

SUSTAINABLE WAYS OF MANAGING FOR ENVIRONMENTAL SERVICES IN KATHMANDU VALLEY

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ABSTRACT: The paper deals with the worsening condition of the environment in Kathmandu Valley. It gives an analysis of the transformation of the Valley; and identifies the causes that have helped to sustain its ecology and social system. It tries to address how its identity and character have survived so far. It also looks into how the people and their culture linked with the economy of the Valley, played a positive role in the wise use of its resources in the past.

The Valley is urbanizing at a rapid pace. This has led to many environmental problems; and the needs of the increasing population could not be met. People leave their native villages and come here to get some kind of work in an informal setting. Their incomes are so small that they can not afford most of the environmental services. This makes the environment deplorable for them to live or work.

Most people in the Valley do not have access to adequate water and sanitation. There is an increasing shortage of water. The problems of solid waste management and the poor condition of roads have worsened the environment. The quality of life is declining due to pollution in terms of carbon emission, waste generation, noise, ugliness, and dirt. This clearly shows that there is an increasing incidence of slums in the Valley. As a result, the demand for a good local environment has increased. There is a tendency to locate modern activities in more pleasant areas. This is also clear from the differences in land values due to hedonic pricing.

People get urban services in different ways. In the provision of these, the primary objective of the government is not to enhance the quality of environment as such. The paper examines why the provision of services has not improved the living conditions of the people. Despite huge investments in infrastructure, the needs of the people are not met. Nor has there been any increase in the physical assets that will help to meet the future needs. It looks at alternative ways of providing services. It highlights the relevance of traditional ways that people used to manage their ambience. It works on how these can be used to develop new areas while sustaining the ecological resources of the Valley. The paper finally suggests measures for the revival of traditional ways of living and their integration to support the Valley level service networks.

Keywords: Kathmandu Valley, New Development Areas, Sustainable Provision of Services, Ecological Resources, Traditional Ways.

1. INTRODUCTION

Kathmandu Valley is a unique area with outstanding geography. It is rich in its cultural heritage with famous architecture. It includes the districts of Kathmandu (except one VDC), Bhaktapur, and most part of Lalitpur. It has a metropolis, a sub-metropolis and three municipal towns. It has several small towns and about 350 villages and hamlets. There are 97 VDCs in it. It is the main destination of most tourists visiting Nepal. There are seven important sites in the Valley listed in the world heritage. They are the three Durbar Squares, Changu Narayan, Swoyambhu Hills, Boudhanath, and Pashupatinath. Besides, there are many *stupas*, *chaityas*, and *bahals* worth preserving. It is well known for its traditional urbanism. Even today, it has a traditional way of living.

The population of the Valley was 1.61 million in 2001. It doubled during the period 1981 - 2001. At present, it is estimated to be growing at the rate of about four percent annually; and it is about 2.3 million at present. The urban population in the Valley was nearly a million in 2001 (Table 1). It is projected to reach 1.9 million in 2011.

Table 1. Population, Area and Selected Services

Indicator	Kathmandu Valley	
	1991	2001
Population, 2001 (Million)	1.09	1.61
Density (persons/ha)	16.2	24.2
Total Area (ha)	66,560	66,650
Population growth rate	4.0	
Urban density(persons/ha)	61.5	92.6
Proportion of urban area (%)	14.4	15.8
Proportion of agricultural land (%)	56.1	41.4
Level of urbanization (%)	54.1	60.5
Hh with modern toilet (%)		65.83
Hh with ordinary toilet (%)		23.88
Hh with piped water (%)		82.60
	Kathmandu Metropolis	
Total area (ha)		4,780
Solid waste generation (kg per capita)		166
Percent solid waste collection		50
Hh with electricity connection (%)		82.7
Sewerage (%)		25
Water consumption (lpcd)		80

The total area of the Valley is 66,650 ha. The proportion of urban area in the Valley was only 11 percent in 1991. It increased to 16 percent in 2001. The social system is still largely based on agriculture.

