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The Path of Humanity - From a Subsistence Economy towards a Global Agri-Food Economy; Concomitant Social, Political, Technical and Scientific Innovations

Walter Pfluger*

University Degree in Science and Economics Policies, Germany

***Corresponding Author:** Walter Pfluger, University Degree in Science and Economics Policies, Germany.

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Abstract

The following text is the summary of a conference that was given on October 15, 2018, on the occasion of the International Seminary of Food Science - SISA 2018, organized by the team of the Institute of Nutrition, Food and Nutrition. Food and Agro-Food Technologies - INATAA - University Mentouri Brothers located in the beautiful city of Constantine in the east of the Republic of Algeria.

The objectives of this conference were to encourage young researchers supervised by Prof.'s excellent team. A. Boudjellal, to become aware of their role in a universal process of evolution of humanity, as well as the importance of their scientific work for the future of life on our planet, reminding them of the geographical context and history of the evolution of the "modern" man who has gained momentum around the Mediterranean and in the "fertile crescent" of the Middle East.

Keywords: *Path of Humanity; Agri-Food Economy; Scientific Innovations*

Introduction

Before turning to the subject of our conference, it seems important to clarify the interests that motivated us and to present succinctly the results of our anthropological research on social and political innovations concomitant with agricultural and agro-food developments.

Drawing lessons from the past, in the context of our topic, we would like to identify key parameters that future social and political organizations should consider in order to provide a context conducive to sustainable socio-economic development based on advanced agriculture. agri-food science.

The structure underlying our understanding of the social and political organization of human life is given by the following three distinct domains:

- Socio-cultural domain;
- Economic field;
- Policy area and legal framework.

Faced with such a subject, the method applied will be used to reduce its complexity, in order to be able to draw the main lessons with lucidity and transparency. Thus, we have tried to identify and summarize, in summary terms, for each great epoch of humanity.

- Agricultural production systems and diets to put them in touch with
- The concomitant social and political innovations that humanity has achieved.

By our way of organizing the historical facts, we pursue the objective to provoke a new look at the facts which are, in principle, all well known, so that a new context appears for

a) Present the evolutionary trajectory of humanity in relation to agricultural and nutritional development;

b) Demonstrate the coherence of social and political innovations that correspond to each level of agricultural production, diets and agro-food economies;

c) To draw the main lessons from the lessons of human history with regard to the future path towards an abundant agro-food, of excellent quality and produced in a sustainable way;

d) To feed reflections for challenges and options for the future development of production and the global agricultural and agri-food market.

To conclude our introduction, it will be important to quickly recall the main parameters in which we will situate our brief analysis of the evolution of the innovating man:

- Space and time (medium and long);
- Geography;
- Demographics;
- Social organization (lifestyle, urbanization, knowledge management);
- Political organization (centralized - decentralized - federal power);
- The impact on economies.

And finally, we will quote some bibliographical sources which nourished our own reflections.

Summary of the conference

The sciences of anthropology and paleontology have noted a stagnation in the evolution of the human species during a period of 1 to 1.5 million years before our era. Technological and social development has not progressed during this long period.

Everything seems to change with the appearance of the Cro-Magnon man who appeared around 40,000 years before our era. The Cro-Magnon man, who has received his name from one of the places of his discovery, corresponds to modern man. So, we can say that we are all Cro-Magnon men. There is an important literature and documentation on the Cro-Magnon man with a coherence of points of view on the most important characteristics, including the ability to practice art, the rites of the burial of the dead, the development of 'more and more sophisticated tools. However, the most important ability to note is his general creativity and innovative intellect. The social organization of the Cro-Magnon man was based first of all on the lineages and later became kinship systems. It was then, according to the main scientific literature of Emil Durkheim, Meyer-Fortes and Evans Pritchard, segmental societies that are sometimes called "societies without power".

Shortly after his appearance, the Cro-Magnon man saw another great event that endowed humanity with complex social and political organizations. Humanity comes to its subsistence era with the Neolithic period around 10,000 years BC.

The essential feature of this era of humanity is that for the first time man produces for his sustenance, whereas in the past his diet was based on gathering and hunting.

