

Subject: Environmental Science (Hons.)

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Name of the teacher: Dr. Arijit Chatterjee

**Name of Topic: CLUSTERS OF DRIVING FORCES
OF LAND-USE CHANGE**

CLUSTERS OF DRIVING FORCES OF LAND-USE CHANGE

Changes in land use and land cover result from a myriad of factors acting on the land surface. These factors fall into two large groups, those originating from human activity and those originating from natural forces.

Human Factors

Among the human factors, the size and growth of the human population plays a large role, but it is not the only underlying human cause of land cover change. The impacts of population growth are amplified or attenuated by institutional factors and national and regional policies, as well as processes of globalization, all of which shape economic opportunities that the populations respond to in complex and interrelated ways that ultimately affect land use and land cover patterns. Increasing affluence of the growing population affects consumption patterns, such as the increased demand for processed food, meat, and dairy by the wealthy urban populations, with repercussions on natural resources and land use.

Demography

‘Demography’ is a cluster of driving forces consisting of different components which affect size and composition of population and households.

Economy

Important economic developments affecting land use are: growth in income and trust funds, rise in double-income households, changes in economic structure, global and local market developments (e.g. agricultural products), and organization of production processes.

Technology

Technological developments are an important driving force behind developments in many sectors and the organisation of society as a whole, which often results in land-use changes. Examples are technological developments which increase productivity in agriculture, technological options affecting underground storage or desalination of water, or internet enabling online shopping.

Societal values and trends

Societal values have an important impact on almost any type of land use. For example, changes in people’s lifestyles can directly affect housing types and locational preferences, as well as consumption patterns, and with that the type and location of economic production. More indirectly, societal values regarding nature, landscape or

agricultural production, for example, may affect governmental budgets, such as for nature development, and restrictions and regulations could affect the size and type of agricultural production.

Policies

To realise government ambitions, the various government levels have access to a large and diverse set of policies affecting land-use. These policies can be categorised by dimension:

- Scale: international, national or local;
- Sectoral level: spatial planning or sector specific;
- Type: juridical and financial, and communication/information instruments.

Natural factor

Climate change and energy transition

In addition to human factors, natural factors have also contributed to changes on the land. Climate change influences land use in multiple ways; for example, via rising sea levels, periods of intensified rainfall or drought, changing temperatures and humidity affecting conditions for biotopes or agricultural production. Consequences of climate change, changes policies, such as mitigation or adaptation strategies. With geology and landforms stable over long periods of time, climate is the most dynamic natural factor to affect land cover at annual to decadal time scales. Most importantly, the recurrence and persistence of drought conditions in the semiarid regions have directly changed the land cover by desiccating soils, shrinking water bodies, stressing the vegetation, and exposing bare soil and sandy substrate to erosion. Indirectly, it has affected people's ability to use the land for crop cultivation and for foraging by livestock, forcing them to find other ways of securing their livelihoods, which in turn have altered the land use and land cover.