Evolution Of Agriculture In History

Concept Of Agriculture

Agri-Culture denotes both a science as well as an industry.

As a science, it signifies a theory that brings, forth the knowledge of raising different types of crops from the soil, i,e., foodgrains, commercial crops, fruits, vegetables, etc.; developing agri-resources, like land, water, bio-diversity, forests; and fostering other agri-activities, such as animal husbandry, bee-keeping, poultry, fishery, agro-forestry, agro-industry, etc.

As an industry, it indicates a system of production that, with its economic, financial, political and cultural dimensions, under-takes to grow and manage various agricultural products and organises all such pursuits concerned with cultivation.

Rise Of Agriculture

Agriculture arose some 10,000 years ago when a given set of circumstances created the possibility of the discovery of plant and animal domestication. At that time, Ice Age was coming to an end. The glaciers were in full retreat. The next few millenniums (a millennium denotes a period of 1,000 years) were to see the continued extinctions of migratory Pleistocene fauna (animals of a given place or time) which had been the main food supply of the upper Palaeolithic (of the old stone age) hunters. New conditions had arisen for humankind's learning of exploiting the particular plant and animal resources.

The discovery of agriculture did not immediately lead to its predominance in human life. For the first five millenniums, pastoralism (i.e., domestication and rearing of animals) constituted the main way of human living. Because the elementary agriculture was not yet viable to meet human food requirements. The pre-10,000 year humans relied entirely on food-gathering and hunting for food.

Agriculture became the predominant social system in the 5th-4th millenniums BC when some increase in the human knowledge of agriculture made it more productive and conditions arose for the settling down of humankind near the sources of water. The total population of our planet at that time was about 10 million.

Both animal domestication and agriculture are still represented in varying degrees in different countries of the world.

Archaeological evidence indicates that the first use of cultivation was made by communities which had achieved some degree of sedentary life through intensive collection of jungle products. Judging from observations of the present day tribals, it is inferred that those early communities had attained certain degree of knowledge of wild plants and their properties

Two early major centres of plant domestication have come to light existing around 6000 BC. One was South-West Asia. That is, the region described as Fertile Crescent, extending from the alluvial plains of Mesopotamia through Syria and down the Eastern coast of the Mediterranean to the Nile Valley of Egypt. The other was in the two American continents. That is, the area from the Northern Mexico to the Northern South America.

Since its origin, agriculture, as an industry has been bettered from time to time by improvements in agri-implements, inputs and a diversification of crops.

Radiocarbon dating techniques had shown that, in Mesopotamian plains, the earliest cultivated grains include the large grained emmer (i.e., T dicoccum which is ancestral to all other species of cultivated wheat and a descendent of large grained wild wheat) and the small grained einkorn (the descendent of small grained wild wheat, T. aegilopoides). Soon the farming knowledge spread from one part of the world to another by the continuous migrations of herders and farmers. In the 4th-3rd millennium BC, we find the emergence of farming communities in Egypt, Iran, Indus valley, China, parts of Europe, etc.

The emergence of agriculture in the two Americas has it own history. Archaeological evidence suggests that, in the North-East region of Mexico, elementary cultivation arose about 6000 BC among people who relied mainly on game and food gathering. The earliest crops included the

pumpkin, pepper and the bean. The corn appeared much later. An early variety of maize (a derivative of a wild form) emerged in about 3000 BC. The emergence and spread of farming communities (around 1500 BC) in this part of the world took over 3,000 years.

The Mississipi Valley and the Peruvian Coast reflect an early diffusion of cultivated plants from the Mexico region. On the Peruvian Coast, a series of cultivated plants had appeared—squash, peppers, gourds, cotton, etc.—by 2200 BC. In the Northern Mississipi Valley, another group of plants—gourds pumpkin, squash, goosefoot and sunflower—seemed to be cultivated before 1000 BC. In the forests of Amazon and Orinoco arose a tradition of cultivating tropical root crops—bitter manioc, sweet manioc and the yarn around 1000 BC.

The change from a food-gatherer to a hunter, next to a herder and then to a farmer, which embraced a period of one to two million years, represented a great historical change. Because, it heralded a fundamental transformation in human civilisation from its ancient to medieval stage. With it, food supply became more dependable and human existence more secure. Human physical labour became less rigorous as compared to the food-gathering and hunting activities. This naturally pushed up the rate of human growth.

Development Of Agriculture

Early farming technology consisted of digging stick and hoe. Thereafter, it has been continuously bettered, both in relation to implements and crops, by human practical experience from time to time.

The plough is believed to have originated in the Mesopotamian region in the 4th century BC. The appearance of plough necessitated some system of land tenure and marked the development of a more diverse form of agriculture. Iron plough-shares made their appearance around 400 BC. The earlier horse driven plough gave rise to cross cultivation, resulting in a system of small squarish fields found throughout Europe during first four centuries AD. After some period, this tenurial system was replaced by the open field system of tenure which included the use of colter ploughs and strip cultivation. It was a cooperative system in which the land was worked in common with ploughs and land owned by individuals. In the middle ages, the land was owned by the king or his feudal lord or the church and the village community worked and lived under it and used to give one-half or one-third of its produce to the feudal lord.

For many centuries, agriculture held undisputed leadership among the world's industries, being surpassed only in very limited areas by such occupations as mining or commerce.

The industrial revolution of the 18th and the 19th centuries (which resulted in the emergence of urban centres, the replacement of serf worker by the hired worker and consequently the increased demand for food) was followed by new changes in agricultural and population sectors.

In the agricultural domain, the open field tenure system was substituted by enclosed field tenure system, agriculture was turned into a commodity, linked to the market, and all vacant lands were brought under the plough. These changes led to more agricultural productivity, but, on the whole, the traditional farming remained predominant.

