JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

ANALYSIS WATERSHED MANAGEMENT ISSUE USING GIS: A REVIEW RANJANGAON KHADGE

Prafull Bhimrao Pisal[1] Vijaya Jaysing Ghadge[2]
AGTI's Dr. Daultrao Aher College of Engineering, Karad[1,2]

ABSTRACT
Forests and land use that defy soil and water conservation laws have exacerbated damage to the Kukadi river basin (watershed). The purpose of this study is to investigate watershed management problems. The significance of watershed management has grown in recent years as the demand for fresh water has risen. The morphological characteristics must be evaluated in order to get the geographical parameters. Surface currents replace groundwater; naturally discharged water, which forms oasis and wetlands, is common at the cheeks and seas. Groundwater extraction wells are often utilized for agricultural, municipal, and industrial reasons. More than 1.5 billion people worldwide rely on groundwater for their drinking water, according to estimates. Groundwater is the world's second most plentiful freshwater source, accounting for 30% of total freshwater resources. The government is attempting, but failing, to increase public knowledge of groundwater management. Water found in soil pores and fractures in rock formations under the earth's surface is known as groundwater. The depth at which soil pores or fissures are fully inundated with water is known as the water level. Surface currents replace groundwater; naturally discharged water, which forms oasis and wetlands, is common at the cheeks and seas. Construction and maintenance of extraction wells for agricultural, municipal, and industrial usage are other popular techniques.

Keywords: Bindusara river, Maharashtra, Watershed Management.

INTRODUCTION

The most essential resource for life is fresh water. Water is required for drinking, sanitation, agriculture, manufacturing, and a variety of other activities. Although water is the most plentiful material in the natural world, it is not distributed equally across the globe. In contrast to diminishing supplies, worldwide water demand is increasing. The biggest requirement of human civilization today is drinking water. The value of current water will only rise as the population of water-scarce regions grows. Water is the main resource that controls the economy, development, and progress of a region, state, or country as the population grows. From alcohol to sanitation, and from industry to agricultural growth, water is the main resource that controls the economy, development, and progress of a region, state, or country.

Our community's growth is dependent on the availability and usage of sufficient water. This priceless resource is in short supply at times, plentiful at others, and equally dispersed throughout space and time. Groundwater is the world's second biggest freshwater source, accounting for 30% of global freshwater resources. Groundwater is the source of drinking water for more than 1.5 billion people across the globe. Rain replenishes groundwater, which then interacts with surface water. As it interacts with the ground, rain, rivers, and other natural water sources artificially refill it.

In many tropical nations, groundwater is the primary source of water. Groundwater is readily available and devoid of the pollutants found in surface water. Groundwater resources, on the other hand, are often abused by humans. Due to a lack of knowledge regarding groundwater resources, we are unable to make full use of them. Groundwater management will take precedence in this situation.

The distribution of groundwater throughout the globe varies based on climate conditions and reservoir features. Groundwater is the most important source of water, and in certain dry regions, it is the only one. Reservoirs are where this fossil is kept. It also explains the widespread use of groundwater for human water supply, which can meet more than 60% of human needs in many parts of the world. Rain and surface water, usually through porous layers, usually give high quality groundwater; it also explains the widespread use of groundwater for human water supply, which can meet more than 60% of human needs in many parts of the world.

Groundwater is water trapped under the ground surface in soil pores and fractures in rock formations. A reservoir is formed when a unit or unit deposit of rock generates groundwater that may be utilized under natural circumstances. The depth to which the gaps, fractures, and voids in the soil holes in the rock are fully saturated with water is known as the water table. Natural discharge frequently occurs near the shores and seas, creating oasis or wetlands, and replenishes groundwater. Extraction wells are a popular way to extract groundwater for agricultural, municipal, and industrial uses.

