Asta-Ja Initiatives for Kathmandu Valley Environmental Pollution Control

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Sustainable Natural Resources for Community Development

ABSTRACT

We highlight Asta-Ja initiatives to implement a comprehensive environmental pollution control study project in the Kathmandu Valley of Nepal. The Kathmandu Valley, one of the fastest growing cities of South Asia, is facing uncontrolled urban growth compounded with serious environmental problems. Recognizing the massive impacts of uncontrolled urbanization on environmental quality, ecological integrity, and socio-economic conditions of humans, Asta-Ja USA, in collaboration with several governmental and non-governmental partner organizations in Nepal, is developing a wide-ranging environmental pollution control study. This study will develop a comprehensive environmental pollution control guidelines for Kathmandu Valley, which will expectedly be very helpful in developing the Kathmandu Valley Environmental Pollution Control Act for sustainable environmental management of the Valley.

INTRODUCTION

- **The bowl-shaped Kathmandu Valley covers about 570 sq. km (220 sq. miles) with its elevation ranging from 1,425 masl to the surrounding mountain ranges of Shivapuri (2,800 masl), Phulchwoki (2,795 masl), Nagarjun (2,825 masl), and Chandragiri (2,557 masl).**
- **Bagmati River - the largest river system in the Valley.**
- **The Valley hosts several World Heritage Sites.**

Source: Google Picture

Fig. 1. The Kathmandu Valley of Nepal.

ENVIRONMENTAL ISSUES IN THE VALLEY

- **South Asia is facing massive environmental pollution.**
- **Nepal is not an exception. More specifically, Kathmandu Valley, the largest and the fastest growing city of Nepal, is experiencing:**
  - **uncontrolled urban growth,**
  - **rapid expansion of impermeable surfaces,**
  - **lack of essential wastewater treatment facilities,**
  - **groundwater pollution and overdraft,**
  - **subsidence,**
  - **massive air pollution,**
  - **high noise pollution and traffic congestion,**
  - **persistent solid waste management challenges, and**
  - **increasing point and non-point source pollution.**
- **Moreover, contamination of soils, groundwater, and surface waters due to leakage of Underground Storage Tank (UST) is another environmental concern.**
- **Unsafe disposal of hazardous and biomaterials is spreading highly toxic substances into the environment.**
- **Studies suggest that water bodies in the valley are extremely polluted. For example:**
  - **Biological Oxygen Demand (BOD) as high as 583 mg/L for Tukucha stream at Tripureshwor; Chemical Oxygen Demand (COD) as high as 1,000 mg/L for Balaju, Bishnumati, and Tripureshwor areas of Tukucha stream; Over 120 mg/L of Total Kjeldahl Nitrogen (TKN) for Tripureshwor, Teku, Balkhu, and Chovar regions of the Bagmati River; Exceptionally high level of fecal coliform counts, and**
  - **Recent flooding of Bhaktapur and frequent drainage failures in Kathmandu City suggest an urgency of stormwater management.**

Fig. 2. The 2018 flooding of Bhaktapur district in Kathmandu Valley, Nepal.

Source: Google Picture

- **Environmental pollution has seriously and negatively impacted public health, tourism, ecological integrity, and economic activities.**

ASTA JA INITIATIVES ON POLLUTION CONTROL

- Asta-Ja USA's partner organizations (i.e. Asta-Ja Research and Development Center (Asta-Ja RDC), Asta-Ja Abhiyan Nepal, Asta-Ja Agriculture Sahakari, and Asta-Ja Byas Bhumi Nepal) have been engaged at various capacities on:
  - Research and development
  - Community capacity-building, and
  - Policy advocacy for agricultural and natural resources development and management, environmental quality, economic growth, and climate change adaptation.
- Asta-Ja campaigners, staff, and volunteers working closely with farming communities in the Kathmandu Valley over the past 10 years.
- Regular visitation of agricultural production farms, organize farmers' meetings and field days, conduct capacity-building training, and host policy decision-making interaction meetings.
- Events attended by wide range of stakeholders including sitting Prime Minister, Ministers, Vice Chair of Planning Commission, academicians, political leaders, growers, and even by foreign diplomats.
- Asta-Ja RDC is collecting information on the use of agrichemicals in food/crop production and its environmental consequences.
- Asta-Ja, in 2017, collected spring water samples from five locations in Kathmandu and three locations in Lalitpur districts and analyzed various indicators of water qualities such as turbidity, conductivity, pH, calcium, magnesium, bi-carbonate, sulphate, sodium, nitrate, chloride, iron, arsenic, and fecal coliform counts.

Fig. 3. Photographs showing examples of events hosted by Asta-Ja.

CONCLUSION AND WAY FORWARD

- Asta-Ja initiatives open up a new ground for collaborative, participatory and comprehensive environmental quality monitoring programs in Kathmandu Valley.
- These initiatives will help to locate environmental pollution "hotspots" in the valley.
- Asta-Ja initiatives will further help concerned authorities in developing comprehensive environmental pollution control guidelines for the valley, which will help in developing the Kathmandu Valley Environmental Pollution Control Act for sustainable environmental management environmental quality.
- Working with governmental and non-governmental agencies, Asta-Ja USA intends to implement a comprehensive surface water quality monitoring project to assess physical, chemical and biological integrity of water bodies in the valley (Fig. 4).
- Water quality monitoring wells will be established in different locations after thorough analysis of the hydro-geology of groundwater in the valley.
- Asta-Ja USA also intends to collaborate with other agencies for monitoring subsidence and groundwater recharge in the valley and is also planning for launching community awareness activities for environmental pollution control in the valley.
- Asta-Ja USA will develop hydrologic and hydraulic models to delineate flood hazard maps for different frequency storms for major flooding sources in Kathmandu Valley. These flood maps will be used to mitigate existing flood severity. These flood maps can also be used to regulate development in floodplain in future. Additionally, these hydrologic and hydraulic models coupled with river monitoring gages and rain gages, can be used to develop early flood warning system in future.

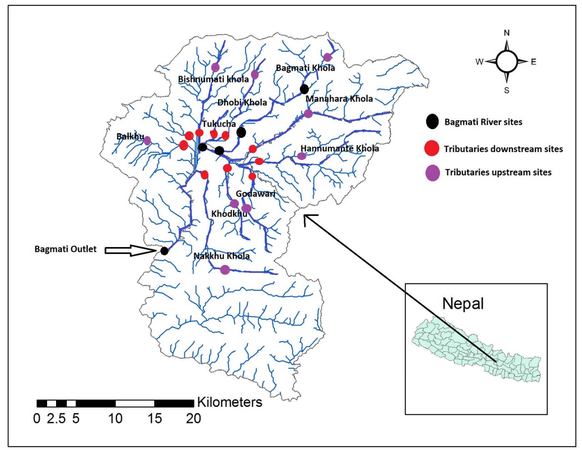

Fig. 4. Preliminary water quality monitoring locations in Kathmandu Valley.