The origin of mankind's agriculture, according to anthropological and paleontological research, lies in a region commonly referred to as the "fertile crescent", from the region of Lebanon today, to Syria along Turkey to descend to the region of present-day Iraq at the mouth of the Euphrates and Tigris in the Indian Ocean. It is in this region that the most important plants began to be cultivated, allowing humanity to lead a sedentary life in permanent villages. From this period, the selection and cultivation of our main cereals (wheat at ~ 8500 years, rice at ~ 6000 years in Asia, corn at ~ 3500 years in the Americas) have installed agricultural production as the main source of food of humanity. Particularly important were the selection and cultivation of cereals with high yield potential, especially wheat (triticum durum and triticum turgidum - Khorasan/Kamut wheat), barley and other plants with a high yield potential. high nutritional value (especially legumes, such as chickpea) Important from the point of view of the diet, the cultivation of the olive tree produces a high quality nutritional oil.

Agriculture thus reinforces the development of the human and the human kind by the provision of food in sufficient quantity and of superior quality. Among the most important effects of this new sedentary lifestyle, we find an accelerated population growth, with the emergence of centralized power institutions before the constitution of the "states" and an increased potential for knowledge accumulation (before our era of science).

We can not fail to mention, among the main stages, the era of the Pharaohs in Egypt (~ 5.000 years, before our era) which is important in the context of our argument, because this social and political organization according to the theocratic mode Was based on a centralization of power by the Pharaoh, who was the representative of God on earth. Indeed, it is important to note the acquisition of skills and techniques in irrigation (concept of "hydraulic companies", according to Wittfogel), with a rational management of water resources on the basis of the control of soils and a hierarchical social organization and centralized politics. It should also be noted that, at that time, writing was mainly used to reinforce the image and structure of the theocracy and, on the other hand, to keep the data in registers for water management. 'irrigation.

The importance of our context in the times of the Roman Empire (~ 2,000 years BC) comes from the fact that we are witnessing the first era of colonization at the regional scale, with plantations specialized for the production of mainly wheat in North Africa, especially in Cyrenaica (region of Libya), as well as in the region of Tunisia and Algeria today. It should be noted here that olive oil with vines remains under indigenous management and is marketed in the sub-region, especially by Phoenicians and Greeks. This period also sees an intensification of the agricultural and artisanal production of humanity thanks to the use of tools, installations and mechanical machines created especially for the interests of the colonization and the political expansion by the military power. Technologies created for military purposes are then also used for civilian purposes. In the context of today's climate change, it is important to mention already the first serious environmental threats such as the destruction of forests for the extension of arable land, the intensive cutting of woods to cover the growing needs for the construction of houses, military and civilian infrastructure, as well as a large number of ships.

The relatively long period of the "Middle Ages", the period of gestation of the "modern times", appears, according to the main historians of this period (Braudel, Wallerstein, Ferguson), the modern era of humanity. giving birth to the capitalism of Europe (from the 15th to the 18th century). The main features of this period of intellectual "renaissance" are the growth of agricultural production allowing the accumulation of capital. Scientific and technical innovations have benefited navigation, thus enabling European geographical expansion on a global scale with the beginning of modern European colonialism. The creation of economic monopolies will be facilitated by the organization of regional fairs in Europe and new financing instruments, including trading houses and their private banks. Let us not forget that during this same period, the accumulation and dissemination of knowledge will be enormously facilitated by typography and that the military powers are increasingly relying on the use of firearms.

At the end of this decisive period for the conception of our modern life we see the birth of the industrial era (nineteenth - twentieth century) and the first era of globalization.

Today, we would like to make us believe that globalization has just started. However, as historical research has shown, the rate of trade in goods had reached the same level as today at the end of the 19th century for countries such as the Netherlands, France or England.

Let us also note that the industrial era (XIXth - XXth century) linked to the first era of globalization also coincides with the time of the colonial empires of Europe (Portugal, Spain, Netherlands, England, France) and their ends which began with the declaration of independence of India in 1947.