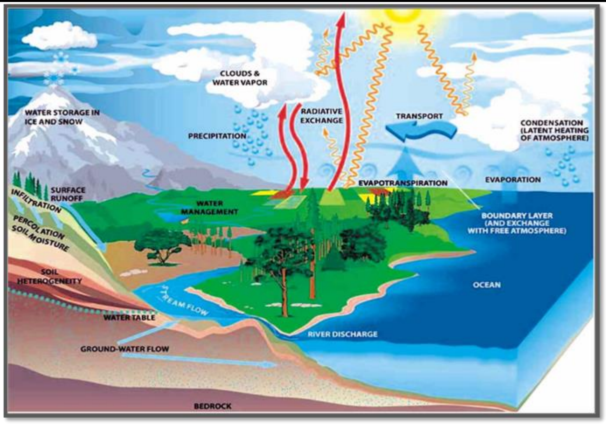


Fig 1: - Watershed

The creation and execution of strategies, programs, and projects to manage and enhance watershed activities impacting the flora, wildlife, and human population along the watershed boundary is known as watershed management. It is not about managing natural resources; it is about controlling human actions that have an effect on those resources. The river's drainage basin serves as a natural barrier to human-environmental interaction management and minimization. Because human activities include the acts of government, towns, businesses, and landlords, watershed management is really a collaborative endeavor. Community water shortages, poor water quality, floods, and erosion may all be avoided with effective watershed management. The cost of maintaining a watershed is much less than the expense of future remediation. Land and water are critical components for agricultural growth and drinking water supply. As a consequence of increasing population growth, urbanization, industry, and agriculture, water consumption has skyrocketed. The monsoons are critical to India's agricultural economy. People are resorting to groundwater independently rather than recharging owing to inadequate rainfall in the past 3-4 years, resulting in groundwater levels below 100-200 meters.
Maharashtra's current drought is worst hydrologically than it was in 1972. The causes for this unusual scenario include the building of huge dams, soggy agricultural patterns, disregard of local water systems, and reckless water management. Big dams, according to the former planning commissioner, are not the answer to Maharashtra's water issues. Despite the acute water scarcity, tanker owners in Maharashtra's Jalna have spent more than Rs. The water industry is flourishing in drought-stricken Marathwada, with over 6 million transactions. To decrease dependence on thermal plants and supply them with precious water, the state should look into alternative energy sources. Despite the present availability of sufficient food grains, the scarcity of drinking water is still extremely severe when compared to the 1972 drought.

As a consequence of recent research sponsored by the International Development Research Center, new technologies and natural resource management (NRM) models have developed in the case of watersheds (IDRC). Watershed initiatives supported by the IDRC have achieved major advancements in integrating collaborative and multidisciplinary research, building NRM resilience organizations, and enhancing broad-based impact methods and approaches. Promoted. The main findings from IDRC's Latin American and Asian Minga and Community-Based Natural Resource Management (CBNRM) Program Initiative Studies are summarized in this document. An in-depth examination of project results came through individual interviews and contacts with IDRC researchers and partners, as well as individual researchers. Because of their biophysical and, in most instances, social features, watersheds are suitable units for NRMs. The interrelationships between significant natural resources and human activities are highlighted in watersheds. Reservoirs, for example, are important data collecting and modeling units in water management. Water, which links various owners via upstream-downstream streams, is the main resource that determines the borders of a watershed. These flows have the capacity to foster collaboration across political and cultural divides, as well as to unite activity at many levels, while also raising the danger of conflict. Second, in watershed management, land use is a critical consideration. Soil quality and water content are affected by the intensity of land use for agricultural and human activities. Water quality in rural regions is threatened by non-point-source pollution from intense agriculture, animal activity, and human waste. Increased floods, soil erosion, and reduced reservoir recharge are all factors that contribute to deforestation.

1.1 Geographic Information system

GIS is a technology that offers radically different way in which we are able to produce and use the maps required to manage our communities and industries. It can create intelligent super maps through which sophisticated planning and analysis can be performed. GIS, GPS and remote sensing tools help in understanding, visualizing, integrating and quantifying research data. GIS assists environmental managers the production of GIS maps that can show how our natural resources respond to change over time including coastal, vegetation and geological. GIS operation is to improve the efficiency of flood disaster monitoring and management. Digital thematic maps namely Slope, Aspect, Landuse, Drainage density, Drainage etc are prepared using ArcGIS software. The availability of high sophisticated 3 D GIS software's continues to expand new possibilities for engineers to perform watershed management analysis in conjunction with hydraulic models to represent water surface elevations, generated from hydrologic and hydraulic models, in a three dimensional terrain model.

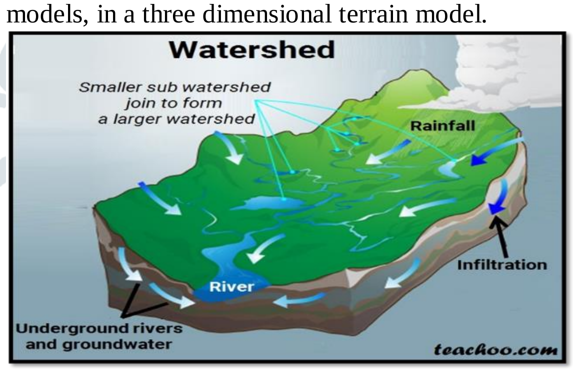


Fig.2 Watershed underground river and ground water

When managing watershed resources, integrated watershed management techniques stress the need of considering more than simply hydrology. Its mission is to create a balance between human and environmental needs while also conserving ecosystem services and biodiversity (Baker 2012). To address increasing population pressures and requests for greater production, watershed management satisfies the requirements of the community and the environment, as well as the varied uses of forests and adjacent lands (Dorsinac 1967). For the sake of this research, we defined integrated watershed management as a management approach that includes integrated and multidisciplinary systems that concentrate on watershed productivity and ecology in connection to water, soil, plants, and animals. The mechanism's integrity must be preserved, resulting in protection and repair. The environment, society, and economy all benefit from ecosystem services.

