rise apartments or large scale industries. The average density in the wards falling into the RED category is 145 ppha. However, there's a huge gap between minimum and maximum densities. The lower density means that the area is not yet built up but significant portion of which has other risks and constraints.

The **YELLOW** Color zone designates Medium Alert Zone and represents the area which is lesser sensitive than the Red Zone, but has high potential for becoming the Red Zone if not planned appropriately. Few high rise buildings could be permitted and large scale industries would be restricted. The land transaction and permit fee would be lower than the Red Zone.

The **GREEN** Color zone or Residential Area Promotion Zone, mostly on the south of the valley, is the most potential residential area. Organize housing and land pooling schemes would be introduced in this zone. More than 60% of the existing area in this zone is constraint free. High rise buildings, medium and large scale industries are suited to be would be promoted in this zone.

Limitation on the implementation of Color Zone

Within each color zone, there may be up to seven land use zones with different land use permissions. The color zone will be identified by KVDA in collaboration with Department of Survey on the basis of the technical assessment of risk and sensitivity while the land use zones will be determined through participatory land use planning as directed by the National Land Use Policy 2015. KVDA may initiate land use census in order to assure wide participation of the landowners.

The land use planning will be overlaid in the cadastral map and backed up with the landowners' information. KVDA will advocate the preparation and maintenance of large scale web based GIS maps. An inter-departmental arrangement will be made to share the information contained therein by KVDA for the purpose of regulating and controlling development in the valley.

The purpose of the identification of land use zones, be it municipality or the region, is more or less the same. The land use zones are identified to devise instruments for the social, economic and environmental development through the optimum utilization of land, more specifically for:

- Transfer of Development Rights
- The development of potential urban area with the suitable provisioning of the urban infrastructure
- The identification and promotion of the tourism potential areas
- The identification of forest, watershed, natural heritage, buffer zones and their conservation towards protection of wild lives and bio-diversity. The identification of calamity prone zones and for the reduction of risks to the human, animals and properties
- Increasing revenue through the use based taxation system, which could also act as a disincentive mechanism for further development
- Future Transportation Development Corridor to link land use and transportation

The urban expansion in the last decade was directed towards north-west area of the valley (Goldhunga, Dharmasthali, Phutung, Manamaiju, Tokha Chandeswori, Jhor Mahankal, Khadka Bhadrakali, and Budhanilkantha etc.); which is ecologically most sensitive areas as there lay the potential water recharge zones. They form a significant natural water reservoir from where large proportion of water can be used for drinking purposes. Shallow aquifers can be locally recharged and are distributed throughout the valley but deep aquifers are confined into foothills on the north and south (Thankot, Mahadevsthan, Matatirtha, Machhegaon) part of the valley. The master plan would strategically develop its policies to guide the urban expansion towards the North-East (Changunarayan and surrounding) or East (Sudal, Tathali, Chitapol) or South (Sirutar, Lubhu, Godamchaur, Thaiba, Harisiddhi, Dhapakhel, Jharuwarasi, Sunakothi, Thecho, Chhampi, Dukuchhap, Bungmati, Khokana, Dakshinkali).

Desirable Condition	Indicators
Effective and efficient Land management Practice in KV	Number of municipalities with Participatory Local Risk Sensitive Land Use Plan
	Number of structures complying with building bye-laws
	% of Land Use Change within each colored Development Zones
	% of Constraint Free Area left for future development
	Time taken to implement land management tool s like land pooling and land acquisition for development
	Development of operating guidelines within each colored development zone of

	the municipality
	Number of projects including resilience measures
	Level of enforcement for Land Use Plan and Policies

Table 6-6 Objectives and Action Plans for Strategy 2: Constraint and Risk Sensitive Color Zones to guide urban expansion and develop Risk Sensitive Land Use Plan of Kathmandu Valley

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[2]
Obj. 4. Develop and enforce "Colored Development Zones" based on the availability of land considering development constraints, multi-hazard risk assessment, carrying capacity and future projection for year 2035	Develop and enforce Risk Sensitive Land Use Plan on the basis of colored development zones and the National Land Use Policy 2069 **(Refer 6.2.1Error! Reference source not found.)**	DoS, DLR, KVDA,	Development Partners, MoUD, Municipalities	O, E
	Develop Participatory Local Land Use Plan on the basis of RSLUP of KV	Municipalities, KVDA	Partner Agencies	O
	Develop, implement and monitor building and planning bye-laws in each zones	KVDA	MoUD, Municipalities	O
	Develop incentive and disincentive mechanisms to promote/ prohibit development in land use zones within each color zones	DLR, KVDA, MoF	MoUD, Municipalities	O
Obj. 5. Plan and promote decongestion in Red Zone	Relocate some of the urban functions from city core areas (Government functions, education facilities, Industrial and commercial areas)	Cabinet, KVDA	MoUD, Municipalities	O
	Improve transportation connectivity (road and transit system) between the Red Zones and newly developing areas in the Yellow/Green Zones to provide businesses and residents with the option of relocating from the Red Zones.	KVDA, DoR, DoTM	MoPIT, MoUD, Municipalities, Transport Operators	S,O
	Prepare detailed area plans, standards and guidelines for redevelopment of highly dense areas (and relocated sites) to introduce risk reduction measures such as wider roads (for emergency access), strengthened buildings, increased amount of multiple open spaces, and buildings that can serve as emergency shelters and critical lifelines during disaster events, and post-disaster recovery.	Municipalities	MoHA, DoR, KVDA	S, O

[2] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[2]
	Undertake upgrading programs in historic and low-income areas to provide improved infrastructure, safe shelters and open spaces, and realignment of streets to facilitate emergency access while maintaining heritage values and accessibility for low income groups.	KVDA, Municipalities	Partner agencies	P, E
	Develop incentives (such as property tax breaks and low-interest loans) to promote adoption of resilience measures for commercial / residential properties.	MoHA, MoLRM, MoF, NRB	KVDA	O
	Work with local agencies to streamline the redevelopment process for projects that include resilience measures.	KVDA, Local Agencies		O
Obj. 6. Promote residential development and non-polluting industries only in selected areas of Yellow Zones	Revise zoning bylaws and prepare guidelines to upgrade urban density in existing built up areas and select target areas in the Yellow Zone	KVDA	Municipalities, Development Partners	O
	Prioritize infrastructure improvements to support increase in urban density and to promote development of target areas.	MoUD,	KVDA, MoPIT	O
	Develop incentives (such as increased allowable density, tax credits and low interest loans) to promote a low income housing component in market rate housing development projects.	MoF	NRB, KVDA, NLHDA, Banks, Financial Institution	O
	Plan and promote non-polluting high tech industries (including manufacturing and service industries) and office to create jobs in targeted areas of the Yellow Zone	MoI	KVDA	O, P
Obj. 7. Plan and promote organized housing and land pooling in designated Green Zone, and few high rise development in South	Develop plans, programs and policies to amend Land pooling or Land Readjustment and Participatory House Pooling	DLR, KVDA	MoUD	O
	Provide infrastructure investments in designated Green Zones to promote housing development	MoPIT	KVDA	O
	Develop incentives such as increased allowable density, tax credits and low interest loans to promote ow income housing component in market rate housing development	NLHDA, KVDA		O

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[2]
	projects			
Obj. 8. Develop Earthquake Risk Management Plan	Use existing information from the 2015 earthquake to characterize hazard, exposure and vulnerability to earthquake and inform a city wide risk profile.	KVDA, MoUD, MoHA	Municipalities, I/NGOs	S, O
	Prioritize the most threatening risks to be addressed and validate the priority risks through a consultative process.			
	Identify and develop a series of structural and non-structural measures to address the priority risks.			
	Develop Earthquake Risk Management Plan consolidating risk assessment, risk prioritization and possible measures.			
	Implement pilot activities in the selected 2-3 municipalities			
Obj. 9. Guide urban expansion towards the North-East , East and South of Kathmandu Valley	Conduct Feasibility Studies to develop New Satellite cities in at least 3 areas of Kathmandu Valley**(Refer 0**Error! Reference source not found.**)**	KVDA, Municipalities		O
	Initiate the implementation of Outer Ring Road development from Nayapati to Bhatedhikhuro and Srijananagar to Satungal with connection to the proposed Fast track and planned Kathmandu-Kulekhani-Hetauda Toll Highway and continue **(Refer 6.2.3)**	KVDA	Local land owners	O, E
	Promote and develop Integrated Urban Service Centre (IUSC) and commercial/business zones in strategic locations to establish employment centers in planned development areas and reduce trip generations to CBDs	KVDA, MoUD		O, P
	Segregate land area in the form of Land Banks for urban infrastructure and services(Waste water treatment plant, land fill sites etc)	MoLRM, MoUD	KVDA	O

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[2]
Obj. 10. Promote linkage of city core area with satellite city development	Improve transportation connectivity to the historic city core area from planned new development areas in east and south through mass transit system, bypass links	MoPIT, DoR, DoA, DoTM	KVDA	O, E
Obj. 11. Promote inter-linkage of Kathmandu Valley with other parts of Nepal	Assess and promote inter-linkage with the area outside the valley (in the east to the Kavre Valley, south towards Hetuada and Nijgadh) to minimize the existing and projected urban development trend	NPC, MoPIT	KVDA	O, E
Obj. 12. Protect prime fertile agricultural lands	Prepare zoning regulations aimed at protecting agricultural land.	KVDA, MoUD, MoA		C, O, E
	Explore various options successfully practiced in other metropolis to develop mechanisms to establish and support transfer of development rights (TDR) from agricultural lands to targeted urban areas.	KVDA, MoLRM	MoUD	O
	Establish a conservation easement program to support farmers who voluntary agree to a freeze on development of their properties	MoLRM	KVDA	O

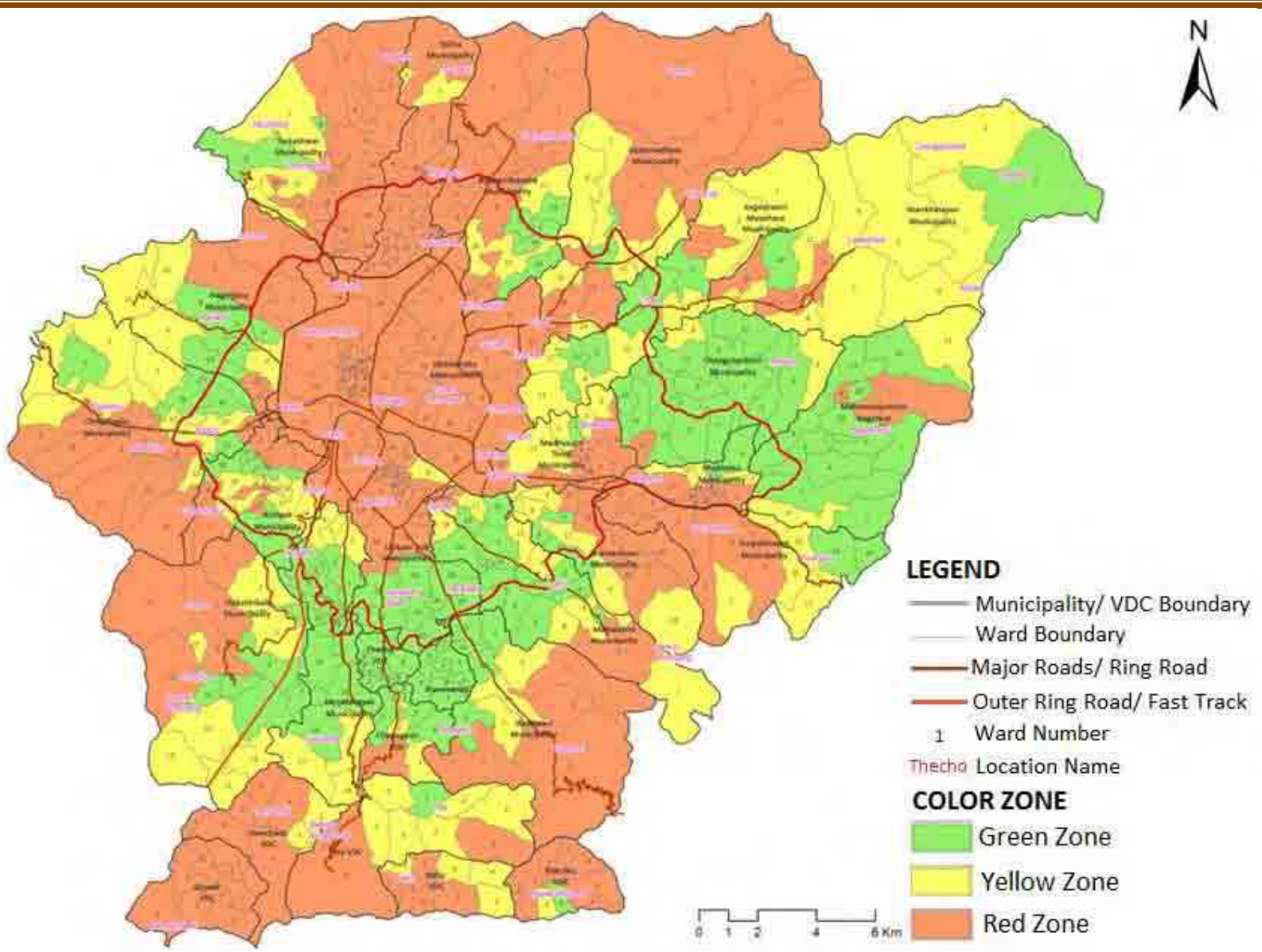

Figure 6-4 Color Zone based on constraint free area

Table 6-7 Land Use and development in prescribed Color Zones

Land Use as prescribed by NLUP 2015	Color Zones		
	Red (High Alert Zone)	**Yellow (Agriculture Area Promotion Zone)**	**Green (Residential Area Promotion Zone)**
Agriculture	Promote urban farming in the leftover space and on rooftops	Designate the agriculture area and restrict constructions	Designate the agriculture area and restrict constructions
Residential	No further high rise buildings/ apartments	Allow high rise apartment/ promote high density in the potential infill areas	Promote individual or group housing/ promote low density
Commercial	No further high rise shopping complex	Promote Integrated Urban Service Centers (IUSC)/ Promote Transit Oriented Development in the potential infill areas	Promote neighborhood market centers
Industrial	No large scale industrial development, except service industries	Promote medium and large scale non-polluting industries	Promote medium and large scale non-polluting industries
Forest	Protect through community involvement	Develop forest park, picnic spots	Develop forest park, picnic spots
Public Utility	Disaster responsive, Climate Resilient, Improved mobility	No planned investment for urban road within the agriculture area, except for conveyance of agriculture produce	Promote community managed self-sustained utility system
Water Bodies	No human activities	Fish Farming	Recreation Park
Others	Identification and protection of public or unclaimed land	Identify open space for Disaster Risk Management	Identify open space for Disaster Risk Management

6.2.1 Preparation of a Comprehensive Risk Sensitive Land Use Plan (RSLUP)

KVDA is taking the lead to prepare the Risk Sensitive Land Use Plan for KV in coordination with Department of Survey, UNDP-CDRMP and private agencies. The plan would be in line with National Land Use Policy 2015 to contribute to risk resilience development of Kathmandu Valley through development, implementation and enforcement of Risk Sensitive Land Use Plan and Building Bye-laws. The strategic Risk Sensitive Land Use Plan is being developed to provide four major outputs:

1. Develop a comprehensive RSLUP for the entire Kathmandu Valley
2. Develop Municipal and VDC level RSLUP for the 21 municipalities and 3 districts.
3. Revise and update the existing Building Bye-laws to correspond to the RSLUP
4. Enhance the capacities of the stakeholders on RSLUP and Bye-laws implementation through training programs for Training of Trainers and engineers/ planners.

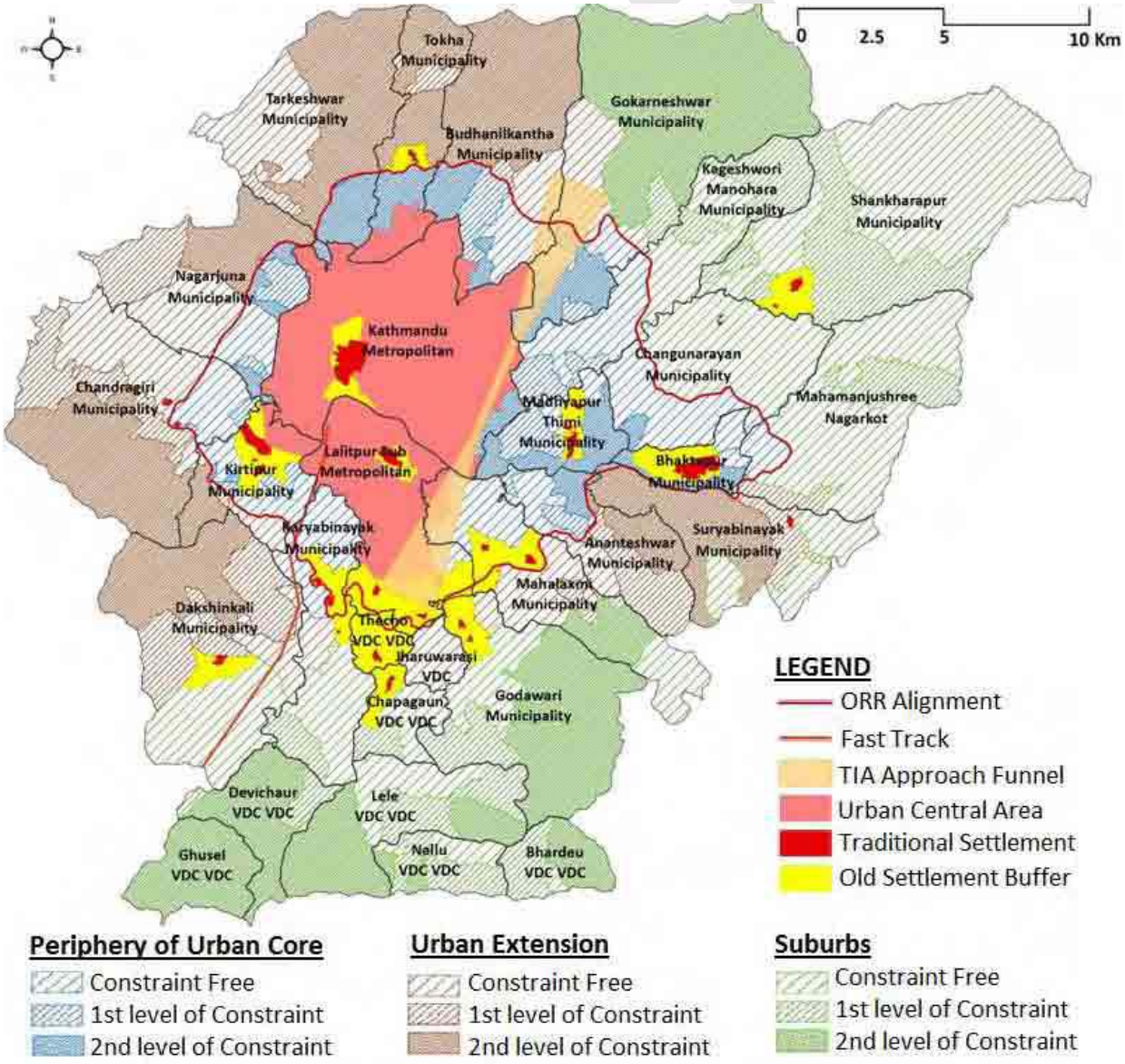

Figure 6-5 Proposed Risk Sensitive Land Use Plan based on Constraint Analysis and National Land Use Policy

