Chapter 2

Spatio-Temporal change in Land use

2.1 Introduction

Since 1910s agricultural land use are studies in United States under the title of rural sociology. This kind of study mainly focuses on the rural social life and cropping pattern. Such studies are done under national Department of Agriculture and land-grant university colleges of agriculture.

The farmers economy is mainly depend on the cropping pattern which studies under the sociology of food and agriculture. Other areas of study include rural migration and other demographic patterns, environmental sociology, amenity-led development, public lands policies, so-called “boomtown” development, social disruption, the sociology of natural resources (including forests, mining, fishing and other areas), rural cultures and identities, rural health care and educational policies. Many rural sociologists work in the areas of development studies, community studies, community development and in environmental studies. Much of the research involves the Third World.

According David Harvey (1982) agricultural land use and traditional thinking is the main them to understand rural sociology. Haussmann and Robert Moses (1942) focus on the process of capital accumulation from the constraints of older spatio-temporal structures. In the 21st century agriculture land use are similar in the entire world which studies under space and time, environment and place. Such kind of study came under social processes and with what effects. Continuous capital accumulation, for example, will produce a quite different set of land use forms from those achieved under some regime seeking an emancipatory, egalitarian and ecologically sensitive politics. Alternative anti-capitalist possibilities are to some degree already present, even though they are the subject of acute contestation and struggle between factions and classes pursuing radically different interests. The issue is not one, therefore, of gazing into some misty crystal ball or imposing some classic form of utopian scheme in which a dead spatiality is made to rule over history and process. The problem is to enlist in the struggle to advance a more
socially just and politically emancipatory mix of spatio-temporal production processes rather than acquiesce to those imposed by finance capital, the World Bank and the generally class-bound inequalities internalized within any system of uncontrolled capital accumulation. Fortunately, the latter powers, however hegemonic they may be, can never entirely control changing land use (let alone the discursive and imaginary space with which thinking about the land use is always associated). Intensifying contradictions within a rapidly accelerating and often uncontrolled changing land use process create all sorts of interstitial spaces in which all sorts of liberatory and emancipatory possibilities can flourish. How and where these social movements within this process might be mobilized into a more general anti-capitalist politics is then the crucial question.

In the Europe there is also from Society similar to Rural Sociology in United State name as The European Society for Rural Sociology (ESRA) was founded in 1957. In it most of studies are based on agriculture and fisheries, food production and consumption, rural development and change, rurality and cultural heritage, equality and inequality in rural society, and nature and environmental care.” (Friedland, W. H. 1982 603)

There is on international association who work for rural sociology name as The International Rural Sociology Association (IRSA). The subject matter of this association is “foster the development of rural sociology; further the application of sociological inquiry to the improvement of the quality of rural life; and provide a mechanism whereby rural sociologists can generate dialogue and useful exchange.” It published in the International Journal of Sociology of Agriculture and Food. (Home Page of IRAS Web 2012)

Population of the world is increase day by day so the demand of the food increases. It leads to commercialization of agriculture production. This commercialization happens on the basis of change in technology of means of transportation. So the farmers invest more and more capital in his field also there is found change in cropping and general land use pattern. It leads to capitalism.
Capitalism is under the impulsion to accelerate turnover time, to speed up the circulation of capital and consequently to revolutionise the time horizons of development. But it can do so only through long term investments (in, for example, the built environment as well as in elaborate and stable infrastructures for production, consumption, exchange, communication, and the like). A major strategem of crisis avoidance, furthermore, lies in absorbing excess capital in long-term projects (the famous “public works” launched by the state in times of depression, for example) and this slows down the turnover time of capital. There is, consequently, an extraordinary array of contradictions that collect around the issue of the time-horizon (the temporalities) within which different capitals function (the time-horizon of finance capital, for example, is hard to match with the requirements of long-term urban and environmental development).(Harvey 1990)