Over the last few decades, the fast growth of computer science and GIS technology has been mainly responsible for enhancing this integrated approach. Remote sensing pictures, geographic information systems, global positioning systems, meta-analysis techniques, and computer simulation models are all accessible, along with access to a large database of coordinators, communities, public interest groups, and other stakeholders. Make an effort to communicate with one another. The growth of the democratic process, as well as public Web-based extension and participation initiatives have enhanced contributed to long-term sustainability.

Applications of new technology, present problems, and future possibilities in watershed management and research are all discussed in this article. It covers the main managerial problems they confront, as well as the strategies and approaches employed to solve them.

As a result, the Watershed Development Program is seen as a possible solution to a variety of issues as well as a potential engine for agricultural growth and development in low-rainfall regions (Joshi et al. 2005; Ahluwalia). (2006). Forever. Increased food production, better livelihoods, environmental protection, gender and equality problems, and biodiversity issues are all advantages of watershed management (Sharma, 2002; Vani et al. 2003a, b; Joshi et al. 2005). Land and water usage efficiency is critical for development and long-term sustainability. Watershed management is a concept that aims to make the best use of natural and social resources possible. As a consequence, land, water, and public resources are crucial in watershed development plans. Watershed is mainly a land-based project that prioritizes water for rural people's socioeconomic development, with the primary aim of increasing agricultural output via moisture conservation and protected irrigation (Joshi, et al. 2004, 2006). Gives. To carry out. This is necessary in a nation where agriculture employs the majority of the population and 60 percent (142 million hectares) of the country's total agricultural land is reliant on rainfall. The majority of India's rain-fed regions suffer from poor productivity, high risk and unpredictability, a lack of technical progress, and natural resource depletion (Joshi et al., 2004). Policymakers, administrators, scientists, and academics have been focusing on sustainable land and water usage for many years. The idea of sustainable development gained much-needed momentum following the Rio Conference in June 1992, according to Kushwaha et al. (2010, p.1479), which focused mainly on 27 sustainable development and agenda principles. (United Nations Conference on the Environment, or UNCED.) Rio de Janeiro, 3-14 June 1992, under a plan for growth and development).

1.2 Necessity

Although it is a component of the systemic hydrological cycle, groundwater is progressively emerging from the shadow of surface water hydrology. The resource's nature and relative accessibility, as well as the simplicity with which it may be accessed decentralized, make it the backbone of Indian agriculture and drinking water security. Millions of farmers throughout the nation rely on it as a shared pool resource. For most rural Indian families, it is their sole supply of drinking water. Many industrial units in the nation depend entirely on groundwater, particularly those outside of designated industrial zones. India is rapidly approaching a severe groundwater problem due to excessive groundwater use and deteriorating groundwater quality. Water is required for all forms of life. It's also a prerequisite for any kind of planning or development. Due to population growth, hydropower production, irrigation, and industrialization, much of the necessary quantity of water has been lost. As a result, a watershed explanation is required for hydropower analysis. DEMs offer superior landscape pictures that may be used to automatically capture watersheds using GIS methods. Initially, Band and LE utilized automated watershed imaging methods. Gbrecht and Martz (1999) published work on different GIS systems and adaptive applications by. (1986), Clark et al. (1982), and Gbrecht and Martz (1999). These techniques are independent of DEM resolution, and their usage is increasing as better resolution DEMs become available, providing more comprehensive terrain representations. In general, the conventional approach to automated watershed description (1999) advocated for high-end GIS and lengthy processing periods (hours) in the field.

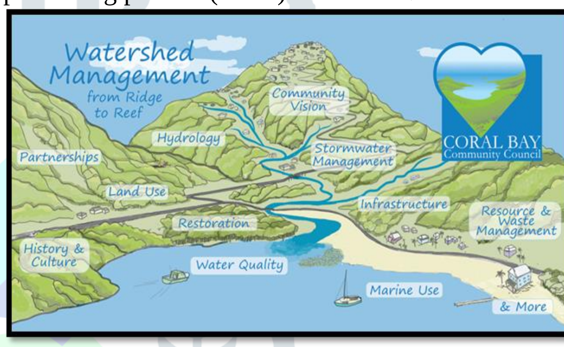


Fig.3 Watershed Management

2. LITERATURE REVIEW

Pankaj Kumar et al. The Kilinochchi Basin in northern Sri Lanka has being studied for potential groundwater shortage regions. IRS-IC LISS III satellite data, LandshotTM digital, and SRTM data were used to generate geomorphological, geological, drainage density, and liniment density maps. The proportionate contribution of each background map to the groundwater potential determines the weight of each background map. On each background map, each feature is also assessed. The groundwater potential index was calculated using ground control points on all backdrop maps and then integrated into the GIS in phases using a generalized aggregation technique. Groundwater potential regions will be identified based on this final expectation and grade. They discovered that using a combined strategy of remote sensing and GIS technologies, they were able to effectively identify groundwater in the research region. Excellent, very good, good, moderate, and poor are the five categories of groundwater potential zones

Nancy Johnson et.al.

