WATERSHED MANAGEMENT SYSTEM

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Abstract - *Our study area is Dore Lake situated in the Kumarswamy layout, Bangalore 560078 and the Identification of sediment source area and prediction of storm sediment yield from catchment area or soil erosion occur in that area for measure that a GIS(Geographical Information system) is proposed .The GIS will provide information and analysis about geographic.An Earth Resources Data Analysis System (ERDAS) imagine image has been used for digital analysis for satellite data for getting the information about soil, land cover of the catchment .And area is calculated on Toposheet. And some methods is discussed to overcome sedimentation and soil erosion and also testing the water quality whether is drinkable or not.*

INTRODUCTION & METHODOLOGY

Soil erosion is a naturally occurring process that affects all landforms.Soil erosion is one of the most critical environmental and most frequently hazards specially in mountains and hilly areas of modern times which occur in any catchment area.Erosion takes a place all the time naturally.Hydrology, topography, soil surface cover, residual land use, subsurface effects, tillage marks are the major factors that affect unplanned erosion processes. soil erosion control techniques are theoretically simple and easy but practically Tough, time-consuming, laborious and costly. Large areas of land now being cultivated may be rendered economically unproductive if the erosion of soil continues occurs in that area.The information taken by sources of sediment yield within a catchment can be used to check the rate of soil erosion occurring within that catchment.The process of soil erosion consists of separation, transport and following deposition. Sediment is detached from the soil surface both by raindrop pressure impact and by shearing force by flowing water. The confined silt is basically transported down the slant essentially by streaming water, in spite of the fact that there's too a little sum of downslope transport by raindrop splash. once the runoff begins on the surface of catchment at that point the measure and amount of fabric begin streaming agreeing to the velocity of runoff that's happens on the surface of catchment. In less inclined surface the speed of runoff is decrees in this way it'll carry less sum of material. Then these material settle down on bottom(less slanted surface). And fine particles advance transported. The sum of sediment stack passing the outlet of a catchment shapes its dregs surrender.

i) STUDY OF LAKE

Dore kere Lake is on 28 acres and is located in the southwest part of Bangalore. It is frequented by many local residents who enjoy the provided walking path, gym, kalyani, and other amenities. A 1MLD Sewage Treatment Plant was constructed in 2010 which discharges treated water into the lake. There are two wetlands on the eastern side of the lake. In total, there are 6 inlet points and 1 outlet from the lake. Of those inlets, the STP treated water discharges into the lake, three inlets will discharge untreated sewage into a wetland which then flows into the lake, and two inlets discharge untreated water into the lake. The volume of inflow through the inlets could not be determined.

ii) METHODS TO REDUCE SEDIMENTATION AND SOIL EROSION

Land disturbing activities, Trenching, Clean fills and Runoff Diversion Channel are some methods to reduce soil erosion.

Sediment Retention Pond, Chemical Flocculation Systems,Silt Fence and Sump/Sediment Pit are some methods to reduce sedimentation.

iii) TEST ON WATER SAMPLE

The water sample is taken out from Lake and then some tests are perform in the College laboratory. some test like pH ,turbidity of water, acidity and alkalinity of sample.

Test perform on water sample	Outcomes
pH of sample	8.3
Alkalinity of water sample	412mg/lt
Acidity of water sample	400mg/lt
Turbidity of sample	50 NTU

2. LITERATURE REVIEWS

1)AHMADI HASAN, NAZARI SAMANI A.A., GHODOUSI JAMAL, EKHTESASI M.R.,(2004)

The current basic circumstance of characteristic assets in Iran come about from abuse of these assets. In show disdain toward of performing watershed administration ventures amid past forty a long time, characteristic assets have been corrupted. In expansion, sufficient suitable inquires about have not been conducted to assess the adequacy and the reasons for disappointment of these ventures. In this inquire about, the watershed administration extend in Menderjan sub-catchment of Zayandehrood bowl was assessed, from planning and proposing to operational stages by quantitative and subjective strategies Fundamental information were collected by examining the ventures reports, coordinate going by, filling out examiner, and meeting pioneers of the watershed. At long last, successful components in operation of extend were categorized in seven bunches. Each of these bunches was partitioned into subgroup variables, which were scoried by weight agreeing to a few parameters.. The results showed that the situation of proposed plan and lacks of economic assessment were the most important influencing factors in operation of project.