Capitalism is under the impulsion to eliminate all spatial barriers, but it can do so only through the production of a fixed space. Capitalism thereby produces a geographical landscape (of space relations, of territorial organization and of systems of places linked in a “global” division of labour and of functions) appropriate to its own dynamic of accumulation at a particular moment of its history, only to have to destroy and rebuild that geographical landscape to accommodate accumulation at a later date. Reductions in the cost and time of movement over space therefore run up against the building of fixed physical infrastructures to facilitate the activities of production, exchange, distribution and consumption. More and more capital is embedded in space as landed capital, as capital fixed in the land, creating a “second nature” and a geographically-organized resource structure that more and more inhibits the trajectory of capitalist development in the midst of greater facility of movement. This tension becomes even more emphatic as the institutions of place become strongly articulated and loyalties to places (and their specific qualities) become a significant factor in political action. The production of territorial organization (the formation of local and metropolitan government systems for example) understood as a process makes territorialization, de-territorialization and reterritorialization a continuous feature in the historical geography of capitalism. (Harvey 1990)
Many if not all of the major waves of innovation that have shaped the world since the sixteenth century have been built around revolutions in transport and communications - the canals, bridges and turnpikes of the early nineteenth century; the railroad, steamboat and telegraph of the mid-nineteenth century; the mass transit systems of the late nineteenth century; the automobile the radio and telephone of the early twentieth century; the jet aircraft and television of the Fifties and Sixties; and most recently the revolution in telecommunications. Each bundle of innovations has allowed a radical shift in the way that space is organised and therefore opened up radically new possibilities for the urban process. Breaking with the dependency upon relatively confined bioregions opened up totally new vistas of possibilities for urban growth. Cronon (1991) shows, for example, how the rapid urbanization of Chicago in the nineteenth century realized these new possibilities so that the footprint of that city across the whole of the American mid-West and West became ever larger as its metabolic-ecological relations changed and as it itself grew in a few years into one of the largest cities in the world. And within the city, as Platt (1991) so brilliantly shows in his Chicago-based study of The Electric City, the progress of electrification allowed the construction of radically new and dispersed urban forms.

Each round of innovation breaking the barriers of space and time has provided new possibilities. The steam engine, to take just one highly significant historical example, liberated the energy supply of cities from relatively inefficient and highly localised constraints, at the same time as it freed local hinterlands from a chronic conflict over whether to use the land for food or firewood (contemporary students now find it very odd, for example, that one of the closer rings of production with which von Thunen surrounded his city in The Isolated State of the early nineteenth century is given over to forestry). But the steam engine could only accomplish its revolutionary role to the degree that it was in turn applied to the field of transport and communications: the coal had to be shunted around. It was and is, therefore, the total bundle of innovations and the synergism that binds them together that is really crucial in opening up new possibilities.

And in this, seemingly quite small things can figure large in what created
possibilities for city growth. The military engineers and mathematicians of the eighteenth century, for example, in using water flow as a form of fortification learned that networks were far more efficient in moving water than direct pipes and channels: this recognition (and the study of the mathematics of networks that went with it) had immense significance once it was applied to cities in the nineteenth century: a given head of water flowing down one pipe can provision no more than 5,000 people but that same head of water when flowed around a network can provision twenty times that. This is a useful general metaphor for urban growth possibilities: the development of an interrelated and ultimately global network of cities drawing upon a variety of hinterlands permits an aggregate urban growth process radically greater than that achievable for each in isolation. (Harvey 2001, Pp19)

One of the peculiar and counterintuitive consequences of this process has, however, been the reassertion of the importance of monopoly power. It is not merely the fact that competition (as Marx long ago remarked and as the Microsoft example so recently demonstrates) always ends up in monopoly or oligopoly, though this has obvious relevance to understanding how a few urban centers (usually dubbed “global cities”) have emerged to dominate and control the world of global finance. But it also leads cities to cultivate “monopoly rents” as attractions for highly mobile capital by selling the uniqueness of their location, their culture (frequently produced and invented at will with tremendous emphasis upon so-called “culture industries”), their urban qualities of life (infrastructure and aesthetics) and the security of their real estate markets (booming office and housing rents and values). Such locational monopolies are attractive lures for finance capital for obvious reasons. (Harvey 2001, Pp22)

