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Interpretation of Aerial Photography

Introduction to Aerial Photography:

Aerial photography means photography from the air. Aerial photography is one of the most common, versatile and economic forms of remote sensing. It is a means of fixing time within the framework of space. Aerial photography was the first method of remote sensing and even used today in the era of satellite and electronic scanners. Aerial photographs will still remain the most widely used type of remote sensing data.

Aerial photographs were taken from balloons and kites as early as in mid 1800s. In 1858, Gaspar Felix Tournachon took the first aerial photograph from a captive balloon from an altitude of 1,200 feet over Paris. Aerial photographs can be made with any type of camera. Many successful applications have employed aerial photography made from light aircraft with handheld 35mm cameras.

For the study of large areas, high geometric and radiometric accuracy are required and these can only be obtained by using cameras that are purpose built. An object looks smaller on a smaller scale photograph than on a larger scale photo. Larger scale aerial photograph will provide a detailed and high resolution view of a small area. Applications of aerial photography include land-use planning and mapping, geologic mapping, archaeology, species habitat mapping and integration of aerial photography into GIS.

Characteristics of Aerial Photography:

i. Synoptic Viewpoint:

Aerial photographs give a bird's eye view of large areas enabling us to see surface features in their spatial context. They enable the detection of small scale features and spatial relationships that would not be found on the ground.

ii. Time Freezing Ability:

They are virtually permanent records of the existing conditions on the Earth's surface at one point of time, and used as an historical document.

iii. Capability to Stop Action:

They provide a stop action view of dynamic conditions and are useful in studying dynamic phenomena such as flooding, moving wildlife, traffic, oil spills and forest fires.

iv. Three Dimensional Perspective:

It provides a stereoscopic view of the Earth's surface and make it possible to take measurements horizontally and vertically – a characteristic that is lacking for the majority of remotely sensed data.

v. Spectral and Spatial Resolution:

Aerial photographs are sensitive to radiation in wavelengths that are outside of the spectral sensitivity of the human eye. They are sensitive to objects outside the spatial resolving power of human eye.

vi. Availability:

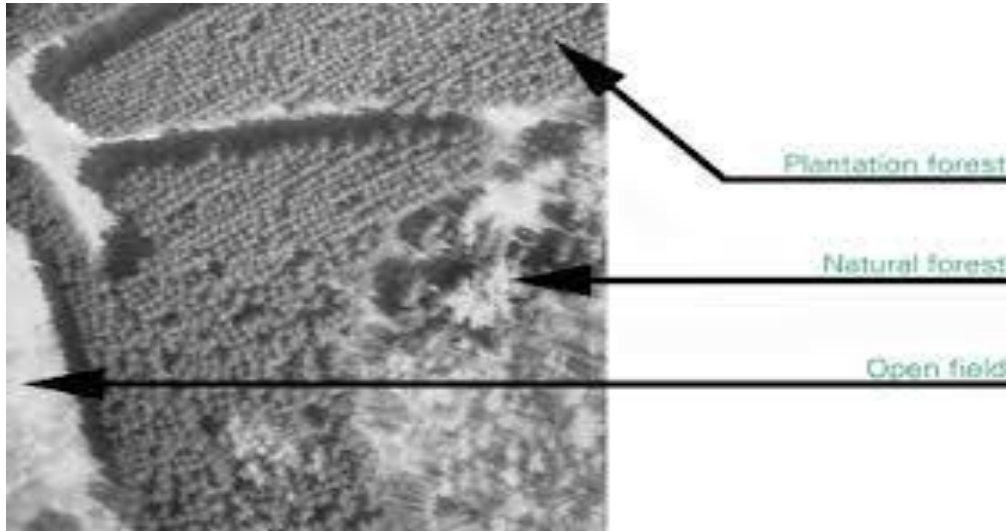
Aerial photographs are readily available at a range of scales for much of the world.

vii. Economy:

They are much cheaper than field surveys and are often cheaper and more accurate than maps.

Aerial Photo Interpretation:

Aerial photographic interpretation is defined as the act of examining photographic images for the purpose of identifying objects and judging their significance.



During the process of interpretation, the aerial photo interpreters usually make use of seven tasks:

- i. Detection,
- ii. Recognition and identification,
- iii. Analysis,
- iv. Detection,
- v. Classification
- vi. Idealization and
- vii. Accuracy determination.

One of the advantages of all aerial photographs is that when taken as overlapping pairs (called stereopairs) they can provide a 3D view or perspective view of the terrain. The most common instruments used are pocket stereoscope, mirror stereoscope, scanning stereoscope and interpreterscope.

An interpreter uses the following basic characteristics of photograph:

i. Tone (also called Hue or Colour)

Tone refers to the relative brightness or colour of elements on a photograph.

ii. Size:

The size of objects must be considered in the context of the scale of a photograph. The scale will help to determine the object.

iii. Shape:

It refers to the general outline of objects. Regular geometric shapes are usually indicators of human presence and use. Some objects can be identified almost solely on the basis of their shapes.

iv. Texture:

The impression of smoothness or roughness of image features is caused by the frequency of change of tone in photographs.

v. Pattern (Spatial Arrangement):

The patterns formed by objects in a photo can be diagnostic e.g. random pattern formed by an unmanaged area of trees and the evenly spaced rows formed by an orchard.

vi. Shadow:

Shadows aid interpreters in determining the height of objects in aerial photographs. However, they also obscure objects lying within them.

vii. Site:

It refers to topographic or geographic location. This characteristic of photographs is especially important in identifying vegetation types and landforms.

viii. Association:

It refers to the occurrence of certain features in relation to others.

Photogrammetry:

It is the science and technology of obtaining spatial measurements and other geometrically derived products from aerial photographs. Photogrammetric analysis procedures range from obtaining distances, area, elevations using hardcopy (analog) photographic products, equipment's and simple geometric concepts to generating precise digital elevation models, use of digital images and analytical techniques. One of the most widespread uses of photogrammetry is in preparation of topographic maps.