2) Manoj K.Jain National Institute of Hydrology

A Geographical Information System (GIS) based strategy is proposed and illustrated for the distinguishing proof of dregs source regions and the expectation of storm silt surrender from catchments. The Integrated Land and Water Information System (ILWIS) GIS bundle has been utilized for carrying out geographic examinations. An Earth Resources Data Analysis System (ERDAS) Envision picture processor has been utilized for the advanced examination of obsequious information for inferring the arrive cover and soil characteristics of the catchments. The catchments were discretized into hydrologically homogeneous network cells to capture the catchment heterogeneity. The cells in this way shaped were at that point separated into cells of overland stream districts and cells of channel stream locales based on the greatness of their stream collection ranges. The net soil disintegration in each cell was calculated utilizing the Universal Soil Loss Equation (USLE) by carefully deciding its different parameters. The concept of sediment delivery ratio (SDR) was used for determination of the total sediment yield of each catchment during isolated storm events.

3)Rabin Bhattarai,Dushmanta Dutta(2007)

A GIS-based strategy has been connected for the assurance of soil disintegration and silt abdicate in a watershed catchment zone. The strategy includes spatial deterioration of the catchment into homogenous framework cells to capture the catchment heterogeneity. The net soil disintegration in each cell was calculated using Universal Soil Loss Equation (USLE) by carefully deciding its different parameters. The concept of dregs conveyance proportion is utilized to course surface disintegration from each of the discritized cells to the catchment outlet. The method of dregs conveyance from framework cells to the catchment outlet is spoken to by the geographical characteristics of the cells. The impact of DEM determination on silt abdicate is analyzed utilizing two diverse resolutions of DEM. The spatial discretization of the catchment and induction of the physical parameters related to disintegration within the cell are performed through GIS procedures.

4)Mostafazadeh, Raouf; Sadoddin, Amir; Bahremand, Abdolreza; Sheikh, Vahedbordi; et al (2010)

Appraisal of surge control ventures within the same conditions is basic in arrange to make strides choice making that help us in watershed administration purposes. Center of this think about is on surveying hydrological impacts of the Jafar-Abad watershed administration venture. The consider zone (109 km2) found in north of Iran within the Golestan area. Matched t-tests were performed for Indicators of Hydrologic Alteration (IHA) in Taghi- Abad gaging station, found within the outlet of the catchment, some time recently and after development of 58 check dams. HEC-HMS demonstrate was calibrated utilizing 12 storm occasions and approved for think about region. Calibrated HEC-HMS show was connected to rainfall-runoff modeling in sub-catchments and Level-pool strategy utilized for store components. Plan surge hydrographs for 2-100 year return periods were recreated for both some time recently and after check dams development periods. The results indicated that constructed structures do not have important effect on IHAs and the amount of these effects was less than 1.5 percent in all cases. Also, by increasing in return period, the effects of structures on peak discharge and flood volume were reduced.

3. CONCLUSIONS

There is a reduction in soil erosion in the watershed areas. However, the variation in the percentage of reduction primarily dependant on quality of soil and moisture conservation activities in the respective areas. It is observed that the programme is mostly successful in maintaining runoff reduction. Sediment yield is more related to current soil condition than to the erosive capacity of the rain. However, erosion rate is highly variable depending on a complex interaction of a number of natural and man induced factors such as differences in morphology, topography, vegetation cover of the soils or vegetation cover of the stream channel of the watersheds.

And some tests on sample have done for drinking purpose. But we got Turbidity more then 5NTU which implies not suitable for drinking purpose .hence use for irrigation purpose.

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