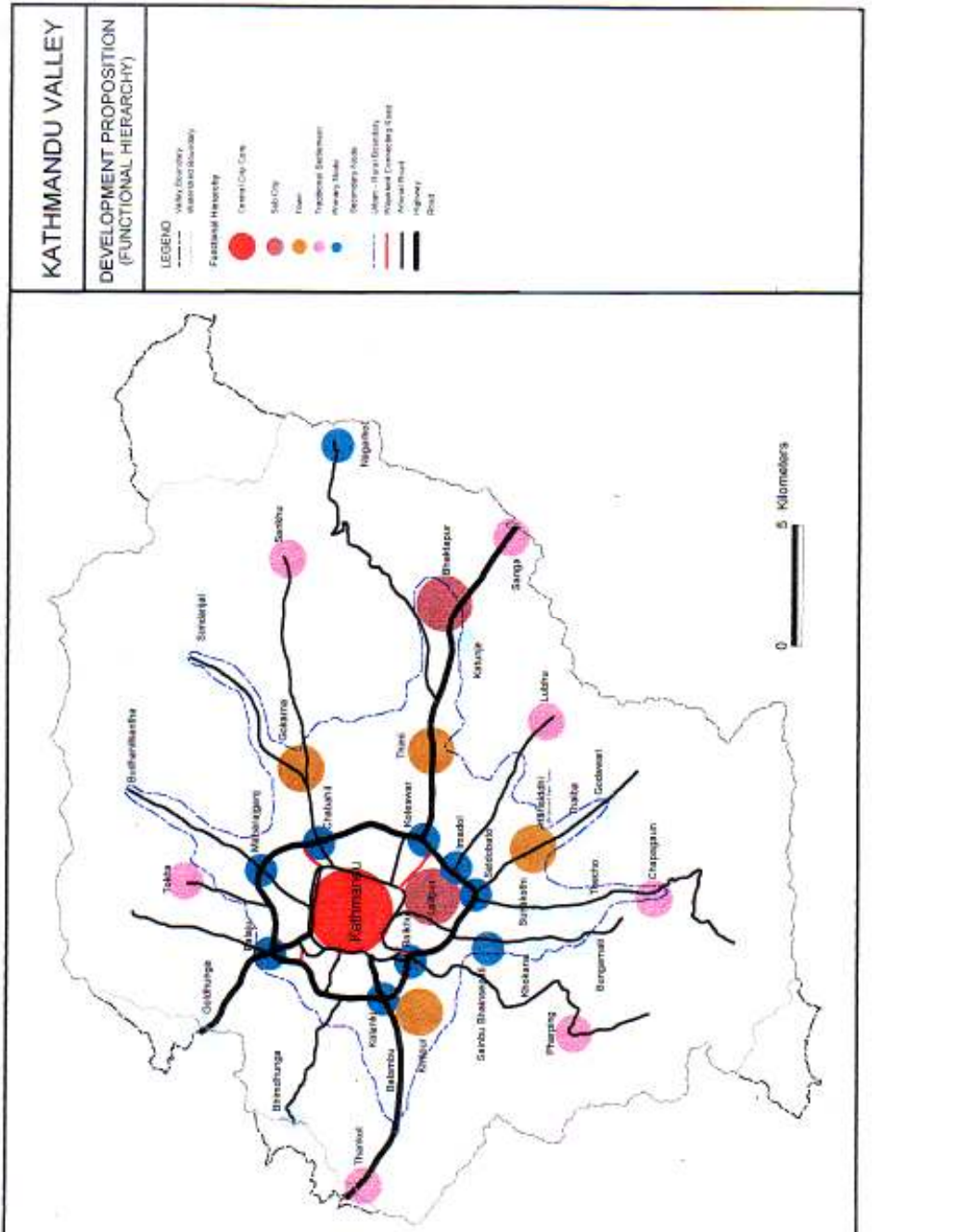


Figure 1. Map of Kathmandu Valley Showing Urban Centers

It suffers from atmospheric inversions and the wind does not easily sweep away air pollutants. Farm land has been rapidly converted to urban uses since 1970. Between 1984 and 1994, urban area in the Valley increased from 3,096 ha to 8,378 ha; and 5,382 ha of the fertile agricultural land were lost in the process of unplanned urbanization. (MoPE/IUCN, 1999: p. 79). The river system is deteriorating with the dumping of urban wastes. Due to ecological sensitivity most land is not suited for urban development.