With more production and a less rigorous human labour, the human numbers grew at a rapid pace. Now, the traditional agriculture began to lag behind the growing food requirements of the swelling population. But the lag was made up by bringing more area under agriculture.

Historically, encroachment of forest and pasture land has provided a ready answer to the agricultural community in the past to increase food production. Over the last 200 years, total cultivated land area has increased from 600 million hectare to 1500 million hectare on a global basis. Even though estimates indicate that the cultivable land across the globe can be increased from the present 1,500 million hectare to about 2,100 million hectare through reclamation of degraded and waste land, the possibility of addition to arable land in Asia including India is less than 10 percent.

It is, however, interesting to note that on a global basis, only 8 percent increase in foodgrain production in the last 50 years, has been through expansion of cultivable area, the rest 92 percent coming form improved irrigation techniques and use of high yielding cultivars. Almost 46 percent of the global foodgrain production comes from irrigated area, which has increased from 80 million hectare in 1950 to 240 million hectare in 1993.

Obviously, the meagre chance of increasing food production by expanding farm acreage apprised everyone that future needs for agricultural production would have to be met out of the growth of

science and technology than out of the expansion of land farming. Once again, human ingenuity and practical common sense enabled humankind to cross this hurdle. The customary farming was transformed into a new technological farming through high-yielding varieties of seed, chemical fertilisers, toxic pesticides, increased irrigation facilities, etc.

For 25 years, the green revolution brought about a period of uninterrupted growth. But in 1990s, it entered a period of stagnation.

Present-day Agriculture

The total agricultural area in the world amounts to 5.0 billion hectare. Of this, about 1.5 billion hectare (30.4 percent) is arable land and land under permanent crops, the remaining two-third is used as pastures for livestock grazing. Crop yields vary from country to country. A decreasing growth rate of 0.3 percent has been noted over the ten years period (1990-2000).

South Asia has the largest share of arable & permanent crop land in total agricultural land (91.5 percent), though with a slow growth rate of 0.2 percent over this period. Within the region, India and Bangladesh have very high shares—94.0 and 93.3 percent respectively. The region which follows South Asia is the Caribbean.

The same picture arises when looking at the share of arable land only in total agricultural area. Once again, the large share in South Asia is due to Bangladesh and India. In the case of permanent crop South Asia has had the largest growth over the decade (at 10.7 percent), and share is 4.5 percent. The country within the region devoting the largest share at its land to permanent crops is Sri Lanka, with 43.3 percent, whereas the rest of the countries have a low share varying from between 1.8 percent and 4.4 percent.

In the world, the share of area under permanent pastures in total agricultural area is 69.6 percent. In South Asia, it is 8.5 percent, and a decline of 2.0 percent was recorded over the period under review. Within regional groups, only the Caribbean shows a share of less than 69 percent. In continental groups, Africa and South America have the highest shares—at 81.4 percent and 80.4 percent respectively.

The world average of agricultural area per agricultural worker was 3.8 hectare, with a large difference noted between regional and economic groups. The largest area was recorded in developed countries, with 37.6 hectare, followed by North and Central America with 30.5 hectare. South Asia had the lowest figure, of 0.7 hectare per agricultural worker. This could be explained by the region's increasing agricultural population pressure for agriculture land. Two countries in the region, Bhutan and Nepal, have the highest overall share of agricultural population in total population (93.8 percent and 93.1 percent).

Response indicators show that the value of agricultural production per hectare of agricultural land is highest in South Asia, at $720.6. Sub-Saharan Africa continues to show the lowest value of $71.8. The high value in South Asia may be due to high cropping intensity and reported low share of area under permanent pasture in total agricultural land as compared to the rest of the regions of the world. On the contrary, the second response indicator of Agricultural GDP per agricultural worker shows South Asia the second lowest in all regions, with a value of US $404. Only Sub-Saharan Africa was lower with US $315.

In the world, about 0.3 billion hectare of land is irrigated, amounting to 5.4 percent of total agricultural land. Growth over the 1990s was 4.4 percent. The share of irrigated land in arable and permanent crop land amounts to 17.8 percent, growing at a rate of 4.8 percent. Asia makes up a share of 33.2 percent of the world's agricultural land, and 12.8 percent of this is irrigated (0.2 billion hectare). The highest share of irrigated land was noted in South Asia, with 35.0 percent, and a record growth rate of 8.1 percent. Pakistan and Bangladesh in particular had a large portion of irrigated land in total agricultural land.

At the global level, the number of livestock per hectare of agricultural area in livestock units (LU) was 0.33. Among regional groups, South Asia reported the highest LU/hectare of 1.09, followed by the Caribbean with 0.77 LU/hectare. A similar picture exists for number of live animals per hectare of permanent pastures. The overall average is 0.48 LU/hectare, with South Asia reporting the highest figure of 12.84, and the Caribbean second in regional ranking, with 1.91. Near East and North Africa showed the lowest number of live animals per hectare of both permanent pasture and agriculture area,

at 0.19 and 0.15 respectively. South Asia may need to watch the growth in its livestock population to ensure that it does not expand too rapidly.

The total world population today is estimated to be 6.5 billion of which nearly 50 percent are engaged in agriculture. Almost 99 percent of the human food supply comes from the land. This shows how important land and the other natural resources—water, forests, bio-diversity, etc.—are for human existence.

The FAO-convened World Food Summit at Rome (November 1996) had committed to providing world food security and the right of all people to have access to safe and nutritious food. It had called for eradicating hunger the world over and reducing the number of hungry to half by the year 2015. However, the goal indicated at the above 1996-World Food Summit and repeated by the 2001-Summit has proved un-attainable due to serious differences among the corporate ruling & business circles over the usefulness and benefit of such a measure.