

Natural Principles of Land Use

INTRODUCTION

LAND USE of any place varies according to the variation in the spatial distribution of sun rays, rainfall, topography of the land, drainage condition, availability of minerals and the location of human habitations in relation to the market centres and transportation lines.

The spatial differentiation of these elements affect the purpose and character of land use. The whole land of the earth surface has, thus, potential value for some use or group of uses, although the area suited for any one use is often quite limited. So far as the principle of land use study is concerned, this can be studied under various uses e.g. agriculture including livestock farming, urban, industrial, recreational and transportational uses, etc.

GENERAL PRINCIPLES OF LAND UTILIZATION

The formation and functioning of land in relation to man is always governed by some inherent laws as the land has the productive capacity of foodgrains, minerals and water, and is the base of all human actions including shelter. In this way, the study of land utilization have some inherent principles which are as follows:

The principle of maximization: This principle emphasized that the utilizer of land and enterprises tend to maximise their value returns. The veracity of this principle lies in the assumption that economic behaviour is regional in the sense that people are motivated by a desire to make use of most of the resources at their command. Personal experience shows that people act in a manner approaching national behaviour because their

actions are purely haphazard but reflect and attempt to maximise the utilization of land in an earnest possible manner. The practical application of this principle may also be illustrated by agricultural production in densely populated nations and in relatively new, sparsely settled areas. In a country where supply of labour is large and a huge amount of capital is accumulated through saving and thrift, only a small fraction of land is available for agricultural use. Agricultural production will be characterised by intensive cultivation with much input, capital and labour. Hence per acre yield will also be comparatively large. In contrast to this labour is relatively scarce in a newly sparsely settled areas of abundant agricultural land, but capital is even more scarce. Hence very few units of capital and labour will be applied in the given territory, and utilization will be extensive. On the other hand, large amount of land will be utilized in an extensive farming with only small investment of capital and labour per acre. In those areas the cultivated land operated by given individual tends to be several time more than that operated previously.

The use of land is also determined by the cost involved and the incurred profit. Thus the purpose of land use study is to search the possibilities of maximum profit after choosing the alternative better use. As for example suppose a farm is engaged in mango garden but the same is not profitable in terms of supplying food to larger number of people. Hence on such plots the cultivation of food crops with better infrastructure facilities could be suggested.

The equi marginal principle: The maximization of land utilization could be achieved through the operation of equi marginal principle. This can be stated after considering effective competition, the division of fixed quantity of use among the number of different uses so that they apportion each use an amount sufficient for increment of a gain and every use might be put for maximum profit. The transfer of resources from one use to another will occur until the rate of achievement from transference equals the rate of loss from withdrawal. A consumer will transfer his expenditure from food to clothing. In case the additional units of clothing will yield satisfaction equal to what had been gained from additional units of food, because additional food would have added greater

satisfaction in comparison with clothing, and for this fact transfer of food into clothing on equi marginal principle is not feasible.

The principle of diminishing marginal rate of substitution: The increasing amount of production and consumption, the increment of satisfaction diminishing for any type of land utilization. It is true when two goods are substituted for one another. The smaller quantities of greater goods are necessary to compensate for the substitution of another good. This is a simplest form of the principle of diminishing marginal rate of substitution. As for example the use of land for vegetable cultivation is less and less in terms of production of rice as the farmer substitutes the first for the second. The same applies to an enterprise when machines are substituted for men. From the operational view of the principle the condition of equilibrium for the individual and also for the utilization of land as a whole is necessary. In case of determining marginal rate of substitution associated with the diminishing utility did not apply once a farmer began to use the land for vegetable cultivation.

The principle of diminishing marginal productivity : According to Malthus the growth of population surpassed food production and food supply and this principle is known as the principle of diminishing physical return. Malthus induced that land could not produce food as fast as population could expand. As our experience goes it is impossible to secure the same proportion of return with the additional input of labour capital and management given to a piece of land for indefinite period. The principle of diminishing productivity applies to the factors of production and determine maximum output with a combination of number of productive parameters.

The principles of specialization and comparative advantage: This principle of land utilization shows that each and every crop cannot be produced with the same amount of benefit and the same level of production. As for example, black soil is most suitable for cotton production. Calcareous mixed with alluvium and volcanic soils are suitable for sugarcane cultivation, etc. but any change in the above set pattern of specialization in land utilization may drastically reduce the production in comparison with cotton and sugarcane respec-

tively. Hence in the selection of alternative use of land instead of cotton and sugarcane would result into loss of production and income.

The principle of first choice: The principle of comparative advantage is commonly referred as the principle of first choice. In case for the production of a crop only a limited number of land are qualified in production to the need, it will be the first choice of such lands. This principle can also be applied in terms of regional location of land utilization after considering the input-output ratio and the maximization of production, on a particular piece of land.

The principle of mapping and search for alternative better utilization of the land: Mapping the use of land through field to field survey, data analysis, cartographic analysis of maps in statistical analysis are the fundamental issue of this principle. This is because land is the base of all types of human decisions. Hence the search of alternative utilization of land involves the following issues:

- Land is the free gift of nature to man for sustenance of life either through forest gathering or subsistence agriculture,
- to increase the productive capacity of land,
- each land have fixed boundary according to human needs and physical resistance factor of nature,
- each land have owner under certain customary rights,
- each piece of land has some utility of agriculture, settlement road, fence, factories, playing ground, garden, aerodrome, etc.
- each piece of land used by man have some economic rent in terms of labour, mind, cash, distance covered and input,
- land use is the product of the demand set by people of any race, religion and income,
- hence with the concept of demand and supply under certain input-output ratio the competition between land use arises and this automatically pave the way for better alternative use of the land.

Optimization of the quality of land use in relation to environment: Under this principle it is impossible to establish a reindeer farm in Equatorial belt because one can rear rein-

deer in colder areas only, not in warm climate. Thus the optimization of the use of land should be searched in the similar environment with favourable ecological conditions and in the same environment in which maximum production could be achieved with better infrastructure facilities.

Principle of increasing the efficiency and capability of the land: This principle is to increase the efficiency and capability and capability of land after knowing the shortcoming through land use survey and classification. With the help of better irrigation, seeds, fertilizer, deep harrowing and intensive cultivation the efficiency and the capability of land could be raised.

Fixation of cropping system around human habitation for least effort and less cost travel: Man tries to set things at accessible points with less cost, and time involved in travelling. Hence the desire to see the presence of almost all categories of land use give rise to competition in between the varying objectives of the use of land. This is because the perishable and costlier vegetables and crops are generally raised near the settlement, while less costlier crops find places away from the village site. For the presence of inherent quality, fertility, productivity of the land, soil conservation practices, manuring, management of irrigation, etc. are important aspects which should be essentially considered by a land use investigator.

Conservation of land for future judicious use: Conservation means the reduction of the rate of exhaustion of productive capacity of land resource in order to bring more and more land under cultivation. This includes the saving of land from the hazards of erosion, insects and pests and on the other hand, the input of fertilizer, irrigation, intensive labour and defence of crops. This also includes consolidation, improving the techniques of farming and proper judicious use of land by avoiding wasteful cultivation.