Standard Operating Procedure (SOP)
Springshed Management for conservation and sustainable use of water resources in mountainous area

NMHS Project: Rejuvenation of springs and Spring-fed Streams in Mid-Himalayan Basins using Spring Sanctuary Concept

PI: Er. Soukhin Tarafdar Garhwal Unit, GBPNIHE, Srinagar-Garhwal

Water being a fundamental constituent of environment and vital for the living beings, sensitivity of water recourses has long-term consequences for mountain ecosystem properties and human societies. However, due to changing hydrological cycle and increasing and competing demands for water are becoming more acute in terms of availability and quality. Another issue is no integration occurred on the interface between sustainable land use, watershed hydrology and reduced vulnerability to climate change. This project therefore focuses on this interface of water demand & availability, major land uses (forest land, agriculture/waste land and urbanisation) for water sustainability in the fragile Himalayan watersheds. The main focus of the project includes -baseline data generation, geo-hydrological investigation, LULC change study, recharge area identification, assessment of water requirements within the sub-watersheds and HRU level using the HYDRA and the SWAT hydrologic models, model development for ground water augmentation, land use model demonstration, generation of decision support system. Finally, main outcomes of the project are: DSS for Efficient Water Allocation Strategies for competing land uses, Land Use Policy guidelines with efficient water allocation, Tool for complementary water budgeting at watershed level, Performance indicators for monitoring & evaluation of land use plan.

Step 1: Comprehensive mapping of Springshed:

Background information of Springshed from secondary data and reconnaissance survey for selected Springshed

Step 2: Data Collection and Monitoring system:

Data collection for water resources, water use, socio-economic profile, Documentation for traditional knowledge w. r. t. water conservation& management and Data analysis (hydrograph/basic software)

Step 3: Understanding social and governance aspects

Analyze existing institutions and systems of management using: questionnaire survey, focused group discussions, key informant interviews, and communication and dialogue with community and public policy makers

Step 4: Hydro-geological mapping of Springshed

Preparation of GIS based maps – DEM, drainage, slope, aspect, soil, geology, lineament, etc.

Step 5: Conceptual hydrological layout of Springshed

Creation of a geological map based on the transect walk and drafting cross-sectional layout for Conceptual development of model (using field data, GPS, geological maps& satellite data)

Step 6: Classifying spring types, identify mountain aquifer and recharge areas

Classification of Spring Type, Broad Identification of the Mountain Aquifer, and Demarcation and Analysis of the Recharge Area

Step 7: Developing Springshed management protocols

Intervention mechanism:
- Physical measures (conservation ponds, absorption terraces, trenches, check dams etc.)
- Biological measures (afforestation, sustainable agriculture etc.)
- Social measures (to prevent pollution, erosion etc.)

Institutional mechanism:
-Conservation and intervention, measures of recharge and discharge area
-Develop operational and maintenance guidelines

Step 8: Impacts assessment

Pre- and post- impact assessment of interventions on spring discharge and other water availability with necessary correction