**COURSE : DISASTER MANAGEMENT (MA/ MSc PART I)**  
**Paper : IV**

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**Topic : Components of Remote Sensing**

**INTRODUCTION**

Remote sensing is the science of obtaining information about objects or areas from a distance, typically from aircraft or satellites. 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 from the targeted area. Special cameras collect remotely sensed images of the Earth, which help researchers "sense" things about the Earth.

Remote means away from or at a distance, while sensing means detecting a property or characteristics. Thus, the term remote sensing refers to the examination, measurement, and analysis of an object without being in contact with it.

Remote sensing is the science and art of acquiring information about the earth surface without actually being in contact with it. This is done by sensing and recording reflected or emitted energy and processing, analyzing, and applying that information.

Remote sensing means you are acquiring information from a distance. When you’re outside, the sun emits light. And each object reflects a mix of red, green and blue colors into your eyes. It’s the same for sensors on board satellites work.

But what’s important to know is that there is a whole range of possible wavelengths in the electromagnetic spectrum from short wavelengths (like X-rays) to long wavelengths (like radio waves).

Electromagnetic Spectrum

And this is why remote sensing is such a powerful discipline. Because we can see beyond human vision, this fact alone lets us see things we’ve never seen before. In other words, we can see the invisible.

**COMPONENTS OF REMOTE SENSING**

In much of remote sensing, the process involves an interaction between incident radiation and the targets of interest. This is exemplified by the use of imaging systems where the following seven elements are involved:

1. **Energy Source or Illumination (A)**: The first requirement for remote sensing is to have an energy source which illuminates or provides electromagnetic energy to the target of interest.
2. **Radiation and the Atmosphere (B)**: as the energy travels from its source to the Target, it will come in contact with and interact with the atmosphere it passes through. This interaction may take place a second time as the energy travels from the target to the sensor.
3. **Interaction With the Target (C)**: once the energy makes its way to the target through the atmosphere, it interacts with the target depending on the properties of both the target and the radiation
4. **Recording of Energy by the Sensor (D)**: after the energy has been scattered by, or emitted from the target; we require a sensor (remote, not in contact with the target) to collect and record the electromagnetic radiation.
5. **Transmission, Reception, and Processing (E)**: the energy recorded by the sensor has to be transmitted, often in electronic form, to a receiving and processing station where the data are processed into an image (hardcopy and/or digital).
6. **Interpretation and Analysis (F)**: the processed image is interpreted, visually and/or digitally or electronically, to extract information about the target which was illuminated.
7. **Application (G)**: the final element of the remote sensing process is achieved when we apply the information we have been able to extract from the imagery about the target in order to better understand it, reveal some new information, or assist in solving a particular problem.