5. Optimum Resource mobilisation and identification is need of 21 St Century in India, discuss the impact and application of various scientific advancement in this regard?

Introduction: Brief about Optimum Resource mobilisation

Body

- Mention about different scientific advancement in related to Optimum Resource mobilisation

Conclusion: Mention uses of remote sensing in socio- economic development

Introduction:

Resource mobilization refers to all activities involved in securing new and additional resources for your organization. It also involves making better use of, and maximizing, existing resources.

Body

Geographic Information System: A Geographic Information System (GIS) is a computer system that analyzes and displays geographically referenced information. It uses data that is attached to a unique location.

Applications of Geographic Information System

- **Mapping**: GIS can be used to provide a visual interpretation of data. Google Maps is an excellent example of a web-based GIS mapping solution that people use for everyday navigation purposes.
- **Telecom and Network Services:** Organizations can incorporate geographic data into their complex network design, optimization, planning, and maintenance activities. This data enhances telecom processes through better customer-relationship management and location services.
- **Accident Analysis and Hot Spot Analysis:** GIS can be used as a key tool to minimize accident hazard on roads, the existing road network has to be optimized and also the road safety measures have to be improved. This can be achieved by proper traffic management. By identifying the accident locations, remedial measures can be planned by the district administrations to minimize the accidents in different parts of the world. Rerouting design is also very convenient using GIS.
- **Urban Planning:** GIS technology is used to analyze the urban growth and its direction of expansion, and to find suitable sites for further urban development. In order to identify the sites suitable for the urban growth, certain factors have to consider which is: land should have proper accessibility, land should be more or less flat, land should be vacant or having low usage value presently and it should have good supply of water.
- **Space Utilization**: GIS helps managers to organize and spatially visualize space and how it can best be used. Operational costs can be decreased by more efficiently using space including managing the moves of personal and assets as well as the storage materials. The 3D visualization in GIS platforms helps planers to create a feeling of experience like virtual walk inside the building and rooms before construction.
- **Development of Public Infrastructure Facilities:** GIS has many uses and advantages in the field of facility management. GIS can be used by facility managers for space management, visualization and planning, emergency and disaster planning and response. It can be used throughout the life cycle of a facility from deciding where to build to space planning. Also it provides facilitate better planning and analysis.
- **Location Identification:** This technique is used to find a location for a new retail outlet. It helps to find out what exists at a particular location. A location can be described in many ways, using, for instance, name of place, post code, or geographic reference such as longitude or latitude or X/Y.
- **River Crossing Site Selection for Bridges**: The important geotechnical consideration is the stability of slope leading down to and up from the water crossing. It is advisable to collect historical data on erosion and sedimentation. On the basis of these information asses the amount of river channel contraction, degree of curvature of river bend, nature of bed and bank materials including the flood flow and the flow depth, all these can be done in GIS within estimated time and accurately.
- **Municipal Infrastructure**: Centre-line drawings for streets, water and sewer utilities linked to databases for integrated planning, construction, and maintenance management.
- **Regional Planning**: Maps, land records, highways, redevelopment plans analyzed for regional impact.

- **Transportation Planning**: GIS can be used in managing transportation and logistical problems. If transport department is planning for a new railway or a road route then this can be performed by adding environmental and topographical data into the GIS platform.
- **Flood damage estimation**: GIS helps to document the need for federal disaster relief funds, when appropriate and can be utilized by insurance agencies to assist in assessing monetary value of property loss. A local government need to map flooding risk areas for evaluate the flood potential level in the surrounding area. The damage can be well estimate and can be shown using digital maps.

Global Positioning System (GPS): It is a satellite-based radionavigation system owned by the United States government and operated by the United States Space Force. It is one of the global navigation satellite systems (GNSS) that provides geolocation and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites.