But the other perspective from which to view the recent history of urbanization is in terms of popular (if not “populist”) seizure of the possibilities that capitalist technologies have created. To some degree this is about the vast historical migrations of labour in response to capital, from one region to another if not from one continent to another. That formulation basically made most sense in the nineteenth and even the early twentieth century’s (though there were always exceptions such as the flood of Irish overseas in the wake of the potato famine that may have been prompted by conditions
of imposed agrarian capitalism but which was hardly a “normal” migration of rural population in search of urban liberties and waged labour). But the flood of people into developing country cities is not fundamentally tied to the pulls of employment attached to capital accumulation or even to the pushes of a reorganising agrarian capitalism destructive of traditional peasantries (though there are many segments of the world where that process is very strongly in evidence). It is a far more populist search to take advantage of capitalist produced possibilities no matter whether capital accumulation is going on or not, and often in the face of economic conditions that are just as, if not more appalling than those left behind. And while one of the effects may be to create vast “informal economies” which operate both as proto-capitalist sectors and as feeding grounds for more conventional forms of capitalist exploitation and accumulation, the explanation of the movement in itself can hardly be attributed to the machinations of some organised capitalist class action. (Portes, Castells and Benton, 1989)

Due to change in production and organizational forms there was an increasing geographical dispersal and fragmentation of production systems, divisions of labour, specializations of tasks, albeit in the midst of an increasing centralization of corporate power through mergers, takeovers or joint production agreements that transcended national boundaries. (Harvey 2001, Pp32)

The world population has almost doubled in the last thirty years. This leads to increase rapid population growth but also through mobile capital mobilizing more and more of the world’s population (including women) as wage labourers.

Increase the profit is desire of each farmer so there is change in land use which leads Capitalism in farms there are many theory of land use put forward by many other. In it one known as Johann Heinrich Von Thunen was a prominent nineteenth century economist. Von Thunen was a Mecklenburg (north German) landowner, who in the first volume of his 1826 treatise The Isolated State developed the first serious treatment of spatial economics and Economic geography, connecting it with the theory of rent. The importance lies less in the pattern of land use predicted than in its analytical approach.
Von Thunen theory is a partial equilibrium approach designed to explain the type of agricultural production that would be best carried out at a given location i.e. deterministic and normative. This theory show how and why agricultural land use varies with distance from market. The intensity of production of a particular crop declines with distance from the market. Intensity of production is a measure of the amounts of inputs per unit area of land i.e. labours, fertilizers, irrigation water, pesticides etc. The type of land use varies with distance from market.

The basic principle underlying the Von Thunen theory is economic rent where by different types of land use produce different net returns per unit area. The two other relationships Thunen emphasized were distance of farms from the market and price received by the farmers.

The relationship between distance and market price is in essence a simple one. The price a farmer obtains for any unit of his product is equal to its price at the market minus the cost of transporting it to the market.

Economic rent is defined as the measures of the level of return, that the market at large would expect a particular price of land to produce. It is basically a measure of the advantage of one price of land over another. This implies that prices of land differ in some respect and that such differentiation is reflected in higher or lower returns per unit of land. Since all farmers receive the same price at any one time and production costs are also assumed to be the same for all farmers, the only basis for such differentiation is the friction of distance, that is, the only advantage that one price of land can have over another price of land is its locational in relation to the market for agricultural products. For this reason, the term lacational rent is used.

The locational rent can be calculated using the formula $LR = Y (m - c) - Ytd$

Where,

$LR$ = location rent per unit of land.
\[ Y = \text{Yield (quantity produced) per unit of land} \]

\[ m = \text{market price per unit of product} \]

\[ c = \text{production cost per unit of product} \]

\[ t = \text{transport rate per unit of distance} \]

\[ d = \text{distance of the unit of land from the market.} \]

It is mostly observed that intensity of cultivation decreases away from the city. If the farm is located close to the city will have an intensive cultivation than the one located away from it. This is because the locational rent on the crops of the farm near the city will be higher than the crops on the farm away.

The market price being the same and the price obtained at the market being the same, the locational rent will be determined by the cost of transportation. The cost of transportation will be less for produce of the farm near the city and hence a higher locational rent.

Intensity of production can be increased with the application of inputs like fertilizers, seeds, irrigation, labour etc. for both the farms nearer the city and away from city. Increase intensity will lead to higher yields and higher the yield higher will be the transportation cost. For the farm away from the city the cost of transportation will be higher and this increased transportation cost will offset to a larger extent the increased the production. For the crops grown on the farm near the city the locational rent will be higher because 1. The yields and consequently production will be higher 2. The cost of transportation is low.

Thus greater distance from the market one cannot afford to intensify the production with additional inputs and costs because the returns that are received from higher yields do not outweigh the greater transport costs to the market. More extensive cultivation is better for agricultural land away from the market since it can be done at lower cost making the returns greater.
2.2 History of agriculture in the India

In India agriculture is started 10000 years ago in which there is found domestication of crops and animals. The beginning of agriculture leads to settled life with techniques improvements and application in the field. The climate of India is monsoon types which promote two harvests seasons in a year. Due to the trade Indian products reached to world market and foreign crops were introduced to India.

