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# Problems and Policy Recommendations

## Problems and Recommendations for Policy and Action

The environmental changes taking place in Kathmandu Valley are far from satisfactory, and, this trend, if it continues, will be unsustainable. Although steps have been taken that have produced positive results, much remains to be done to maintain and improve environmental resource use and improve the quality of life.

A two-pronged strategy is necessary to formulate and follow appropriate standards for new developments in all sectors; in using environmental resources, on the one hand, and in gradually preventing the unsatisfactory levels of use of existing environmental resources on the other. Public awareness and public pressure; critical analysis of the issues by involving all stakeholders; bold and appropriate decisions by the government; and planning and implementation by all stakeholders can ensure success.

Promotion and practice of a voluntary and preventative approach are more cost-effective and more suitable for sustainable development. The following sections deal with the main problems and suggest policies for the five key issues presented in the previous chapters.

### Air pollution and traffic management

Air pollution, particularly concentration of particulate matter in Kathmandu Valley, are substantially greater than national and international standards. Although responses over the past few years have shown positive impacts and improvements, more effective steps need to be undertaken to bring air quality to the desirable level.

The main problems relating to air pollution in Kathmandu Valley presently are listed below.

- Kathmandu-centric development, causing rapid and haphazard urbanisation
- Institutional capacities are weak in this sector.
- Insufficient involvement of agencies and stakeholders
- Focus on a curative rather than on a preventative approach

The policy for this sector should focus on prevention and control of vehicular emissions as they are the main source of air pollution in Kathmandu. The policy should draw upon lessons learned from successful transformation of Kathmandu's brick industry and its positive impact on air quality. The key factors leading to success are public awareness, public pressure, and bold government decisions implemented with support from the private sector, NGOs, and international agencies. Road/transport planning and polluting industrial units should also be target areas for improvement.

The following policies are recommended.

**Incentives for cleaner and zero-emission electric vehicles** – The import duty on certified cleaner vehicles should be lowered to promote the purchase of cleaner vehicles.

**Improve emission testing and control enforcement to discourage use of highly-polluting vehicles** – Emission testing needs to be made effective. Surprise roadside testing should be increased.

**Promotion of effective maintenance of vehicles** – Awareness of the savings and benefits of preventative and timely maintenance should be emphasised. Skill training for mechanics must be promoted. Accredited private emission testing centres can be established on a pilot basis at good quality workshops where maintenance can be carried out immediately. Such facilities can then be expanded.

**Effective planning for cities and their management – including traffic management** – Newly-planned areas should have standard widths for roads. In existing city areas, roads should be improved to facilitate traffic circulation.

**Promotion of non-motorised vehicles and public transport through providing them with better services and facilities** – Good public transport services can help reduce the number of private vehicles. The emphasis should be on zero emissions from public transport.

**Promotion of cleaner production and energy efficiency in industries using boilers and furnaces** – Cleaner production assessments and energy audits for boilers and furnaces would help save fuel and reduce air emissions.

**Improvement in air quality governance** – Air quality governance is a comparatively new idea in Nepal. Stakeholders should be helped to coordinate their endeavours and to improve their capabilities by introducing continuous improvement cycles, both in plan and practice.

## Settlement pattern

The ecosystem of Kathmandu Valley should be preserved not only to ensure healthy living conditions but also to mitigate disasters that may lead to loss of life and property. The most sought after tourist destination in Nepal may turn into a filthy settlement unless the settlement pattern is planned and managed properly.

The main problems are as follows.

- Centralisation of political and economic power
- Poor capacities of municipalities and local authorities
- Weak enforcement of existing legislation, plans, and programmes
- Overlapping roles of local authorities and central government
- Traditional land-use and management policies and complex land-ownership patterns
- Conflict between rural and urban strategies
- Inadequate trunk infrastructure

The long-term development concept approved by the government in 2002 needs to be translated into plans, programmes, and actions at both valley and local levels. At valley level, trunk infrastructure (such as the water supply system, electricity transmission and distribution

network, sewerage and drainage network and treatment facilities, landfill sites and major arterial roads, and bus terminuses) has to be planned and developed. At local level, land and housing development schemes, infrastructural improvement, and conservation of open spaces and heritage sites have to be developed. Moreover, the local authorities in Kathmandu Valley need to develop a common vision.