The Valley is urbanizing rapidly; and with this, the disparity between the rich and the poor has been increasing. At the same time, the Valley's fragile ecosystem has also been seriously affected. Nevertheless, it is still livable and inclusive; and it has been so far able to maintain its identity and character. It is the home of several historical towns and settlements with immense cultural heritage. The urban heritage has still remained more or less intact; and is an integral part of a living culture, not just a museum. The historical sites are not yet impaired by the emerging threats. In spite of upheavals and threats during different periods of time they survived. Their survival can be explained by the richness of the culture, highly efficient urban form and dynamism, sustainable planning of the settlements with judicious use of land and open spaces; and their social, economic and cultural significance even for the contemporary Nepali society. The medieval towns are built as compact settlements and are highly efficient in terms of transportation and land use. They help to satisfy economic, social, religious, and cultural needs of their residents.

Cultural and religious features have dominated the economy of the Valley. The growth of the urban economy can largely be explained by its unique cultural features and its natural attractiveness. Public investment is definitely not the key factor. The heritage by itself served as a magnetic pole. Activities and investments were drawn because of it. Its very attractiveness and obsession and perhaps adulation made it vulnerable at the same time; and led to commercialization. The unique type of urban heritage has served as an integral part of the urban economy. It is of great value even today although people do not feel it nor appreciate it.

Urban development created lots of wealth in the Valley. But only a little could be invested in improving the services that are necessary to make it more sustainable. This means economic progress in the near future is likely to be affected due to lack of services. This will also affect the carrying capacity in the future; and productivity will also decline. Moreover, investments need to be increased in order to make the city able to afford most of the amenities.

It has become necessary to shape the urbanization of the Valley in such a way that everyone gets access to environmental services and the Valley develop as a bioregion. Threats are mainly due to the ever increasing needs that can not go unsatisfied. The growth has urged for more services. When services are provided in more sustainable ways, threats will be minimized.

2. ENVIRONMENTAL SERVICES (ES)

ES refer to various types of infrastructure and services necessary for good urban environment in order to make cities livable. These include potable water and sanitation; parking areas and access roads; drainage and garbage disposal; and management of eco-system and open space.

ES is required not only to raise the living standard of the people but also to enhance economic growth and sustain it over a long period. The failure to manage urbanization has led to the creation of slums with health problems.

The linkage between economic growth and services is cyclic. The more developed a city is, better will be the services it can provide, better the services are, more efficient will it be, which in turn will make services more affordable. ES are thus a key to sustainable urban development in the Valley.

Strategies to manage urbanization are linked with the sustainable ways of providing ES. These should focus on making towns and cities of the Valley more inclusive and livable using its potentials in creating a self-reliant economy. The viability of such measures depends on the nearness of the people with the decision-making process. People get alienated when service agencies are kept at a distance. This leads to inefficiency and leakage in the system. Such agencies resort to poor imitation of external models. They ignore the value of community efforts.

ES locally produced by the people cost much less compared to the same produced by the formal sectors. This has in fact made ES unaffordable. When people work to improve their ambience, changes are possible. But unfortunately, the contribution that people used to make in the past in the improvement of their ambience has decreased. For some extra income they work long hours and cannot spare any time for the improvement of their settlements. Today, they either pay for or remain deprived of even the basic services.

Living in slums is considered as a sign of poverty. Slums are areas where people live without adequate ES. We today spend a great deal of our earnings to solve the newly created problems of urban life. This is an indicator of unsustainable ways. It also means using less sustainable ways of life.

3. PROBLEMS AND ISSUES

3.1 Worsening Condition of Environment

Kathmandu Valley is urbanizing very fast. Due to rapid increase in the population and the exposure to modern amenities, the pressure on environmental resources as well as services has greatly increased over the years. The Valley has a severely limited network for providing ES to meet the changing needs. Service conditions are deteriorating especially in the metropolis. Urban roads are in poor condition and are not maintained regularly. Solid waste management suffers due to disputes in the management of landfill site. The collection of garbage is not regular. There is an increase in the per capita waste generation. There is overcrowding at places where the poor work and live.