Consumer participation affects watershed management studies, according to the research "User Participation in Watershed Management and Research." It broadens the collaborative research agenda to include new topics including organizational behavior, collective action, and conflict resolution, as well as a shift in technology and practice development and delivery. This will need further research on locality and watershed management problems, starting with a synthesis and comparison of previous experience in areas like boundary and size, facility transaction costs, and building indicators. Partnership management, which is not closely connected to research - it is regarded a knowledge creation process that supports technological and organizational development - is often hampered by a lack of suitable technical choices, information, and organizations.

Monika Saini, et.al. Examines the paper "Measuring the Impact of Watershed Management Programs on the Watershed Community's Livelihood." The SLA employed in this study can objectively evaluate the impacts of watershed management on the community's livelihood. From before WW to before WMP, livelihood in the Lakshmipura Watershed improved. They also discovered that the watershed community's livelihood has improved significantly in terms of capital. These benefits are mainly due to the therapies employed during WMP. Capital Assets Evaluation Quantitative Livelihood Assessment In assessing such development initiatives, this approach is very useful. This method enables you to keep track of livelihoods at several levels. The subsistence score may be computed using the respondents' general average approach, which takes into account socioeconomic status, property ranking, land size, caste system, village, and watershed level. This approach may also be used to design a watershed management plan during the implementation of WMP. Quantitative evaluation of subsistence capital aids in the prioritization of watershed management activities and the development of capital-oriented solutions. This approach also aids in program monitoring and assessment, as well as providing valuable feedback for future program growth and better program design.

Dr. (Mrs.) Hansa Shukla et.al The research of "Watershed Management: Its Role in Environmental Planning and Management" ends the report. Integrated approach: This method entails the integration of technology within the drainage area's natural limits for the optimum development of land, water, and plant resources in order to satisfy humans and animals' fundamental requirements in a sustainable manner. The goal of this strategy is to raise ordinary people's living conditions by improving their earning potential and giving all of the necessary facilities for proper production (Singh, 2000). Integrated watershed management, land and water conservation techniques, water collection and groundwater recharge in ponds, enhanced water resource efficiency and crop diversity, better seed usage, integrated nutrition management, and integration were all achieved. Methods of rot management, etc.

Government Policy: - Primary stakeholders, government and non-government organizations, and other entities are all involved in coalition policy, which deals with collective action and community involvement. Watershed management requires a diverse set of skills and talents. Important factors include easy access and timely guidance to farmers on how to monitor the impacts of watersheds. It increases farmer awareness and improves their capacity to reach out to the appropriate individuals when issues occur. Engineering, agricultural science, forestry, horticulture, animal husbandry, entomology, sociology, economics, and marketing are among the skills required. It is not always feasible to get all of the necessary assistance and expertise at a company. As a result, to optimize the efficacy of different watershed initiatives and interventions, the consortium method draws in experts from a range of disciplines.

R. Ramesh, et.al LOICZ Global Change Assessment and Synthesis of River Catchment - Coastal Sea Interactions and Human Dimensions" was studied. Erosion and sedimentation. Pollution and hunger have also been discovered. This research is interested in the effect of human civilization on physical motions along the shore, such as water, sediment, nutrients, heavy metals, and man-made pollution. DPSIR matrices were created utilizing expert knowledge gathered from workshop presentations and discussions focused on different causes, pressures, state changes, and effects on rivers up to the shore. The LOICZ basin approach offers an in-depth evaluation of key natural processes and coastal states influenced by natural and human pressures to examine river basin-based coastal alterations. Due to energy exchange, sedimentation, and water flow, as well as biodiversity, coastal regions for human settlement, rest, and the whole south, rivers and their downstream areas play an essential role in coastal development. Asia's and the world's economic activity.

