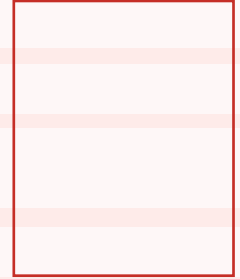


<i>SAWA PGD Fellow</i>	:	<i>Rabi Wenju</i>
<i>Institution</i>	:	<i>NEC</i>
<i>Title</i>	:	<i>River Degradation and Livelihood Impacts: Analysis of Solid Waste Disposal in Hanumante River in Bhaktapur</i>
<i>Email</i>	:	<i>wenju_rabi@hotmail.com</i>



## 1. Background

Urbanization leads to rise in population density, and changes in consumption patterns that puts immense pressure on municipal services to manage the ever increasing volumes of solid and liquid wastes. Lack of sanitary landfill and mismanagement leads to haphazard dumping along the Hanumante River in Bhaktapur..

Solid waste management has become the most important environmental problem in urban Nepal. In the past, there was little waste, as almost everything was recycled and reused, and assimilated into the environment. The traditional sustainable waste management is no longer functional due to changes in lifestyles, consumption patterns and increasing dependence on consumer goods.

## 2. Objectives

The overall objective of this study was to look into the river degradation of Hanumante River, the artery of the Bhaktapur city and its impacts on livelihood, resulting from the disposal of solid waste into the river.

## 3. Study Area

This study focused on the reach of Hanumante River located within Bhaktapur Municipality. The major sources of the Hanumante River are rainfall, natural springs and groundwater contributing to the flow.

Hardly twenty years back, people living in Bhaktapur used to bathe, swim and even drink water from Hanumante. The river has now turned into a virtual sewerage. Even though the river has become a dumping site, some old people still use the river to bathe and perform rituals. The River is also directly linked to the economy and livelihood of the people particularly, those engaged in farming. Farmers grow vegetables along the river, and this is one of the main economic activities of the people of Bhaktapur.

## 4. Research Methodology

The first set of research methodological tools involved a walk through and mapping of river reach and was semi-structured. The second set of tools related to laboratory analysis of water quality, before and after the points of solid waste disposal. Secondary sources of information relating to solid waste disposal in the river, were collected to substantiate the primary information collection.

## 5. Research Findings

All the areas under study have been used for solid waste dumping. The solid waste dumping the Hanumante River dates back for almost 20 years. The disposal of organic solids and liquid wastes is the main cause of river water quality degradation. The level of pollution has been progressively increasing from upstream to downstream locations. The zero concentration of DO at some sites clearly reflects the highest concentration of pollutants at these sites.

A majority of the households were found to be disposing a daily load of solid waste without segregation. The proportion of respondents practicing segregation of the solid waste was noted to be 53% at Hanumanghat, 47% at Tinkune, 33% at Libali and 13% at Bhelukhel.

Lack of proper concern, from the Bhaktapur municipality, is the factor for solid waste disposal along the river bank. The concerned authority in the municipality seemed to be ignorant that improper disposals had an adverse effect on the river. The three main contributors of solid waste were found to be municipal waste collection system, industries and the households.

The water flow in Hanumante River has decreased due to the withdrawal of water from the brick industries. The haphazard disposal of solid waste along the banks of river in absence of landfill site aggravated the process of degradation. This process was exacerbated with the increase in population and urbanization and changing consumption patterns.

Thanks to the Hanumante River becoming a mere virtual drainage and dumping sit, people now do not use the river water except for religious and irrigation purposes. Unmanaged disposal of the solid waste does not only impair the aesthetics of the area but is also the source of a foul smell produced with the decomposition of solid waste. The foul smell has an adverse impact on the lives of the people. People feel uncomfortable while carrying out daily work.

The increasing incidences of four diseases- diarrhea, skin diseases, headache/dizziness/vomiting and fever were identified and believed that the cause of increase in the incidences of these diseases has been the increasing solid waste disposal along the river course.

## 6. Conclusion

The haphazard and rampant solid waste disposal along the banks of Hanumante River is a major problem in the degradation of river. The shutdown of the only compost plant has aggravated the dumping process which has been used by Bhaktapur municipality itself for a long time in the absence of land fill site. Lack of concern from the municipality is seen as the main factor. The Hanumante River has become a mere dumping site. Apart from disposal of solid waste disposal, untreated sewage has also dramatically ruined the quality of river water.

Analysis of river water quality at five specific locations reveal that major cause of water quality degradation has been disposal of organic solids and liquid waste and that the level of pollution has progressively increased from upstream to downstream locations.

The river water is only used for irrigation and some important religious and cultural purposes. The congestion of the river width as a result of solid waste dumping has resulted in an increase in flash floods incidents. People living in close proximity to the river frequently face floods during monsoon and foul smell during the dry season.

## 6.2 Recommendations

1. The activities like disposing the wastes in the banks of river that degrade the river should be avoided.
2. There should be the strong provision for proper and safe collection and disposal of the wastes generated from the municipality. The municipality should also make arrangement for restart of the compost plant.
3. Solid waste generation cannot be isolated from the urbanization and modernization of the society. As such there should be the proper mechanism for the management of waste.
4. Household segregation of waste should be done.