In the last decades of the 20th century, we witness an unprecedented acceleration of the evolution of humanity with the creation of the global financial market through the creation of the Bretton Woods system under the leadership of the United States and Great Britain, followed by the development of electronic financing tools and the globalization of trade across the world. At the same time, we see an intensification of the human occupation of the land dictated by accelerated population growth accompanied by widespread urbanization. The intensification of the productivity of humanity is growing rapidly thanks to the use of modern machines and technologies, computers and finally artificial intelligence and robots. Agriculture is experiencing rapid growth in productivity through the use of synthesized chemical inputs and technological, scientific and genetic innovations. Since 1950, the green revolution that began in India has brought about 500 million Chinese out of poverty and undernutrition in thirty years. In this At the same time, we are seeing deforestation, especially in the tropics, with the destruction of the topsoil and the over-exploitation of fisheries resources.

This era of exploitation and industrial use of human and natural resources is followed by the so-called “post-modern” era, which is our present time. We are also becoming increasingly aware of the enormous challenges that lie ahead in agro-food innovations, which often seem to go beyond our technical and scientific capabilities.

The challenges in relation to agricultural production and agri-food industries (food and nutrition security) relate primarily to sustainability through better management of agricultural production in sufficient quantity and allowing the production of high quality foods. Challenges with respect to natural resources consist mainly of better management of water, land and energy. The resources currently available to humanity to meet the challenges come mainly from the intellectual capacity of man and are essentially technological innovations and scientific research, international cooperation and the free trade system. The most important threats lie in the policies of the public authorities and the practice of war (capitalist model of Europe), the polarization of powers with a real and persistent potential for violent confrontation, the continuous demographic growth (the causes and the side effects of poverty) and climate change.

In this context, we should ask ourselves whether our socio-political approaches are adequate and whether our technological and scientific resources are sufficient to effectively meet the challenges.

And following this quick analysis, we must ask ourselves what are the most important lessons that this course on the evolution of modern humanity offers us concerning the links between innovations by agro-food sciences and concomitant social and political innovations.

Compared to scientific research we are currently observing three main organizational systems for research and innovation. These systems can be considered competitive;

a) The American system;

b) The European system;

c) The Chinese system.

The American system, compared to others, is decentralized at the level of individual states and their universities and research institutes. Research is largely funded by private sources, often industrial and commercial. As a result, it is assumed that the results of this research and innovations serve primarily private interests and markets.

All in all, this system is very efficient and is always considered superior because of the number of innovations produced. So far, nearly 75% of scientific literature is still written in English.

The European system, in which there are significant differences between nations, is characterized by the relative importance of funding from state budgets.

All in all, this system is also very effective, but with a reduced number of innovations and with major regional disparities including near-stagnant regions and others very advanced.

China's scientific research system is of relatively recent date. This system is called communist or socialist by Americans or Europeans. The reality is that this system, with regard to research and technological innovation, is financed largely by state funds, but its operation remains very liberal, with more and more private funding.

Thus, this system is also very effective and seems to catch up at high speed. This system is likely to become the system of the future because it is based on its own strengths and quickly learns lessons from other systems.

From the point of view of social and political organization what innovations should be given priority?

It would be daring and probably useless to give recipes and precise advice as to the actions and measures to be taken by humanity to better organize its future socio-cultural, political and economic life.

Thus, we would like to indicate, once again, the fields of human evolution with the main parameters to take into consideration:

A. Social organization: Based on collectivism vs. the free individual;

B. Political organization: Centralized vs. decentralized and federalist;

C. Economic organization: Autonomous vs. led by politics.

The main issues, and ultimately, the choices to be made at the agri-food level relate to:

- The composition of the diet and the
    - Role of agriculture,
    - Role of livestock,
    - Role of fisheries resources.

With regard to the economies and modes of operation of economies, the main areas

a) Management of main natural resources:
    - Land and forests;
    - Waters;
    - Energy.

b) The management of production;
   - National;
   - Regional;
   - Global.

c) The accessible finance market for production;
   - National;
   - Regional;
   - Global,

d) The management of food distribution and the role and functioning of markets at the level;
   - Local;
   - National;
   - Regional;
   - Global.

For each area and point raised, we could, on the basis of the lessons learned from our previous analysis, give indications as to the lessons to be learned.

