**Research Proposal**

**Summary:** The project proposal aims to watershed management. The proposal expose the actual interest in the area of the hydrology of small watersheds, in particular the planning and development of small watershed calls for rigorous understanding about the occurrence and movement of water in the surface and sub-surface systems along with top nutrient soil in a small watershed. For this work use advance technology i.e Remote Sensing and GIS, this probably will include the hydrological modeling of an interactive prototype of a possible tool.

**Introduction:** Rivers have a vital role in the economics of most societies as major sources of basic needs of human being is being provided by rivers as water (domestic, agriculture and industrial) Power, navigation, food and aesthetic (Bera and Bandyopadhyay 2013). However, most of the major rivers of the world and almost all in India have been subjected to multidimensional threats, both natural and anthropological in nature, leading to large scale ecodegradation of riverine ecosystem which in turn affect human society. Floods and droughts are of obvious human concerns Rapid human population growth and increased per capita demands for water, especially in developing countries are expected to develop acute water scarcity by 2025 (Engleman and Le Roy, 1993). In the past, river developments have caused dramatic ecological impacts – loss of habitat diversity, the reduction of species richness and decline in productivity. Rivers are natural streams of water that flow from higher to lower elevations across the land surface. Their continued relies upon a supply of water from overland flow, through flow (infiltrating water), interflow (subsurface), and base flow (from water table) and precipitation falling directly into the river. The fluvial activity is instrumental in shaping landforms and serves as integrator of broader environmental conditions, especially hydrological cycle (Naiman et al. 2002).

However, the modern approach to river development is founded on the concept of environmental sustainability which can be achieved by adhering to the sound scientific understanding of operating ecological principles of river ecosystem’s functioning (Assessment of resources, their mode of utilization and incorporation of suitable restoration measures). The watershed approach is a well-accepted coordinating framework for planning and development. The integrated nature of activates and information involved in water and land management calls for collation and generation of data relating to geological, biological and ecological resources for different eco-systems.

**Origin of the research problem:** The problem of water availability & water storage in Bankura, Puruliya, Paschim Medinipur & part of Birbhum district regions is one of the biggest challenge due to low as well as uneven distribution rainfall throughout the season & undulating arid plateau topography. So the study is very much essential to mitigate the problem.

**Hypothesis:** After completion of this work we may find out the present condition of watershed in Bankura and Puruliya district area and their geo-referencing conservation sites for crop production, export, employment opportunities and areas development.

**Aim and Objectives of the study:** In the above context, the present research proposals aims water resource management towards sustainable development and improve **eco-system**.

**Objectives** of this study**:** (Up to micro watershed / Village level).

* Identification surface water body.
* Delineated and coded watershed boundary.
* Location of well and tube well records using GPS survey.
* Analysis the historical Land use/ Land cover form satellite image.
* Creation socioeconomic data base based on socioeconomic survey.
* Analysis fertility soil zone through soil sample.
* Improving the socio - economic status of the farmers.
* To protect, conserve and improve the land of watershed for more efficient and  
  sustained production.
* Comparative study of water availability and settlement location.
* Crop suitability wise adopt alternative crop.

The present research work will include geomorphology, geohydrology, drainage characteristics, meteorology, water qualities, soil characteristics; biodiversity, land use and land cover systems of selected study areas. Besides, major environmental issues of this lateritic drought prone areas of West Bengal (soil erosion, deforestation, flood, flash floods, wetland destruction, modern technology based agricultural practices, habitat alteration; drainage basin system and watershed characteristics) will also be taken into consideration through ground truth verification, samplings of structural components of riverine ecosystem, laboratory analysis of field samples, collection of information through questionnaire.

**Work Plan:** The proposed research work plan has been categorized into following section with expected time in brackets:

1. Literature review and the set up of an articles database. (3 months)

2. Contact with expert of the field Scientist, Professor, Engineer, analysis. (3 months)

3. Collect different published information for create data base. (3 months)

4. Study and processing the collect data for analysis. (6 months)

5. Analysis the dataset by different model based. (6 months)

6. Model verification and the validation processes. (1 months)

7. Testes and documentation of results by attend some scientific events and publication in an international journal. (6months)

8. Final documentation of the project in the form of a book. (6 months to 1 year)

**References:**

Bera K, Bandyopadhyay J (2013) Prioritization of watershed using morphometric analysis through geoinformatics technology: a case study of Dungra sub watershed, West Bengal, India. Int J Adv Remote Sens GIS 2(1):1–8.

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Naiman, R.J., Bilby, R.E., Schindler, D.E. & Helfield, J.M (2002), Pacific salmon, nutrients, and the dynamics of freshwater and riparian ecosystems. Ecosystems 5: 399-417.