THE PROGRESS VIEWED FROM THE PERSPECTIVE OF AGRICULTURAL REVOLUTIONS

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Poland, 2017

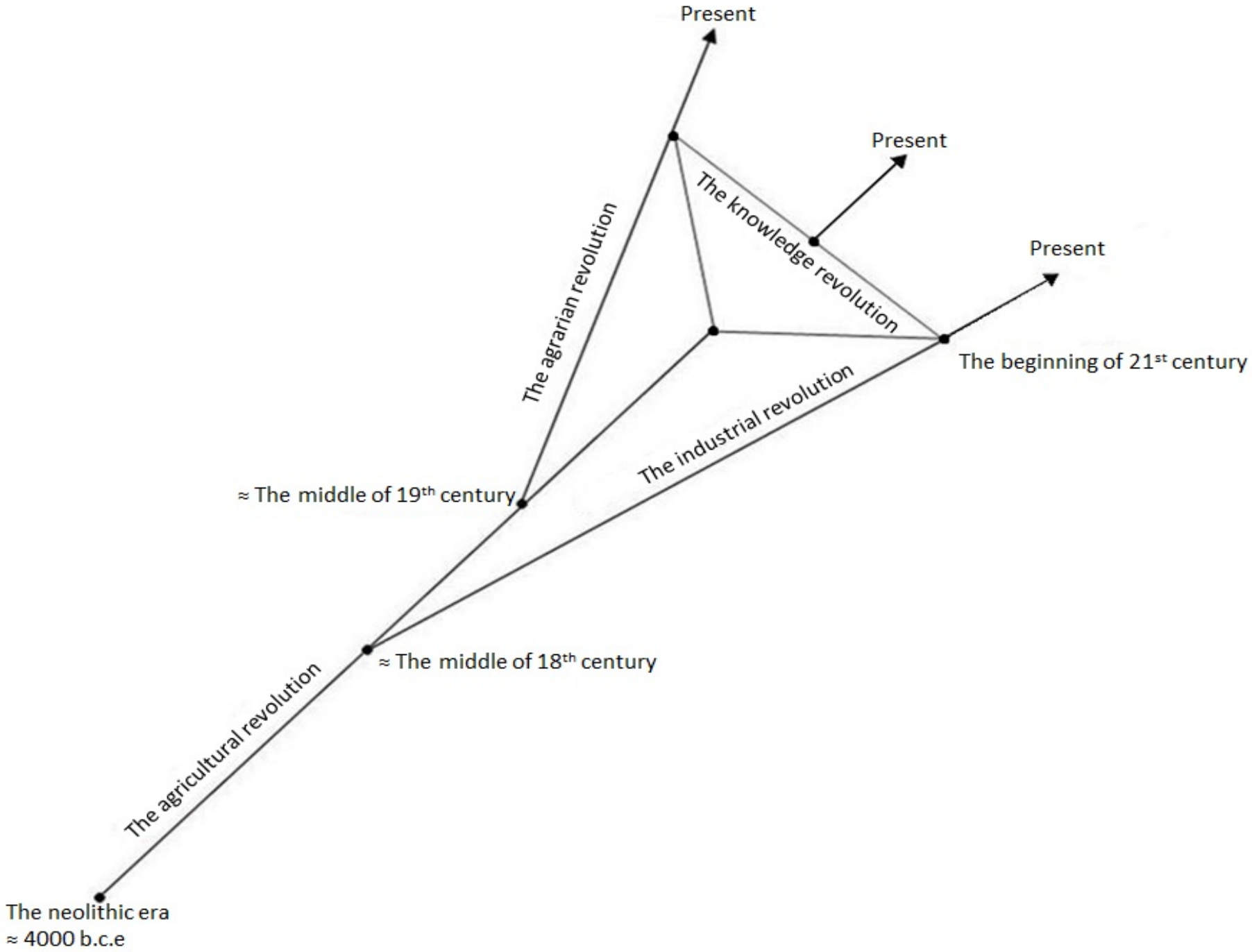
Agenda

- Introduction
- The agricultural revolutions
- Conclusions

- This material represents a synthesis of my book: “The agriculture on time scale”, by the Romanian Academy editor, Bucharest, 2017.

Introduction

- In all the human history, the food demand has followed an increasing trend due to the population growth.
- In agriculture, several changes have emerged due to the progress from or outside this sector.
- The progress from agriculture has registered four qualitative moments defined as revolutionary actions.


Present
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The knowledge revolution
The agrarian revolution
The industrial revolution
The beginning of 21st century
≈ The middle of 19th century
≈ The middle of 18th century
The agricultural revolution
The neolithic era
≈ 4000 b.c.e

1. The agricultural revolution

General objectives	Determined actions	Starting periods	Time course	Assessment indicators**
The fight for food through actions on plants and animals	Domestication of plants and animals Introduction into production of new species of animals and plants Improving productive capacities	Neolithic era, about 4000 b.c.e. *	About 6000 years.*	Production, respectively consumption of agricultural products per person

- The domestication of plants and animals was dominated in the beginning of the period; In time, this has strongly diluted overtime.
- The second action, in the Romanian territory, the introduction into production of new species of animals and plants has been registered between XVII and XIX century as a result of the discovery of new world territory (maze, potatoes, tomatoes).
- The improvement of productive capacities of plants and animals , which represents the discovery of new species of plants and animals, started with the beginning of officialising the research activity.

