

# Factors Affecting Agricultural Productivity: Geographical Analysis

## Abstract

The technological factors relate to improved seeds, manures, fertilizers, irrigation, facilities, implementation of modern technology, insecticides and pesticides and other farming practices. As for as the institutional factors are concerned the size of holding, nature of ownership and type of tenancy may be cited. The study of soil moisture is of great importance. It is essential to consider how soil and how the rain or irrigation water received by the soil is disposed. Light and sun shine are also very essential for the growth of plant and process of forming carbohydrate which makes up a large proportion of their bodies being initiated by the intake of energy contained in light from the sun. This is one of the reasons that our new achievements have not reached to the farmer. Their fields are smaller and scattered. The small holding leads to great waste of time, labor and cattle power.

**Keywords:** Fertilizers, Manures, Soil.

## Introduction

Increasing out-put per hectare of lands in the main problem which is attracting the attention of most of today. Land for agricultural purpose is limited while the population is increasing at the fast rate; it is, therefore, the major concern of the agricultural to fight against the odds provided by some factors of agricultural productivity. It is a well known fact the agricultural productivity is influenced by a number of complex factors. The main sets of factors are physical, technological and institutional. Among these sets of factors the climate and soil is the chief constituents of the environmental or physical factors. The technological factors relate to improved seeds, manures, fertilizers, irrigation, facilities, implementation of modern technology, insecticides and pesticides and other farming practices. As for as the institutional factors are concerned the size of holding, nature of ownership and type of tenancy may be cited. According to D. Stamp, "The crop productivity per unit area depends partly on the nature factors of soil and climate and partly on the management and organization of farmers"<sup>1</sup>.

The regional variation on the crop productivity is very much influenced by variation in climatic condition. According to prof. Shafi, "The natural advantage of soil and climate, however, influence to a significant degree the overall production of crops and show a direct bearing on agricultural efficiency"<sup>2</sup>. While measuring crop productivity, therefore, climatic constituents and soil should be taken into consideration. These factors produce major change in the average as well as with crop productivity. Rainfall is the integral to the crop productivity. Rainfall provides moisture to the crops and grass land through soil. The most frequent cause of infertility or defective productivity is an unsatisfactory moisture-air status in the soil. This means that either there is deficiency of moisture or deficiency of air in the soil. Excessive moisture is not a harmful factor. However deficiency of air, which is caused due to the fact that pore spaces of soil are completely filled with water and thus the air is completely excluded, leads to ill-growth of plants.

It is obvious that for the satisfactory growth of crops, abundant moisture is necessary. The study of soil moisture is of great importance. It is essential to consider how soil and how the rain or irrigation water received by the soil is disposed<sup>3</sup>. Light and sun shine are also very essential for the growth of plant and process of forming carbohydrate which makes up a large proportion of their bodies being initiated by the intake of energy contained in light from the sun. Sunshine is desirable for rapid growth and ripening of crops.

## Aim of the Study

1. Calculate the percentage of soil moisture.
2. To analyse the label of crop production per hectare.
3. Calculate the percentage of used Manure and Fertilizer.



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**Soil**

Soil is derived from rocks. The weathering processes are responsible to produce soil. Soil is composed of four major constituents. They are inorganic particles, organic material, water and air<sup>4</sup>. A good soil must be freely drained but must be of such a texture that adequate moisture for plant growth is retained in the soil. The fertility or productivity of a soil is more dependent on satisfactory water condition than on the natural content of plants foods. The fertility of the soil also depends on the chemical composition of the soil.

The essential elements of plant growth are carbon, hydrogen and oxygen which are derived from air and water while phosphorous, potassium, sulphur, calcium, iron, magnesium, boron, manganese, copper, zinc, molybdenum and chlorine are detained from the soil. Nitrogen comes from both soil and air. Nitrogen, phosphorous and sulphur in the soils are the constituents of organic matter. These three nutrients become available to plants only after biological decomposition takes place. The unrecompensed minerals of the primary importance are necessary to supply power to the plant. The secondary weathered minerals have greater power to supply nutrients to the plants. Phosphorous is needed after the need to nitrogen has been met. These two are restored to the soil by animal manure. The third is potash which is restored by farm yard manure or by artificial fertilizers containing potassium. Deficiencies are not always revealed by chemical analysis. For example, only a fraction of the phosphorous found on soil analysis is actually available to the plants<sup>5</sup>. The minor nutrients elements copper zinc, molybdenum may be deficient in soil to the point where they limits yield and affect the quality of crop<sup>6</sup>. A deficiency of boron leads to the cranky interior of some apples. Manganese deficiency affects greatly the yield of peas and potatoes<sup>7</sup>.