Kathmandu is the national capital and the central government's role is crucial in the provision of valley-level infrastructure. The coordination of different government line agencies is needed to implement urban development projects. Hence, a valley-wide apex body with the representation from local authorities should be established. This body should be responsible for guiding government line agencies and local authorities in plan implementation. It should be able to mobilise resources from the government as well as the private sector. The proposed apex body should replace the existing Kathmandu Valley Town development Committee with offices in three districts.

Local authorities need to improve their delivery of basic services. Since it is their responsibility to enforce land-use plans and issue building permits, activities concerned with valley-wide planning should be coordinated among them. To do so financial and technical capabilities need to be improved.

The following actions are proposed to guide the future growth of settlements in Kathmandu Valley.

**Formulation of an urban land-use and management policy for Kathmandu Valley** – Such a policy should be integrated with the existing cadastral system. Land needs to be categorised into agricultural land or land for urban development. Land subdivision, transfer, acquisition, or assembly should take place as per the urban land-use policy. Similarly, expansion of the road network and trunk infrastructure should be carried out according to the land-use plan. Municipalities and VDCs should be entrusted with keeping land records and monitoring land subdivision.

**Land zoning** – Zoning of agricultural land that needs to be preserved; environmentally sensitive areas such as landslide and flood-prone areas; and public land to prevent settlement development in these areas

**Streamlining issuance of building permits** – by conforming to the existing planning framework, norms, and standards

**Separate treatment of existing city core areas and traditional settlements** – by formulating appropriate building byelaws and subdivision regulations

**Reservation of land for national-level establishments** – such as the national stadium, parliament house, inter-city bus terminus, and future government establishments

**Development of appropriate sanitation systems** – such as septic tanks for low-density areas and sewerage treatment plants for densely built-up areas

**Improvement of the existing urban road network** – to discourage ribbon development on radial roads

**Upgrading existing settlements in both rural and urban areas** – by improving the physical and social infrastructure

**Encouraging the planned development of settlements** – at appropriate locations by launching land-pooling and sites and service schemes by the government; and housing development programmes by the private sector

**Introducing a vacant land tax** – in municipal areas to discourage land speculation

### Drinking water resources

There are many problems concerning drinking water in the Kathmandu Valley.

**Widening gap between demand and supply of drinking water** – household consumption and economic activities such as industry, hotels and restaurants, transport, and others

**Deteriorating quality of water** – the quality of drinking water has deteriorated because of the inadequacy of treatment plants, direct discharge of untreated sewage into rivers, mixing the storm-water drainage system with the sewerage system, and inefficient technical management of the piped water distribution system.

**Depleting groundwater table and drying up of spring sources and ponds** – due to overexploitation of groundwater, the groundwater table has fallen at an alarming rate each year.

**Low priority given to sanitation in health programmes and frequent implications of drinking**

**water in intestinal diseases** – due to unhygienic conditions, water-borne diseases such as diarrhea, dysentery, and gastro-enteritis often occur in the valley.

**Damage to the aesthetic value of sacred rivers, lakes, and ponds** – haphazard construction of buildings and sand and stone quarrying on the banks of rivers and ponds are responsible for the declining aesthetic value of the water bodies.

**Arsenic contamination** – indications of contamination in groundwater

**Data gaps in water quality, quantity, and maintenance of rivers**

Although there are many organisations and agencies involved in water supply and distribution, prevention of pollution, and contamination in the valley, the interventions have not yet produced adequate results. On the other hand, there has been a rise in awareness in local communities about water-use rights. The following policy actions are recommended.

**Promote involvement of local communities in waste management to prevent water pollution and contamination** – Waste disposal should be managed through local communities to control open defaecation, and impose minimum housing standards. Such activities will help prevent pollution of water bodies.

**Promote biological treatment of wastewater** – Biological treatment of wastewater is preferable to discharging untreated domestic sewage and industrial waste into rivers. Treatment plants for industrial and domestic waste should be established: on-site treatment plants for treating domestic waste at community level should be introduced.

**Allocate more resources for the supply of potable water** – Providing potable water to the public will reduce the cost of treated water and decrease expenditure on health care for water-borne diseases in the long run. More resources should be allocated to research into water-source protection and strengthening the existing supply network.

**Promote rainwater harvesting** – Appropriate techniques for rainwater harvesting for domestic purposes should be adopted.

**Promote awareness, water conservation, and use of water-saving equipment** – Effective awareness activities about conserving water quality and quantity

and techniques for recycling domestic grey water should be carried out across the valley.