In the middle age techniques of irrigation was improved remarkably it affecting the crops which leads to economies of Islamic kingdom in India. Land and water management systems were developed with an aim of providing uniform growth despite some stagnation during the later modern era the independent Republic of India was able to develop a comprehensive agricultural programme.

In India and its surrounding country there was only dominancy of wheat and barley crops and after that domestication of sheep and goat in early age of agriculture (10000 years ago). In the period of the Neolithic revolution (roughly 8000-5000 BC.), agriculture was far from the dominant mode of support for human societies. But those who adopted it, have survived and increased, and passed their techniques of production to the next generation. This transformation of knowledge was the base of further development in agriculture. By the 5th millennium BC agricultural communities became widespread in Kashmir. The cotton was grown in India in between 5th millennium BC to 4th millennium BC. The modern base of cotton industry is rooted very ancient time. Method of cotton spinning and fabrication continued since ancient time in India.

In Indian subcontinent there is found various fruit like mango, muskmelon etc. Wild Oryza rice appeared in the Belan and Ganges valley regions of northern India as early as 4530 BC and 5440 BC respectively. Rice was cultivated in the Indus Valley Civilization. This rice cultivation was found in Kashmir and Harrappan region of India since 2nd millennium. Also mixed farming was performing in Indus valley.

The irrigation facility was developed around 4500 BC in Indus Valley civilization. This irrigation facility is developed with planned settlements. Also in this area there was
found artificial reservoirs at Girnar dated to 3000 BC and canal irrigation was started 2600 BC.

**Vedic period- Post Maha Janapadas period (1500 BC – 200 AD)**

In India summer monsoon is longer and have contained moisture in excess. In India, both wheat and barley are held to be Rabi (winter) crops and—like other parts of the world—would have largely depended on winter monsoons before the irrigation became widespread. The growth of the Kharif crops would have probably suffered as a result of excessive moisture. Jute also cultivated in this period for making ropes and cordage. Some trees also domesticated for worshiped and medicinal uses.

Also in this period there was found soil classification and metrological observation for the purpose of agriculture (322 – 185 BC The Mauryan Empire). In this period there was constructed and maintenance of dam for irrigation purpose.

**Early Common Era – High Middle Age (200 – 1200 AD)**

In the Early Common Era there was found the evidence of agricultural crops such as rice, sugarcane, millets, black paper, various grains, coconuts, beans, cotton, tamarind, sandalwood, palm etc. in Tamil people they also know about Systematic ploughing, manuring, weeding, irrigation and crop protection. Water storage systems were designed during this period. Kallanai (1st-2nd century AD), a dam built on river Kaveri during this period, is considered the as one of the oldest water-regulation structures in the world still in use.

In India the Spice trade is much popular at this time. Also in this era Chinese sericulture are practiced in India. The technique of Crystallized sugar was discovered and the earliest reference of candied sugar comes from India.

**Late Middle Ages - Early Modern Era (1200 – 1757 AD)**

In this age there is found the fusion of Indian and Persian irrigation technology which brought revolution in agriculture techniques. It leads to economic growth and
growth of material culture. In this era there was found agricultural zones which producing rice, wheat or millets. Rice production found in Gujarat while wheat production was mainly north and central India.

1. **Colonial British Era (1757 -1947 AD)**

   British Empire rule over India there is found global market for commercial crops such as Cotton, indigo, opium, and rice. The second half of the 19th century saw some increase in land under cultivation and agricultural production expanded at an average rate of about 1% per year by the later 19th century. Due to extensive irrigation by canal networks Punjab, Narmada valley, and Andhra Pradesh became centres of agrarian reforms. Roy (2006)

2. **Republic of India (1947 AD onwards)**

   After the independence Indian government drives the special program name as five year plan for the improvement of food and cash crop supply. For this they grow more food campaign and Integrated Production Programme. In this five year plan government pay attention towards Land reclamation, land development, mechanization, electrification, use of chemicals—fertilizers in particular, and development of agriculture oriented ‘package approach’ of taking a set of actions instead of promoting single aspect soon followed under government supervision.