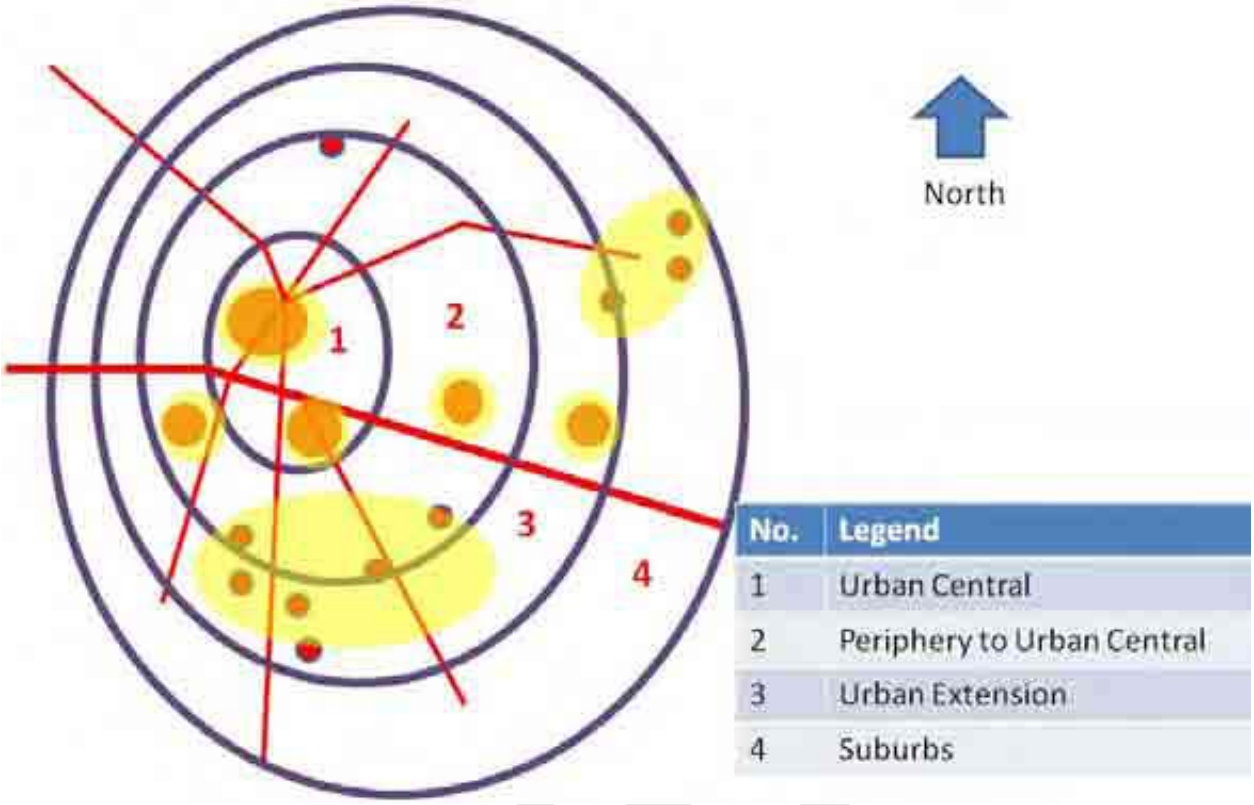

Figure 6-6 Schematic Layout of Proposed land Use Zones, which would be the basis for developing the Building Bylaws

Figure 6-6 shows a schematic layout of the proposed land use zones in the Valley. Considering the population density, land use, risk sensitivity, nature of the urban structure and constraint free land area for development, the valley has been divided into four sections:

1. Urban Central
2. Periphery to Urban Central
3. Urban Extension
4. Suburbs

Different set of bye laws would be prepared and implemented for the four different zones as per the Risk Sensitive Land Use Plan of the Kathmandu Valley. The bye laws would be contextualized as per the zones.

6.2.2 Development of Satellite Towns in Kathmandu Valley

The project is to develop three model towns as pilot projects in three districts through the land pooling in accordance with the specific land use zoning and building bye laws. Such towns cover a range of development and conservation strategies that help to protect natural environment and cultural essence of the area; make communities more resource efficient, economically stronger, and socially diverse. Major means of attaining the goal include utilization of climate responsive design, renewable energy resources; development of urban infrastructure and services (including 3R enforcement leading to zero waste) that make the best use of available land and technology; promote a diverse mix of activities and housing options, among others.

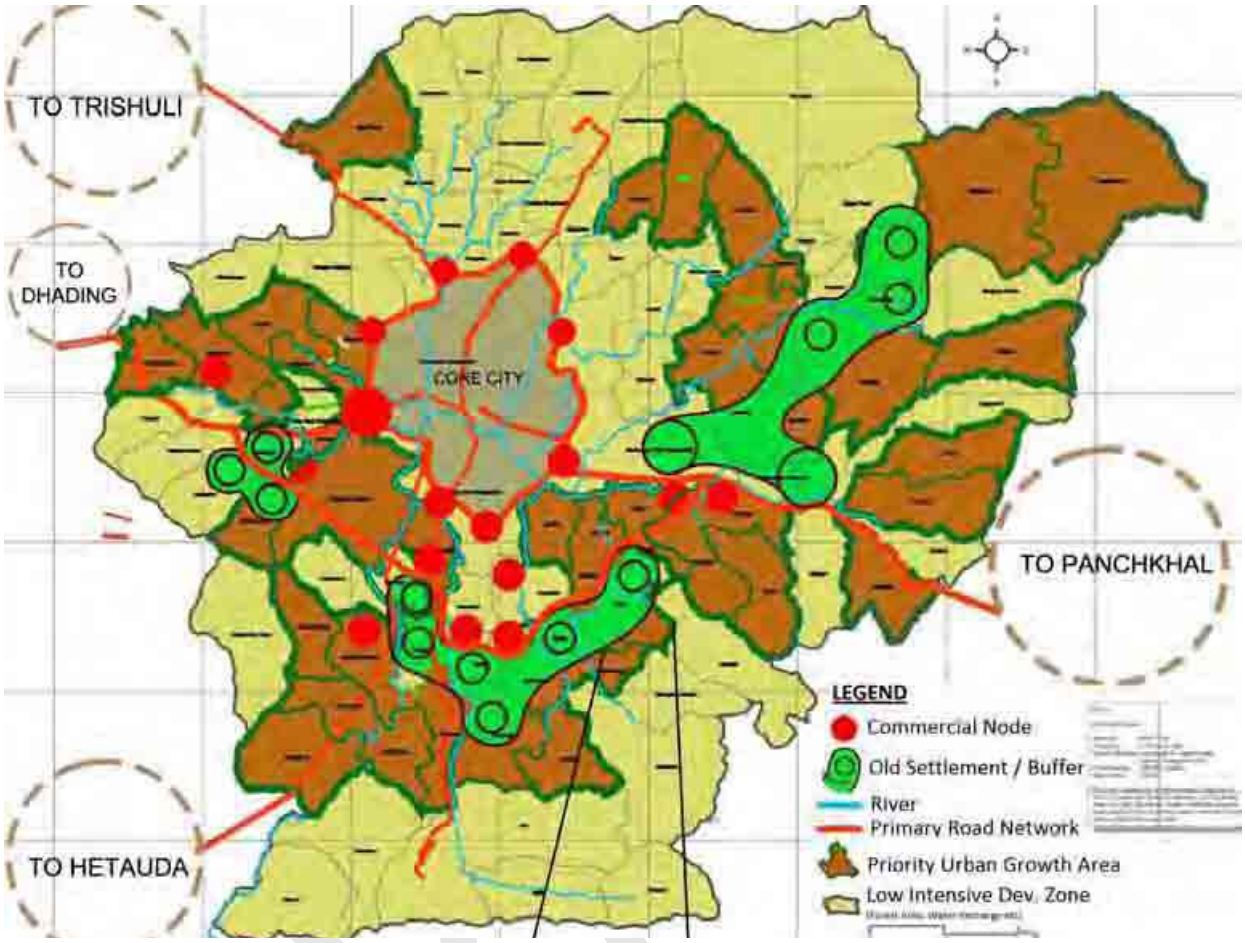

Figure 6-7 Probable areas for Urban Expansion and Development

6.2.3 Implementation of possible sections of Outer Ring Road

The most appropriate way to guide the urban expansion is possibly through the introduction of outer ring road from Nayapati to Bhatedhikhuro and the south of Araniko Highway to Satungal. Outer Ring Road on the north-west would be abandoned due to risk sensitive area and topographical difficulty.

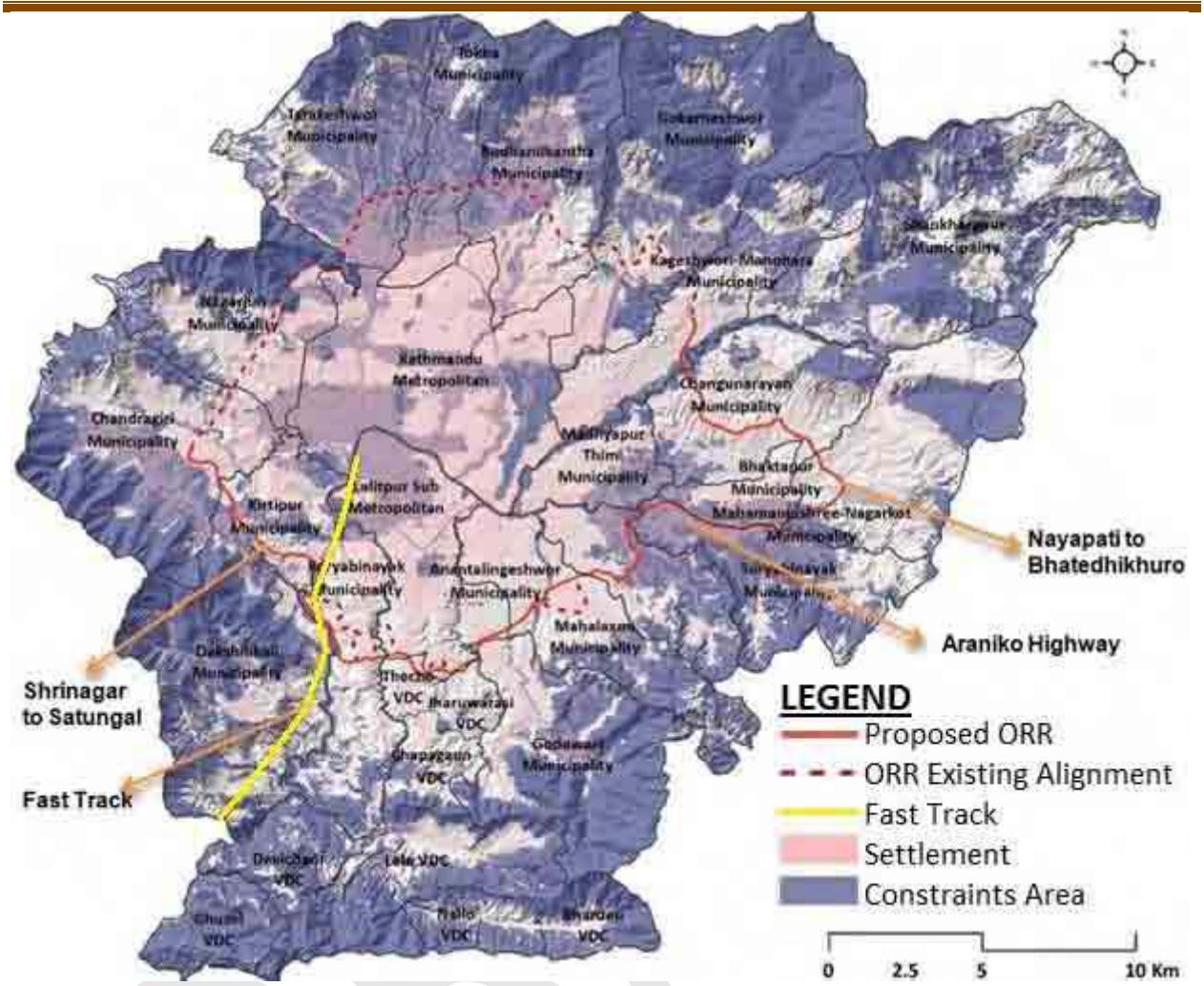

Figure 6-8 Map showing plan for Outer Ring Road project

With the opening of these two stretches of ORR, following direct advantages are expected:

- The linkage of south to the east and the north to the south would be enhanced dramatically
- The urban extension could be guided towards east or south
- The land development component alongside the outer ring road would create a significant space for accommodating the future population. It is expected to hold about 1.05 million populations along these 42km of stretches.
- The agriculture land could be preserved through the promotion of color zoning
- The linkage to fast track and Hetauda Tunnel road would be much more convenient

6.3 Strategy 3: Develop Urban Pressure and Risk Resilient Urban Infrastructure

Major Issues to be addressed:

- Inequitable urban infrastructure and services to accommodate the increasing population
- Need to link coordinated investment in infrastructure development and urban planning
- Lack of urban infrastructure standards
- Lack of adequate public and private sector investment in infrastructure to facilitate planned and resilient satellite pockets

Urban utilities and infrastructure support critical functions of a city. With the declaration of new municipalities in the Kathmandu Valley, KVDA has acquired additional responsibilities for the provision of adequate infrastructure services to the citizens. The infrastructure services need to meet a minimum Level of Service (LoS) for the population covered and respond to urban pressure, climate change and disaster risks. Mapping of all the utilities and infrastructure in the municipalities and understanding the risks resulting from natural disaster and climate change is one of the essential planning processes. This will help KVDA coordinating with concerned municipalities to facilitate the delivery and upgrading of infrastructure and associated services as well as the consideration of natural disaster and climate change risks in new and existing infrastructure projects.

Listed below is the major urban infrastructure management required for the Kathmandu Valley. The design of national strategic projects and large projects such as highways, strategic bridges, river restoration and channeling works in dense residential and commercial areas, large apartments, factories, schools and hospitals that may pose significant impacts to lives and properties, must be carried out and would obtain approval from the authority prior to the construction.

Desirable Condition	Indicators
Provision of basic infrastructures and services in each municipality	Urban Infrastructure Condition Index
	No. of Households utilizing the provided infrastructure and services
	Number of projects with risk management measures
	Number of Infrastructure development projects with PPP model

Table 6-8 Objectives and Action Plans for Strategy 3: Urban Pressure and Risk Resilient Urban Infrastructure

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[3]
Obj. 13. Develop Urban Infrastructure Standards for KV	Standardize drawings and monitoring guidelines for urban infrastructures, considering natural disaster and climate change risk in current maintenance regime for public infrastructure.	MoPIT, MoUD, KVDA	MoUD, Local Bodies and Relevant agencies	S,O
	Develop a standard approach to undertake site selection for new urban infrastructure to promote development in lower hazard areas while meeting	KVDA	MoUD, Relevant agencies	S,O

[3] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[3]
	Level of Service requirements.			
Obj. 14. Undertake a disaster and climate change risk assessment for existing urban infrastructure	Using the standard developed in Obj.13, undertakes a risk assessment for existing urban infrastructure and associated services in the KV.	KVDA, MoUD	MoFALD, relevant agencies, MoHA	uS,O
	Prioritize the risks and agree on the most threatening risks requiring the implementation of risk treatment measures. The prioritization would consider the criticality of the assets and services and the population serviced.			
	Develop and implement risk management measures with both public agencies and private companies.	KVDA, MoUD	MoFALD, I/NGOs , Private Sectors, and relevant agencies	**S,C,O**
Obj. 15. Promote design and construction of climate change and disaster resilient urban infrastructures	Determine the desired 'level of hazard immunity' for new urban assets to be designed and built based on the criticality of assets and services provided.	KVDA, MoUD, MoFALD		**S,C,O**
	Promote the use of the standards (developed in Obj. 13) for both public and private assets through awareness campaign and training session for professionals of various industries (engineers, planner, architects, asset managers, etc.).	KVDA, MoUD, MoFALD	relevant agencies	**S,C,O**
	Promote private sector investment in development and maintenance of urban infrastructure through provision of incentives when disaster risks and climate change are considered in the design and construction of new public assets.	MoUD, NIB	Private Sectors, Partner agencies, AEPC	**S,C,O,P**
	Promote PPP model to attract private investment, particularly in resilient urban infrastructure projects through political commitment, provision of guarantee for the investments.			
	Develop strategy to raise capital for infrastructure financing to address the backlogs in infrastructure and provision of services in KV.			
Obj. 16. Enhance the capacities of local bodies to	Develop and implement an awareness campaign based on the issues identified for KV and the strategies being	KVDA	Local bodies, Partner agencies	**S,C,O**

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[3]
support societies and communities to develop coping capacities to Climate Change and Disaster Risk	promoted.			
	Undertake a gap analysis of current professionals and practitioners in local bodies; develop a tailored training program based on existing capability and capacity and the identified gaps.	KVDA		**S,C,O**

6.3.1 Water Supply

Major issues:

- Insufficient supply of water with respect to the increasing demand
- Unsatisfactory water quality due to lack of sufficient water treatment plants
- Excessive ground water extraction
- Lack of sustainable ground water recharge and rainwater harvesting practices
- Lack of coordination among the agencies responsible for water supply and management

Desirable Condition	Indicators
100% access to Water Supply (100 lpcd in urban areas)	Per Capita Consumption
	% of household with access to piped water supply and public taps

Table 6-9 Objectives and Action Plans for Water Supply Management

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[4]
Obj. 17. Expedite water supply projects	Prepare and implement water recharge plans, adopt land use policies and revise byelaws to protect water recharge areas.	PID/ KUKL	Municipalities, Relevant agencies, KVDA	S,C
	KVDA will work with relevant agencies to speed up the process of improving Bulk Distribution System and Distribution Network Improvement within the year 2020.			
Obj. 18. Strengthen water supply system	In coordination with relevant agencies, strengthen Non-Revenue Water management to control water leakages and illegal connections and improve the revenue and return on investment for KV water utilities.	PID/ KUKL	Municipalities, Relevant agencies, KVDA	S,O
	Develop and implement stringent policies to prohibit excessive ground water extraction			S,O