Water supply is inadequate. Some residential areas do not have services at all. The lack of services has caused the creation of slums. The quality of life is deteriorating. Urban environment is polluting fast. Traffic management is very bad. There is energy crisis with heavy load shedding round the year and scarcity of petroleum products. Air and water pollution are severe with health hazards.

3.2 Depletion of Environmental Resources

Environment in the Valley is deteriorating rapidly. With the loss of farm land and greenery, the problems of air pollution have increased, and solid waste management has become more problematic. Water resources have become inadequate. The access to fresh air, water, and open space has decreased. The need for ES has increased all the more with the depletion of natural resources.

3.3 Increasing Cost of ES

With the depletion of environmental resources and the increasing cost of managing for these, the cost of ES is increasing rapidly. In the rural context, people have more time and less opportunity cost. As a result, they take care of the management of services they need. While the change is inevitable and may be desirable, the services provided through other means have proved to be not only costly but also inadequate. The community action previously available is fast disappearing and the erstwhile viable techniques have been replaced by not necessarily better ones. In addition, there is an evidence of duplication in many cases that raises the overall cost and creates inconvenience to people all the more.

3.4 Environmental Problems due to Rapid Urbanization

The transition from rural to urban ways of living is generally accompanied by the repercussions of development. Adjustment to modern ways of life also involves extra costs. The failure to manage for the adaptation process dealing with such costs has led to unsustainable ways. Both the public and the private sector have become slow to prepare the people for the change. Instead of raising public awareness on sustainable ways, they promote unsustainable ways for short term financial gains. Most of the costs relate to the management of the wastes due to the adoption of modern techniques. Some of the problems due to rapid urbanization in the Valley are as follows:

- Settlements in sensitive areas like flood planes.
- Premature loss of agricultural land.
- Formation of slums with inadequate public health and sanitation conditions.
- Problems of water supply and pollution.
- Energy shortage, limited use of alternate energy and high prices for energy.
- Mismatch between transportation and land use leading to severe traffic congestion and pollution.
- Problems of solid waste management and dumping on riversides.

3.5 Deprivation

Although there has been a substantial increase in investments, problems have increased due to severe deficiency in ES. As the cost of services increased, most people became unable to pay for these. Most people have become deprived of even the essential services. As such, they should be categorized as poor when judged from their access to sanitation, water and other basic services. With more funding, costs of providing these have increased, but the quality of services could not be enhanced. Social affordability did not increase along with the increase in investment. People do not get what they want even if they are willing to pay. Moreover, the wages most people earn in the Valley are insufficient to get rid of their deprivation. What they earn is spent mainly on food. It is far from being sufficient to pay for ES. Although the contribution of the poor to the urban economy is significant, their income is not sufficient to pay for ES.

The failure to manage for ES in dense urban areas has led to what might be called collective poverty. Dirt roads, polluted rivers, garbage dumping in public places and traffic congestion with air and noise pollution affect the entire population. However,

poverty in the poorer locations is alarming; and the poor are most affected due to environmental deterioration.

3.6 Sprawl Growth and Commuting Problems

It is easier to provide services in a dense and compact area. This used to be the beauty in the design of the medieval towns. Sprawl growth has not only destroyed the valuable agricultural land but also made the provision of services costly and inadequate. The price of transport is not affordable to many. Poor people walk long hours for work and for getting access to essential services.

3.7 Inadequate Policy Focus

Goods and services that are not socially affordable are encouraged to be produced as this serves the immediate interest of the government. This way the extent of financial benefits is more and the private interests are served more. Policy is not focused on dealing with urban poverty and environment.