Dr Indrani Mukherjee et.al The aim of this research is to examine and analyze the seasonal spatial variation of ground water depth in the region. The present situation **work's** methodology is heavily reliant on extensive fieldwork. Previous literature has been very useful in gaining a broad understanding of the research topic. The data and base maps were gathered from a variety of public and unofficial sources. Prof. Soumita Ghosh's article focuses on the area bordered in the north by the Mayurakshi River and in the south by the Ajay River (parts of Birbhum district, West Bengal). High levels of iron and fluoride in ground water are a significant issue in four Ajay-Mayurakshi Interfluve blocks, namely Khoyrasol, Rajnagar, Sainthia, and Suri – II (greater over the permitted limit of 1.5 mg/l). Mr. Sumanta Biswas has attempted to investigate the severe pollution of groundwater by naturally occurring contaminants in the Ganges plain of Northern India and the deltaic area of West Bengal. In the shallower of two regional aquifers, arsenic impacts 25% of water wells. The contamination is caused by organic materials in aquifer sediments, which causes anaerobic conditions in the aquifer.

Prathmesh Chourey et.al The indicator's aim is to make complicated water quality parametric data as complete information simple to comprehend. The water indicator is a broad indication of water quality that gives a basic sense of the possible issues with water in this region. It is based on some of the most significant characteristics. Water pollution is one of India's most serious issues, with organic, toxic, organic, and inorganic pollutants polluting almost 70% of the country's surface water resources and different groundwater reserves. Untreated sewage, industrial waste, and organic runoff from agricultural regions are the leading sources of water pollution in India, according to the CPCB (Central Pollution Control Board). MPCB tests pH, nitrate, TDS (total dissolved solids), hardness, fluoride, microbial content, sulfates, and other parameters in groundwater twice a year at around 50 groundwater monitoring sites. The models scored between 7.5 and 8.5 on average. In the Python taluka's Wahegaon and Katpur villages, the groundwater in the Rangabad region was found to be extremely alkaline, with a pH of greater than 8.5. In Rangabad, Pune, Solapur, and Kolhapur, nitite and fluoride levels are also high.

Anupriya et.al We looked at the Vidarbha area, which has a lot of water, as part of the research. Water storage is expected to be lower at lower altitudes than at higher elevations. It is relatively simple to establish how the rivers are linked using hydrological data from the research region and tributary rivers. It will be considerably simpler to carry water to the lower regions if there is more water in the highlands. On the height map, appropriate routes should be drawn. It will be simpler to evaluate the project based on how it is constructed. This information is extremely helpful for administrative authorities who may use it to plan the building of check dams, reservoirs, and seapage tanks to enhance water supply in the studied region. Analyzing such an environmental issue with this software is a significant step forward. The fundamental concept behind linking the river is to supply water to a region that has a year-round water deficit. This river interlinking project's idea is to transfer some water from rivers to dry rivers with large rivers.

Belayneh Bufebo et.al Studies a report entitled "Shenkola Watershed, Land Use / Land Cover Change and Its Driving Forces in South Central Ethiopia". Forest acreage decreases and agricultural land increases. Agricultural land increased from 70.49 per cent in 1973 to 79.48 per cent in 2017, while forest land fell from 29.51 per cent in 1973 to 20.52 per cent in 2017. The main reason for LU / LC change is agricultural development, policy change and social unrest, population. Stress, scarcity of agricultural land and biophysical causes. Climate change, loss of biodiversity, loss of basic forest products, habitat change, declining quality and water availability and declining agricultural yields are all effects of LU / LC change. Expansion of agricultural land at the expense of forest in the Shenkola catchment area has a detrimental effect on the natural resources and livelihoods of the local people. Consequently, appropriate measures must be implemented to mitigate significant changes in land use and to align environmental protection with human livelihoods.

Perrine Hamel et.al "The Value of Hydrological Information for Watershed Management Programs: The Camboria, Brazil Case," is the author of the article. According to our findings, hydrological data should be created in cooperation with data consumers (investors or project managers). And, ideally, landowners who are involved in the planning process). We advise you to: Using interdisciplinary approaches and border work, determine if shareholders will utilize the findings (and, if so, how), and ii) develop suitable models and monitoring systems. In the Cambori WPP, science's primary function is to improve communication, give credibility, and show commitment to long-term assessment procedures, thus reducing the viable scientific creation of resources, such as the investment model. Implementation and fieldwork.

Helena Huđek et.al One research concluded, "Review of Hydroelectric Dams in Southeast Europe - Monitoring Distribution, Trends, and Data Availability Using the Multinational Danube Catchment Suberia Example." In certain Observe nations, large-scale monitoring and tracking data to see freshwater biodiversity (fish and macrophages) and hydropower impacts. This study will contribute to the development of a knowledge base on the environmental effect of hydropower production, which will be useful for energy projects, investors, and other stakeholders when evaluating hydropower projects. More information choices enable more balanced responses and the creation of comprehensive methods to address climate change, energy security, and freshwater biodiversity loss, culminating in a huge degradation of river ecosystems. It is possible to turn it off. I'm free to go now. If maintained in the appropriate locations and with sufficient mitigating measures, hydroelectric facilities may actually generate ecologically beneficial electricity. We investigate the regional distribution and trends of HPPs, as well as the availability of hydrological and biological monitoring data from national agencies that may be utilized in the EIA. The Danube tributaries in Slovenia, Croatia, Bosnia and Herzegovina, Serbia, and Montenegro are our research TRD rivers.