[4] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

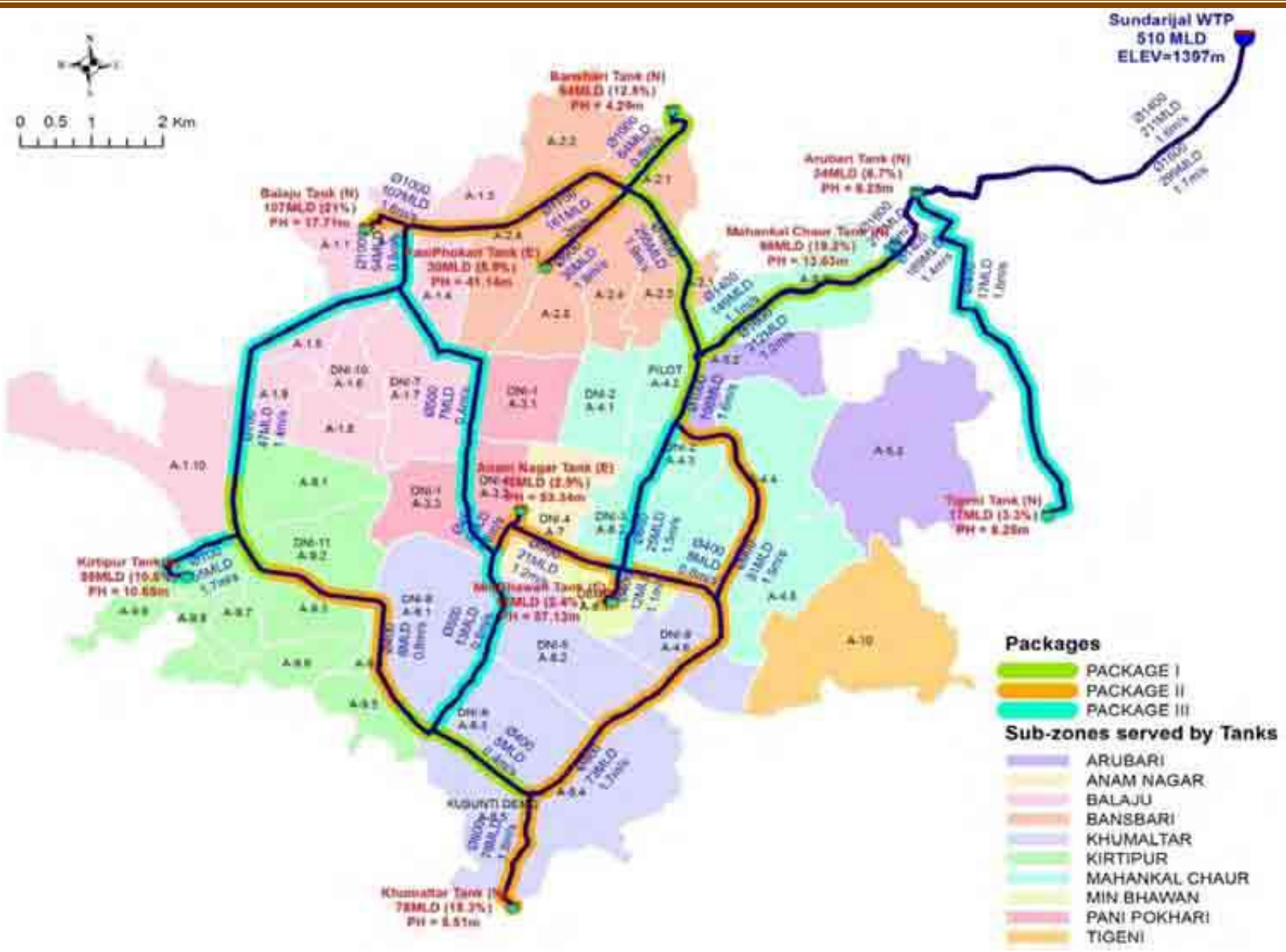

Figure 6-9 Kathmandu Valley Water Supply Improvement Project (Source: PID)

6.3.2 Waste Water Treatment

Major issues:

- Lack of 100% Household access to toilets and sanitary system
- Lack of segregation of domestic and industrial wastes
- Inadequate number of active Waste water treatment plants within the Kathmandu Valley
- Lack of clear responsibilities and coordination among the agencies responsible for sanitary system management within KV, along with their coordination with KUKL and DoR

Desirable Condition	Indicators
Waste Water Treatment Provision	% of Households with toilet facility
	Ratio of Population to no. of functional water treatment facility
	Ratio of current demand to existing capacity of each functional water treatment facility
	No. of institutional/ commercial buildings with their own waste water treatment system

Table 6-10 Objectives and Action Plans for Waste Water Treatment and Management

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[5]
Obj. 19. Coordinate in development of Waste Water Treatment System	KVDA as a main coordinating agency would coordinate with various sectors working to build Community Based Waste Water Treatment Plant along major rivers in KV, such as Kathmandu Valley Waste water Management project	PID, HPCIDBC	Municipalities, KVDA	S,C,O
Obj. 20. Promote water treatment in institutional buildings	Promote and develop incentives to install waste water treatment system in institutional buildings	KVDA	Relevant institutions	S,C,O

6.3.2.1 Kathmandu Valley Wastewater Management Project

Rapid and unplanned urban growth coupled with inadequate investment in wastewater infrastructure has left poor-quality wastewater services in the Kathmandu Valley. Most of the wastewater treatment plants and equipment are either out of operation or only partially operational (Shrestha). Moreover, the disposal of untreated sewage in rivers is affecting the quality of surface and groundwater, increasing the incidence of disease, and imposing associated economic burdens. Only one wastewater treatment plant, with a capacity of 16.4 MLD, uses mechanized treatment, while the other four use waste stabilization pond systems. The government approved a long-term capital investment and asset management program in 2010 to prioritize year-wise investments in water supply and wastewater infrastructure in Kathmandu Valley. Its implementation will help reduce pollution in Bagmati River in accordance with the Bagmati Action Plan (ADB, 2013). The primary objective of the Kathmandu Valley Wastewater Treatment Project is to develop infrastructure regarding Wastewater Management System for overall improvement of environment of Kathmandu Valley including improvement of water quality of rivers.

[5] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

The major objectives of the project are:

- Improve the wastewater management capacity of Kathmandu Valley
- Maximize the efficiency and effectiveness of existing sewerage system and service provision through restoration, establishment, and extension of sewerage services in KUKL service areas
- Strengthen sewerage infrastructure to abolish ingression of wastewater into water supply pipeline and help prevent the pollution of drinking water
- Improve water quality in urban rivers and tributaries and their ecosystem

Project Component of Proposed Waste Water Treatment Plant in KV

Waste Water Treatment Plants	**Package 1: Guheshworu WWTP** **Package 2: Gokarna (Design Complete, awaiting for ADB concurrence)** **Package 3: Dhobighat WWTP** **Kodku WWTP** **Sallaghari WWTP**
Interceptor Sewers	**3 Packages**
Sewer Network	**To be finalized after completion of Sewer Asset Condition Survey**

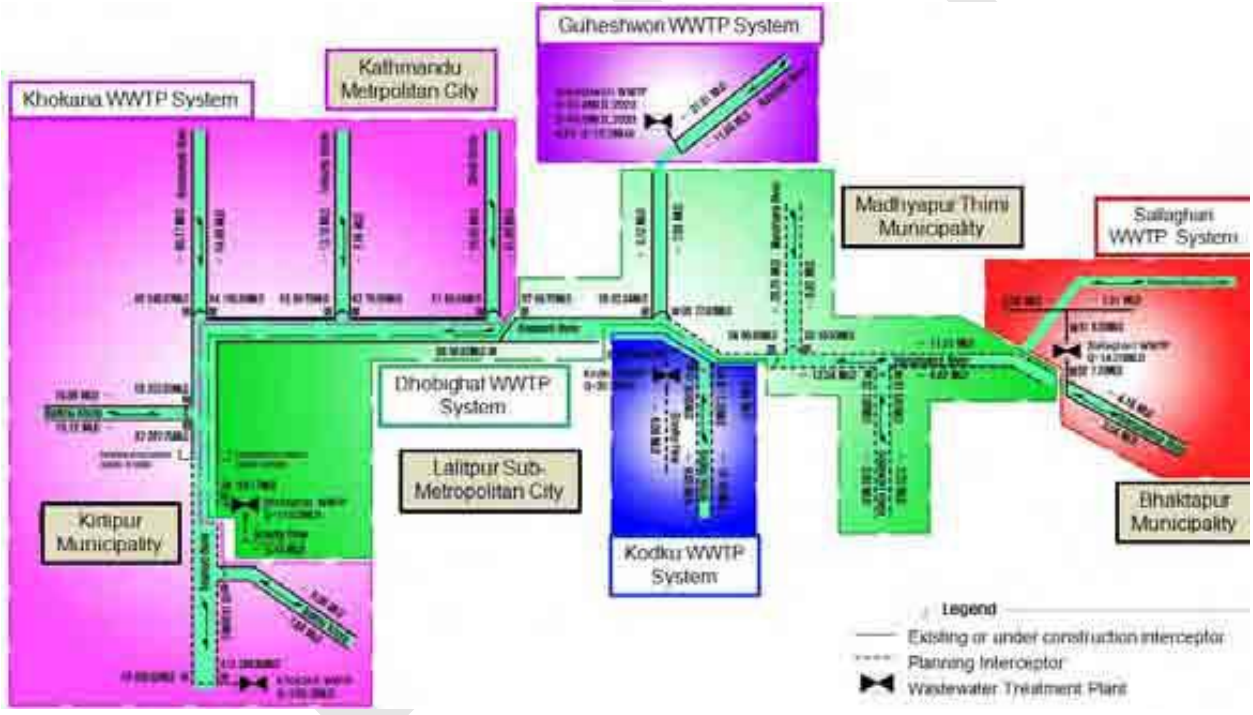

Figure 6-10 Wastewater flow balance in Kathmandu Valley (Source: PID)

The areas covered by WWTPs are not only specifically for treatment purpose but could also provide recreational area and Public Park for population on reserved area in WWTP or water front. A survey on Sewer Asset Management System is being conducted and mapping of sewer assets has been done. The data and maps are available online for public viewing purpose with real time data. This project is the beginning of the resource mapping in KV. It is necessary to build upon this by adding on other urban infrastructure and utility mapping. The availability of such data will help a lot of agencies in developing programs pertinent to current status of KV.

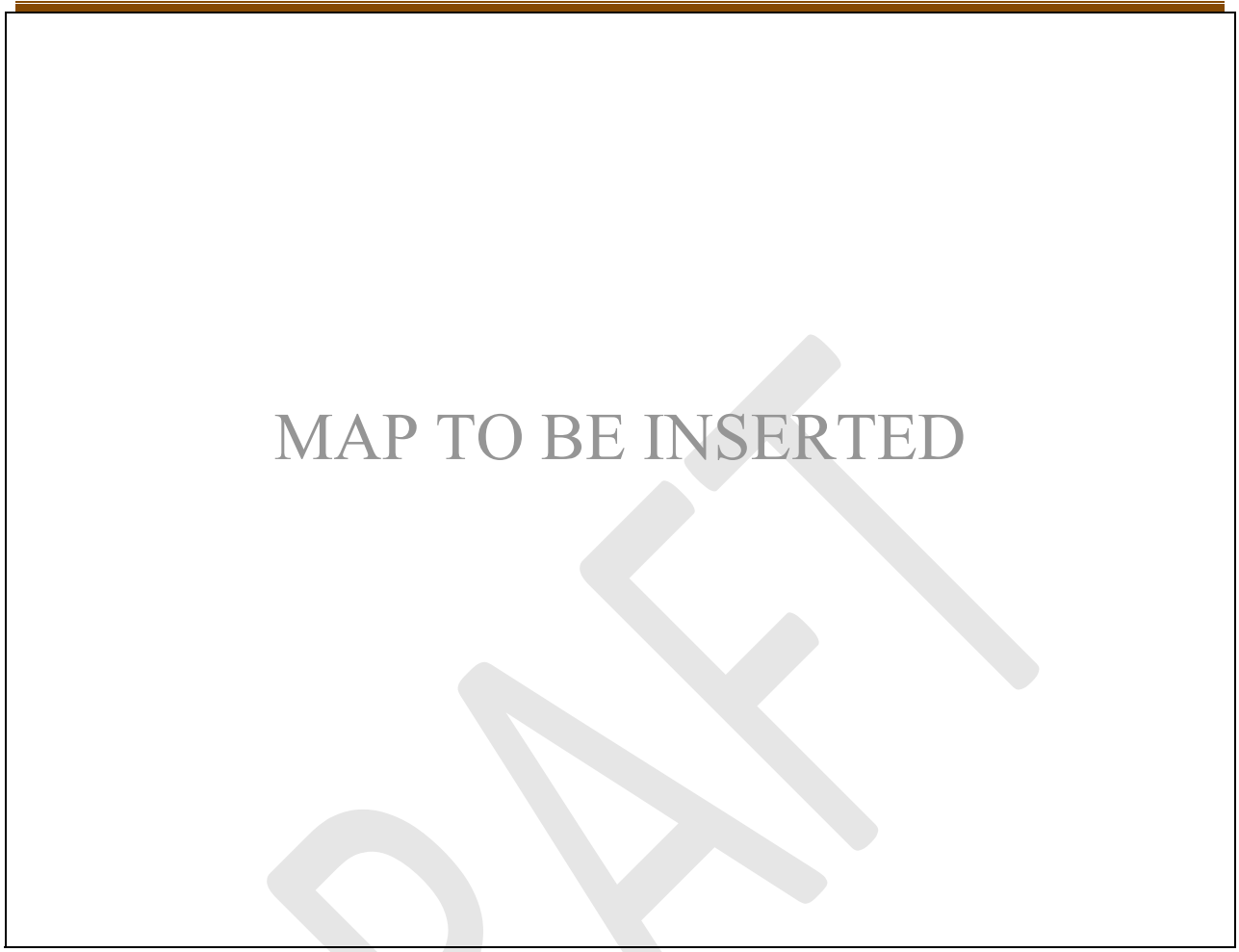

Figure6- 11 Drainage System Plan of Kathmandu Valley

6.3.3 Solid Waste Management

Major Issues:

- Open dumping of solid wastes
- Lack of clear cut guidelines for waste management
- Lack of Coordination between Municipalities (designated to manage solid wastes) and SWMTSC (planning and regulating agency for solid waste management)
- Lack of waste segregation and waste recycling practice
- Increasing usage of non-biodegradable plastic materials
- Lack of management for E-waste, medicinal wastage
- Need for coordination among related agencies
- Need for Solid Waste Management Strategy considering KV as a single development unit

Desirable Condition	Indicators
100% Household waste collection (10 ppha)	% of waste collected in each municipality
	Number of Functional Solid waste Management Units in Municipalities
Provision of Landfill site	Number of Land fill sites
	Ratio of demand and existing capacity of each Land fill site
	Number of Community Based Waste Water Treatment Plant

Table 6-11 Objectives and Action Plans for Solid Waste Management

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[6]
Obj. 21. Promote Integrated Solid waste Management	Prepare Solid Waste Management strategy and plan for Kathmandu Valley	SWMTSC	Municipalities, KVDA, Concerned Stakeholders	S,C,O
	Develop local level plan for waste management for each municipality			
	Regulate and upgrade the current practices of solid waste collection and management for the sustainable management of solid waste			
	Construct Sanitary landfill site for the municipality or cluster of municipalities (> 50,000 population)		Municipalities, KVDA	S,C,O
	Develop and implement programs and policies to segregate waste at source	SWMTSC, Municipalities	KVDA	S,C
	Allocate land areas for management of municipal solid waste, e-waste and medical waste	KVDA, MoEST, SWMTSC	Municipalities	S,O
Obj. 22. Manage medical waste	Introduce mechanisms to ensure the implementation of Waste management policy which requires all medical institutions and manufacturers to manage medical waste themselves	DoHS, Municipalities SWMTSC	KVDA, Medical Institutions and manufacturing industries	S,C,O
Obj. 23. Manage e-waste	Establish 'Environment Research Center' to research on effective management of electronic waste and develop stringent policies to manage the same, introduce EPR (Extended Producers' Responsibilities)	SWMTSC, MoEST	KVDA, Municipalities	S,C,O
Obj. 24. Debris / Construction Waste Management	Develop a Services team to provide technical resources for debris management	KVDA	Municipalities	o
Obj. 25. Promote community based waste mgmt	Conduct awareness campaigns to promote Community based Waste Management	SWMTSC	Municipalities KVDA	S,C

[6] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

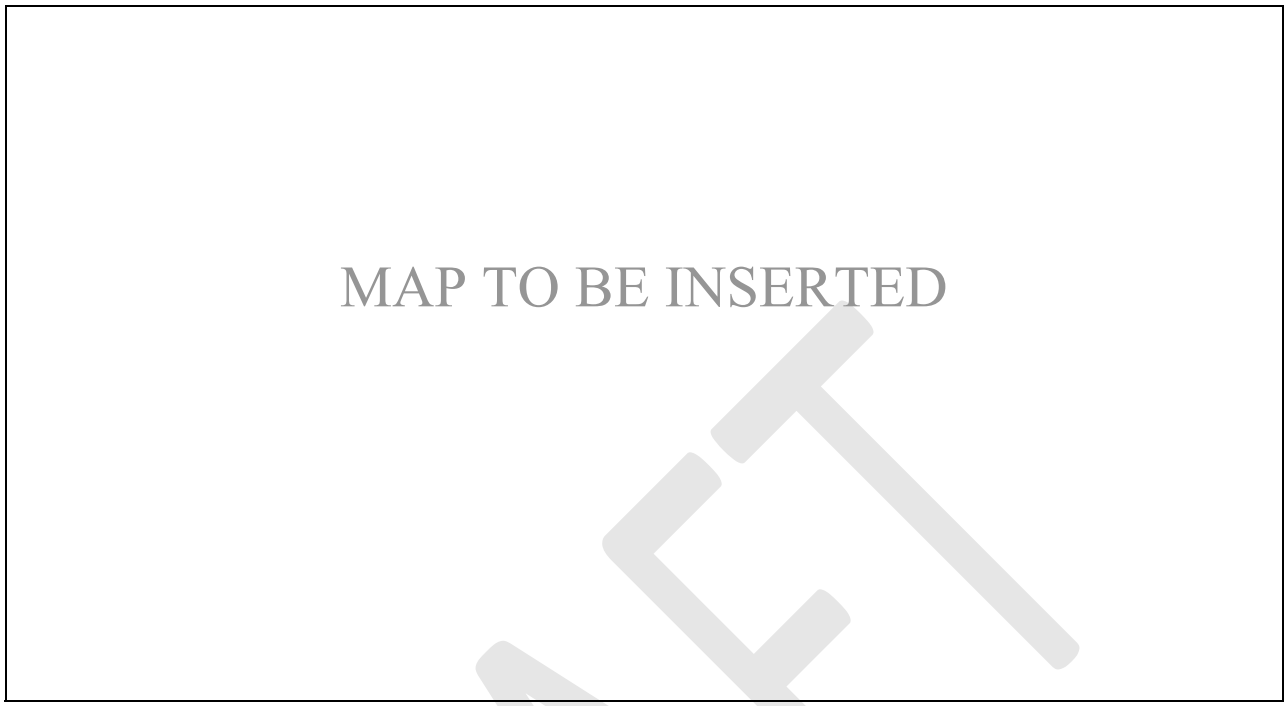

Figure 6-12 Locations of Land fill sites in Kathmandu Valley

6.3.4 Road

Major Issues:

- Trail Roads (developed organically as per the land parcel boundary)
- Several Institutions Involved (Department of Roads, Municipality)
- Road Density and Standards (Yet to be defined)

Desirable Condition	Indicators
Adequate road infrastructure (7.5 km/ sq.km.)	% of road coverage per sq.km.
	Density of Road network in urban core
	Rate of compliance of Urban Road Standards in each municipality

Table 6-12 Objectives and Action Plans for Road Network

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[12]
Obj. 26. Develop Road Standards and Guidelines	Prepare Kathmandu Valley Urban Road Standard, Urban Road safety management system, natural hazards and climate change risk standard (mostly in relation to drainage system and pavements).	KVDA, DoR	MoUD, MoFALD, MoPIT, DoR, relevant agencies	S,O
	Prepare Street Beautification Guidelines to include aesthetic considerations in large urban projects.	DoR, KVDA	MoUD, MoFALD	E
	Explore options to collocate utility corridor in urban road easements as a pilot project	KVDA	Municipalities. DoR	O
	Plan bike corridors, pedestrian	DoR	KVDA	S,C,O

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[12]
	paths/crossings, and dedicated bus lanes as part of roadway projects to provide safe options for alternate modes of travel			
Obj. 27. Construction of Road Networks	Introduce Transport Connectivity Plan	DoR, KVDA	Development partners	S,C,O,P
	Implement Disable friendly regulations	DoR	KVDA, relevant agencies	S
	Construction of Exclusive Pedestrian Path and Cycle Track			S,C,O
	Continue Road widening projects as per the bye laws, especially for the purposes of emergency access during disasters	KVDA, DoR		S,O

6.3.5 Transportation

Major Issues:

- Private sector dominance in Urban Transport System
- Only 3% of entire transportation network covered by public transport
- Establishment of transport structure without proper transport master plan
- Lack of quality and mismanagement in public transport system

Desirable Condition	Indicators
Provision of sustainable urban public transport service in KV	Availability of Kathmandu Valley Urban Transport Master Plan
	Population served by Public Transportation
	Average design and Travel speed for connectivity to major urban areas
	Ratio of Travel Demand and Public Transport capacity
	No. different types of vehicles registered annually

As a highly important aspect for urban mobility, public safety and security, Kathmandu Valley Development Authority is working to prepare and implement Transport Master Plan that incorporates vehicular traffic management, along with walking and cycling.