4. SOME LESSONS FROM THE PAST EXPERIENCES

In the past, community used to manage most of the services they need. With a concern for public welfare, the government started to provide services through the creation of parastatals. However, they are neither efficient nor interested in the social good. With decentralization, the role of municipalities has increased over the years. Although there is a policy to mobilize the private sector, it is not attracted to invest in ES; as these involve financial risks and do not give immediate returns. There is not a clear cut demarcation among the role of different actors. Awareness at community level to choose between alternative ways of getting access to different services is critical in giving more viable options to the people.

There are different ways of providing different services. The viability of any mode of provision for a specific service may vary according to the size of the settlement. The level of urbanization across the Valley is varied. The capital city suffers most from acute shortage of essential services. Here people resort to different means of getting services but yet end up with inconvenience and heavy costs. It shows the conflict between traditional and modern approaches; the former being rapidly displaced by the latter. But this is not something that other parts of the Valley are taking after. Even here in the suburban parts and new development areas, there is the possibility of using traditional approaches. Moreover, the value of community-based approaches has increased as conventional ways have failed to meet people's needs. They are at the same time becoming more unsustainable. The

analysis of the transformation of the Valley shows that several factors have so far sustained its ecology and social system. It also shows that people and their culture played a positive role in its development.

The city of Bhaktapur has transformed itself using a community based self-reliant approach. It has fully used the potentials of traditional urbanism in harmony with the changing needs. There is little chance for Kathmandu metropolis to replicate these. The reason is huge government spending that promotes the use of modern goods and services. Besides, being the seat of the government, there are many more urban functions located here; and commuting costs are higher.

Lalitpur, the second city, has also been able to manage for ES with the revival of some of the traditional ways. Other municipalities, Kirtipur and Thimi, are also following these paths. In new development areas, there is a good potential for the people to produce ES with the use of traditional ways. However, the government helps the private sector to use capital intensive approaches as the main concern is the monetary returns. The primary objective of the government is not to enhance the quality of environment as such.

People get urban services in different ways. Although the government is taking the primary responsibility, the provision of services has not improved the living conditions of the people. According to one study, the investment made in environmental infrastructure by the public sector was far less compared to that made through land pooling projects. (Joshi et. al., 2000). Despite huge investments in infrastructure, the needs of the people are not met. Nor has there been any increase in the physical assets that will help to meet the future needs.

Projects backed by community initiatives have found to be more successful. The government and the donors sometimes help such projects in the course of creating show pieces. But this may undermine indigenous efforts; and the community is made more dependent. Even for getting better and cheaper services from the formal sector, community strength matters. There is a strong link between service provision and local empowerment.

ES produced locally are of greater value in a smaller settlement compared to the same in the capital city. Although they can be produced in a much cheaper way, the competition with others is steep. These are more unlikely to be integrated with Valley level services due to conflict of interests.

With technological progress, sustainable ways of living are likely to be eroded. The incidence of change in technology is the mismatch between the people's response and increased cost in using alternatives. Change in technology brings changes in the life style. The way things done in the past will disappear as new ways come up

but they might not be more sustainable. As an example, had we been able to continue the old practice of reusing and recycling the solid waste, the problem today would have been less severe.

5. SUSTAINABLE WAYS OF PROVIDING ES

As conventional ways have proved to be not sufficient in the provision of ES in the Valley, it is necessary to revive traditional ways and rely more on community efforts. This will help to increase the overall efficiency of service delivery; and make these more accessible and cheaper. For this, areas for intensive development need to be demarcated, and people should be allowed to play a key role in managing their ambience. Land pooling project sites are appropriate areas in this regard. Given the autonomy and right to choose between alternatives, people can be pursued to use more environment-friendly approaches; and their settlements can be developed in the form of more self-reliant communities. In order to ensure the viability of community produced services, these need to be integrated with the Valley level networks. With a view to promoting such an approach, the following should be considered.

5.1 Community Management

Community actions play a key role in the provision of ES. People should be involved in the process of producing goods and services they want. Services produced by the community are preferred also due to the fact that people will own them and maintain them with a sense of belonging.

