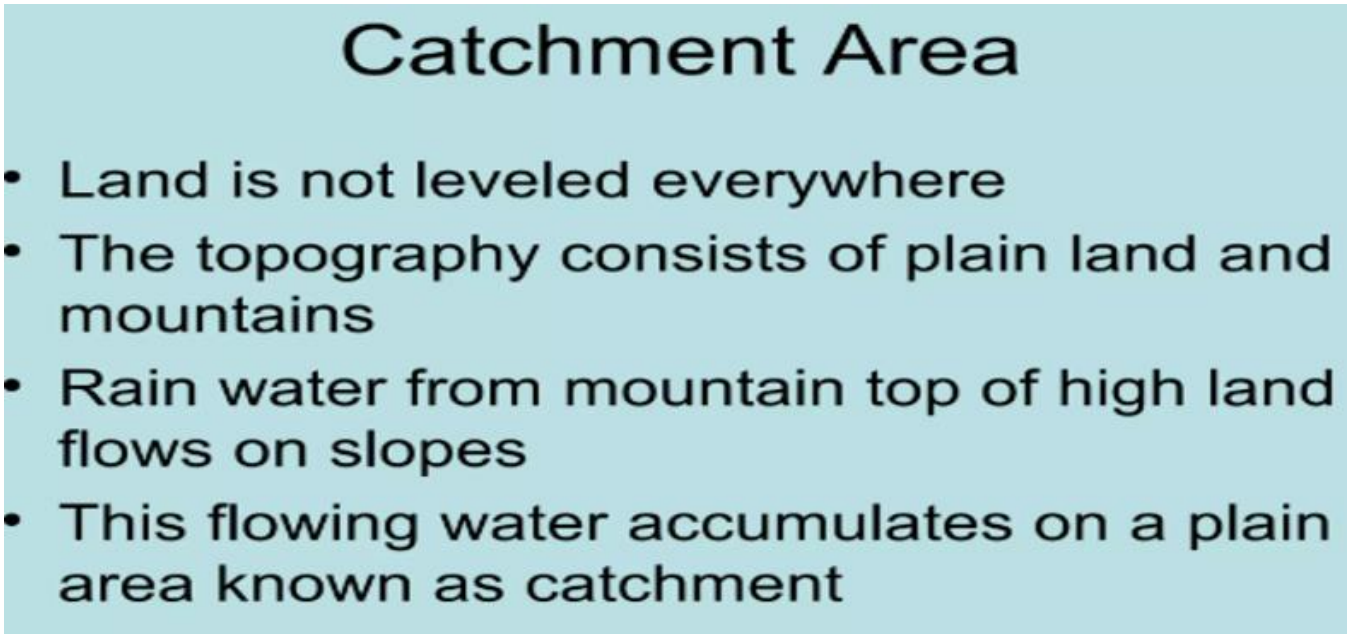
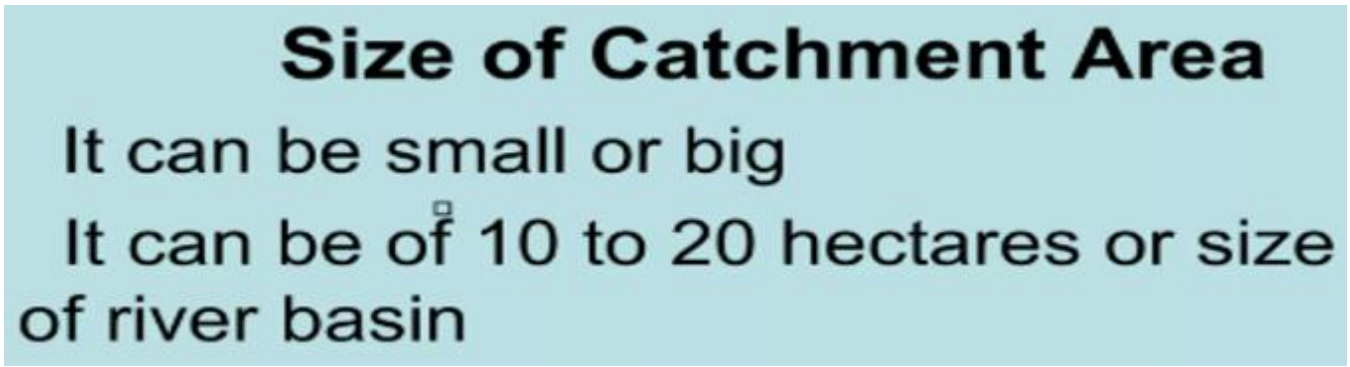
## SOCIO-ECONOMIC CHARACTERISTICS OF THE CATCHMENT AREA

Socio-economic characteristics of a catchment area are crucial for airport planning and design, as they determine passenger demand, operational needs, and economic impact. Key factors include population density, income levels, industry concentration, and cultural characteristics, which influence travel behavior, demand for different services (like freight or business travel), and the airport's role in regional development. Airport planners use this information to forecast demand, optimize routes, and design facilities and services that meet the specific needs of the community.