Table 6-13 Objectives and Action Plans for Transportation

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[7]
Obj. 28. Develop mechanism to address urban transport related issues	Develop coordination Mechanism to develop Transport plan	KVDA, MoPIT, Municipalities and relevant agencies	DoTM, DoR, Development Partners	o
	Expedite the pilot KSUTP Project and extend it to the entire valley			
	Prepare Kathmandu Valley Urban Transport Master Plan in consonance with the Valley wide connectivity plan			o
	Include consideration of emergency management and evacuation routes in the Urban Transport Master Plan			S

[7] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

	Coordinate with MoEST, DoTM and concerned stakeholders on reducing vehicular noise and pollution and promoting emission free vehicles			S,C
	Conduct feasibility study for the possibility of BRT and MRT in KV			O
Obj. 29. Coordinate transportation network improvements with land use changes	Prioritize transportation network improvements in areas where land uses are rapidly changing.	KVDA, MoPIT, Municipalities	Other relevant agencies	O
	Initiate transportation projects where new development is planned to spur growth.			
	Plan and implement bus route restructuring	KVDA, MoPIT	Partner agencies	O

Kathmandu Sustainable Urban Transport Project

Kathmandu Sustainable Urban Transport Project (KSUTP) has been initiated in collaboration between MoPIT, ADB and Global Environment Facility, with objective to restructure public transportation system in Kathmandu Valley. The major issues identified by the study are:

i) Duplication of routes with lack of coordination between operators,
ii) Traffic congestion and environment degradation due to high volume of low capacity vehicles
iii) Unmanaged transport terminals and loading area leading to congestion in city centre,
iv) Poor quality of service and facilities for passengers
v) Inadequate institutional capacity to control old and poorly maintained vehicles together with over supply of vehicles on roads.

KSUTP has suggested major policies for

i) Operational reforms that includes development of route hierarchy, route restructuring, rationalization of fleet, bus stops, lay-byes, terminals and depot and system efficiency measures
ii) Industry structure reforms that encompasses transition from independent operators to bus operating companies, public sector institutional reforms and route contracting

KVDA plays a vital role in supporting the implementation of the action plans as proposed by KSUTP, that includes but is not limited to, establishment of road hierarchy for allocation of subsequent route hierarchy and restructuring of public transport network plan with adequate infrastructure and institutional capacity for implementation. The plan is in consonance with the proposed new Urban Structure of the KV, constraint free developable areas and linkage between transportation and Land Use. KVDA can also play a facilitative role in addressing critical issue of land that is vital in development of transport related infrastructures such as bus terminals, traffic education centers, lay-byes, and in the implementation of Transfer of Development Rights. Such project should come under the KVDA umbrella and be extended to the entire valley.

Development of Kathmandu Valley Urban Transport Master Plan

KVDA and MoPIT, in collaboration with JICA, is in the process of developing the Kathmandu Urban Transport Master Plan, which builds upon the backdrop of "The Study on Kathmandu Valley on Road Development" conducted in 1993. Based on this study, donors contributed to improve urban transport of the Valley by supporting the project implementation. The updated Urban Transportation Master Plan is necessary as a consequence of urbanization and increase of traffic volume caused by rapid population growth. Data Collection Survey on Traffic Improvement in Kathmandu Valley and a Detailed Planning Survey was conducted in 2012 and 2013 respectively, in response to the request by the Government of Nepal. Through these surveys, the project on urban transport improvement for Kathmandu Valley was deemed necessary to be developed and implemented for the development of valley wide transport and urban mobility. Four different working groups along with one collective working group have been formed to discuss and correspond to JICA Study teams which are:

- Establishing Comprehensive Urban Transport Master Plan (Target year for short term – 2020; Mid-term – 2025; Long term – 2030)
- Implementation of the pilot project
- Capacity Development of relevant agencies to monitor, maintain and alter the Master Plan

The study includes the following major components:

1) Comprehensive Mobility Plan to improve the mobility of people and goods
2) Integration of Urban Transport and Land Use through New Urban Structure
3) Traffic Management Plan
4) Sustainable Urban Transport Management Plan including Non-Motorized Transport and Pedestrians
5) Parking Management Plan
6) Management of Urban Transport Infrastructure
7) Road Safety Management

Table 6-14 Development Program in each stage for Kathmandu Urban Transport Master Plan

	Short Term (Year 2020)	Mid Term (Year 2025)	Long Term (Year 2035)
Target	• Widely-sharing of the contents of Master Plan • To keep current traffic service level	• To implement necessary actions for the achievement of future vision of Urban Development • Implementation of Priority Project for Road Improvement and Introduction of Public Transport	• To implement Vision of the Future for Urban Transport • Implementation of Traffic environment which is safe, convenient and comfortable • Rolling Plan
Land Use Plan	• To apply the system for the guidance and Land Use Control	• Improvement of Pilot Area of New Urbanized area for the realization of future land use	• Realization of Future Urban Structure based on the Urban Development

	Short Term (Year 2020)	Mid Term (Year 2025)	Long Term (Year 2035)
		pattern	Scenario
Road Network Plan	• Completion of On-going Road Construction Projects • Implementation of additional measures to solve current traffic issues	• To promote the improvement of high priority roads for the establishment of future road network system • Improvement of future trunk road network such as inner Ring Road, etc.	• Implementation of Major Road Network
Public Transport Network Plan	• Strengthening of institution, staffs and capacity for the enhancement of public transport network	• Implementation of Pilot Route for New Public Transport System	• Implementation of Major • Public Transport Network

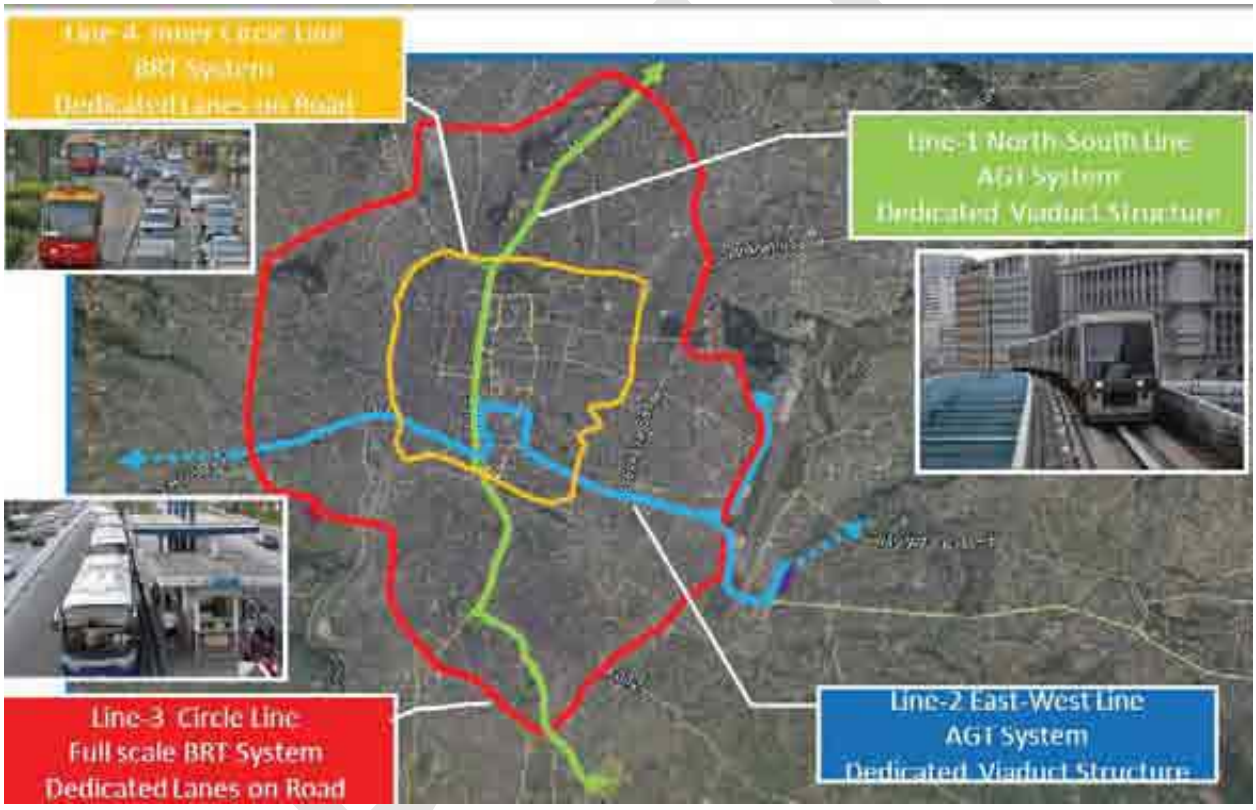

Figure 6-13 Proposed plan for Mass Rapid Transit system by supported by KVDA, MoPIT and JICA

After much deliberation, following urban structure concept for Kathmandu Valley is being proposed:

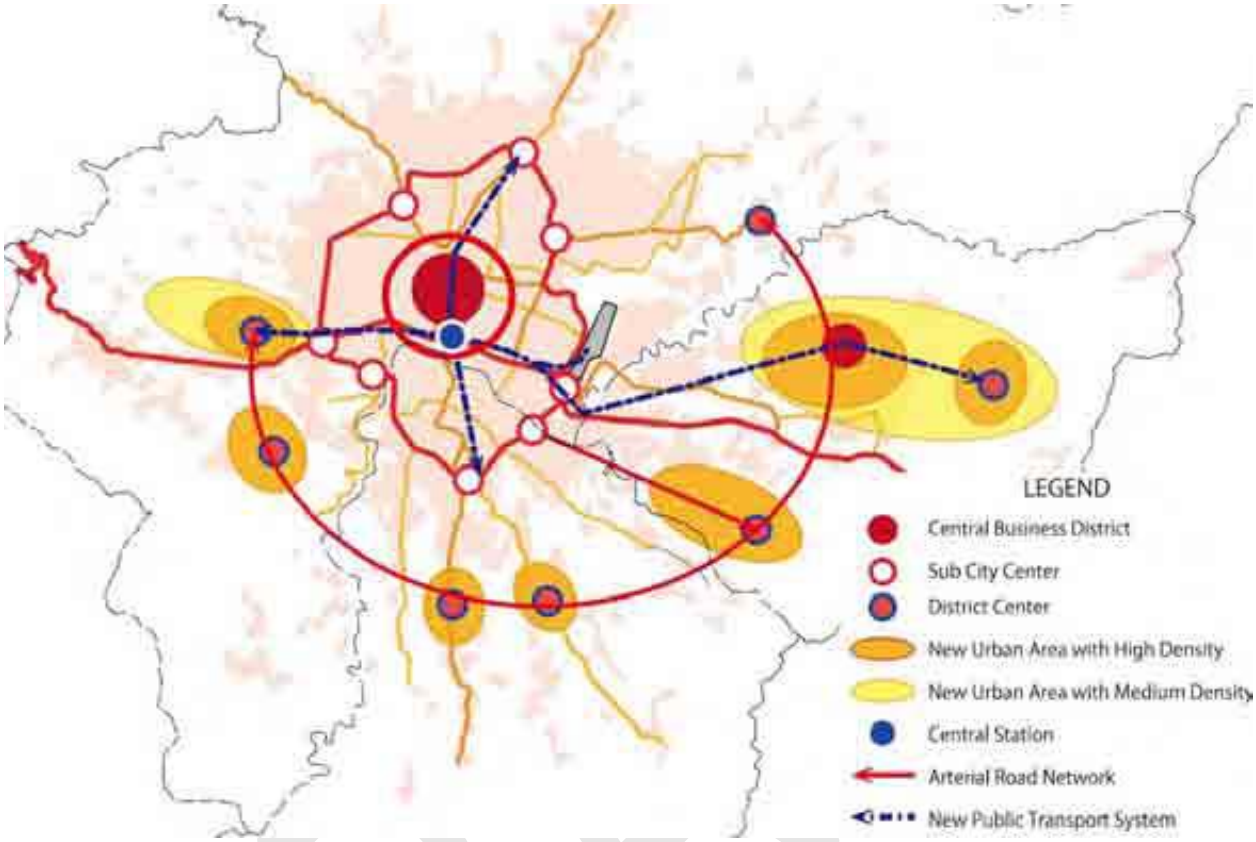

Figure 6-14 Conceptual Transport Connectivity / Urban Mobility Plan

Further exploration on the viability of mass rapid transit will be carried out considering the integration of risk sensitive land use and urban transport system. The plan will be prepared by 2016. In addition, KVDA will also work in integrating land use and transportation in the valley. The Transit Oriented Development could be promoted in the less risk sensitive area i.e. yellow and green zone. The basic principles on Sustainable Urban Transport adopted by the Kathmandu Sustainable Urban Transport Project (KSUTP) will be extended to other municipalities to enhance the mobility of people and goods. While doing so, the strategy of Avoid-Shift-Improve will be given high priority.

6.3.6 Housing

Major Issues:

- Lack of affordable housing
- Increasing number of rental population and informal settlement
- Lack of rental housing Norms/ standards and rental control

Desirable Condition	Indicators
Provision of affordable, adequate and risk resilient Housing	Number of projects under 'Urban Poor Housing Program'
	Floor area per capita
	Ratio of Income and Housing Price
	% of structures that follow building byelaws and Building codes
Regulate informal settlements	Number of Squatter settlements
	% of squatter population in KV

Table 6-15 Action Plan for Housing

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[8]
Obj. 30. Undertake urban upgrading and promote low-income housing in private housing projects	Develop plans for slum and squatter resettlement and implementation of plans similar to the Ichangu Narayan Land Pooling Project under 'Urban Poor Housing Program' (Refer to 6.3.6.1)	KVDA, MoUD	MoCPA, Development Partners	S, O
	Review update and monitor group housing standards.	KVDA	Development Partners	S, O
	Prepare incentives (such as density bonuses or property tax breaks) for private sector projects in the Yellow and Green Zones, which include low-income housing.	KVDA, MoUD		O
	Develop incentives such as increased allowable density, tax credits and low interest loans to promote ow income housing component in market rate housing development projects	NLHDA, KVDA		O
Obj. 31. Provision of Rental control	Develop regulatory framework mainly for rental services	MoHA	KVDA, DUDBC	O
	Develop incentive policies for rental control	KVDA, DUDBC	District Administration Office	O
Obj. 32. Promote environment friendly buildings	Develop standards for green buildings (that include aspects such as water conservation, and low energy use)	DUDBC, MoEST	KVDA	O
Obj. 33. Improve	Facilitate a community based assessment of current buildings	DUDBC	KVDA, MoUD	S

[8] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

the consideration of paraseismic measures in the housing stock	(could be used to inform KV broader risk assessment).			
	Introduce incentive system to ensure safety compliance during design and construction phase	DUDBC	KVDA, MoUD	S
	Introduce awareness campaigns to promote further the consideration of para-seismic measures in the design and construction of new housing	DUDBC	KVDA, MoUD	S
	Explore incentives options to improve the consideration of para-seismic measures for the housing sector.	DUDBC	KVDA, MoUD	S

6.3.6.1 Housing for Urban Poor:

The National Shelter Policy (1996, revised 2012) and National Urban Policy (2007) acknowledge housing for the urban poor as a basic need of people, linking it with the nation's economic development. As per the initial studies of Housings for the urban poor, proper planning is required to plan for housings for Lower income Groups, Middle Income Groups and Upper Income Groups (Malla, 2014). Three major Shelter Delivery Models that could be adopted include:

1. Government Led Housing Model
2. Private Developers Housing Model
3. NGO/Community Initiated Housing Model

With an aim to manage proper accommodation to urban poor living along the riverside, the Government of Nepal has acquired 0.43 hectare land area within the Ichangu Narayan Land Pooling Project under 'Urban Poor Housing Program.' The project provides rental units for 227 households (27.60 sq.m. per unit) on a cost recovery basis with improved basic services and better living conditions of the urban poor. While this covers just around 6% of the current need of 3,600 to 4000 housing units for the poor, such exemplary projects could provide a basis for future housing development for the urban poor.

Figure 6-15 Rental Housing for the Urban Poor [Image: KVDA]

6.4 Strategy 4: Environment Conservation and Management

Major Issues:

- Increased vulnerability to natural disasters such as earthquake, flood, landslide, fire etc
- Need to integrate disaster risk mitigation approach and preservation of natural environment from planning

Environmental management has been one of the most challenging concerns of the urban management in Kathmandu Valley. The increasing river pollution due to the uncontrolled discharge of sewer and dumping of solid wastes, issues of solid waste management, air and noise pollution due to old vehicles and unpaved surface, lack of greeneries are few of the examples that are posing threats to the environment of the valley. Though KVDA has a limited role in the urban management, it can play a crucial role in devising the policies that aim to create conducive urban environment.

In addition, owing to the perpetual electricity load shedding and its impact on the social life and economy, there's an urgent need to address the issue; particularly in the night where safe mobility of people is a great concern. KVDA will work with Alternative Energy Promotion Centre and other international agencies to promote solar street lights in the strategic and urban roads.

