Chapter 1
Real Need of the World in Food:
A Future of Agricultural Production

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ABSTRACT

Mankind has minimal areas of agricultural land that produces more food than required to feed the world's population. When allocating forces and assets within the framework of the global policy of investing in agriculture, it can be safely reduced. What is food policy in the 21st century? First of all, it is advisable to increase investments in the study of food opportunities, the development of technology for the collection and processing of aborigine animals and plants in particular territories with a further increase in investments in the methods of biological technology. It is advisable to increase the investments in industrial methods for obtaining food products from animals, plants, microorganisms, in the future – in the course of chemical industrial synthesis. Vernadsky predicted that in the future, mankind will switch to autotrophic nutrition, i.e. artificial synthesis of food from inorganic materials. Biotechnology will gradually reduce the volume of traditional agricultural production.

INTRODUCTION

What could be the prospects for obtaining human resources in the future? This problem is considered using the examples of agricultural history of the world, particularly, agricultural sectors of such big countries as Russia and China.

The three following questions are under consideration.

- During the communism era in the Soviet Union (USSR) and China, many products were chronically in short supply. Store deficiencies were strongly associated with the last years of communism. Currently, there are no collective and state farms in Russia, urban population is not engaged into agricultural production. Farming as social phenomenon is underdeveloped. Despite these, however, there are enough food products in the stores. What is the source of this abundance?

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- At the end of the 18th century, English economist Thomas Malthus (1798) predicted a series of crises, including an agrarian crisis. Humanity is growing by geometrical progression without limit, the resources of the Earth, although abundant, are still limited. The growth of the population may cause a shortage of food products. Currently, food production on a per capita basis is bigger than ever before. In average terms, globally, there is no food deficiency. Why? What is the source of this productive force?
- Agricultural production, however, experience many challenges, including natural ones. One of the questions is why do weeds grow and spread faster than cultivated plants?

BACKGROUND

About two thousand years ago, per capita acreage of agricultural land was 120 hectares. In the modern times, there are only two hectares of land per capita. If this trend continues, in the middle of the 21st century, per capita acreage will reduce down to insignificant size. Certainly, agricultural production will never disappear entirely, but it will undergo substantial changes. Why does this happen and what predictions can be made?

There are four major ways to produce food:

- Passive production without the reproduction of the resources. It is divided into gathering, hunting, and fishing. Alternatively, the passive method is also eating the corpses of the animals killed by the predators. According to Porshnev (1963), anthropologist, this method of obtaining food prevailed among the Neanderthal people.
- Active animal breeding.
- Plant growing, that is active farming in extensive and intensive forms. Extensive farming provides for the expansion of acreage, while intensive one involves increasing yields through the use of fertilizers, breeding, and other agricultural technologies.
- Biological technology, that is, the production of food products by industrial methods at the factories and plants.

A transition to a more advanced technology is food revolution, the basis for which is the increase of world population. Until 1955, the population increased at an exponential rate (Table 1).

The increase of the population at an exponential rate required more and more food to feed the people. Under the extensive method of obtaining resources without changing the technologies, new territories were developed. Sometimes it was accompanied by the aggressive wars. The resettlement of the peoples from the North of Europe and the fall of the Roman Empire in the 5th century were associated with the need to expand the territories of extensive agricultural production for the Germanic tribes. This process was accelerated by a global cooling in the 5th century. The establishment of the Genghis Khan's empire which took place through the wars of conquest was stimulated by two circumstances. The first one is the growing population in the Golden Horde. The second one is a cold snap which reduced the efficiency of grazing. Genghis Khan's empire was not able to change food resource technology to the plant agriculture because of national mentality.

In the developed countries, there happened agricultural revolutions. The transition from animal breeding to farming allowed increasing food resources by 10-100 times without substantial increase in