# How to select a Catchment

- Catchment area consists of a river basin or a source stream
- It can span huge area
- The size should not be small or too big
- Small catchment area is not benefitial for storage
- It should be selected such that minimum 5 villages are benefitted

# Objective of Catchment Area Development

- To make usage of land which is not in use
- To stop soil erosion
- To store rainwater which is wasted
- To bring maximum amount of area under irrigation
- To promote plantation over barren lands
- To make available drinking water for all

# Beneficiaries of catchment area

- Agriculture as well as barren lands
- Villagers
- Domestic animals and cattles
- Forested areas
- Areas under plantation

**Airport site selection:** Airport site selection involves criteria like topography, meteorology, and accessibility, while ICAO (International Civil Aviation Organization) stipulations guide technical aspects such as runway length, orientation, and safety areas to ensure international standards are met.

*Factors for site selection* include land availability for expansion, proximity to population centres, ground and public transportation access, and a location that aligns with regional plans.

ICAO guidelines cover the technical design, including runway and taxiway specifications, obstacle limitation surfaces, and airport lighting, to maintain flight safety.

## Airport site selection

Site selection for an Airport depends upon the class of an airport. Following are the important factors to be considered for selection of site for major airports:

1. **Regional plan:** The selected should suit the regional requirements so that it will become an integral part of the network of airports.
2. **Airport use:** The selection site depends upon the use of an airport whether for civilian or for military operations. In emergencies civilian airport are taken control for military purpose. Site selected should be such that it should give natural protection to the area from air raids and this important for airport in combat regions. If site contains bushes the planes can be hidden by the underground installations.
3. **Proximity to the other locations:** Site selected for a new airport should not interfere for the operation in the existing airport. This depends upon the volume of traffic, type of aircraft and type of air control system adopted.

   Following are the minimum spacing's for guide lines:

   a) For airports serving general aviation aircraft under VFR conditions = 3.2kms

   b) For airports serving bigger aircrafts with two piston engine = 6.4kms

   c) For airports operating piston engine aircrafts under IFR conditions = 25.6kms

   d) For aircrafts operating jet engine aircrafts under VFR conditions = 160kms

4. Ground accessibility: The site should be readily accessible to users. The time to reach an airport should not be more than 30minutes by drive from the residential area or from commercial area. The best location is adjacent to a Highway. Also availability of public transportation system should to be seen.

5. **Topography:** A raised ground or an hill top is usually ideal site for an airport for the following reasons:
   a) Less obstruction in approach zones and turning zones.
   b) Natural drainage.
   c) More uniform wind.
   d) Better visibility due to less fog.
6. **Obstruction:** When aircraft is landing or taking off it loses or gains altitude very slowly compared to the forward speed. For this reason long approach zones are provided on either side of a runway known as approach zones over which aircraft can safely gain or lose altitudes. The area should be kept free of obstructions. The obstruction may be fences, trees, pole lines, buildings and other natural or manmade objects. The future growth can be controlled by zoning laws.
7. **Visibility:** Poor visibility lowers the capacity of the airport. The site selected is free from fog, smoke like industrial areas.
8. **Wind:** Runway should be so selected that lading and take off is done by heading into the wind. The direction of wind opposite to the direction of landing and takeoff. This provides greater lift on the wings of the of the aircraft during takeoff as this provides faster rise much earlier and shorter length of runway. Also during landing the head wind provides breaking effect and aircraft comes to rest in a smaller length of runway. Hence wind data that is direction, intensity and duration should be collected and studied at least for a period of 5 years. This helps in proper orientation of runway and shape of the site needed. The site should be to windward direction of the city so that minimum smoke from the city is blown over the site.
9. **Noise nuisance:** It depends upon path of the aircraft, type of engine and gross weight of the aircraft. The landing and takeoff should pass over the land which is free from residential and industrial area. Buffer zone or acoustical barrier may have to be provided.
10. **Grading, drainage and soil characteristics:** Ground profiles determine the shape of the airport and pattern of the drainage system. The possibility of flooding should be studied. Site with higher water tables which requires costlier subsoil drainage is to be avoided. The most suitable type of soil is like pervious material like gravel and sand combined with natural binder. The soil which becomes plastic when wet is completely avoided.

11. **Future development:** Assuming that air traffic is going to increase in future, more runways may be needed for an increased traffic. Also more facilities may be needed for passengers, baggage and cargo and shelter for aircraft. Additional traffic control facilities may also be needed. Hence larger area is to be acquired initially. Undesirable structures should be prevented in zoning area.

12. **Availability of utilities from town:** Facilities like water supply, sewerage, vishould be given consideration.

13. **Economic consideration:** cost estimates should be prepared for entire airport both initial and final stages. It should include land, clearing and grading of land, drainage, removal of hazards, paving, lighting, construction of buildings, roads, parking areas, landing system and the site which is economical should be preferred.