Desirable Condition	Indicators
Physically aesthetic, socio-culturally vibrant, inclusive and ecologically sensitive urban environment	Urban environmental indices
Management of urban forest and land to improve urban environment and reduce hazards	% of urban forest coverage in urban areas
	% of agricultural space in urban areas
Preserve and develop Open space and water bodies	% of area of open spaces
	Number of conservation projects of open spaces, traditional water systems, ponds
Improved environmental condition in meeting the standards of air, water, noise, and land pollution	Pollution level in compliance with the set standards
100% access to renewable energy resources	% of Household with access to renewable energy resources

Table 6-16 Action Plans for Environment Conservation and Management

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[9]
Obj. 34. Develop Kathmandu Valley Disaster Risk Management Plan	Prepare and Implement Kathmandu Valley Disaster Risk Management Plan and Monitor the level of implementation	KVDA	MoHA, Development Partners	S, C, O
Obj. 35. Promote Urban Forest areas	Designate special forest areas and conduct a feasibility study to set up a "payment for ecosystem services"	KVDA	Municipalities, partner agencies, DoF	S,C,O

[9] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

	program (PES). Explore options through the PES program to compensate landowners for preserving the special forest areas and setting up a pilot cash incentive program to encourage local community management of forested areas. Consider levying special tax on urbanizing areas to support the PES program.			
	Manage the existing protected forests (eg.Shivapuri National Park) along with Community and religious forests to promote eco-tourism	MoFSC, MoCTCA	Municipalities, KUKL, HPCIDBC, Community Forest Groups	S,C,P,E
	Identify land areas to establish and management urban parks	KVDA, MoFSC	Municipalities, Local Communities	S,C,P,E
	Conduct tree and shrubs plantation campaigns; promote their maintenance through Corporate Social Responsibility	MoFSC	Private Sectors, KVDA, Municipalities	S,C, O,P,E
	Conduct regular maintenance of existing urban forestry and timely removal of hazardous trees that are threat to human safety	DoR, DoF	Municipalities,	S,C
	Develop guidelines for the selection of appropriate tree and shrub species for scientific plantation to ensure that the tree species are best suited for the specific urban areas	DoF, KVDA	Municipalities, Nurseries	S,C,O
	Introduce regulatory provisions to include greenbelts as integral part of road network planning and river bank management	KVDA, NPC	Municipalities, DoF	S,C
	Development of Animal Rescue Center and Central Zoo in Bhaktapur area	NTNC	Private Sectors	S, C, O, P
Obj. 36. Preserve and develop Open space	Prepare Open Space Atlas of public and Government lands (Refer 6.4.1)	KVDA	MoLRM, Dev Partners	O
	Develop open space standards for Kathmandu Valley (refer 6.4.2)	KVDA, NPC	Development Partners	S,C,O,E
	Undertake a gap assessment to determine availability, connectivity and shortages of open spaces across the valley, particularly from a perspective of providing emergency evacuation spaces during hazard events, ecological benefits such as storm water detention areas, as well as public health benefits and further prepare open space plan, strategies,	KVDA		S,C,O,E

	programs, cost and funding mechanism to increase open space			
Obj. 37. Develop a partnership model for operation and management of Open spaces	Build parks, entertainment and socializing spaces at neighborhood level	KVDA	Municipalities, Local Communities	S,C,O,E
	Coordinate and compliment planning with HPCIDBC for the improvement of Bagmati and Vishnumati River Basin	HPCIDBC, KVDA	MFSC, DDC, Municipalities, Partner agencies	C,E
Obj. 38. Develop a partnership based model for operation and management of ponds/ water bodies	Identify and develop plans to conserve traditional water systems, ponds, wetlands and groundwater recharge areas (Ref 6. 4.3)	KVDA, Municipalities	Local Communities	O
	Work with local community groups to restore and manage traditional water systems, ponds, wetlands and other groundwater recharge areas	Municipalities	Local CBO, Development Partners	S,C,O
Obj. 39. Provide regulations and incentives for Air Pollution control	Preparation and implementation of guidelines for activities and usage of "Polluters pay" collection tax	MoSTE, KVDA, DDC	Municipalities, Local Bodies, Private sector	S,C,O
	$PM_{2.5}$ and PM_{10} (Monitor and survey) Real time data access	MoSTE, KVDA, DDC	Municipalities, Local Bodies, Private sector	S,C
	Integrate urban forestry as an integral part of road network planning and road expansion projects	KVDA, DoR, DoF	Municipalities, Local Bodies,	S,C
	Tax incentives to promote non-polluting vehicles and Mass Transit System	MoPIT	Private Sector	C, O
Obj. 40. Provide regulations and incentives for Water Pollution control	Monitor and survey of water quality in water bodies within KV	MoSTE, HPCIDBC, KVDA	Local Bodies	S,C
	Develop regulations to prohibit direct flow of agricultural and industrial wastes into river	MoSTE, MoUD, KVDA	Municipalities, CBO	S,C,O
	Develop incentive mechanisms to promote decentralized waste water treatment System (DEWATS) before discharging into rivers and streams	Municipalities,	CBO, Local Bodies, Industrial Sectors	S,C
Obj. 41. Provide regulations and incentives for Land Pollution control	Relocate heavy polluting industries from the core residential areas of KV	MoUD, KVDA, MoI		S,C,O
	Develop Strict regulations to conserve agricultural areas in KV	MoUD, KVDA, MoLFRM	Municipalities	S,C,O
Obj. 42. Awareness and Training Programs to promote Environment Friendly	Conduct awareness and Training programs to educate and involve people in environment friendly development activities (Eg. Urban forestry, open space management,	Muncipalities	Development Partners, CBO, I/NGO, Media	S,C,O

Planning approach	Pollution control activities etc.)			
Obj. 43. Promote the usage of renewable energy sources in Kathmandu Valley	Land management for large-scale solar farm	KVDA, MoLRM	NEA, Municipalities, AEPC	O,P
	Advocate for urban centre focused hydropower project	DoED	KVDA	P
	Installation and maintenance of solar lights in the strategic urban roads	KVDA, AEPC	NEA, Municipalities, DoR, I/NGOs, Private sector	S, O
	Introduction of net-metering, bilateral connection that allows people to buy and sell electricity	DoED	Municipalities	O,P
	Develop programs and incentive mechanisms to promote installation of renewable energy sources in urban households	AEPC, DOED	KVDA, NEA	O,P

Table 6-17 Standards for Open Space requirements as per the Planning Norms and Standards ((MoUD, 2013)

Facilities	No.	Population/Unit	Area (in Ha.)	Area (in Ropani)
Exhibition cum fair ground	2 sites in Urban Expansion Zone	25,00,000	Upto 40 each	798.6
Amusement Park	1	25,00,000	Upto 10	199.65
International Sports Complex	1 in Urban Expansion Zone	25,00,000	Upto 200	3993
University Campus	4 sites in Urban Expansion zone	25,00,000	Upto 20	399.3
Disaster Management Center	1 for each administrative zone	25,00,000	1 Ha along with suitable open area + 2 Ha for shelter, temporary ground	59.895
City Park	1	10,00,000	100	1996.5
City Level Multipurpose Playground	1	10,00,000	8	159.72
District Level Recreational Club	1	5,00,000	0.5	9.9825
District level Sports Center	1	5,00,000	0.5	9.9825
Cremation Ground	1	5,00,000	0.4	7.986
Service Market (Open markets)	1	5,00,000	6	119.79
Auditorium for music, dance, drama (eg. Open air theater)	1	1,00,000	0.1	1.9965
Meditation and Spiritual Center	1	1,00,000	0.1	1.9965
Multipurpose Community Hall (could be used as	1	1,00,000	0.2	3.993

temporary shelter after disaster)				
Community Center	1	1,00,000	0.2	3.993
Community level Park	1	1,00,000	5	99.825
Bus Terminal	1	1,00,000	0.1	1.9965
Parking Spaces	1	1,00,000	0.6	11.979
Neighbourhood play area	1	10,000	1	19.965
Neighbourhood Park	1	10,000	1	19.965

6.4.1 Preparation of Open Space Atlas

Different sources have identified 887 public open spaces in the valley for preservation and its utilization during and after any emergencies. Some of these open spaces will be designed as green parks as well as emergence response area, wet lands will be preserved as the natural habitat and historic ponds will be revitalized. KVDA aims to enhance the quality of life and sociability of its citizens by improving the environment as well as through the identification, cadastral based open space atlas preparation, particularly for the revitalization of underused public open spaces for detail maps of open spaces within the Kathmandu Valley. This atlas of public open spaces, which includes public and government owned land, would be recognized as a part of PHYSICAL DEVELOPMENT PLAN. Most importantly, KVDA will proactively work with different relevant agencies, interested social group to bring these spaces within Valley under KVDA umbrella to develop them in a consolidated manner.

No conversion of Land Use in such open spaces would be permitted. Moreover, depending upon the location and land size, some public open spaces would be designed to be utilized for various purposes, including EbA (Ecology based Adaptation) enhancement, post disaster management, socio-cultural harmonization, entertainment, public health parks, open air learning centers- developing kids world where they can have hands on learning experiences on various aspects of citizens duties and responsibilities. KVDA, in consultation with municipal authorities, would take the lead considering the valley wide needs.

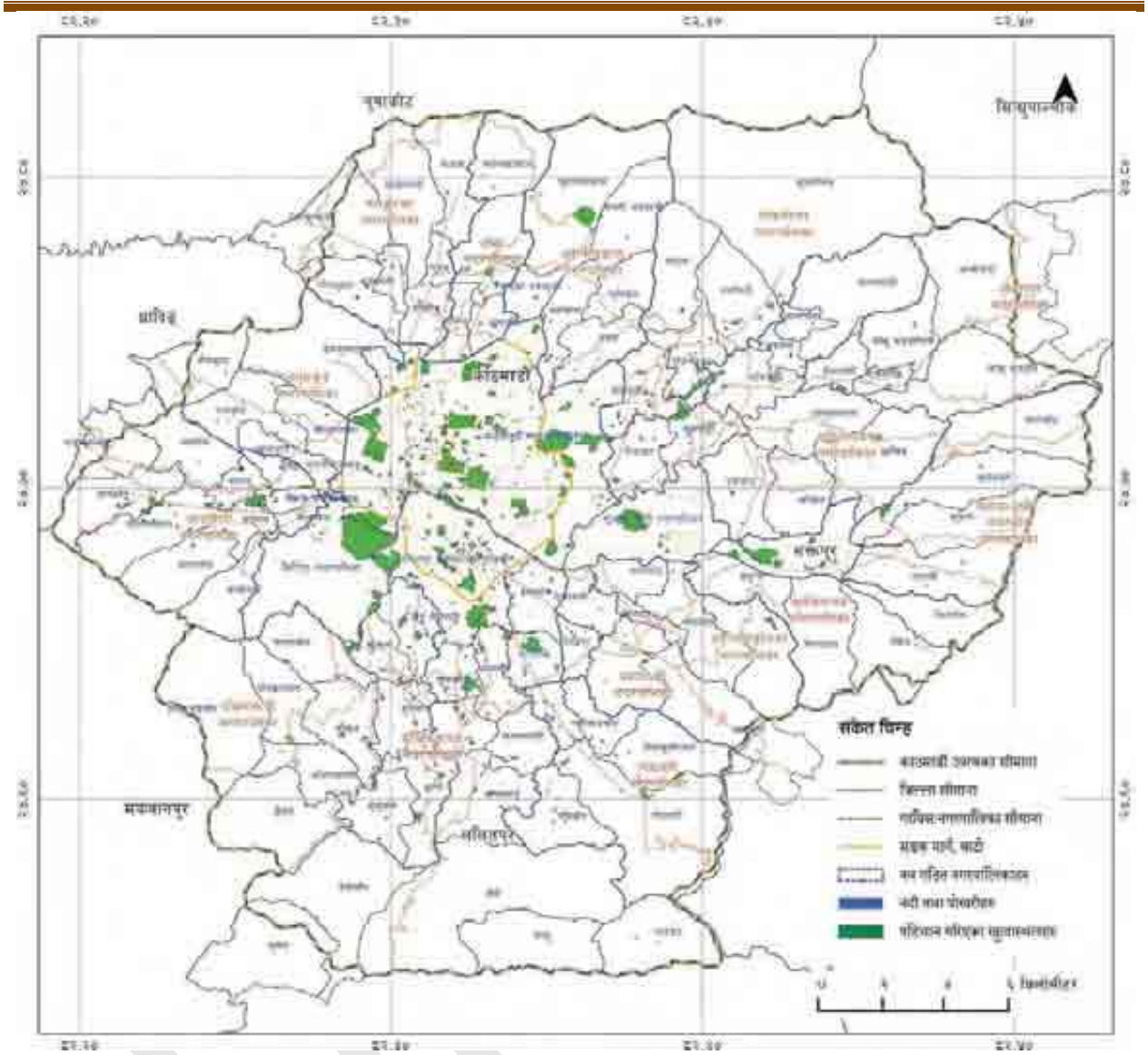

Figure 6-16 Map of open spaces in Kathmandu as presented in the Atlas of open spaces (Nepali Version)

6.4.2 Preservation and Development of Open Spaces

Being the most important heritage destination and main gateway to the country, the Kathmandu Valley has the potential to drive economic growth through generation of recreational and economic opportunities. The most alarming situation is the ever diminishing open space in these newly developed areas that may lead to severe implications in the event of disaster. With the current condition of increasing population density and decreasing open spaces, there is a dynamic and accelerated interest in the concept of outdoor recreation. Considering the idea, the Government of Nepal is planning to acquire approx 15 hectare land within the Kathmandu Valley to be developed as recreational parks. While these spaces shall be utilized for recreational purpose during leisure, they would also serve as an emergency space for humanitarian purpose in case of natural disasters. KVDA would proactively work with MoUD, MoF, MoLRM to advocate for support in this sector.

Similarly, The Planning Guidelines 2071 has a provision that requires 30% of total area to be segregated in case of residential land area less than 250 sqm, whereas areas more than 250 sq.m. would have at least 40% of total areas as open space. In case of public and government owned land, there is a mandatory provision to segregate at least 50% of the total area as open space. Furthermore, KVDA would be collaborating with the related municipalities and local bodies to promote the development and preservation of open space. At least 5% area of the wards would be developed as open spaces with easy accessibility for the locals in case of an emergency. In case of densely populated city core areas, the authority would work in close collaboration with the local bodies to identify and protect open spaces.

As per the budget speech of Nepal, one open space would be allocated for 25,000 population. Thus, in order to address the commitment, the KVDA would work to develop open spaces in congested and High density built up areas. In addition, the following measures would be considered:

- Prohibit building construction in Institutionally owned areas
- Inclusion of private open land in land banking through Part land+ Part compensation model
- Prepare major policies, plans and programs to conserve open spaces

Map to be inserted (JICA open space)

Figure 6-17 Plan of open spaces for neighborhood (Source: JICA, 2016)

6.4.3 Preservation of Ponds/ Wetland Areas

Preservation, redevelopment and promotion of ponds/ wetland areas such as the Nagdaha Lake and Ikhapokhari, among others, into a recreational space could be a major step towards such development processes. These areas hold a rich cultural and historic value and its surrounding open spaces could be acquired to conserve the area from possible encroachment and for the development of public parks for youth, recreational space for children, social space for elderly, spill over space during festive season, community parks for local residents and ground water recharging area. These type of preservation projects could be a source of income diversification as a commercially vibrant space through effective utilization and provision of local assets.

Five objectives set by the Government of Nepal for Bagmati river are:

i) Making Bagmati river system free of sewerage,
ii) Managing solid waste along river bank,
iii) Making river banks free from informal settlements,
iv) Increasing volume of water in the river,
v) Focusing activities on improvement of environment at both policy and community level.

KVDA will collaborate with HPCIDBC, in addressing critical issue of land management that is vital in addressing issues of informal settlements and establishment of Decentralized Water Treatment System

(DEWATS). The active role of KVDA will be highly important in development of riverfront spaces for recreational and other public activities, with disaster management component like flood water alarm system in place.

6.4.4 Urban Energy

KVDA would play a key role in facilitating provisioning of land for large-scale solar farm that will generate electricity for commercial use.

Integrated Solid Waste Management Project (ISWM) for Kathmandu Valley has been initiated under was envisioned by the Ministry of Local Development (MoLD) to manage the municipal solid waste of Kathmandu Valley through a Public Private Partnership (PPP) approach. The project was brought under the ambit of the Investment Board after the enactment of the Investment Board Act 2011, with GoN partners MoUD, MoFALD and SWMTSc. The model entails Build, Operate, Own and Transfer mechanism. Of many expected benefits of the project, its major outcome is to convert waste into forms of energy such as biogas and electricity and to promote minimal residual waste. It is an ambitious project with investment size of approximately USD 100 million. The first EOI for this project was issued in 2010 and at present two private companies have been selected for preparing DPR. However, the success of this project greatly depends upon partnership between public and private sector, where KVDA will play a critical role to support and facilitate this collaboration so that a model of PPP will be established, which will be replicated in other such projects.

As suggested in NUDS (MoUD, 2013), KVDA will also advocate for urban centre focused hydropower project, which is justifiable in case of the valley as it consumes almost one third of the national supply of electricity, which will certainly increase in future.

Electricity transmission:

To address the problem of dangling electricity wire in the roads, which is an eye sore, KVDA will play a collaborative role in construction of utility duct under the road surface, so that various utilities such as electricity, telecommunication, optical fiber, etc. will be channeled through that duct.

Also, introduction of net-metering, bilateral connection that allows people to buy and sell electricity, will be launched as a pilot project in Kathmandu to encourage use of renewable energy for generation of electricity with economic benefit.

Electricity consumption:

Government of Nepal has already incorporated energy efficiency in its development approach, for example use of solar street lamps and the provision of subsidy in products using solar energy. However, KVDA will also play a pivotal role in extensive use of solar power in public infrastructure, and incentivize use of energy efficient appliances like LED lighting, smart electrical appliance at residential, public and commercial level. Introduction of subsidy through urban solar program in 2072 budget is commendable, which will have huge impact in Kathmandu valley due to its huge housing stock.

MAP TO BE INSERTED

Figure 6-18 Map showing locations of substations and major transmission lines

6.5 Strategy 5: Urban Regeneration of Historic City Core and Traditional Settlements

Major Issues:

- Need to preserve historic and socio-cultural assets of Historic city core areas and Heritage sites
- Structural problems, high occupancy and lack of access to critical facilities in historic settlements

The major tourist attractions in Kathmandu are the historic arts, culture and religion of the old towns. The seven world heritage sites that are located in the close proximity need to be preserved not only for the tourists but also for the future generations. The unique Nepalese architecture and artifacts are found in the old settlements or the temples. Considering the immense need to preserve the rich socio-cultural and architectural assets of the historic city core areas, Urban regeneration is being highly emphasized as a major tool to redevelop the specific areas by effectively utilizing the urban space, provide opportunity for economic activities and develop earthquake resistant neighborhood, while preserving the rich socio-cultural identity of the areas. Vertical Replotting[10] in the core city area may be instrumental in creating economically vibrant environment.