Nawarat Krairapanond et.al This article examines the many methods to river basin management, as well as how they are influenced by particular problems and the political environment in which they occur. Thailand's fast growth has centered on the need for comprehensive resource management to address the severe issues of drought and floods since the late 1970s. Because deforestation is thought to be the root cause of these issues, the first step was taken in watershed management. The article goes through the chosen system in depth before moving on to the political and administrative problems that arose during implementation. In emerging nations, water resource management issues are becoming increasingly severe. Wherever water resource management issues have arisen since the turn of the century, it has been regarded as the most suitable level river basin to research and solve these issues.

III. RESEARCH GAP

In Ranjangaon Khadage, Watershed Management is most important endeavor. Much past research on watershed management has been an ad hoc response of individual researchers to small parts of the overall management problem. Improving the management of upper watersheds requires an integrated approach. Biophysical and socioeconomic re- search and information must be organized and designed so that the results can be readily used by planners and decision makers.

A combination of information exchange, case studies, action research, and pilot projects can be used to address many of the research topics. Research should be designed to provide generalizations that can be used for planning and implementing watershed management projects. These studies should include the following elements: (1) methodologies for the interdisciplinary analysis of watersheds based on the framework discussed in the workshop and presented in this report; (2) formulation of hypotheses using questions presented in this report as a starting point; (3) collection and analysis of information concerning the actual implementation of watershed management programs; (4) devising measures to test the feasibility and transferability of resource management actions and implementation tools to specific watershed situations; and (5) devising methods for monitoring and providing local feedback on the performance of watershed management projects.

IV. METHODOLOGY

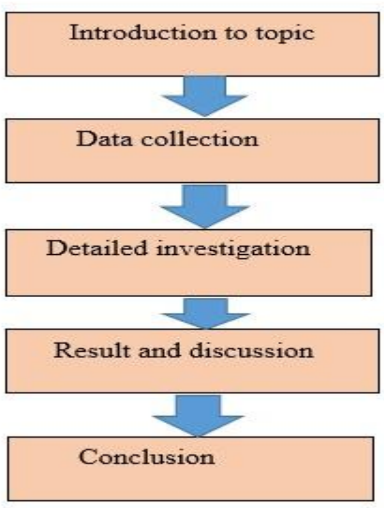
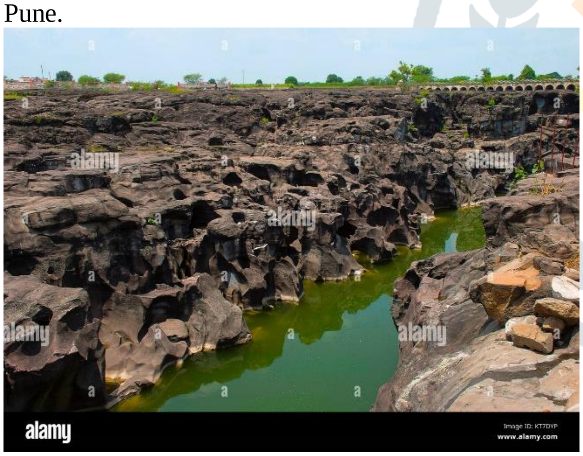


Fig.4 Methodology Flowchart

V. STUDY AREA

5.1 Kukadi River Basin (Ranjangaon Khadage)

Location map showing the boundaries of the study area and study area map showing various administrative features are depicted as per below figure. Watershed is located in Pune District. Watershed ranges from latitude 583356° N and longitude 2095700° E to latitude 557596° N and longitude 2083933° E. Watershed contributing to Kukadi River which is tributary of Godavari river. The study area falls in the semi-arid zone of Pune.



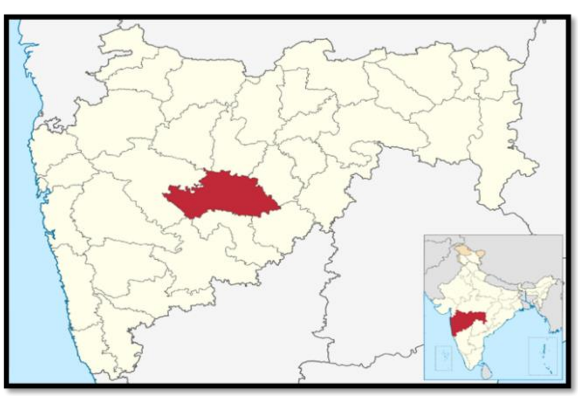


Fig.5 Ranjangaon Khadage Google Map

5.2 Data Collection

The spatial data requirement consists of DEM of study area, satellite image, hydrological data, ground water level data of study area, water quality standards and different maps provided by respective department.

