RS & GIS APPLICATIONS GENERAL

UNIT-5&6

Geology:

RS and GIS has vital role in geology, where it involves the study of land forms, structures and the subsurface to understand the earth crust.

The multi spectral data provides information on lithology based on spectral reflectance and it also provides the topography and roughness of the soil.

GIS provides information on group planning to access mining area. It also provides information on

a) Mapping of surface deposits / bed rock composition.
b) Structural mapping.
c) Lithological mapping.
d) Mineral Exploration.
e) Environmental geology.
f) Mapping and monitoring of mineral resources.
g) Geo-Hazard mapping.
h) Lineament extraction.
i) Exploration of hydrocarbons.

Geomorphology:

Geomorphology is the study shape (or) configuration of earth's solid surface above & below the ocean level which involves the classification

of land forms and the process is by which they develop.

(or)

Geomorphology is the study of landforms and Land scapes including the description, classification, origin and history of planetary surfaces.

It deals with different landforms that characterised the earth topography, it's origin, Sequence of evaluation, present status and their future trend.

The lithological unit (Rock type) and Geomorphic unit (Land forms) are the fundamental units of Geomorphology and it includes

1. Endogenic processes.
   a.) volcanizam
   b.) plate tectonics.
   c.) folding, faulting.
2. Exogenic systems.
   a.) Weathering.
   b.) Erosion.
   c.) Flowing water
   d.) Glacial (ice)
   e.) Eolian (Wind)
   f.) Coastal (waves).

over the last few decades with the help of satellite technology the wide aerial information

has been collected for effective monitoring of landforms.

It is now feasible to observe and study respeatatively large area land features upto the continental dimension through the space born on technology.

Applications in forest Management:

Forests are more important natural resources where human population depends for food, fuel, recreations, air quality ----.

They also serve as habitats for millions of plants and animals by keeping. this in view. an efficient management is required to promote sustainable development.

Earlier it was managed and monitored by various fields / manual surveys but now after the entry of spatial technology the effective managing and monitoring of forest resources becomes easy which in turn leads to beneficiary to the nation.

* The role of spatial technology in forest Management:

1. Mapping of land use / Land cover to find out the health of the forest.
2. Estimation of bio mass.

3. Clear cut mapping / shifting cultivation.
4. Deforestation.
5. Mapping of transport network system to reach the location whenever is needed.
6. Effective management of water sheds.
7. Identification of new species.
8. Monitoring of air quality.
9. Mapping of soil fertility.
10. Initiations to protect wild life with the help of satellite technology become easy.
11. Controlling unauthorized entries.
12. Estimation of infrastructure.
13. Estimation of periodical changes with the help of GIS maps easy.
14. Mapping of conversions for urbanization and other development activities becomes easy ..... etc.

Role of RS and GIS applications in agriculture:

Agricultural industry also using GIS techniques for increasing yields, managing resources, reduction of input, cost and prediction of future outcomes and many more applications.

GIS applications are endless at the national and local level, agricultural planners use geospatial data for deciding best zone for certain plant, soil suitability, topography.... etc can be determined by using raintall data. The applications are

a.) Crop health analysis.

b.) precision agriculture.

c) compliance mapping.

d.) yield estimation.

Importance of RS in urban application:

- Environmental monitoring.
- Land cover mapping.
- Site suitability and catchment area analysis.
- Study of transportation system and important aspects both in static and dynamic mode.
- study urban growth.

GIS:

1. Area monitoring.
2. site selection studies.
3. Regional potential and feasibility analysis.
4. Land use policy can be interpreted.
5. Land management and land use planning issues.

Both:

- preparation of base map.
- Growth truth.
- Size, shape, texture.
- Location of pipe line.
- Highway planning & Engineering.
- Site survey for town planning.
- slope stability studies.
- Engineering soil mapping.

Watershed Management:

It can be defined as of area covers all the land which contributes runoff to a common point and surrounding ridge line.

Components:

a.) Human resource development.

b.) water management.

c.) Crop management.

d.) Livestock management.

e.) Afforestation management.

Types:

a.) Macro water shed ⟶ 50,000 Hec.

b.) sub water shed ⟶ 10,000 - 50,000 Hec.

c.) Milli water shed ⟶ 1000 - 10,000 Hec

d.) Micro water shed ⟶ 100 - 1000 Hec.

e.) Mini water shed ⟶ 1 - 100 Hec.

objectives:

1. To increase infiltration of rain water.
2. To improve and increase the production of timber, wild life resources.
3. To check soil erosion.

4. To control damaging runoff.

Factors affecting:

a.) Water shed characters < Size, shape, soil
Topography.

b.) Climatic characteristics < Precipitation.
Intensity of rainfall.

c.) Watershed operation

d.) Land use pattern < Density
Vegetative area.

Merits:

a.) Saving of energy, to lift ground water.

b.) Reduction in soil erosion.

c.) Improvement in the quality of ground water.

Demerits:

a) Higher cost need to built it.

b.) It depends on the rainfall of the area.

c) Water sheds require regular maintainence.