**Setting up a lead agency to coordinate water resources in the valley** – This agency is urgently required to coordinate water-related organisations, set standards, and plan and organise supplies. Adequate data on water quality and quantity should also be collected and stored regularly. Research on drinking water resources should be continued.

**Control of leakages** – Leakage of piped water should be controlled through efficient monitoring mechanisms.

## Waste management

Urban waste management remains unsatisfactory despite the fact that there are policy and legal frameworks and effluent standards and despite the many project efforts to improve the situation.

The main issues and concerns related to this state of affairs are the following.

**Contradictions/overlaps/duplications of authority and confusion generated by the many acts and rules** – (central agencies, municipalities, the private sector, and NGOs/ CBOs).

**Poor capacity** – of the institutions involved to undertake their assigned roles

**Poor resource mobilisation and financing capabilities** – Currently about one third of the municipal budget is spent on solid-waste management (SWM) activities. Long haulage to Sisdol is likely to increase the management costs.

**Negligible efforts to encourage/ promote the 3Rs (reduce, reuse, and recycle)** – The main approach taken to waste management appears to be collection and disposal without considering the consequences.

**No clear strategy for dealing with industrial and medical waste** – Although industrial waste is small in quantity compared to the total volume of waste, its pollution potential is higher than other forms of waste. This is also true of waste generated by health care institutions.

**Inadequate/ineffective/weak compliance monitoring and enforcing mechanisms** – Although standards exist, compliance is not monitored or enforced.

**Lack of a long-term plan for wastewater treatment** – Although several studies and plans have taken place in the past concerning collection and treatment of wastewater, particularly for the Kathmandu and Lalitpur municipalities, these have not been adopted in practice. This situation has been aggravated by uncontrolled expansion of settlements.

**Poor operation and maintenance of facilities** – Waste facilities are generally in poor repair. Landfill sites often meet with public opposition, basically caused by unsatisfactory operation and management. Most wastewater treatment plants are non-operational.

Waste management in the urban areas of the Kathmandu Valley needs substantial improvement. In order to achieve this, a holistic and integrated approach linked to overall urban development and management is required. The following actions are proposed for improvement of waste management in the urban areas of Kathmandu.

**Clarify roles and mandates of agencies** – The LSGA gives the authority and responsibility to municipalities to manage waste in their territories. However, central agencies, such as the SWMRMC, NWSC, DWSS, continue to be involved in planning and provision of waste-management facilities and in operating them. The overlapping mandates of various agencies and contradicting provisions of different legislations often create confusion at operational level. In order to increase effectiveness and efficiency, it is essential to revisit the current institutional and legislative provisions and assign clear and complementary rather than contradictory mandates and roles to the various agencies. Although efforts have been made, for example, to limit the role of SWMRMC (by ministerial directive not by amendment of the act) to policy, coordination, and development of landfill sites, such efforts are isolated. CBOs, NGOs, and the private sector can play meaningful roles in solid waste and wastewater management, particularly in waste collection, recycling, and operation of waste facilities.

**Promote composting** – Around 70% of the solid waste generated in Kathmandu's urban area is organic, and this will become a problem if not dealt with properly. Various attempts have been made by the government, municipalities, and NGOs to increase awareness about the benefits and methods of home composting. The compost bins subsidised by Kathmandu and Lalitpur municipalities are becoming popular among certain sections of the population. Similarly, community

composting is being carried out by some NGOs. Although Teku compost plant has operational problems, the private sector is showing an interest in establishing and operating compost plants. Appropriate measures should be taken to promote this endeavour by making sites available for composting, purchasing the compost produced, or by paying tipping fees to process the waste.

**Promote reuse and recycling** – Reuse and recycling already take place to some extent: materials collected are either recycled in Nepal or exported to India. Hawkers collect recyclable materials from generation points and waste pickers collect recyclable materials from dump sites or transfer stations. These hawkers and waste pickers sell the materials to scrap dealers who export them outside Kathmandu. Recyclable materials include paper, plastic, bottles, broken glass, discarded wool pieces, iron/metal, leather, and animal bones. Incentives should be given to promote such activities (e.g., tax incentives) and the scrap tax levied on the export of recyclable material outside Kathmandu should be abolished.

**Encourage door-to-door collection of solid waste** – Door-to-door collection offers a number of benefits, including control of haphazard littering on the streets, improvements to hygiene, and reduction in overall waste collection costs: it is also possible to promote waste segregation at source. Door-to-door collection is already available in some city areas, mainly provided by NGOs and the private sector. These activities need to be expanded.

