CHAPTER IX

NATURAL RESOURCES

Resources may be defined as that part of man's physical environment on which he depends for support in obtaining the means to attain certain needs. The significance of resources as ultimate means to satisfy needs would depend not only on the properties of the individual physical assets that make up a country's resource-base, but also on the complex relationships existing between these single assets. These relationships are influenced by the availability and accessibility of complementry and co-operant resources and by present or expected marked conditions.

The inherent qualities and attributes of a resource are not sufficient to enable it to participate in production and to acquire value in the process. For this purpose it is also necessary that co-operant or complementary resources (factors of production) should be available and that there should be a market for the

1. Erich Zimmerman - "What we Mean by Resources" in L. Drummond, (ed.) Texas Looks Ahead, Austin, Univ. of Texas, 1944, Chap.1.
resulting product. Access to co-operant or complementary factors of production and access to the market (or demand) are essential to the concept of an economic resource. The value of an economic resource depends upon the terms on which the requisite complementary factors of production are available and on the strength of the market demand for its products. Thus, its value depends in part on the market for the goods which can be produced with or from it and in part on the market for other goods which can be produced with necessary co-operant factors of production.

Resources have been classified as natural and artificial, reproducible and non-reproducible, actual and potential, and static and dynamic.

Natural resources include endowments and attributes provided by Nature. They are the gifts of nature. Artificial resources consist of manufactured and synthetic man-made materials. The distinction between natural resources and produced resources is generally blurred, since human skills and efforts as well as capital (produced resources) are commonly used to improve or


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increase the economic productivity of natural resources such as land or rivers. Improvements in transport and the activities of traders have frequently altered the facts of geography. Agricultural production in many parts of the world depends quite as much on the construction and maintenance of irrigation channels, dykes and drainage as on "the original indestructible powers of the soil". The very soil for farming operations has sometimes had to be gathered together by cultivators, or made productive by clearing, terracing, and the like. Nevertheless, it is convenient for purposes of exposition to consider successively three broad categories of resources, viz., natural material resources, human resources, and produced material resources or capital.

The sub-soil and subterranean natural resources have usually been considered non-reproducible. However, such a classification is unsound due to the extent and limit within which a resource is reproducible or non-reproducible. The division of physical assets into two classes, reproducible and non-reproducible,
although vague, has not been abandoned completely.

Potential resources are those goods which lie dormant due to lack of knowledges and technology. If unearthed they would be promising. Whereas actual resources are those which have already been exploited and are accesible and have been equipped with economic usefulness and value.

The value of a resource does not depend upon its physical qualities or technical efficiency alone. A complex network of present and future market influences, forms, part of the environment in which value is conferred upon resources. It follows that the value of any one resource is dependent on the value of other resources. It is therefore somewhat misleading and arbitrary to treat particular resources, or categories of resources, in isolation unless the interdependence of resources is kept firmly in mind.

The exponent of static school hold that resources in the world are static and fixed. On the other

hand, the supporters of modern dynamic school hold that resources are functional and operational. Beyond doubt, the total matter of planet earth is undoubtedly constant and fixed, but within the sphere of the earth this matter can be transferred from one region to another and therefore can be considered dynamic in this sense.

Nature provides the basic materials which man utilizes and upon which man develops his economic life. And so there is close correlation between natural endowments and human economic activities. Minerals and metals have formed at all times an integral part of man's material needs. This is clearly brought out by the fact that various civilizations have been named after them.

The potentiality of natural resources is not automatically realized. A mere physical presence of natural resource is not a condition for economic development although they help its initiation and support its ongoing nature. It is the power and the ability to

optimally exploit these resources in the process of expansion and transformation of the production frontier that is important. The economic value of an industrial resource in its natural state depends upon (a) its chemical composition and grade, and hence the costliness of refining or purifying it to normal market standards, (b) its inherent transportability and (c) its accessibility to means of transport to other complementary materials and to markets.

The use of resources and the role they play in the economic life of people depend on the form of adaptation to a given environment, that is to say, on technology. The relationship of resources to the kind and level of technology is very intimate. In many underdeveloped economies there are deposits of many minerals that are not being used because of technological deficiencies. In fact, resource function is the result of a combination of nature, man and culture (technology). This combination differs from place to place and from time to time. And, naturally, resource function also varies. Economic activities differ. Functions and development of

resources differ from place to place, and herein lies the
genesis of development and underdevelopment.

Experience of developed countries tells
us that the dearth of natural resources can constrain
economic growth only to a limited extent as natural
resources are interchangeable with human resources of
capital, skill know-how and technology. The best examples
in this context are Japan, Hongkong and Israel.
Undoubtedly, the quantity and quality of natural resources
at a society's disposal are both the cause and the
consequence of its development. Resource availability is
not a sufficient condition for economic change and resource
scantiness is not inevitably fatal to economic progress.
certainly, without a minimum of resources there is not much
hope for economic development. The almost physiocratic
idea of linking economic growth tightly to available space
and natural resources does not fit in modern circumstances.
Japan today is the third industrial power in the world
with a high level of economic development despite

9. David Horowitz - Natural and Human Resources as agents
of Economic Growth, Rehovot conference on Economic Growth
in Developing Countries - Materials and Human Resources
Sep - 5-11, 1973, Israel.
scarcity of natural resources. Another example is Israel, a country with a pronounced scarcity of natural resources and yet an outstanding record of rapid economic development.

However, over much of the under-developed world there is no such pronounced lack of natural resources. Climatic conditions are also not so unfavourable as to present insurmountable barriers to development. It would be an oversimplification to suggest that the under-developed countries in general are ill-favoured with natural resources and have niggardly endowments, especially of minerals and fertile land, and that this is a principal cause of their poverty. All developed countries began by being under-developed by modern standards. Indeed they remained in this state until quite recently. The natural resources in their territories, whether rich or poor, have only been developed within a comparatively short period of history.

The relative role of natural resources in economic development tends to decrease as an economy grows. In his paper entitled "A General view of Natural Resources

10. P.T. Bauer and B.S. Yamey - op.cit. in Economic Growth" presented to the conference on Natural

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Resources and Economic Growth, Professor Theodore Schultz suggested that the ratio of natural resources to the complex of all resources used by a country in the creation of its national income falls from about 20-25 per cent to a low level of about 5 per cent as an economy advances from lower to higher stages or as we move from a preindustrial to a developed economy. The declining importance of resources is principally associated with a relatively low income elasticity of demand for agricultural products, changes in the production functions caused by improved techniques, better seeds and fertilisers and more efficient land management. The result is a diminution in the land input per unit of output.

Economic progress may occur inspite of an overall meagerness of resources and a lack of specific raw materials that happen to be important elsewhere. We have already stated that Israel and Japan are good cases in point. This is not to say that the greater availability of resources to a country already on its way to economic development will not facilitate the process of economic change by increasing the number of alternatives facing the country and raising the level of expectation and
possibilities for successful development. Rather, what we want to stress is that the role of natural resources for development is only secondary. A country can do with fewer natural resources if it has a highly skilled labour force and ample capital equipment. The interchangeability of these factors has a bearing on the whole problem of development and growth in countries with a low standard of living and limited resources. Abundance, on the other hand, may lead to waste and dissipation which will impair economic progress. In fact, resource shortage may induce progress by creating pressures for substitution and invention and a spirit of research and resourcefulness. Japan, again, is an excellent example of extensive resource substitution. Advances in electronics, ultrasonics, synthetic fibres, high polymer chemistry, agriculture, and metallurgy, to name a few, have been changing every phase of economic activity. They illustrate the ever-expanding frontier of industrial resource creation.