Application Global Positioning System (GPS):

- Cellular network - Transmission and reception of mobile signals requires synchronisation of clocks across different stations. This synchronisation can be achieved only by high precision source of time, which is served by GPS. Electricity grid monitoring - Modern electricity grids use Supervisory control and data acquisition (SCADA) systems that gather live data from every node on the grid for real-time analysis requires synchronisation between time at different nodes. This is achieved by GPS.
- Tracking: GPS can be used to live track persons, pets etc. by means of devices attached to them.
- Logistics: VPS holds potential to dramatically revolutionize the logistics and transportation sector by enhancing navigational capabilities of robots, drones and driverless cars.
- Navigation: The technology can be a game changer in navigational experience in dense urban areas where GPS services are often distracted or blocked by skyscrapers.
- Business and Marketing: VPS allows businesses to fill the Google business profile through which customers can see relevant information about the business.
- Remote sensing is the process of detecting and monitoring the physical characteristics of an area by measuring its reflected and emitted radiation at a distance (typically from satellite or aircraft). Special cameras collect remotely sensed images, which help researchers “sense” things about the Earth.

Remote sensing: Remote sensing is the acquisition of information about an object or phenomenon without making physical contact with the object, in contrast to in situ or on-site observation.

Applications of remote sensing

Agriculture

- Soil Properties Sensing: Soil Texture, Structure, and Physical Condition Soil Moisture; Soil Nutrients.
- Crop Sensing: Plant Population; Crop Stress and Nutrient Status.
- Yield Monitoring Systems: Crop Yield; Harvest Swath Width; Crop Moisture:
- Variable Rate Technology Systems: Fertilizer flow; Weed detection, pressure sensors
- Crop production forecasting: Remote Sensing is used to predicting crop production and yield over a given field and determine how much of the crop will be harvested under the specific conditions. The researcher can predict the crop quantity that will be produced in given farmland over a given period of time.
- Determining crop damage and crop progress: In the event of crop damage or crop progress, remote sensing technology can be used to penetrate the farmland and determine exactly how much of a given crop has been damaged or under stress and the progress of the remaining crop in the farm.
- Crop Identification: The crop can also be identified using remote sensing technology especially in cases where the crop under observation is mysterious or shows some mysterious characteristics.

Biodiversity

- Remote Sensing plays a major role in detecting and monitoring global- to local-scale processes that affect ecosystems, species, and ecosystem services, with effects on genes being an emerging field.
- Remote sensing plays a major role in mapping and understanding terrestrial biodiversity. It is the basis of most land cover/land use maps, provides much of the environmental data used in species distribution modelling, can characterise ecosystem functioning, assists in ecosystem service assessment, and is beginning to be used in genetic analyses.

- Remote sensing is frequently used to generate maps of terrestrial ecosystems, which are often based on a map that delineates different vegetation types or land uses.
- Controlling forest fires: Information acquired by satellites using Remote Sensing enables firefighters to be dispatched on time and over correct locations so the damage from such fires can be decreased to minimal.

Acoustics

- Sonar: passive sonar, listening for the sound made by another object (a vessel, a whale etc.); active sonar, emitting pulses of sounds and listening for echoes, used for detecting, ranging and measurements of underwater objects and terrain.
- Seismograms taken at different locations can locate and measure earthquakes (after they occur) by comparing the relative intensity and precise timings.
- Ultrasound: Ultrasound sensors, that emit high-frequency pulses and listening for echoes, used for detecting water waves and water level, as in tide gauges or for towing tanks

Other applications

- Light detection and ranging (LIDAR) is well known in examples of weapon ranging, laser illuminated homing of projectiles. LIDAR is used to detect and measure the concentration of various chemicals in the atmosphere, while airborne LIDAR can be used to measure the heights of objects and features on the ground more accurately than with radar technology. Vegetation remote sensing is a principal application of LIDAR.
- Radiometers and photometers are the most common instrument in use, collecting reflected and emitted radiation in a wide range of frequencies. The most common are visible and infrared sensors, followed by microwave, gamma-ray, and rarely, ultraviolet. They may also be used to detect the emission spectra of various chemicals, providing data on chemical concentrations in the atmosphere.
- Assessment of train stability: In interferometer technology, landscape deformation is measured with sensors using phase differences. This technique is mostly used in sectors of oil and gas in order to measure train technology.

Conclusion:

Nationally, remote sensing data provides critical information used to monitor and predict weather and climate change, land use changes at a macro scale, and monitor and protect our borders.

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