**Upgrade existing facilities for solid waste management and develop new facilities** – The current solid waste management facilities are inadequate and need improving. Old facilities should be renovated and new ones built in strategic locations.

**Operate and maintain wastewater treatment plants** – Wastewater treatment plants are not in full operation, with the exception of the treatment plants at Guheshwori and Thimi. Huge amounts of money and effort have been invested in developing these treatment plants. Their status should be assessed and they should be repaired if necessary. Operation and maintenance of these plants will reduce the pollution of surface water significantly.

**Establish industrial wastewater treatment facilities** – Treatment plants can be established for industrial estates (such as Balaju industrial estate) and clusters of

industries (e.g., the carpet dyeing and washing industries from Boudha are planning to move to a cluster in Mulpani area).

**Promote cleaner production in industries** – Environmental Sector Programme Support (ESPS) has carried out studies on cleaner production (CP) potentials in various industries in Nepal. It has suggested a number of no cost, low cost, and high cost CP options: in most cases the return period of the investment is short. However, only a very few options have been implemented by the industries. The industries need to be convinced about the importance of adopting these options, as they will reduce waste.

**Introduce waste management in health care institutions** – At present there is no systematic system for management of solid waste and wastewater generated by health care institutions. Although there are some incinerators, these are generally not in operation because of operational difficulties or public opposition. A suitable plan is needed to deal with solid waste and wastewater generated by health institutions.

**Promote community wastewater treatment plants wherever possible** – Community wastewater treatment plants, such as the one recently built at Thimi, have potential in situations in which a few hundred households can come together and provide space to build such facility.

**Develop decentralised wastewater treatment plants** – Previous studies on wastewater have recommended decentralised wastewater treatment plants in Kathmandu and Lalitpur municipalities. Similarly, small separate treatment plants for populated institutions such as army camps, hospitals, and prisons have been recommended.

**Introduce strong compliance monitoring** – Although various standards are set, compliance enforcement is weak. Strong and independent monitoring mechanisms should be devised to ensure compliance with the standards and requirements laid down by legislation and permits.

### Natural disaster preparedness

Kathmandu Valley is extremely vulnerable to earthquakes. There are numerous faults inside the valley that are active seismic sources. Incessant rainfall and unplanned land use also trigger landslides each year causing loss of many lives. Although some work on

disaster preparedness has been carried out, there are still problems.

- Low level of awareness among the general public about natural disaster preparedness
- Weak capacity and poor coordination among the relevant agencies
- Absence/inadequacy of vulnerability assessment and hazard maps
- Financial constraints
- Haphazard settlement and absence of land-use plans
- Low-level of emergency preparedness

For effective disaster management and earthquake disaster preparedness, the following actions are recommended.

**Awareness raising and education about disaster preparedness** – Earthquake awareness programmes should be carried out by the relevant organisations. Earthquake Safety Day should be observed throughout the country to increase earthquake awareness. Natural disaster management courses should be included in secondary and higher secondary school curricula. A Master's degree course in disaster management should be established.

**Institutional strengthening** – The institutions responsible for disaster preparedness need improving. Coordination among them should be enhanced. An acceleration network should be set up to gather acceleration data in order to establish attenuation relations, as this will be useful for designing earthquake resistant buildings. Municipalities should have disaster management committees and networks.

**Carrying out vulnerability analyses and preparing hazard maps** – These analyses should be carried out for the public, schools, hospital buildings, and other infrastructure. Hazard maps should be prepared for all Municipalities.

**Resource allocation** – Each government organisation should allocate budgets for disaster management. Highly vulnerable old buildings should be either demolished or retrofitted.

**Zoning of hazard-prone areas** – Areas with faults and where repeated disasters have occurred should be abandoned for settlement purposes.

**Enhancing emergency preparedness** – Emergency plans and evacuation routes must be developed and drills practised. Location of safe places should be disseminated to the general public. Fire brigade services should be increased and improved. A database on the availability of hospital beds should be maintained and kept up to date. Emergency material should be located in easily accessible areas, and this should be made known at least to municipal authorities and responsible personnel. Hospitals and other important buildings should have automatic power generators installed and maintained. Emergency food supplies and equipment for search and rescue should be stockpiled.

**Enforcing building codes** – Building codes should be enforced in all new buildings and plinth areas greater than 100 sq. m. for buildings with three or more storeys should be a sine qua non. Fire extinguishers should be kept inside important buildings.