It is necessary to allow smaller communities to produce and consume services. These face external threats due to market distortion and the interest of the capital. People should be allowed to choose between alternatives. Instead of inducing people to use unsustainable products like petrol; the government should enable people to use viable alternatives. Community produce will continue to be viable; if the environmental costs are duly taken care of. They should be compensated for helping the government to improve the environment. The comparative advantage of such an approach is due to the use of local resources as well as the local consumption of services. This allows for a huge saving in transport costs. They can be promoted through the adoption of realistic standards.

The major factors contributing to a high degree of participation of the people in land pooling projects are the project's exclusive reliance on their land, and the appreciation of their participation. After the completion of the project, community groups formed for land pooling should be pursued to work to provide ES.

5.2 New Development Areas

It is necessary to create urban centres where services can be more easily provided and maintained. As mentioned earlier, land pooling projects have become successful to alleviate environmental problems in the Valley to a large extent. These sites have good potential to produce ES and hence to house more people. Appropriate techniques can be applied for the rapid densification of such areas.

5.3 Rural Urban Linkage

In the context of rural urban linkage, the relevance of traditional ways that people used to manage their ambience in the past cannot be questioned. Urbanization in the Valley was linked with agricultural system. This has made the provision of services easier as well as sustainable. New urban areas need to be developed while sustaining the ecological resources of the Valley. Efforts should be made to create dense villages to service the cultural and natural environment.

5.4 Integration with the Valley Level Service Networks

Service provision should be linked with the need to develop the Valley as a single bio-region. ES produced at the community level should be integrated with the Valley level service networks. Their integration is feasible as well as desirable. Threats are not difficult to be overcome as the service needs are not met by conventional approaches.

5.5 Standards

Viable traditional ways get replaced by new ones on the ground of not meeting officially set standards or the risks involved therein. In this regard, the relation between social affordability and the set standards should be understood; and the gap between the two should be narrowed down. Policies have encouraged the consumption of unsustainable goods and services. As a result, the quantity of demand for these increases.

Affordability with respect to a society as a whole also means access to all. This implies the ability to produce for all at affordable prices. This urges the need for awareness generation on realistic standards all the more.

6. CONCLUSION

With urbanization, there is a rapid loss of natural resources in the Valley; and the cost of ES is increasing. As a result, it is becoming more difficult to provide ES like

water, sanitation, and energy and so on. Conventional approaches alone will not be able to provide such services. In smaller settlements and towns, traditional ways are still relevant. However such approaches face increasing threats from modern ways of living. The government should promote these by helping communities to take a key role in the management of their environment.

ES should be managed for the sustainable development of the Valley. Through planned urbanization with the help of appropriate techniques like land pooling, selected nodes at the urban fringe could be developed as dense villages where traditional ways can be revived. Such settlements can be identified and serviced in line with the concept of integrated development of the valley as a single region. In order to develop it as a single region, it is necessary to unite all its constituent parts. By providing sustainable transport system, it is possible to link urban centres in the fringe with the city center. Through the planned development of such areas, it is possible to sustain agriculture and greenery in the Valley. It is possible to prevent the premature loss of agricultural land; and the ecosystem of the valley can be maintained through such measures. This will help to retain the natural beauty and culture of the Valley. It is also necessary to maintain the river-system and manage the watershed areas. Through this approach, it becomes easier to provide necessary ES in order to make these available to the growing population. This will reduce the ecological footprints of the urban areas as well. This will help to integrate conservation with the economic progress of the Valley.

As the conventional ways are more costly to the people, they should be encouraged to get engaged in community networks in the provision of services. The challenge lies on the integration of the traditional ways with the conventional ones. In this regard the conflict between the two should be understood. Due to primitiveness, changes to modern ways are resisted and some modern ways though inappropriate, replace traditional ones. The two models contrast sharply; but yet it is possible to get best out of them.

It is necessary to inspire people to share their time and efforts in making their ambience more humane and livable. It is cheaper for them this way than to rely on the conventional ways. It is possible to transform rural areas into sustainable and vibrant urban centers. People should be made aware of their needs and the possibilities of meeting them in the best possible way. Let the people use their creativity, wisdom, and ingenuity to find solutions to their problems. Community action on high density urban centers at selected places will help to keep the Valley green and growing in a sustainable way.

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