

# Agricultural\_develop ment

Business, Industries



Before the start of the 20th century, the overwhelming majority of increases in agricultural production were the result of an increase in the amount of cultivated areas. However, the start of the 21st century has come to demand that nearly all increases in agricultural production result from the increased productivity of existing cultivated areas, thereby leaving an extremely window of time for countries to make the dramatic shift from a system of production that has long been based on resources to one that is based on science (Ruttan, 2001 p. 179).

To quantify the shift in terms of population, as the global population neared \$1 billion, the increased demand for agriculture was met by expanding farm land area. In sharp contrast, the population, and consequently the demand for agriculture, more than doubled after 1950. Virtually all of the demand, which suddenly doubled, was met by increasing farm productivity (Federico, 2005 p. 388).

For developed countries, the shift from a most resource-based system to a science-based system began in the 19th century. But, unfortunately for developing countries, these changes did not begin to take place until the second half of the 20th century, thereby leaving the developing countries at a disadvantage because the demands placed on agriculture had doubled by this time.

Population and income growth were the underlying causes of this two-fold increase. Because demands are expected to rapidly double again, substantial and scientific and technical effort will be required in the world's poorest countries in order for them to complete the transition to the science-based system (Ruttan, 2001 p. 179).

Since the 1950s, the overall understanding of agriculture's role in economic development has increased. In the past, development economists in premodern and traditional societies viewed agriculture as static as sustained annual growth rates as low as 0.5 to 1% were feasible over extended periods.

With industrialization, agricultural output growth rates increased to 1.5% to 2.5%, rates which were sustained for extended periods of time in Western Europe, North America, and Japan. Since 1950, growth rates have shifted further upward to 3%.

This increase primarily took place in newly developing countries like Brazil, The People's Republic of China, and Mexico. As output growth rates steadily increased, economists came to adopt the new view that agriculture was dynamic rather than static (Ruttan, 2001 p. 180).

By 1960, the high-payoff input model merged as a new theory by which economists were attempting to understand agriculture. It took into consideration agroenvironmental constraints and is based on the conclusion that these constraints make agricultural technology location specific.

For example, it was discovered that technologies that were developed in highly developed countries were generally not transferable to less developed countries which had different climates and resource endowments.

Additionally, it appeared evident that because poor countries were not providing peasant farmers with technical and economic opportunities, reallocating resources in traditional peasant agriculture would only produce marginal productivity gains.

Under the high-payoff input model, it was argued that developing economies could be transformed by investments from the public and private sectors to make high-payoff technical inputs available to poor farmers (Ruttan, 2001 p. 187).

Between the 1970s and mid 1980s, Hayami, Ruttan , and Binswanger developed a new agricultural model in which conditions in the economic system arose from technical and institutional change. This model was based on the recognition that there is more than one path to technological development.

These different paths to development make it possible for a country to substitute more abundant factors for scarce factors. Techniques which allow for the substitution of other labor factors are termed “ labor saving”, while techniques which facilitate the substitution of other land factors are referred to as “ land saving”.

Mechanical technology corresponds with labor saving technology, as it substitutes power and machinery for labor. Biological technology, which tends to substitute intensive production practices and industrial inputs for land, corresponds with land saving techniques.

Chemical fertilizers, increased recycling of manures, pesticides, and pathogen-resistant crops are example of land saving technologies. Mechanical technology and mechanical processes were the driving force of the industrial revolution. But biological and chemical technologies became more prominent in the latter half of the 20th century (Ruttan, 2001 p. 188, 190).