Urbanization and Climate Change: Impacts and Adaptive Strategies for Water and Food Security

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SUMMARY

Increasing rate of population and growing urbanization has put immense pressure on land and water services in peri-urban landscape in Kathmandu, Nepal. The process is further getting complicated with the increased variability in climate in the recent times. This paper describes the implication of growing urbanization and climate variability on water and food security in the peri-urban context of Kathmandu. This paper also looks into the adaptation practices and strategies of the people at household, community and institutional level to deal with increasing problems of water and food security in the area. In order to present the context of peri-urban landscape, the paper has used Lubhu as a case.

The study involved focus group discussions with different groups of people, key informant's interviews and interaction with the local leaders, personnel in the development organizations and relevant government agencies. At present, households at Lubhu depend on pipe water supplied public taps where the supply has been only for few hours a day. People developed alternative water supply system from a nearby river source; however, due to poor water quality, they are compelled to depend on the older system despite high level of water scarcity. The traditional water systems- dug wells, stone spouts and ponds, which have traditionally been serving the water needs of the people have either vanished or in a poor state of management and use. In order to upgrade the water quality of the system that derives water from the river, people have initiated developing water treatment system.

Farmers have been depending on rainwater for crop cultivation and adapting through switching agricultural crops to less water demanding crops and even more by deviating towards off-farm activities. The local community is adequately convinced of need for sustainable management of water to meet the future needs of the people in the area. This process however needs to be supported by concerned government agencies and development organizations.

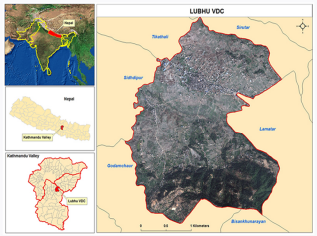
INTRODUCTION

Lubhu Village Development Committee (VDC)

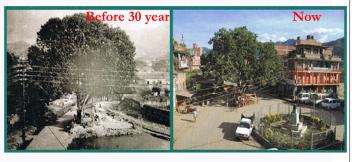
- A traditional Newar settlement
- Located 10 km away from south-eastern urban part of Kathmandu, capital of Nepal
- More than 700 year long history and tradition of water and other natural resources management
- Area- 4.76 square kilometers and Population-10,585; Number of household- 1,871
- Population growth rate-3.2 percent against national growth rate- 1.4 percent
- Rapid urbanization and land use transformation
- Major Occupation- Agriculture, Business and Service

Existing Scenario of Water Infrastructures:

- Traditional water infrastructures: dug wells, stone spouts, water tanks and ponds; closely linked to their culture and religious rituals
  - Many of these traditional water systems are either non-functional or almost vanished over time due to urbanization and rampant construction of physical infrastructures.
- Five major drinking water supply systems are functioning only through public tap stands
- Seven small irrigation systems