1) DEM Tiles: - Cartosat-1Digital elevation model (DEM) data was collected Bhuvan website Source: http://bhuvan.nrsc.gov.in
2) Rainfall Data- Obtain from official website of Govt. of Maharashtra:www.maharain.gov.in
3) Soil Maps: - Soil Maps provided by National Bureau of Soil Survey (NBSS)

5.3 Basic of Remote Sensing and Geographic Information System

1. Remote Sensing

The art and science of making planetary observations using sensors aboard an airplane or satellite is known as remote sensing. These sensors gather data in the form of pictures, which they may then modify, analyze, and display. Remote sensing is a method of assessing and collecting data about an item or event without having to come into close touch with it. Remote sensing images are incorporated in the GIS. Data may be obtained in areas that are inaccessible to the public, such as volcanoes and ocean depths, using remote sensing.

Remote sensing is the recovery of data without the use of an item or a phenomenon, as well as without on-site examination of the site or physical interaction with the topic. Only data about Earth and other planets is referred to by this name. Remote sensing is utilized in geography, land surveying, and a variety of other geographical.

The phrase "remote sensing" currently refers to the use of satellite or aircraft-based sensor technologies to identify and classify things on Earth. The surface and atmosphere, as well as the signals provided by the seas, determine it (when detected by satellite or object sensor). Goes). The signal is transmitted to the airplane, and the sensor detects its picture) (when the sensor is exposed to sunlight). (I caught a glimpse of myself in the mirror.)

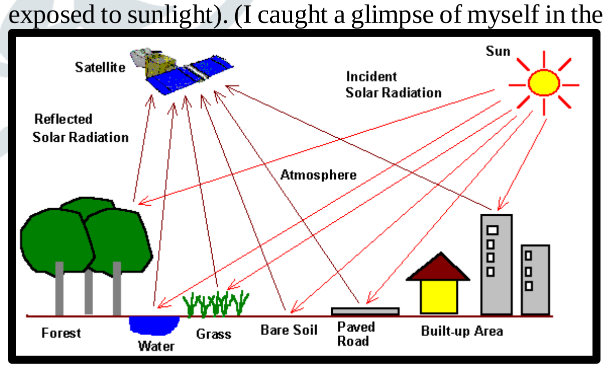


Fig.6 Shows Processing of Sensors in RS

The interaction between incident radiation and interest targets is involved in this process. The usage of an imaging system with the following seven components is an example of this. Remote sensing, on the other hand, detects radiated energy using non-imaging sensors.

1. Energy source or illumination - The initial need of remote sensing is an energy source that illuminates or delivers electromagnetic energy to an energy target.

2. Radiation and the Environment - As energy moves from its source to its destination, it interacts with the atmosphere. A second touch may occur when the energy passes from the target to the sensor.

3. Interaction with the target- After passing through the environment, the energy interacts with the target, which is determined by the radiation target as well as the radiation characteristics.

4. Energy recording by sensor- Once the energy has been dissipated or released from the target, a sensor is required to capture and record the electromagnetic radiation (remotely - not attached to the target).

5. Transmission, Reception, and Processing - The energy measured by the sensor is often sent electronically to a receiving and processing unit, where the data is transformed into an image (hardcopy and/or digital).

6. Analysis and Commentary - The processed picture is presented and/or digitally or electronically retrieved in order to acquire information about the published subject.

7. Application - The remote sensing procedure is complete when we are able to better comprehend an issue, discover new facts, or collect information from pictures. Complete an application.

From start to end, these seven components encompass the whole remote sensing process. We'll look at them all in the fifth chapter of this lesson, based on what we've studied. Have fun on your trip!

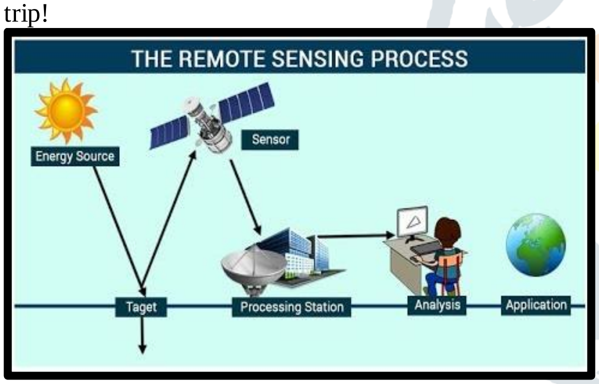


Fig.7 Shows Processing of RS Data in GIS tool

VI. CONCLUSION

It can be inferred that geographical factors play a significant role in determining the study area's fundamental geophysical parameters. These variables aid in the identification of surface drainage, topography, soil type, and texture, all of which shed light on surface characteristics. Groundwater occurrence in the research region is primarily controlled by geology and soil type, followed by line density and drainage density. GIS analysis revealed the truth. The geo-informatics movement is proven time-effective for groundwater occurrence and mapping, as well as creating a scientifically sound groundwater management strategy.

