Subject: **Environmental Science (Hons.)**

Semester/Year : **2nd Semester/ 1st year**

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Name of Topic: **Land use and Land cover dynamics**

Land use and Land cover dynamics

Land use and land cover dynamics are widespread, accelerating, and significant processes driven by human actions but also producing changes that impact humans. These dynamics alter the availability of different biophysical resources including soil, vegetation, water, animal feed and others. Consequently, land use and cover changes could lead to a decreased availability of different products and services for human, livestock, agricultural production and damage to the environment as well. Changes in land use and land cover conditions could be responsible for the problems associated with hydrological resources.

Land cover is defined by the attributes of the earth's land surface captured in the distribution of vegetation, water, desert and ice and the immediate subsurface, including biota, soil, topography, surface and groundwater, and it also includes those structures created solely by human activities such as mine exposures and settlement.

Land use is the intended employment of and management strategy placed on the land cover by human agents, or land managers to exploit the land cover and reflects human activities such as industrial zones, residential zones, agricultural fields, grazing, logging, and mining among many others.

Land use change is defined to be any physical, biological or chemical change attributable to management, which may include conversion of grazing to cropping, change in fertilizer use, drainage improvements, installation and use of irrigation, plantations, building farm dams, pollution and land degradation, vegetation removal, changed fire regime, spread of weeds and exotic species, and conversion to non-agricultural uses.

Land use and land cover changes may be grouped into two broad categories as conversion and modification. Conversion refers to changes from one cover or use type to another, while modification involves maintenance of the broad cover or use type in the face of changes in its attributes.

Land-use dynamics play a major role in driving the changes of the global environment. Hence, global mapping of irrigated and dry land agriculture, semi-natural areas and forest cover, reflecting their dynamics, can contribute to the assessment of the biophysical implications of land use and land cover change within the Earth's system. Generally, agriculture is found to be the major driver of land cover change in tropical regions. Understanding the mechanisms leading to land use and land cover changes in the past is crucial to understand the current changes and predict the future land cover change.

Land use and land cover change (LUCC) research needs to deal with the identification, qualitative description and parameterization of factors which drive changes in land use and land cover, as well as the integration of their consequences and feedbacks. One of the major challenges in LUCC analysis is to link behavior of people to biophysical information in the appropriate spatial and temporal scales. Land use and land cover change trends can be easily assessed and linked to population data.