Desirable Condition	Indicators
Developed Historic core area settlements with vibrant architecture, culture and thriving economy	No. of projects that successfully completed urban regeneration process
	% of Households that participate in urban regeneration process
	Pedestrianization of historic core areas
	Number of historic core areas with bye-pass road

Table 6-18 Objectives and Action Plans for Strategy 5: Urban Regeneration of Historic City Core

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[11]
Obj. 44. Rejuvenating the core historic cities through the preservation of the historical, cultural and social assets	Develop plans to pedestrianism historic core areas	KVDA	MoTCA, DoA, Municipalities	O, P, E
	Construction of bye-pass road around such sites	DoR	KVDA, DoR, Municipalities	O
	Develop projects on conservations and revitalization of historic core area (refer 6.5.1)	KVDA, Municipalities	Academia	O, E
	Urban Regeneration of Heritage Core of Kathmandu Valley and old settlement	KVDA, Municipalities	CBOs, Tole Sudhaar Samiti, DoA	O, E
Obj. 45. Prohibit vertical subdivision of buildings in city core areas	Develop policy , bye laws and incentive mechanisms to prohibit vertical division of buildings mainly in city core area	KVDA	NLHDA, RUPSON	O, E
Obj. 46. Support the DoA to undertake reconstruction of heritage areas	Partner with Department of Archaeology to improve cultural context of heritage areas as part of reconstruction efforts.	DoA	KVDA	O, P, E

[10]Vertical Replotting is the collective reconstruction of the old buildings into more feasible residential or commercial buildings without compromising the local architecture, building hygiene and safety.

[11]**S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

6.5.1 Urban Regeneration of Heritage Core of Kathmandu Valley and old settlement

KVDA will put efforts to scale up the current pro-poor urban regeneration project being implemented in Lalitpur Sub-metropolitan City to prominent heritage areas of Kathmandu, Bhaktapur, Kirtipur and Madhyapur Thimi. The urban regeneration project will focus on the development of economic opportunities in the areas through the conservation of physical and intangible heritage, tourism development and promotion of local arts and crafts. The old settlements other than the historic core of municipalities will also be studied and local area plans in those settlements will be prepared.

Pro-Poor Urban Regeneration Pilot Project: Pro-Poor Participatory Plan for LSMC

The Pro-Poor Urban Regeneration Pilot Project for LSMC is being directed under the guidance of KVDA and LSMC with the support from Japan Social Development Fund and World Bank. The project provides multi-dimension of poverty applied to define target beneficiaries in the project area, including criteria of vulnerability and lack of assets. The pilot project area covers 4 contiguous wards (16, 18, 21 & 22) in the WHS buffer zone of LSMC.Highest concentration of poor, vulnerable communities among buffer zone.

Its main objectives are:

a) To contribute to improving the living conditions of poor and vulnerable households in selected wards in the historic core of Lalitpur City by piloting urban regeneration activities;
b) To demonstrate feasibility of an integrated urban regeneration approach to decision-makers

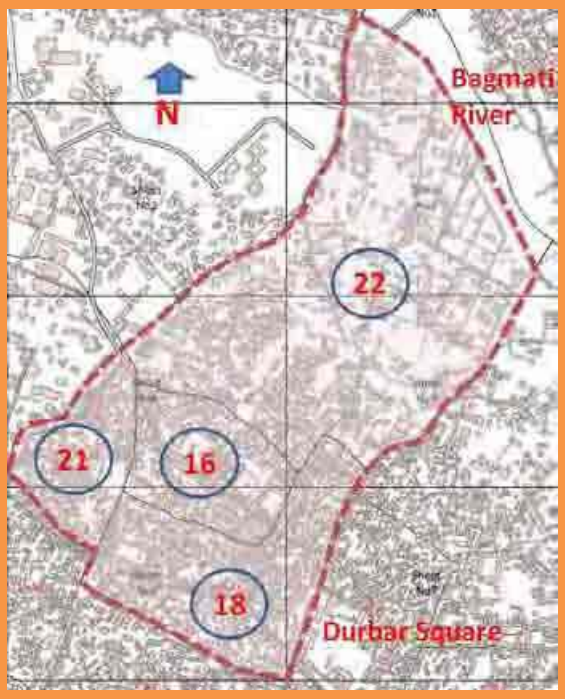

Figure 6-19 Location Plan for PPURP project

Such pilot projects are to be scaled up in other areas of the valley so as to encourage planned urban development and rejuvenate the art, craft and culture to give impetus to local economy.

6.6 Strategy 6: Promotion of Economic Opportunities through identified Growth areas

Major Issues:

- Inequality of economic opportunities to promote local economy
- Inadequate capital investment in public goods and services

The promotion of tourism and allied services helps creating employment opportunities in several sectors, mainly in wholesale and trade, transport, real estate and corporate business. As a major tourism center, the promotion of handicrafts and artifacts also help to enhance Gender Equality and Social Inclusion (GESI) as these can be made at household or neighborhood level. As a blooming center for education, Health and construction sectors, areas would be segregated along the green and yellow zones to promote the economic activities within the valley.

Desirable Condition	Indicators
Economically thriving urban areas	GDP of municipalities
	No. of economically active population in urban areas
	Employment ratio

Table 6-19 Objectives and Action Plans for Strategy 6: Promotion of Economic opportunities through identified Growth areas

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[12]
Obj. 47. Promotion of economic opportunities to create employment opportunities in several sectors	Identify potential economic opportunities and growth areas of municipalities	KVDA, Municipalities	Private Sectors and Local Bodies	O,P,E
	Prioritization of infrastructure development to facilitate economic growth	KVDA, MoUD		P
	Designate land use zones to promote development of sports venues (Education institutions, Hospitals, football/cricket stadium in yellow colored zones) to support development of sports in the country as well as to attract sports tourism in the KV	KVDA, MoYS		P, E
	Identify and develop potential Tourist areas to promote agro tourism and cultural tourism	NTB, Municipalities	MoTCA, NTB	S, P, E
	Identify, develop and maintain eco trail or cycle trail around the valley to foster the local economy and livelihood	KVDA, MoUD, DoR		O, P, E
	Promote development of tourism service infrastructures such as hotels, recreational centres, golf course, eco-parks	NTB, HAN	KVDA	C, P, E

[12] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

6.7 Strategy 7: Promotion of Gender Equity & Social Inclusion in decision making process and development activities

Major Issues:

- Need to mainstream gender equity and social inclusion in all decision making and activities

KVDA would pay special attention to promote social inclusion while preparing its plans and programs and implementing them. The concerns of the gender, poor, marginalized, disadvantaged, physically challenged will be addressed and any kind of discrimination will be discouraged. The informal sector in Kathmandu Valley has not only been rising but has also been contributing towards making the general people's life easy, while learning lessons from other countries. Under the general framework of MoUD, KVDA would coordinate with related NGOs, CBOs, Local elected bodies and other agencies to provide the vulnerable population with the opportunity to market their skills, products and services in organized manner by protecting the interests of the neighborhood.

Desirable Condition	Indicators
Inclusion of vulnerable population in major development activities and decision making	Number of participants in social audits
	% of disadvantaged population in decision making development process
	Percentage of trained informal sector workers
	Number of organized markets for street vendors, workshops and repair shops

Table 6-20 Objectives and Action Plans for Strategy 7: Promotion of Gender Equity and Social Inclusion in decision making process and development activities

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime [13]
Obj. 48. Devise social accountability mechanism	Develop platform for public hearing, and social audits	KVDA, Municipalities	I/NGOs	S
	Plan and design self, family, community and neighborhood policing mechanisms/ mass media and awareness campaign for better implementation of development control and regulatory tools. Such mechanism would be built around "safety" and "better living environment".	KVDA, Municipalities , Police	Media Partners	S
Obj. 49. Recognize informal sector and give opportunity to their business in organized manner	Review and develop major plans, policies and incentive policies to encourage public and private sector involvement and investment in promoting social equity	MoUD	Municipalities	S
	Provide special attention to promote social equity while preparing its plans and programs and implementing them with due concerns to the gender, poor, marginalized, disadvantaged and physically challenged people	MoWCS	KVDA, Social Group Agencies	S

[13] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

	Develop capacity building trainings for informal sector workers	KVDA, MoUD,	Municipalities Dev. Partners	O, P
	Prepare development plans for organized retail vegetable markets at 10 different places in consultation with the local bodies	KVDA, Municipalities , DoAg		O, P
	Identify plans to develop markets for Street vendors, workshops, and repair shops on street	Street Vendor Association	KVDA, municipalities	O, P
	Feasibility study of Urban Haat Bazar (weekly market) along Ring Road and Koteshwor - Surya Binayak Highway	Municipalities , Street Vendor association, DoAg	KVDA,	O, P

6.8 Strategy 8: Encourage Safety and Security in Urban Development

Major Issues:

- Inadequate emphasis on safety, security and risk resilience in urban development

Kathmandu valley, as a major urban concentration in Nepal, has a myriad of challenges mainly on issues of crime and safety, transportation security, public health concerns, environmental safety and natural disasters. In this context, planners and policy makers have the major responsibility to protect citizens' lives from death, injury or property losses to make sure that safety is an integral part for development. Considering the issue of land impact on safety and security, the development initiatives would focus more on developing standards and address issues that have been a hurdle to promote safety and security in urban development.

Desirable Condition	Indicators
Safe and Risk resilient urban areas	Urban areas with operating emergency services like fire brigade
	No. and distribution of safe evacuation areas
	Ratio of Security personnel per municipality
	Availability of evacuation plan at local level
	No. and distribution of community buildings
	Availability of urban safety units

Table 6-21 Objectives and Action Plans for Strategy 8: Promote Safety and Security in Urban Development

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime [14]
Obj. 50. Strengthen Security system	Develop security circuit within the KV with surveillience for people and traffic at KV entry points	Metropolitan Police	KVDA, Line agencies, Municipalities	S,O
	Digital Hub for inter-agency data sharing			
	House - metric blocking system			
	Application of Geographic information system for local organizations, community analysis, public administration and economic development.			
Obj. 51. Ensure crime reduction and promote safety	Establishment of Urban safety units – latest techniques to evaluate crime prevention projects, including but not limited to locating hot-spot areas of urban crime	APF, Nepal Police, Municipalities	KVDA, Private Sectors	S,O
	Relocate polluting industries			
	Establish sport and recreation centers to promote youth involvement in positive measures			
	Establish Transit House within Police Stations			
	Establish child care centers and Old age homes at neighborhood/ city level			

[14] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

	Develop standards for requirement of security personnel and related infrastructures	Nepal Police, Army, Municipalities	KVDA, Private Sectors	
	Strict planning permits for skyscrapers and parking provisions, commercial spaces			
	Conduct awareness programs that focus on community policing: siren system + mechanism to connect to police			

6.9 Strategy 9: Promote Private Sector Involvement in Urban Development Activities

Major Issue:

- Inadequate effort to ensure private sector participation as key stakeholder in comprehensive and planned urban development

From the Private Sector's perspective, Kathmandu Valley would evolve as a cultural, social and economic hub of the nation. To attain this vision, private sector involvement would be a major supporting factor in achieving the strategic objectives envisaged by the proposed 20 years SDMP. These private sector actors may include individual taxpayers, local and foreign investors; manufacturers, service providers, technology providers, education providers, contractors, students, etc. Considering their potential input in the urban development process, it is being essential to clearly define their role so that all the concerned actors throughout the economic value chain are represented in the process. In order to mainstream private sector involvement in the urban development process, KVDA would collaborate and hold periodic interaction programs with related actors, mainly Nepal Investment Board, Public Private Partnership Cell of National Planning Commission, Confederation of Nepalese Industries and FNCCI Nepal.

While there are numbers of potential sectors of urban development in the valley, two distinctive models would be beneficial, where private sector can participate and bring in innovation and efficiency while delivering the services,

a) Public Private Partnership Model (PPP)

Public Private Partnership is a way to leverage for the accelerated growth as it brings in the resources and efficiency of private sector in development activities. While the role of private sector would be to initiate the project, arrange finances and assume implementation risks; the Public sector would be responsible to facilitate the work process, share risks, provide viability gap funding and monitor the overall progress. The instrument of Public Private Partnership (PPP), the act and regulation of which is being amended, can be used to make the service delivery models financially viable for the private sector to participate. This could leverage the accelerated growth of planned urbanization of the valley.

Few examples of such model would be:

- Multi Storied Car Park at the Central Business Districts
- Urban Re-generation of City Core areas
- Management and Operate Public Bus Terminals, Airports
- Utility Management
    - Water Supply
    - Solid Waste Management
    - Telecommunication
    - Electricity
- Maintenance of Urban Roads
- Operate and Maintain Public Transportation including
    - Buses
    - Taxies
    - Monorails
    - Cable Car
    - Trams
    - Metro System
    - Mass Rapid Transit System
    - Flyovers and Interchanges
- Build Smart Cities

- Construct and manage convention centers/ exhibition centers
- Participate in heritage conservation and maintenance
- Conservation of Culture, Music and Arts etc.

b) Encourage Corporate Social Responsibility (CSR) Initiatives

CSR initiative is a major business practice, adopted by individual business enterprise or corporate houses, which involves participating in initiatives that benefit the society. In such model, the necessary resources, including investment, for delivering these services are managed by the private sectors. The services are delivered in partnership with the public authorities, who have the responsibility to facilitate, monitor and provide tax incentives for effective service delivery. Some examples of such initiatives could be the development and management of,

- Public Park in the available open spaces within the communities and alongside the rivers.
- Public toilets
- Public bus stands
- Organization or sponsorship of musical/cultural and sports events
- Public libraries at the community level etc.

Desirable Condition	Indicators
Active participation of both public and private sectors in development process	No. of development projects using PPP model

Table 6-22 Objectives and Action Plans for Strategy 9: Promote Private Sector Involvement in Urban Development Activities

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[15]
Obj. 52. Prepare Economic Vision for Kathmandu Valley 2035	Prepare a document that explores and sets out a vision for what the economy of Kathmandu Valley would look like within the year 2035 and beyond	MoF, KVDA, Private Sectors		O,P
Obj. 53. Promotion of Private sector involvement in development projects	Identify development projects where private sector can participate and lead Develop policies to facilitate private sector involvement in urban development activities	MoF, KVDA, Private Sectors	Line agencies	S, P, E

[15] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

6.10 Strategy 10: Emphasize on Information, Communication and Advocacy

Major Issues:

- Need to establish transparency and accountability of KVDA's actions

KVDA intends to foster partnership with various national as well as international agencies to promote knowledge sharing, maintain relationship and implement the action plans. This involves knowledge mobilization and communication of information to all relevant stakeholders in a timely fashion that will enable the KVDA to undertake informed evidence based decisions in planning, developing and monitoring/regulating valley wide urban development activities. Advocating with key decision makers is essential in order to ensure appropriate enabling of policies, coordination and funding mechanisms. Thus, in order to implement the envisaged plans, policies and programs, strong advocacy and communication mechanism is required, both at international and national level, through coordination with media, civil societies and I/NGOs. Applications for membership in international societies through challenges on smart and resilient cities are also being considered and will be sought after even in the future.

Figure 6-20 Ensuring Advocacy and Communication contributes to Strategic Change

Advocacy and communications strategy is based on the need to create awareness and build credibility around the principles, objectives and programs of SDMP. It is also necessary to maintain a sustained interest among concerned partners to continue to support its implementation. Most importantly, information, communication and advocacy would help to develop a common ground where the plans and programs proposed by the 20 years SDMP for the Kathmandu Valley could be aligned with the plans and programs of related agencies at implementation level.

The role of media and civil society would be highly important to disseminate relevant information to the general public. In addition, the "Right to Information Act 2007" and "Right to Information Regulation 2009" supplements the concept of right of citizens to demand and obtain information held by public agencies on any matter of public importance. This drives KVDA to notify people about its actions and get consultative feedbacks in order to head in the right direction.

Desirable Condition	Indicators
Utilization of advocacy and communications strategy to inform decision making	No. of feedbacks received by KVDA
	No. of press releases and news articles dedicated to the urban development process
	No. of consultative meetings and workshops

	% of stakeholder participation in consultative meetings
	No. of national and international affiliations

Table 6-23 Objectives and Action Plans for Strategy 10: Emphasis on Information, Communication and Advocacy

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[16]
Obj. 54. Play a lead role in advocating for the implementation of the SDMP	Set up an information system, so as to act as an information centre as well as disseminate the information to the public with ease	KVDA	Advocacy Information Commission, Rastriya Samachar Samiti, MoIC	
	Raise awareness among key stakeholders, public and private sector about the role of KVDA in the sustainable development of Kathmandu Valley through media, civil societies and build up partnership to contribute to the same	KVDA	Media Partners	O
	Hold regular consultative meetings, workshops and seminars with concerned stakeholders to gain feedback on various action plans and projects for the development of KV	KVDA	Other related agencies	O
	Apply for international affiliation as and when required	KVDA		
	Construct Learning-Innovation-Application Center to create platform and opportunity for sharing information and ideas within and outside KVDA, nationally and internationally to internalize and institutionalize knowledge **(Refer 6.10.1)**	KVDA	Other Collaborative Partners	O

6.10.1 Center for Learning, Innovation and Application:

The current planning approach in context of Kathmandu Valley lacks adequate experienced human resource, knowledge and facilities for developing and applying innovative ideas for sustainable urban development. Hence, it is highly important to develop a Center for Learning, Innovation and Application in order to create an environment to tackle the issues pertinent to the development of Kathmandu Valley, with the synergy of cross-cutting technologies and indigenous knowledge. KVDA has a strong willingness and commitment to establish such centre that will promote learning and facilitate its staff. The project would include a data centre for research and implementation of emerging geo-information technologies to support informed spatial decisions in urban planning and management. Inclusion of public space for exhibitions and seminars related to urban sectors would be additional features of the centre, which would be utilized as a platform for knowledge dissemination and allow the centre to achieve higher cost recovery levels as well.

[16] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

6.11 Strategy 11: Youth Mobilization and Participation in Urban decision making processes and development activities

Major Issues:

- Youth participation in urban development and management
- Lack of awareness about the role and responsibilities of youth in urban development and management
- Lack of proper structure or accountability mechanism for the youth involvement in urban development and decision making processes

National Youth Policy, 2015 has defined youth as a population group between 16-40 years (MoYS, 2015). In Nepal Youth population accounts for 40.3 percent of the population and is considered an invaluable asset of the nation, as well as a change agent. Based on National Youth Policy 2072, Ministry of Youth and Sports is implementing program in 15 sectors such as Education, Employment, Health and Social Security, Youth Empowerment and Leadership, Participation and Mobilization, Art, Literature, Culture, Sports and Entertainment, Controlling Drug Abuse, Human Trafficking Controls, Controlling Crime and Violence, Youth Participation in Environmental Protection and Sustainable Development, Increasing Accessible to Science and Information Technology, Youth Participation in Sustainable Peace Building and Conflict Resolution, Capacity Building, Priority to Special Group, Partnership.

Youth is increasingly dwelling in the cities, 58.71 percentage in the valley (NPCS, 2012). Urbanization is going to continue in the Valley, which will act as the engine for the economic growth and social transformation for decades to come, affecting the lives of numerous communities and many youth. Life in the Valley is difficult for young people as they are exposed to social and environmental vulnerabilities, including disaster and climate change. Youth at the present face relatively high level of unemployment due to which most of them are forced to leave county and struggle in vulnerable working condition in informal sectors particularly if they are less educated. There has been a steady increase in the total number of labor permits issued for foreign employment. According to (MoLE, 2013/2014) a total of 17, 29,252 (excluding individual applicants) labor permits were issued over the six-year period, representing a staggering 137% increase between 2008/09 and 20013/14 where the Valley accounts for 2.21% of labor permit.