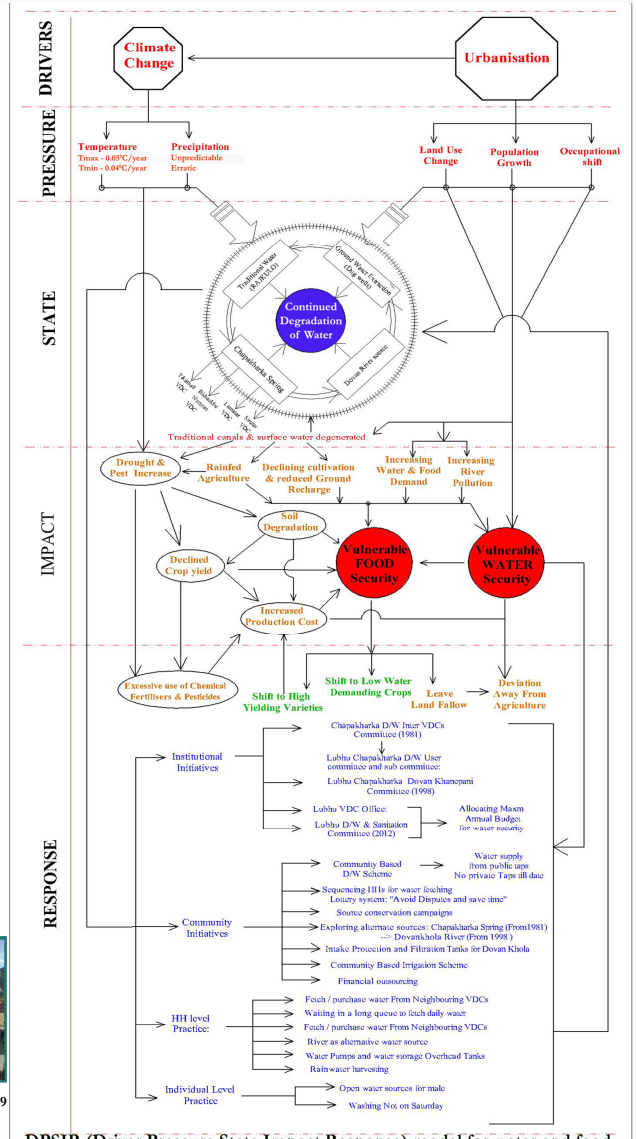


Location map of Lubhu

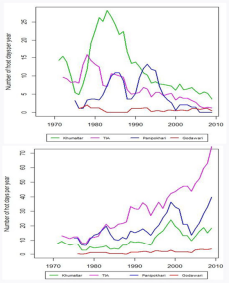


Source: Our Lubhu, 2009

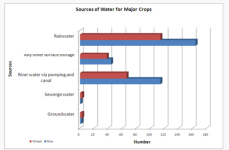
Pictures showing landuse change at Lubhu



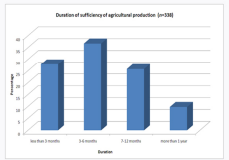
DPSIR (Driver Pressure State Impact Response) model for water and food security issues at Lubhu



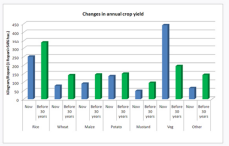
Hot days (Maximum Daily Temperature > 30°C) are increasing. Cold days (Minimum Daily Temperature < 0°C are decreasing. This implies the warmest and the coldest days and night of the year have become warmer.



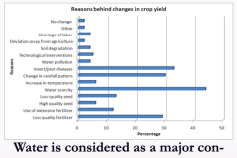
Rainwater is the major source for irrigating crops



Only 10 % of the total population has year round agricultural production sufficiency

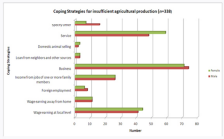


Productivity of major crops is decreasing except green vegetables as compared to the productivity 30 years back



Water is considered as a major constraint for agricultural production

COPING STRATEGIES



Business, service and wage earning at local level are the major strategies to cope with year round agricultural production insufficiency

Scarcity of water has compelled people to depend on drying and polluting river as an alternative source

Different sized buckets on queue to collect water

Rooftop Rainwater Harvesting to collect water for washing, livestock feeding and irrigation.

Collecting Water from water sources at other VDCs

Water as valuable good "Traditional well locked inside iron gate"

River source conservation awareness campaign in order to aware upstream people in conserving the river water which is the source of water for people of Lubhu.

POLICY IMPLICATION

- People in Lubhu have been facing critical water supply in terms of quality and quantity as a result of failure in upgrading the infrastructures and services. One time investment in the development of physical infrastructure for water supply would not be enough, at least in the peri-urban areas, where processes of urbanization and population change is rapid and continued process. Improvement of water infrastructures and services would be imperative for water and food security.
- Accelerated land use transformation with complete disregard of the traditional water systems has been important part of the problem responsible for increased water scarcity in the area. Policy initiative and actions favoring rehabilitation and upgrading of traditional water systems would help addressing water security in the peri-urban and urban areas of Kathmandu.
- Rapid conversions of agricultural area into human settlement have important implication to urban ecology. Maintaining open space and agricultural lands in the peripheral area for continued environmental services should be important element of urban land use plan.

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