The effective integration of remote sensing data into the GIS platform aided in the creation of a comprehensive map of groundwater conditions in the research region. Using remote sensing data and the GIS application Arc-GIS, thematic maps for groundwater observation sites in the research region were produced. Arc-GIS is utilized to generate research area border, stream network, geomorphology, linearity, and drainage density maps using various hydrological methods. Using weighted overlay analysis in a GIS context, a map of prospective groundwater research sites was created.

REFERENCES

1. Liu Laixing, Li Daren and Shao Zenfeng, "Research on geospatial information sharing platform based on Arc-GIS server" The International Archives of the Photogrammetric, Remote Sensing and Spatial Information Sciences, vol. XXXVII. Part B4, pp.791-796, 2008.
2. Linfang Ding and Liqui Meng, "Comparative study of thematic mapping and scientific visualization", Journals on Annals of GIS, vol. 20, No. 1, pp. 23–37, January 2014
3. Tajinder Kaur, Renu Bhardwaj and Saroj Arora, "Assessment of groundwater quality for drinking and irrigation purposes using hadrochemical studies in Malwa region, southwestern part of Punjab, India", Journal of Applied Water Science Vol.7, pp. 3301–3316, Octomber-2017
4. Rajat C. Mishra, Biju Chandrasekhar and Ranjitsingh D. Naik, "Remote sensing and GIS for groundwater mapping and identification of artificial recharge sites", Journal of Geo-Environmental Engineering and Geotechnics, ASCE, Vol. 3, No. 2, pp. 216-221, August, 2012
5. Y. Srinivasa Rao and D. K. Jugran, "Delineation of groundwater potential zones and zones of groundwater quality suitable for domestic purposes using remote sensing and GIS", Journal on Hydrological Sciences, 48(5), pp. 821-833, Octobre 2003.
6. B. S. Chaudhary and Sanjeev Kumar, "Identification of groundwater potential zones using remote sensing and GIS of Kaushalya-Jhajhara Watershed in India", Journal of Geological Society of India, Vol.91, pp.717-721, June 2018.
7. S. K. Nag and A. Kundu, "Application of remote sensing, GIS and MCA techniques for delineating groundwater prospect zones in Kashipur block, Purulia district, West Bengal", Journal of Applied Water Science, vol. 8, issue -38, pp. 38- 51, February 2008.
8. M. Nagarajan and S. Singh, "Assessment of Groundwater Potential Zones using GIS Technique", Journal of Indian Society of Remote Sensing Vol.37, pp. 69–77, March 2009.
9. R. Al-Ruzouq, A. Shanableh and T. Merabtene, "Geomatics for mapping of groundwater potential zones in northern part of the United Arab Emiratis - Sharjah city", The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-7/W3, pp. 581-586, May 2015.
10. Ram Avtar, C.K. Singh, Satyanarayan Shashtri, Amit Singh and Saumitra Mukherjee, "Identification and analysis of groundwater potential zones in Ken–Betwa river linking area using remote sensing and geographic information system", Journals in Geocarto International, Vol. 25, No. 5, pp. 379–396, August 2010.
11. Pankaj Kumar, Srikantha Herath, Ram Avtar and Kazuhiko Takeuchi, "Mapping of groundwater potential zones in Killinochi area, Sri Lanka, using GIS and remote sensing techniques", Journal of Geological Earth Science, Vol. 2 (5), pp.58-72, March 2006.
12. N. S. Mangesh, N. Chandrashekhar and J. P. Soundranayagam, "Delineation of ground water potential zones in Theni district, Tamil Nadu, using remote sensing,

GIS and Multi influencing factor", Journals of Geosciences Frontiers, Vol. 3 (2), pp. 189-196, February 2012.

13. Ramu, B Mahalingam and M Vinay, "Identification of ground water potential zones using GIS and Remote Sensing Techniques: A case study of Mysore taluk –Karnataka", International journal of Geomatics and Geoscience Volume 5, Issue 3, pp. 392-403, 2014.
14. M.L. Waikar and Aditya P. Nilawar, "Identification of groundwater potential zone using remote sensing and GIS technique", International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET) ISSN: 2319-8753 Vol. 3, Issue 5, May 2014.
15. M Gupta and P K. Srivastava, "Integrating GIS and remote sensing for identification of groundwater potentialzones in the hilly terrain of Pavagarh, Gujarat, India", Journal of water International Vol. 35, issue. 2, pp. 233–245, March 2010.