Figure 6-21: Youth in queue for the EPS Korean Language test [source:(MoLE, 2013/2014)]

As young men and women have potentials and represent the largest share of the population, they are the agents of economic, social and political change, not only is there a need for a national policy to forge

their involvement in nation building, but also equally important to harness their energy in the urban development processes. Time and again, when and where needed youth has shown their leadership, organizational skill and volunteerism to tackle the most difficult challenges faced by the communities. According to (JIMEE, DIXIT, TANDINGAN, & SHARMA, 2015)more victims of 25April, 2015 earthquake were rescued by communities rather than national and international rescue teams; youth of Nepal have already demonstrated their capabilities. Therefore, it is important to involved youth and provide them the platform in different levels and sectors through which they can utilize their knowledge and energy in steering valley to an inclusive and sustainable urban area.

The Government should be inclusive, accessible, collaborative and responsive to youth (Davis, Bergh, Lundy, & Amanda, 2014). Working with young people and valuing their input is crucial if development policies are to be truly inclusive and relevant to those they are intended to serve. Though the primary responsibility for accountability rests with governments, it is equally important that the citizens, especially youth, are aware and willing to participate in development activities. For that there is a need of investment in the demand side of the accountability equation. Therefore, to strengthen the capacity of youth and communities to effectively voice their concerns it is important to invest in formal and informal education and trainings in order to foster active citizenship amongst young people.

According to the United Nation's, My World Survey that collected over 7 million responses from around the world on Post 2015 development goals, youth (16-30) from Asia and Oceanic voted for a "good education" and "an honest and responsive government" as the highest priority. According to the UN major group for children and youth the major priorities for a youth friendly and livable cities are social cohesion and equality, urban governance, capacity and institutional development, spatial development, urban ecology and environment, urban housing and basic services.

Vision for valley through the eyes of youth

To sensitize and explore the aspiration of the youth on development of Kathmandu valley a survey on the topic "vision for the valley" was conducted in the initiation of KVDA. 37 students from class 5 to a Bachelor's level were invited to write down their vision for the development of Kathmandu Valley. They wished for environment friendly -pollution free, sustainable valley together with priority in heritage conservation.

Therefore, youth should be empowered as the stakeholder, caretaker and leaders for the sustainable urban development. They are capable of ensuring inclusive governance, protecting urban environment and leading innovative and entrepreneurial approaches.

Desirable Condition	Indicators
Youth involvement in urban development and decision making process	Youth participation in social, political, environmentally-oriented NGOs
	No. of active TLO ,CBO ,WCF and its active participants
	Young people who use internet for interaction with public authorities
	Young people using internet for accessing or posting

Table6- 24 Action Plans for Youth Mobilization and Participation in Urban decision making processes and development activities

Objectives	Action Plans	Lead Agencies	Supporting Agencies	Regime[17]
Obj. 55. Include youth in design and planning processes	Engage youth in workshops to develop comprehensive physical development plan at both Macro (valley level) and Micro level (municipal level planning)	KVDA, Municipalities	Academic Institutions, Volunteering organizations	O
	Ensure youth representation in TDC , TLO,CBO,WCF	KVDA, Municipalities	Media Partners	O
	Create a Sustainable Development Unit to develop a platform to mainstream the goals in municipal strategies and to monitor them with active youth representation and ownership	Municipalities		S, C, O, P, E
	Involve youth in the design, planning or conceptualization of cities for innovative ideas on future cities which are inclusive and sustainable	KVDA, Municipalities	Academic institutions, Professional society, Volunteers from I/NGO's	S, C, O, P, E
Obj. 56. Engage youth in different levels of advocacy	Engage youth through social media: Run Awareness and discussion campaigns regularly to capture voices of youth in shaping their city and to create an avenue for local communities to provide feedback on existing policies and implementation	KVDA, Municipalities	MoUD	S, O
	Encourage a massive volunteer culture through local youth club's leading community clean up campaigns (Saving our cities) by collaborating with civil society, private sector and government bodies	MoWCS	KVDA	S, C
	Engage youth in sports at macro and micro levels to lobby for safe recreational areas around the city and positive usage of open spaces/ parks to promote a healthy lifestyle to improve quality of life	KVDA	Municipalities Development Partners	S, O, E
Obj. 57. Capacitate youth to contribute towards urban economy	Public sectors and Private sectors to provide training and skills exposure opportunities to youth from different backgrounds, and provide safe working environments for youth in both the service and labour intensive sectors	Public sectors, Private sectors	KVDA, Municipalities	O, P
	Promote local tourism through art, architecture, cultural heritage lead by the local youth groups or individuals	KVDA, Municipalities		O, P, E

[17] **S:** Safe **C:** Clean **O:** Organized **P:** Prosperous **E:** Elegant

	Invest on youth innovation that could create employment, economic gain and improve the urban environment	Private Sectors	KVDA	S, P
Obj. 58. Empower youth to contribute towards urban environment and safety	Enable youth to be first responders in disaster by providing first aid and disaster risk reduction and response training through municipalities	Municipalities		S, O
	Involving youth in creating awareness among general public, especially immigrants and tourist (national/international) on the urban environment (waste disposal) and traffic rules for safety.	Municipalities	Ward Offices	S, C, O
	Youth clubs to form community watch groups to actively monitor safety and security in local communities	Municipalities	Ward Offices	S, C, O
Obj. 59. Provide community center platform for youth to interact with government stakeholders	Invest in leadership development of youth through counselling and interactions with government stakeholders (Face to face or through vitual communication by using website, Blogs, social networks etc.)	Municipalities		o
	Encourage youth making special contributions towards the Urban development processes by having the State honor them (use incentive and decentivte mechanism)	Municipalities		o

SUMMARY OF CHAPTER 6

As population growth and land use change in Kathmandu Valley are inevitable, there is a greater need to assess the positive and negative factors that govern the urban growth. In addition, the strategies proposed in the 20 years SDMP (2015 – 2035) address the issues of urban growth with a vision **"TO ESTABLISH KATHMANDU VALLEY AS A SAFE, CLEAN, ORGANIZED, PROSPEROUS AND ELEGANT (SCOPE) NATIONAL CAPITAL".**

In this context, KVDA has developed the Strategic Development Master Plan to address 'new requirements' which considers the existing and emerging trends of urbanization, environmental issues, socio-political and economical situations of the Valley. SDMP utilizes the studies of Urban Growth Trend, Multi-Hazard Risk Assessment, and Constraint Analysis as a major basis for planning. Infrastructure and environmental improvement, urban regeneration and risk sensitive land-use planning are the four major areas of focus and the ten major strategies address their pertinent issues. Each of these strategies is backed by a number of specific objectives and activities for lead and supporting agencies. Each activity is further linked with the five components of SCOPE, which is the main mission of the SDMP (2015- 2035).

Strategy 1: Planning to be done at two Levels: Macro (Valley Level) and Micro (Municipal Level)
It adopts the best land-use options to translate assessment into appropriate location of land uses, functions, facilities and land use regulations and policies for its execution at two stages: Macro and Micro Level. Macro Level planning conceives Kathmandu Valley as a single planning unit, while considering available opportunities and constraints for development. Alternatively, micro level planning provides strategic framework at municipal/ VDC level to guide land use plan and major infrastructure projects within the areas that would ultimately influence planned urban development. The major activities are revision of the existing plans and policies to facilitate the implementation of the SDMP (2015 – 2035), preparing Comprehensive Physical Development Plan for KV; developing Large Scale GIS Database of Urban Infrastructure and Land Information System; developing guidelines to implement GLD, Land Pooling, land valuation and land subdivision; and developing digital addressing system for all municipalities/ VDCs.

Strategy 2: Constraints and sensitivity based zoning and Land use plan to guide urban expansion and Risk Sensitive Land Use Plan of KV
An assessment of land conditions in the valley reveals the constraint free buildable area to be only 34.8% (25,122 ha) of the total area of the valley. This enforces the need for constraint and sensitivity based land management that guides future urban planning decisions, demarcates land based on natural hazard, climate change risks, environmental constraints, food security issues, and guides future development towards areas at lower risks. The strategy divides the landform of the valley into 3 different color zones:

Red Zone: High Alert Zone with limited constraint free space
Yellow Zone: Medium Alert Zone that is lesser sensitive than Red Zone
Green Zone: Residential Area Promotion Zone; potential residential promotion area

The strategy also stresses on development, implementation and monitoring of building and planning bye- laws in each color zones. The strategy includes improving transport connectivity between the different zones, developing incentive mechanisms to relocate urban functions from city and guides urban expansion towards North-East, East and South part of the valley by developing new satellite towns and implementing the Outer Ring Road project.

The activities mainly focus on promoting residential and non-polluting small scale industries and encouraging organized housing through effective land management in the yellow zones. It also encourages improvement of transportation connectivity to the historic city core area from planned new development areas in east and south through mass transit system, bypass links.

Strategy 3: Urban Pressure and Risk Resilient Urban Infrastructure
This strategy focuses mainly on development of urban infrastructure standards and risk management measures, allocation of land areas for infrastructure management, promotion of partnership to attract private investment in urban infrastructure projects and development of monitoring mechanisms to assess the major gaps in

implementation process. Acknowledging public safety and security as an important aspect for urban mobility, the strategy focuses on collaboration with related line agencies and utility agencies to prepare Urban Road Standards, Emergency Road Network Plan and KV Urban Transport Master Plan, along with assessment of viability of mass rapid transit system. The strategy also includes plans to encourage private housing projects along with the promotion of low income housing and implementation of regulatory framework for rental services as well. The strategy establishes KVDA as the main coordinating agency that works with each of the utility agency to upgrade the systems and develop regulatory mechanisms to ensure effective and efficient infrastructure management and service delivery.

Strategy 4: Environment Friendly and Risk Resilient Planning Approach

The strategy focuses on developing partnership based model for operation and management of urban forest, open spaces as well as water bodies within the valley. Open space development and management has been a major part of the activities within this strategy considering its usage as a leisure space during regular times and as an evacuation space during disasters. Hence, the strategy strictly emphasizes on developing at least 5% of the ward area as open space. Additionally, the activities included providing regulations and incentives to control air, land and water pollution as well. Owing to the energy crisis in the valley and its impact on the social life and economy, the strategy also emphasizes on promoting use of alternative energy and environment friendly development activities.

Strategy 5: Urban Regeneration of Historic City Core and Traditional Settlements

The major tourist attractions in Kathmandu Valley are the historic arts, culture and religion of the old towns. However, the historic settlements in the old towns face major problems due to high occupancy rate, aging buildings, vertical building subdivision, lack of access to critical facilities and decreasing quality of urban life, which adversely impacts the value of these core historic cities. The 2015 Gorkha Earthquake further strengthened the need to rejuvenate these cities and build their resilience to disasters, thereby preserving the historical, cultural and social assets of the Valley. This strategy focuses mainly of urban regeneration of heritage core of Kathmandu Valley, developing regulations to prohibit vertical division of buildings, and partnering with major stakeholders to improve cultural context of heritage areas as a part of reconstruction efforts with the idea to contribute to improving living conditions of households in the historic core areas.

Strategy 6: Promotion of Economic Opportunities through identified Growth areas

It focuses on creating employment opportunities within the Kathmandu Valley. The activities within this strategy emphasize on identification and development of potential tourist areas within the valley to promote agro tourism, cultural tourism and tourism related service infrastructures, thereby, fostering local economy and livelihood. In addition to designating land use zones to develop sport tourism areas, the activities also emphasize on developing eco-trails that connect the 7 World Heritage Sites.

Strategy 7: Promotion of Gender Equity and Social Inclusion

This strategy ensures gender equity and social inclusion in the urban development process. It focuses on devising social accountability mechanisms by developing platforms for public hearing and social audits. The activities further include developing plans, programs and implementing them with due concerns to the gender, poor, marginalized, disadvantaged and physically challenged people as well as informal sector that has not only been rising but has also been contributing towards making the general people's life easy.

Strategy 8: Emphasize on Information, Communication and Advocacy

This strategy promotes safety and security that includes transportation security, public health concerns, environmental safety and natural disasters. It focuses on strengthening security system, ensuring crime reduction and promoting safety, recognizing informal sector and giving opportunity to their business in organized manner.

Strategy 9: Promote Private Sector Involvement in Urban Development Activities

This strategy promotes private sector involvement in urban development activities. The two major models where the participation of the private sector brings innovation and efficiency while delivering the services are a) Corporate social responsibility initiatives and b) Public private partnership. SDMP aims to develop policies that help involve the private sector in urban development activities.

As a corporate social responsibility private sector could develop and maintain Public parks, Public toilets, Public

bus stands, Organization or sponsorship of musical/cultural and sports events, Public libraries at the community level etc. Furthermore, by using public private partnership model projects such as Multi Storied Car Park, Urban Re-generation, Management and Operation of Public Bus Terminals, Airports , Utility Management, Maintenance of Urban Roads, Building Smart Cities, Construction and management of convention centres, Participation in heritage conservation and maintenance, Conservation of Culture, Music and Arts etc. could be done.

Strategy 10: Emphasize on Information, Communication and Advocacy

In order to implement the envisaged plans, policies and programs, strong advocacy and communication mechanism are required, both in the international and national level, through coordination with media, civil societies and I/NGOs. The strategy focuses on transparency and accountability of KVDA's actions. KVDA aims to set up an information system, so as to establish itself as an information centre. It also plans to construct "Learning-Innovation-Application Centre" to create platform and opportunity for sharing information and ideas within and outside KVDA, both nationally and internationally, to internalize and institutionalize knowledge.

Strategy 11: Youth Mobilization and Participation in Urban decision making processes and development activities

Youth represents the largest share of population and are the major agents of economic, social and political change. It seems imperative to promote their involvement in nation building and also in the urban development processes. The strategy focuses on empowering young people in the Valley as stakeholders, caretakers and leaders for the sustainable urban development of KV. The activities proposed mainly emphasize on engaging the youth in different levels of advocacy and capacitating them to contribute towards urban economy, environment protection and urban safety.

परिच्छेद ६ को सारांश

काठमाण्डौ उपत्यकामा जनसंख्या वृद्धि तथा भु-उपयोगमा हुने परिवर्तन अनिवार्य छन्, तसर्थः सहरी वृद्धिलाई प्रभाव पार्ने सकारात्मक र नकारात्मक पक्षहरुको लेखाजोखा गरिनु अनिवार्य छ । यसका अतिरिक्त, बीस वर्षे रणनीतिक विकास गुरु योजना (२०१५-२०३५)मा प्रस्तावित गरिएका रणनीतिहरुले सहरी वृद्धिका सवालहरुलाई **स्वच्छ, सुरक्षित, सुन्दर, सुव्यवस्थित, र समृद्ध राष्ट्रीय राजधानी** भन्ने दूरदृष्टिका आधारमा सम्बोधन गर्दछन् ।

- यसै सन्दर्भमा काठमाडौं उपत्यका विकास प्राधिकरणले उपत्यकाको सहरीकरण, वातावरणीय सवालहरू, सामाजिक, आर्थिक र राजनीतिक परिस्थितिहरू जस्ता मौजुदा तथा उदीयमान प्रवृत्तिहरूलाई आकलन गर्दै बीस वर्षे रणनीतिक विकास गुरु योजना (२०१५ देखि २०३५) तयार गरेकोछ । यस रणनीतिक विकास गुरु योजनाले सहरी वृद्धिका प्रवृत्तिहरु, बहुपक्षीय जोखिमको विश्लेषण र सीमाहरूको लेखाजोखाका अध्ययनहरुलाई यसका योजनाका प्रमुख आधारहरूका रूपमा अङ्गीकार गरेको छ । यस गुरु योजना तयार गर्दा मुख्य गरी चारवटा क्षेत्रहरू- भौतिक पूर्वाधार निर्माण, वातावरणीय सुधार, सहरी पुनरुत्थान (Urban Regeneration) र जोखिम संवेदनशील भू-उपयोग योजनामा केन्द्रित गरिएको छ र यिनीहरुसँग सम्बन्धित विषयहरूको सम्बोधन गर्नका लागि दशवटा रणनीतिहरू प्रस्ताव गरिएका छन् । विशिष्ट उद्देश्यहरू बोकेका प्रत्येक रणनीतिहरूलाई कार्यान्वयन गर्ने मुख्य तथा सहायक संस्थाका लागि सोही उद्देश्य अनुरूपका क्रियाकलापहरू पनि मोटामोटी रुपमा तय गरिएका छन् । त्यसै गरी प्रत्येक क्रियाकलापहरुले - **स्वच्छ, सुरक्षित, सुन्दर, सुव्यवस्थित, र समृद्ध** (SCOPE: Safe, Clean, Organized, Prosperous and Elegant) का आयामहरुमा पुऱ्याउने योगदान समेत पहिचान गरिएको छ । यिनीहरू नै **काठमाण्डौ उपत्यका २०३५ र पछि; रणनीतिक विकास गुरुयोजना (२०१५ देखि २०३५)** का मुख्य ध्येय (Mission) पनि हुन् ।

- **रणनीति १: दुई तहमा गरिने योजनाः बृहत् र सूक्ष्म तह**
  यसले भू-उपयोगका सर्वोत्कृष्ट विकल्पहरूलाई अपनाएको छ र प्राप्त मूल्याङ्कनलाई, भू-उपयोगको उपयुक्त स्थान, क्रियाकलाप, सुविधाहरु तथा भू-उपयोग सम्बन्धी नियम र नीतिहरूलाई दुई चरणमा कार्यान्वयन गर्ने योजना बनाएको छ- बृहत् र सूक्ष्म तह । बृहत् तहको योजनाले विकासका लागि प्राप्त अवसर र सीमाहरूको विचार गर्दै काठमाडौं उपत्यकालाई एकल योजना एकाइका रूपमा ग्रहण गरेकोछ । विकल्पका रूपमा, सूक्ष्म रूपको योजनाले योजनाबद्ध सहरी विकासलाई प्रभाव पार्ने क्षेत्र भित्र भू-उपयोग योजना र प्रमुख पूर्वाधार परियोजनाहरूलाई मार्गदर्शन गर्ने नगरपालिका/गाविस तहका रणनीतिक रूपरेखाहरू उपलब्ध गराउनेछ ।

  यसका प्रमुख क्रियाकलापहरुमा काठमाण्डौ उपत्यकाका लागि विस्तृत भौतिक विकास योजना तयार गर्नु; सहरी पूर्वाधार र भूमिबारे वृहत् प्रकारको जि.आई.एस.डेटाबेस सूचना प्रणाली तयार गर्नु; निर्देशित भूमि विकास (GLD), भूमि एकीकरण (Land Pooling), भूमिको मूल्यांकन तथा खण्डीकरण सम्बन्धी नीति कार्यान्वयनका लागि निर्देशिका विकास गर्नु; सबै नगरपालिका र गाविसहरुमा डिजिटल (digital) ठेगाना प्रणाली विकास गर्नुका अतिरिक्त रणनीतिक विकास गुरु योजना (२०१५-२०३५) को कार्यान्वयनमा सहजीकरण गर्ने मौजुदा योजना तथा नीतिहरुको पुनरावलोकन गर्नु हो ।