2. The industrial revolution

General objectives	Determined actions	Starting periods	Time course	Assessment indicators**
Highest yields by attracting and improving progress factors	Mechanization Treatment with chemicals Land improvements Marketing Management	The second half of the nineteenth century.	Over a century and a half	Output per unit of production

- The mechanization phase has started with the steam engines and, after the second world war, Romania has begin to produce tractors and other agricultural machinery.
- The adoption of chemical factors was extended after 1960s when Romania had 6 big such factories for agriculture.
- The most representative land improvements are the irrigation actions which started also in the ‘60s. In the next 30 years, Romania has prepared more than 3 million hectares of land for irrigation.
- The marketing and management actions have gained scientific meaning in agriculture once the big cooperative structures have developed.
- Conclusion:
  - All this steps towards industrialization of agriculture, with Romanian efforts, have been in a continuous regress after 1990 and until 2007, when, after EU integration, Romania started to redress its industrialization process but with imported foreign factors.
  - The degree of mecanization suggest a low position of Romania among the EU countries from the point of view of agricultural area reported to the number of tractors: ex.: Romania – 54 ha/tractor while in EU – 11.8 ha/tractor.

3. The agrarian revolution

General objectives	Determined actions	Starting periods	Time course	Assessment indicators**
Increase stability in production, based on new social, economic and property relationships.	Agrarian reforms The land market	First agrarian reform, 1864	About a century and a half.	The weight (%) of the land under translation in the total (arable) agricultural area; The average size of agricultural holdings.

- In the existence of the Romanian state, since 1859 until now, there have been 6 agrarian reforms in agriculture. In 5 of them (1864, 1921, 1945, 1991 and 2000), the transfer of land has been made from the big properties to small ones. Only one, from 1949-1962, the transfer has been made from the small properties to the big exploitations.
- In Romania, the land market has not had a linear and constant evolution. Until 1949 (the beginning of the communism era), the land market has been in a relative increase, but not to significant levels from the point of view of results. In the communism era, the land market has been frozen. After 1997, the land market is beginning to function, by adopting new continuous legislative framework, especially since the integration in EU.
- Conclusions:
  - As a result of the agrarian reforms, the rural households is predominant in the Romanian agriculture. Their number reaches the level of more than 3.8 million while gather more than 55% of the agricultural land area and they have an average size of around 3.5 ha/farm.
  - Almost 4 million hectares (27%) of the land from 14.8 million ha was sold to the foreign owners due to the liberalization of the land market

4. The post-industrial revolution

General objectives	Determined actions	Starting periods	Time course	Assessment indicators**
Knowledge as a source of added value	The digital era The consolidation of the knowledge market	Starting the transition process from industrial to post-industrial, 2000 *.	About a decade and a half **.	Work productivity The agricultural productivity is on the same level with the industrial productivity

- Research and innovation increase in importance and become more conscious activities required for sustainable development.
- The scope is to ensure free access to the factors of progress in which the two classic actors - manufacturers or information providers - shall meet with consumers.
- According to the classical economy concepts, in this phase, the knowledge becomes the fourth source of economic increase among the nature, capital and work.
- Conclusions:
  - From an innovative perspective, the horizontally interconnections between the vectors of the three revolutions led to the appearance and manifestation of the fourth leap in the evolution of productive forces in agriculture, namely the revolution of knowledge.
  - It is the revolution that, unlike the first three, does not personalize itself through its own vector, but through symbiotic actions within it.
  - In other words, the revolution of knowledge is part of the first three, parts which by the content belong to them, but by the degree of renewal, the assimilation of the new and the abstract way, and not the material manifestation, fall within the scope of the latter.

Conclusions (I)

- Finally, the key of this scientific research results from the impact of the progress on agriculture.
- The impact of the progress was manifested in all the human history, but is obvious in four distinct period, namely the four revolutions.
- These are revolutions because after every such jump, determined by forces falling within the scope of progress, the results of agriculture have undergone obvious improvements.

Conclusions (II)

- In personalizing these revolutionary leaps, it is important to know:
  1. the relationship between the new and the old,
  2. the rhythm (rhythms) in which the new appears and it is assimilated,
  3. the time and the rhythms in which the new is diluted and becomes old.
- When in these three aspects the new is on a fundamental position, it can be appreciated that there are favourable conditions (but not mandatory) for a new qualitative leap, that is a new revolution.

Conclusions (III)

- Under the impact of progress, agriculture has:
  - produced more food - the agricultural revolution,
  - recorded higher returns - industrial revolution,
  - created stability and predictability for branch relations - the agrarian revolution,
  - for the future it is predicted that the barriers which separates the agricultural productivity from the industry productivity shall be declining - the knowledge revolution.

Thank you for your attention.