**Manures**

Manures constitute the soul of soils. Green manure is the principal means of adding organic matter to the soil. The green manure crop supplies organic matter as well as additional nitrogen particularly it is a legume crop. A leguminous crop not only produces 8 to 25 tons of green matter per hectare but also adds about 60 to 90 kg of Nitrogen when ploughed under<sup>8</sup>. The experimental data regarding intensive cropping in the past few years in the different parts of country indicate that the best return out of chemical fertilizer is obtained when the chemical fertilizer are used along with the bulky organic manure which act as soil amendent<sup>9</sup>.

Farmyard manure is valued all-round soil improver. It does not enter into competition with common fertilizers but should be used in conjunction with them. Its values are greater that can be assessed by the consideration of its content of plant nutrients. Not only does its supply to a greater or lesser extent all the plant foods that are likely to be deficient in agricultural land, but it improves the texture and tilth of soil. It also increases its capacity to hold water and to retain soluble nutrients that would otherwise be washed down beyond the root range of crop life. An average sample of dung contains where-as in Indian condition, it contains 3 percent potash<sup>10</sup>.

Most of the nitrogen in dung is contained in organic forms and some only becomes readily available for crops. For centuries, night soil has been used as valuable manure in china, when used in raw state, it is a hazard to health, but when dried, composed or otherwise treated, it is relatively less harmful. In India, it has been estimated that 3.5 million tons annually are available. Night soil has an approximate composition of one percent nitrogen, .5 percent  $P_2O_5$  and .1 percent K.O. Besides these, there are certain crops which are to be ploughed under as manure to improve the soil for a succeeding crop. These crops are known as green crops. The importance of leguminous crops and their use as green manure in improving soil productivity has been long known to the Indian farmers<sup>11</sup>. The growing of leguminous crops like sanhemp and dheincha in rotation with cereal or case crops help not only the supply plant nutrients but also to maintain soil fertility. Indian soil is in such a state that there is neither increase of production. It is, however, not difficult to increase the yield per hectare by manures and specially manures with nitrogen for which the land has the greatest hunger.

**Artificial Fertilizers**

To-day, the area needs more and more output from the land. In the developing world like India, where population is the most serious factor, it is necessary to keep pace with the growing demands for food grains. If man struggles for producing maximum food per unit area, per unit time, there is no alternative except to depend more and more on fertilizer. The fertilizer has been playing a major factor in raising agriculture productive. It is true that the level of fertilizer's use per hectare of cultivated land is closely linked with the level of crop production per hectare. Fertilizers are often regarded as substitutes for animal manures, but that is not a correct interpretation of their purposes. Animal manure improves soil condition and supply of nutrients, but they (fertilizers) are essentially the by-products of a particular form. Applying the commercial fertilizers, it is possible to improve fertility.

The high yield potential of the new cereal varieties can be achieved only, if they are used in conjunction with adequate impute of fertilizer and water, careful attention of crop protection, and generally high standards of farming. For most traditional varieties of wheat and rice, fertilizer responses fall off at about 40 to 50 kilograms of nitrogen per hectare. For high yielding varieties, the response increases up to 100 kilograms N, 40 to 60 kilograms  $P_2O_5$  and absent 40 kilogram  $K_2O$  per hectare<sup>12</sup>. Pests and diseases are another problem. In addition to close attention to crop protection measures, it is essential to develop a number of disease resistant varieties. Better cultivation practices are also needed while introducing the high yielding varieties. Raising the agricultural productivity, the technological problem should be assessed in relation to the level of production and input per hectare. The technical problem is neither a social nor an economic one. It is also not a problem of organization. The main headache is the media through which the farmers can be educated regarding the new techniques and

technology which aim at increasing the productivity. Our farmers are illiterate and uneducated so it is necessary to create such type of environment which will enable them to put the new techniques into practice<sup>13</sup>.

#### Conclusion

The influence of land tenure system is often over riding. This is one of the reasons that our new achievements have not reached to the farmer. Their fields are smaller and scattered. The small holding leads to great waste of time, labor and cattle power. Presently many difficulties are experienced with regard to the use of irrigation facilities and protection of crops from local diseases. The credit system should be expanded in order to purchase different inputs. It is very necessary to pay more attention to price relation and other factors influencing the farmer's incentives to purchase inputs in order to raise the production and sales. The problem of marketing of surplus commodities and storage facilities should also be looked into. Efforts should be made to popularize modern technology so that productivity per hectare could be enhanced.

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