   In India from 1960 there was improvement of agricultural production and it supportive activity because Green Revolution (1960), Yellow Revolution (1986-1990), White Revolution (1970-1996) and Blue Revolution (1973-2002). It means that use of Biotechnology for the earlier reforms and the newer innovation of agriculture. After that market based agriculture are practiced by some Indian farmers.

   Agro processing industry was emerged after 1980 which gives the more benefits to farmers. Also exports of agricultural product grow at well over 10.1 % annually since 1990s. Now a day there is one new trend known as contract farming is arise, it also gives the more benefit to the farmer.
After the independence India become one of the larger producers of wheat, edible oil, potato, spices, rubber, tea fruits and vegetables in the world. The government of India pay attention for improvement of quality and quantity of agricultural product for this they established the various institution for agriculture related research. These organized under the Indian Council of Agricultural Research (1929), The National Dairy Development Board (1965) and National Bank for Agriculture and Rural Development (1982).

Now agriculture acquires 22% of India’s GDP and 58% of country’s workforce engaged. Also India is leading country for the production of milk, fruits, cashew nuts, coconuts, ginger, turmeric, banana, sapota, pulses, and black pepper. India is the second largest producer of groundnut, wheat, vegetables, sugar and fish in the world. India is also the third largest producer of tobacco and rice, the fourth largest producer of coarse grains, the fifth largest producer of eggs, and the seventh largest producer of meat.

2.3 INDIAN COMMERCIALIZATION OF AGRICULTURE

When agriculture products are primarily use for sale in distant markets, rather than to meet their own needs for food or to sell in local markets is known as commercialization of agriculture. In India now a day’s many commercial crops are taken like cotton, tobacco and sugarcane which fairly grow in British rule because land revenue had to be paid mostly in cash and the prices of these crops were much higher at that time relative to the prices of food grains. Thus, commercialization of agriculture in pre-British period existed only in its embryonic form.

The base of commercial agriculture in India was started during British rule because in British Rule market are expands and agricultural crops are improved by qualitative as well as quantitative. In India qualitative changes found in three stages ‘First, before the British rule, product markets were constrained and subject to imperfections, given multiplicity of weights and measures, backward and risky transportation systems, and extensive use of barter. British rule and the railways weakened these constraints. By doing so, it enabled closer integration of global, regional and local markets. Second, from the time of industrial revolution, a new international specialization began to emerge
as a result of trade. India specialized, in agricultural exports. Third, in turn, changes in the product market induced changes in land, labour, and credit markets’.

A. Effects of Globalization

According to economists, there are a lot of global events connected with globalization and integration.

It is easy to identify the changes brought by globalization.

1. Improvement of International Trade. Because of globalization, the number of countries where products can be sold or purchased has increased dramatically.

2. Technological Progress. Because of the need to compete and be competitive globally, governments have upgraded their level of technology.

3. Increasing Influence of Multinational Companies. A company that has subsidiaries in various countries is called a multinational. Often, the head office is found in the country where the company was established.

4. Power of the WTO, IMF, and WB. According to experts, another effect of globalization is the strengthening power and influence of international institutions such as the World Trade Organization (WTO), International Monetary Fund (IMF), and World Bank (WB).

5. Civil Society. An important trend in globalization is the increasing influence and broadening scope of the global civil society.

B. World Trade Organization (WTO)

Until the end of 1994, there was no multilateral or international trade organization. Between 1947 and 1994, eight rounds of negotiations took place under the aegis of the General Agreement on Tariffs and Trade (GATT). The first seven rounds concentrated on tariff reductions and commodity agreements. The last round, the Uruguay Round, lasted over seven years from 1986-1994, and widened the ambit of discussions to cover subjects like tariffs, non-tariff measures, rules and services, intellectual property rights,
dispute settlement, textiles and clothing, and agriculture. The Uruguay Round of trade negotiations ended with an agreement founding the World Trade Organization. In April 1994, 104 members became signatories to the agreement with minor changes in the original draft and the final Act came into force from January 1, 1995. At this stage, the WTO membership grew to 135 countries.

The formation of WTO has posed certain challenges such as reduction of tariff barriers and liberalization of traditional trade in goods and services, etc. The WTO is not a simple extension of GATT. It completely replaces GATT and has quite a different character. While GATT was applied on a provisional basis, WTO commitments are full and permanent. Secondly, GATT applied to trade in merchandise goods whereas WTO covers a whole range of trade-related issues.