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Advantages and Applications of Geographical Information System (GIS) In Fisheries

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Introduction

GIS may be de ned as the integration of computer hard & so ware with spatially referred digital data so that storage, retrieval, manipulation, analysis and display all forms of geographically referenced information. A GIS is a computer-based tool used for analyzing the geographical information. It holds a database of spatial data and attributes or descriptive information about features on a map that can be used to create preferred maps [1].

Geographical Information System (GIS) has become a major component of modern life and the contribution of this system in daily life has been increasing by the new invention of technology and methods. GIS was basically developed as a tool for terrestrial use such as infrastructural development, watershed management, agriculture and forest conservation, but later it became a supporting tool in many diverse sectors. GIS and its technologies have added a new leeway in a shery sector also by applying its tools for extracting scienti c output from the collected data. Geographical Information Systems (GIS) is being applied in various forms in diverse elds [2].

- GIS is application oriented.
- Frequent revision of digitized GIS data is possible.
- Changes over time can easily & rapidly monitor through GIS.
- GIS technology enables high quality output.
- Spatial patterns & processes can be e ectively described & explained by GIS.

Applications of GIS in Fisheries

Identi cation of suitable sites for freshwater & brackish water aquaculture: is is an original use of GIS in sheries-related work. For any successful aquaculture activity, a suitable site is a prerequisite. An optimal aquaculture site aids in better management of the aquaculture resources, and it ensures the sustainability of the farming activity. ere are many criteria, guidelines, and essential factors for the selection of a site for aquaculture such as the topography of site, slope of land, water ow, volume availability, water quality, weather parameters, access and location of utilities, legislation concerning water rights, etc. helps in the decision making process. GIS gives the best platform to combine all this information and identify the areas that qualify the optimal set of parameters, which would be the best-suited areas for aquaculture [3].

Modeling sh activity and movement: ese applications area is just getting underway. Here the aim is to attach numerical models to a GIS to simulate, describe, or predict a range of processes. Examples include – movement models.

Analysis of sheries catches and e ort: Fishery managers are interested in where shing e ort is concentrated; how much sh is

management

e GIS-based studies will give a clear picture of the Spatio-ten distribution of shes in the selected study area and help in identi cation of critical shing grounds in terms of shery and marine biodiversity.

e other uses of GIS are for de ning sh habitat and organizing and executing living marine resources (i.e., the dynamics of marine objects), tracking marine mammals and analyzing their hunting and migrant lines; which can assess the e ciency of marine protected areas, and answer to problems related to environmental ruins [2].

Planning for water body resource zonation & mapping of aquatic species: It is important to have an inventory of wetlands and their catchments in terms of conservation and management of wetland resources. Digital maps are potent tools to achieve this. erefore, Maps are essential for monitoring and quantifying the change over time scale, and it helps in decision making.

Distribution of di erent sh species in relation to physical habitat characteristics: It will be of the utmost interest for those working in sheries management or science to know the relationships between sh distributions and various environmental parameters. e types of parameters being commonly used include water temperatures (especially thermal fronts), upwelling indices, water depth, marine chlorophyll abundance, bottom sediment type, and salinity [4].

Establishing regional and national sheries databases: Although not directly a GIS application to sheries management, it is clear that without substantial data inputs, then sheries GISs could not function. So in some major shery regions, a massive e ort has gone into establishing databases, metadata sets, and in setting up regional data centers, e.g., in eastern Canada or at the various World Data Centers. Fisheries related data sets are slowly becoming accessible over the Internet [5].

Conclusion

By delivering goods and services through proper route planning,

GIS tools can save billions of dollars annually. GIS regularly helps in the day-to-day management of many natural and human-made resources, which includes sewer, water, power, and transportation networks. An application of GIS in marine and coastal ecosystem study is an emerging eld today. e marine geographical interpretation using GIS became a vital tool in the eld of marine policy making, planning, and conservation. e critical role that GIS plays to the cooperation of organizations in various international agreements for the management and the use of the marine areas include maritime transport, sheries, recreation, disposal of waste, conservation.

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Con ict of Interest

None

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