However, in order to avoid venturing into too broad areas of sociology, economics and anthropology, we prefer to just give the title or theme of the field that we should, from our point of view, explore to contribute to the design of the future life on our planet. In addition, we would like to announce the change in principle and paradigm that should guide us in transforming the way of life and action in general, of women and men in their respective societies and economies. This paradigm shift will, according to our point of view "from the confrontation towards cooperation" between free men organized in civil and professional associations.

The bibliographic indications are as follows:

In the end, all of us will be asked to get involved and commit to creating a world that will please us and allow us to live on a planet earth healthy and balanced and to feed us in a natural and pleasant way.

The theme will be "the associative and solidarity economy" on a global scale based on the free development of women and men on our land.

For introductory studies (in French), the selected bibliography could consist of the following books and texts:

- Amandine Barthélémy and Romain Slitine, Social Entrepreneurship, Innovating in the Service of the General Interest, Vuibert, 2011 (ISBN 2-311001914).
- Jean-François Draperi, Make another world possible. Social economy, cooperatives and sustainable development, Presses de l'économie sociale, 2009, 3rd ed (ISBN 2952385408).
- Cyrille Ferraton, Associations and Cooperatives. Another Economic History, Erès, 2007 (ISBN 978-2749207223).
- Laurent Gardin, Solidarity initiatives. Reciprocity versus the market and the state, Erès, coll. "Societies in Change", 2006 (ISBN 978-2749206707).
- Isabelle Guérin, Women and Solidarity Economy [archive], Paris, The Discovery, 2003 (ISBN 2-7071-3941-6).

- Serge Guérin, From the Providence State to the Accompanying State, Michalon, 2011 (ISBN 978-2841865239).
- The ESS Lab (dir.), For another economy, Alternatives économiques, coll. "Pocket" (No. 46 bis), November 2010 (ISBN 2-35240-051-1).
- Jean-Louis Laville (eds.), Solidarity Economy. An international perspective, Hachette Littératures, coll. "Plural Sociology", 2007 (ISBN 2012793533).
- Géraldine Lacroix and Romain Slitine, The social and solidarity economy, Collection What do I know?, Presses Universitaires de France (PUF), 2016.
- Pierre Thomé, Creators of utopias. Democracy, self-management, social and solidarity economy, Yves Michel editions, coll. "Civil Society", 2012 (ISBN 978-2364290136).

In order to facilitate quick access and an overview of the ideas presented above, we have prepared a synoptic table.

Overview of the main steps of the evolution of the "modern" man

Social and political organization system	Agricultural and agri-food production system	Economic and financial organization system
Caveman	Hunter-gatherers	Segmental company system
Neolithic	Agricultural production	Cheffery system
Hydraulic/Centralist Empires	Systemized/centralized agricultural production	"Heavenly" Kingdoms
Modern capitalism of Europe	Capitalist colonization; Exploitation of agricultural resources through a "market" system	Monopoly system supported by nascent states/modern financial systems and commercial banks
Global empires and modern colonization by Europe (Spain, Netherlands, France, England)	Intensification of capitalist colonization; Production for the global "market"; The birth of "free trade" as the "ultimate" trading system;	Rule of law/rule of law; Bond market/state bonds: the state as guarantor and source of financing
American hegemony and European domination	Industrialization of agricultural production; Green Revolution; Improvement and intensification of the "free trade" system;	Global finance market; Economic hegemony by the technological advance; Financial hegemony by the Bretton Woods system and the dollar;
Transformation of the economic system into a productivist system	Over-exploitation of earth/earth resources (earth, water, energy) Climate change; Mass destruction of fauna and flora; Loss of biodiversity; Industrialization of production through increased investment in research	Improvement of previous systems; Dominance of savings by finances; Prioritization of economic and financial interests in relation to political interests
In the future: Cooperative and associative systems	Sustainable production in ecosystems managed by democratic and participatory principles; Local and regional production units networked at national and global level.	Economies of common goods; See Bibliography

Main General Bibliographical References

Braudel Fernand. The dynamics of capitalism, The history of civilizations.

Diamond Jarred. Guns, Germs and Steel.

Felber Christian. Change Everything: Creating an Economy for the Common Good.

Ferguson Niall. Empire: How Britain made the modern world, The Ascent of Money.

Wallerstein Immanuel. World-Systems Analysis.

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