- **रणनीति २: काठमाण्डौ उपत्यकाको सहरी विस्तार र जोखिम संवेदनशील भू-उपयोग योजनालाई मार्गदर्शन गर्ने सीमितता तथा संवेदनशीलतामा आधारित जोनिङ्ग, तथा भू-उपयोग योजना ।**
  उपत्यकाको जमिनको अवस्था बारे गरिएको एक अध्ययनले सम्भावित प्रयोगका आधारमा उपत्यकाको सम्पूर्ण क्षेत्रफल मध्ये सीमितता रहित सहरी विकास गर्न सकिने क्षेत्र जम्मा ३४.८% (२५,१२२ हे.) देखाएको छ । यसले भविष्यका सहरी योजना निर्माणमा मार्गदर्शन गर्ने, प्राकृतिक प्रकोप, मौसम परिवर्तनका जोखिम, वातावरणीय सीमीतता, खाद्य सुरक्षाका सवालहरुका आधारमा जमिनलाई सीमांकन गर्ने र भविष्यको विकासलाई कम

जोखिमयुक्त क्षेत्रहरूमा निर्देशित गर्ने, जोखिम र संवेदनशीलतामा आधारित भूमि व्यवस्थापनलाई कार्यान्वयनमा ल्याउने कुरामा जोड दिन्छ । यस गुरु योजनामा उपत्यकाको जमिनलाई तीन क्षेत्रमा वर्गीकरण गरी प्रत्येक क्षेत्रलाई बुझाइमा सहजता र सरलताका लागि तीन रातो पहेँलो र हरियो रङमा चित्रण गरिएको छ ।

अति जोखिम क्षेत्र (रातो)-उच्च सतर्कता क्षेत्र, सुरक्षित क्षेत्र कम भएको अति संवेदनशील क्षेत्र,

मध्य जोखिम क्षेत्र (पहेँलो)-: मध्य सतर्कता क्षेत्र, अति जोखिम क्षेत्र भन्दा कम संवेदनशील क्षेत्र

सुरक्षित क्षेत्र (हरियो)-आवास प्रवर्धन क्षेत्र, सम्भावित आवास विस्तार योग्य क्षेत्र ।

यस रणनीतिले प्रत्येक तीन वर्गीकृत क्षेत्रमा व्यवस्थित सहरी विस्तार तथा विकासका योजनाहरु कार्यान्वयन र नियमनका लागि आवस्यक ऐन, नियम, मापदण्ड तथा निर्देशिकाहरु तर्जुमा गर्ने विषयलाई पनि समेटेको छ । यसका अतिरिक्त विभिन्न क्षेत्रहरुका बीचमा यातायात सञ्जालको सुधार तथा विस्तार, अवाञ्छित जनघनत्व तथा जोखिमयुक्त क्षेत्रमा बसोवासलाई निरुत्साहित गर्न र जोखिम रहित क्षेत्रमा बसोसास स्वतस्फुर्त रुपमा अभिप्रेरित गर्न प्रोत्साहन (Incentive) का संयन्त्रहरुको व्यवस्था गर्न जोड दिएकोछ । भुकम्प उत्थानशील हरित शहरहरु (Earthquake Resilient Green Satellite Town) को विकास, र तेश्रो चक्रपथ परियोजना कार्यान्वयन गरी उपत्यकाको उत्तर-पूर्वी, पूर्वी र दक्षिणी भागमा सहरी विकासलाई विस्तार गर्दै जाने कार्यहरु पनि यस रणनीतिका अभिन्न अङ्ग हुन् ।

यी क्रियाकलापहरु प्रभावकारी भूमि व्यवस्थापनका माध्यमबाट पहेँलो क्षेत्रमा आवासीय तथा प्रदुषण नगर्ने साना प्रकृतिका उद्योगहरु र संगठित हाउजिङ् प्रवर्धन गर्ने विषयमा केन्द्रीत रहेको छ । वृहत् पारवहन प्रणाली र बाइपास सडकको निर्माणका माध्यमबाट पूर्व तथा दक्षिणमा योजनाबद्धरुपमा विकास गरिने नयाँ क्षेत्र देखि ऐतिहासिक मुख्य सहर सम्म यातायातको सुधार गर्ने कार्यलाई प्रोत्साहन गर्दछ ।

- **रणनीति ३: सहरी चाप र जोखिममा उत्थानशील सहरी पूर्वाधार**

यस रणनीति सहरी पूर्वाधारको मापदण्ड र जोखिम व्यवस्थापनाका उपायहरूको विकास गर्ने, पूर्वाधार परियोजनाहरूको व्यवस्थापनका लागि भूमि निर्धारित गर्ने, सहरी पूर्वाधार परियोजनाहरूमा निजी लगानी आकर्षण गर्ने र योजना तथा कार्यान्वयन प्रक्रिया बीचको मुख्य अन्तरललाई आकलन गर्ने कार्यमा केन्द्रित रहेको छ । सहरी गतिशीलताका लागि सर्वसाधारणको सुरक्षा र अभयतालाई केन्द्रमा राखेर पर्याप्त मात्रामा द्रुत गतिको यातायात प्रणालीको उपयोगको सम्भाव्यताको लेखाजोखा गर्नुका साथै सहरी सडकको मापदण्ड, आपत्कालीन सडक सञ्जाल(Network) योजना र काठमाडौं उपत्यका सडक सञ्जाल तथा यातायात गुरु योजना तयारी र कार्यान्वयन गर्नका लागि सम्बद्ध सरकारी निकाय र सेवा प्रदायक निजी स्तरका संस्थाहरुसँग सहकार्य गर्ने विषयमा यो रणनीति केन्द्रित छ । यस रणनीतिले काठमाण्डौ उपत्यका विकास प्राधिकरणलाई प्रभावकारी र निपुण पूर्वाधार व्यवस्थापन तथा सेवा वितरणको सुनिश्चितताका लागि प्रत्येक सेवा प्रदायक संस्थाहरुसँग प्रणलीको स्तरोन्नती गर्न तथा नियमनकारी संयन्त्रको विकासका लागि संयोजनकारी निकायका रुपमा स्थापित गर्दछ ।

- **रणनीति ४: वातावरण संरक्षण र व्यवस्थापन**

यस रणनीति उपत्यकामा रहेका सार्वजनिक खुला स्थल, सहरी वन, र जलाधार क्षेत्रहरूको संरक्षण र व्यवस्थापनका लागि साझेदारीमा आधारित नमुनाहरु विकास, विस्तारमा र परिमार्जनमा केन्द्रित रहेकोछ । यस

रणनीतिले विपद् व्यवस्थापन लगायत अन्य बहुआयामिक क्षेत्रमा खुला क्षेत्रको आवस्यकताको मनन गर्दै उक्त क्षेत्रको विकास र व्यवस्थापनलाई प्रमुख क्रियाकलापको रुपमा अङ्गीकार गरेको छ । तसर्थ यस रणनीतिले विपद् व्यवस्थापन, जलवायु अनुकूलन, पानी पुनर्भरण, सामाजिक, सांस्कृतिक तथा अन्य बहु आयामिक दीर्घकलीन आवस्यकता पूरा गर्नका लागि गुरु योजना तयार गरी खुला क्षेत्रहरुको विकास गर्ने कुरामा जोड दिएकोछ । यसका अतिरिक्त हावा, जमिन र पानीको प्रदूषण नियन्त्रण गर्नका लागि नियमन र प्रोत्साहन (regulation and incentive) को व्यवस्थालाई यसका क्रियाकलापमा संलग्न गरिएकोछ । हरित अर्थतन्त्र तथा दीगो प्रविधिले प्रचलनमा रहेका अत्यधिक ऊर्जा खपत गर्ने निर्माण पद्धतिलाई विस्तारै प्रतिस्थापित गर्दै दीगो प्रकृतिको प्रविधिको प्रयोगमा प्रोत्साहन गर्नेछ । उपत्यकामा बढ्दो ऊर्जाको माग र ऊर्जाको कमीले सामाजिक जीवन एवं अर्थतन्त्रमा पारेको प्रभावका सन्दर्भमा, यस रणनीतिले वैकल्पिक ऊर्जाको प्रयोग र वातावरण अनुकूल विकासका क्रियाकलापहरूलाई प्रवर्धन गर्ने कुरामा जोड दिएकोछ ।

- **रणनीति ५: ऐतिहासिक मुख्य सहरको पुनरुत्थान**

  काठमाडौं उपत्यकाका प्रमुख पर्यटकीय आकर्षणहरू पुराना सहरहरूका विविध ऐतिहासिक कला, र संस्कृतिहरु हुन् । तथापि उच्च जनघनत्व, पुराना घरहरू, घरहरुको ठाडो विभाजन (Vertical Subdivision of Houses), महत्त्वपूर्ण सुविधाहरूमा पहुँचको अभाव र सहरी जीवनको घट्दो गुणस्तरका कारण पुराना सहरहरूका ऐतिहासिक बस्तीहरूले चुनौतीहरूको सामना गरिरहेका छन् । यसले गर्दा यी प्रमुख ऐतिहासिक स्थलहरूमा नकारात्मक प्रभाव परिरहेकोछ । गोर्खा भूकम्प २०१५ पश्चात् यी सहरहरूलाई पूर्ण रूपमा जीर्णोद्धार गरी विपद्मा उत्थानशील बनाउँदै उपत्यकाको संस्कृति र सामाजिक धरोहरको संरक्षण गर्नुपर्ने आवश्यकता टड्कारो रूपमा महसुस भएकोछ । यस रणनीतिले घरको ठाडो रुपमा विभाजन गर्ने कार्यलाई निषेध गर्ने र खासगरी काठमाडौं उपत्यकाका प्रमुख ऐतिहासिक क्षेत्रमा बसोवास गर्नेहरूको जीवनको गुणस्तरमा सुधार गर्ने कार्यमा योगदान दिन प्रमुख साझेदारहरूसँग मिलेर कार्य गर्दै काठमाडौंको प्रमुख ऐतिहासिक क्षेत्रको पुनरुत्थान गर्ने कुरामा जोड दिएकोछ । पुनः प्रयोगयोग्य सामग्रीको प्रयोग हुने परंपरागत भवन निर्माण शैली दीगो तथा हरित प्रविधिका रुपमा स्थापित भईसकेको परिप्रेक्षमा, प्राकृतिक विपद्को समयमा आर्थिक तथा मानवीय क्षति पनि कम गर्ने र पर्यटन प्रवर्धनमा पनि सहयोगी हुने हुनाले यस्तो निर्माणका लागि बेग्लै मापदण्ड तयार गरी संरक्षण गर्ने विषय पनि यस रणनीतिमा प्रस्तावित गरिएको छ ।

- **रणनीति ६: आर्थिक अवसरहरुको प्रवर्धन**

  यो रणनीति काठमाडौं उपत्यकामा रोजगारका अवसर सिर्जना गर्नमा केन्द्रित छ । यस रणनीतिले समेटेका क्रियाकलापहरूले उपत्यकामा कृषि-पर्यटन, सांस्कृतिक-पर्यटन, र पर्यटन सेवाका पूर्वाधारहरूको प्रवर्धनका लागि स्थानीय अर्थतन्त्रलाई सबल बनाउने र सहरवासीको जीविकालाई सरल बनाउने सम्भावित क्षेत्रहरूको पहिचान गरी विकास गर्ने कुरामा जोड दिन्छन् । खेलकुद-पर्यटन विकास गर्नका लागि भू-उपयोगका क्षेत्रहरू पहिचान गरी तिनको समुचित व्यवस्थापनको योजना निर्माण गर्नुका अतिरिक्त यसका क्रियाकलापहरू ७ वटा विश्व सम्पदा क्षेत्र(World Heritage Sites)लाई जोड्ने, किफायती एवं सुविधायुक्त पर्यावरणीय पदमार्गहरू लगायतको विकासमा केन्द्रित छन् ।

- **रणनीति ७: लैङ्गिक समता र सामाजिक समावेशिताको प्रवर्धन**

  यस रणनीतिले सहरी विकासको प्रक्रियामा लैङ्गिक समता र सामाजिक समावेशितालाई सुनिश्चित गर्छ र यो सार्वजनिक सुनुवाइ र सामाजिक लेखा परीक्षणका लागि उपयुक्त साझा मञ्च (platform)को विकास गराएर, सामाजिक जवाफदेहिताको संयन्त्रलाई प्रवर्धन गर्ने कार्यमा केन्द्रित छ । यसका क्रियाकलापहरूमा लिङ्ग, गरिबी, सामाजिक बहिस्कार, सुविधा विहीनता र शारीरिक विकलाङ्गताका कारण उचित आत्मसम्मानको अनुभूति गर्न नसकिरहेका वर्गलाई जागरूक गराउने मात्र नभई जनसाधारणको जीवन सहज बनाउन योगदान गरिरहेका निजी

तथा अनौपचारिक क्षेत्रको सम्लग्नतामा योजना तथा कार्यक्रमहरू तयार गर्ने र तिनीहरूलाई कार्यान्वयन गर्ने विषयहरू समेत समावेश गरिएका छन् ।

- **रणनीति ८: सहरी विकासमा निर्भयता र सुरक्षाको प्रवर्धन**

यो रणनीतिले यातायातको सुरक्षा, जनताको स्वास्थ्यको चासो, वातावरणीय सुरक्षा र प्राकृतिक विपद् समेत समेटिएको, सुरक्षा र नागरिकको निर्भयतालाई प्रवर्धन गर्दछ । यो सुरक्षा प्रणालीको सुदृढीकरण गर्ने, अपराध न्यूनीकरण गर्ने, सुरक्षाको प्रवर्धन गर्ने, अनौपचारिक क्षेत्रको पहिचान गर्ने र व्यवस्थित रुपमा उनिहरूका व्यवसायलाई अवसर प्रदान गर्ने विषयमा केन्द्रीत छ ।

- **रणनीति ९: सहरी विकासका क्रियाकलापमा निजी क्षेत्रको सम्लग्नताको प्रवर्धन गर्ने**

यस रणनीतिले सहरी विकासको प्रक्रिया तथा क्रियाकलापहरुमा निजी क्षेत्रको सम्लग्नतालाई मूलधारमा ल्याउने विषयलाई जोड दिन्छ । निजी क्षेत्रले सेवा प्रदान गर्ने क्रममा नवीनता र प्रभावकारिता ल्याउने गरी सहभागी गराउने वातावरण निर्माण गर्ने कार्य प्रमुख निजी क्षेत्रका संगठनहरु र राष्ट्रिया योजना आयोगको सार्वजनिक निजी साझेदारी निकाय बीचको निरन्तरको अन्तरक्रियाका माध्यमबाट गरिनेछन् । यसका अतिरिक्त कर्पोरेट सामाजिक उत्तरदायित्वका क्रियाकलापहरु प्रवर्धन गर्नका लागि प्रोत्साहनको संयन्त्र पनि विकास गरिनेछन् ।

कर्पोरेट सामाजिक उत्तरदायित्वका रूपमा निजी क्षेत्रले सामुदायिक स्तरमा सार्वजनिक पार्क, सार्वजनिक शौचालयहरू, सार्वजनिक बस बिसौनीहरुको बिकास गर्न सक्छ अथवा सांस्कृतिक/साङ्गीतिक कार्यक्रमहरू, खेलकुदका कार्यक्रमहरू सार्वजनिक पुस्तकालयहरू आदिको आयोजना वा प्रायोजन गर्न सक्छ । यसका अतिरिक्त निजी तथा सार्वजनिक नमुनाको प्रयोग गरी, धेरै तला भएको कार पार्किङ्ग, पुराना सहरको पुनरुत्थान, सार्वजनिक बस टर्मिनल र एयरपोर्टहरूको सञ्चालन र व्यवस्थापन, Utility हरूको व्यवस्थापन, वा प्रायोजन गर्न सकिन्छ । यसका अतिरिक्त सडकको मर्मत, स्मार्ट सिटीको निर्माण, सम्मेलन केन्द्रहरूको निर्माण र व्यवस्थापन, सम्पदाहरूको संरक्षण र मर्मत सम्भार र संस्कृति, सङ्गीत, र कलाको संरक्षण पनि गर्न सकिन्छ ।

- **रणनीति १०: सुचना, संचार, र वकालत तथा पक्षपोषण (Advocacy)**

परिकल्पना गरिएका नीति, योजना, तथा कार्यक्रमहरू कार्यान्वयन गर्नका लागि, राष्ट्रिय तथा अन्तराष्ट्रिय तहमा संचार माध्यम, नागरिक समाज तथा राष्ट्रिय तथा अन्तराष्ट्रिय गैरसरकारी संघ संस्थाहरु, सह उद्देश्य भएका अन्य संघ संस्थाहरु, अन्य वहुपक्षीय र द्वीपक्षीय विकास साझेदार संस्थाहरुसँगको सहकार्यमार्फत जोडदार पक्षपोषण (Advocacy) गर्न सक्ने संचार संयन्त्र निर्माण गर्ने विषयमा यो रणनीति केन्द्रीत रहेको छ । यस रणनीतिले काठमाडौं उपत्यका विकास प्राधिकरणका क्रियाकलापहरुमा पारदर्शिता र जवाफदेहितामा जोड दिन्छ । व्यवस्थित तथा एकीकृत विकासका लागि यस संस्थालाई सहरी पूर्वाधारहरु लगायतको सूचनाको केन्द्रका रूपमा विकास गराउने गरी सूचना प्रणालीको विकास गर्दै जाने योजना बनाएको छ । यसले ज्ञानलाई आत्मसात् तथा संस्थागत गर्ने उद्देश्यले, राष्ट्रिय र अन्तराष्ट्रिय रूपमा काठमाडौं उपत्यका विकास प्राधिकरण भित्र र बाहिर पनि सूचना आदानप्रदान गर्ने मञ्च र अवसर सिर्जना गर्नका लागि "सिकाई-नवप्रवर्तन-प्रयोग केन्द्र" निर्माण गर्ने योजना बनाएको छ ।

- **रणनीति ११: शहरी निर्णय प्रक्रिया र विकास गतिविधिमा युवा सहभागिता र परिचालन**

काठमाडौं उपत्यकाको जनसंख्यामा युवाको सबै भन्दा बढी प्रतिनिधित्व रहेको छ र युवा शक्ति आर्थिक, सामाजिक र राजनीतिक परिवर्तनका प्रमुख अभिनेता हुन्। राष्ट्र निर्माण र शहरी विकास प्रक्रिया मा पनि

युवाहरुको संलग्नता बढाउन जरूरी देखिन्छ। यो रणनीतिले युवा जनसंख्यालाई उपत्यकाको stakeholders, caretakers र युवानेताको रूपमा ल्याउन केन्द्रित छ। प्रस्तावित गतोवोधिहरु युवालाई विभिन्न पक्षपोषणको तहमा संलग्न गराउने र शहरी अर्थव्यवस्था, पर्यावरण संरक्षण र शहरी सुरक्षा तिर योगदान दिन जोड दिएको छ।