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RESEARCH ARTICLE

Theoretical and Empirical Overview of the Importance of Agriculture in the Economic Development of a Developing Country

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ABSTRACT

Agriculture, a critical sector within the economic system, encompasses activities aimed at utilizing and transforming the natural environment for the production of plants and animals beneficial to humanity. Its multifunctional nature renders it dynamic and indispensable in the development of any nation. This article delves into this subject by providing a theoretical and empirical review, aiming to revisit certain experiences and achievements in agricultural production. While economic literature sometimes suggests an ambiguous relationship between agriculture and the broader economy, in developing countries, this sector remains vital due to its contributions to national wealth, employment, and foreign trade. This underscores the sector's significance in the economies of developing nations and the potential ripple effects it may induce, despite the challenges it faces, such as low productivity, limited mechanization, and climate change, when formulating development strategies.

1. INTRODUCTION

Economic history reveals the importance of agriculture in the development process. It is not surprising that the first economic reflections focused on agriculture, considered, moreover, as being "the lever of economic growth", therefore a prerequisite for any development (Basle et *al* ., 1993). The physiocrats saw agriculture as the almost exclusive source of all wealth. For this school of thought, agriculture was not only a fundamental activity, but a major one for individuals who devoted most of their income to their food. Development economists found in agriculture the sector upstream of other sectors of activity insofar as it provides them with the resources necessary for their development. Lewis (1955) had observed that the role of agriculture is unequivocal in the take-off of an economy.

Throughout the world economic literature, various authors have long been interested in agriculture. In order to better understand the problem of development, it is necessary to understand the precursor role and importance of agriculture in an economy. Several works have been devoted to this. They range from theoretical foundations to empirical studies. As such, this study reviews the links (theoretical and empirical) between agriculture and the economic development of developing countries (DCs); and focuses on a brief illustration of the challenges it faces.

2. THEORETICAL AND EMPIRICAL LINKS BETWEEN AGRICULTURE AND ECONOMIC DEVELOPMENT

Before addressing the theoretical and empirical overview of the link between the agricultural sector and economic development, it seems necessary to define the concept of "agriculture", the center of interest of this study.

2.1 Concept of agriculture

Agriculture can be defined as the cultivation of the soil. It is the practice by which men and women domesticate plant or animal materials useful to society (Dufumier , 1986). Clément (1981) defines agriculture as "all the work aimed at using and transforming the natural environment for the production of plants and animals useful to man". By these definitions, agriculture is an economic activity in the sense that it uses rare resources in order to satisfy human (food) needs. It is therefore an economic activity whose object is the transformation and development of the natural environment in order to obtain foodstuffs useful to man and in particular those intended for his food.

In economics, agriculture is often considered as the set of activities whose function is to produce financial income from the exploitation of land (plant production or agriculture proper), forests (silviculture), water products (aquaculture), farm animals (livestock) and wild animals (hunting). Therefore, the principles of political economy can be applied to agriculture. Also, as an economic activity, its operation is governed by different mechanisms that contribute to its operation. Examples include: production, profit maximization, market price formation, distribution, etc.

Agriculture was born from the idea of man to plant seeds. Since this action, man has not stopped thinking about how to produce more in order to satisfy his needs. We then moved from subsistence agriculture to market agriculture. Indeed, economic phenomena (the search for profit, the market, technology, galloping demography, etc.) have transformed agriculture. This transformation has not been without impact on economic development. The positive link between agriculture and development is also established in several studies. Johnson and Mellor (1961) had the merit of identifying five types of sectoral links that emphasize the role of agriculture in economic growth. These links operated by both consumption and production include: (i) the supply of foodstuffs for household consumption; (ii) the supply of surplus labor that it has to companies in the industrial sector; (iii) the facilitation of the emergence of new outlets for national industrial production; (iv) increasing the supply of domestic savings for industrial investment and (v) the supply of foreign exchange from the export of agricultural products. This means that agriculture plays a major role in the economy.

2.2 Theoretical basis of the economic role of agriculture

From the point of view of economic analysis, agricultural activity has attracted the attention of several authors throughout history. For the physiocrats, production is only agricultural; agricultural activity consists of producing foodstuffs and certain raw materials useful to the community.

For Lewis (1955), the agricultural sector participates in the formation of capital, frees up low-productivity labor to supply other sectors, particularly industry, by constituting a market for industrial products, a supplier of foreign currency to finance imports. In his conclusion, which is similar to that of Lewis (1955) but which differs from the way in which agriculture affects economic growth, Malassis (1961) showed that it is by adapting the supply of agricultural production to the quantitative and qualitative growth of food demand, by transferring resources in the form of workers and capital, by raising the productivity of agricultural labor, by becoming a customer of other branches of activity as its income rises that agriculture contributes to the increase in national production.

Furthermore, the place of agriculture in any development strategy of a country is attested by relevant facts. Japan, thanks to the cultivation of silk, has distinguished itself as one of the rare countries to have succeeded in financing its development without resorting to external savings. Similarly, "most economists agreed in recognizing that the industrial revolution at the end of the 17th century in England would certainly not have taken place if it had not been preceded by an agricultural revolution that was both broad and profound, which made it possible to improve the basis of productive accumulation, to free up a large part of the workforce in favor of the industrial sector mainly, to feed the cities and to expand domestic outlets by increasing the purchasing power of farmers" (Kassé , 1996). Preceding the latter, but in a more general formula, Diaw (1995) saw, for his part, the expansion of agriculture as the engine of successful development, which in turn creates

the conditions for broadly distributed growth, capable of reducing poverty. The author believes that agricultural growth favors the rest of the economy. The poor benefit directly, if they are farmers, and they benefit indirectly from the increase in demand for labor and products in the non-agricultural sector. Gillis et *al* . (1998) did not reach a contrary conclusion when they estimate that agriculture, through its profit potential, attracts foreign direct investment which is likely to create jobs and open new investment niches for local operators with a view to increasing local production. Pierre Rainelli (2007) will go further by showing that the impact of agricultural growth on poverty reduction is unequivocal in developing countries. For him, improving agricultural productivity leads to lower food prices; which allows for an increase in demand. As a result, the use of inputs increases and a primary processing activity can be set up; and this movement has repercussions on the rest of the economy. Recently, in its report on development, the World Bank (2008) concluded that agriculture contributes to economic development as an activity, a means of subsistence and a provider of environmental services, which makes it a unique development tool. To illustrate this assertion, the World Bank (2008) showed, using the case of the Chinese economy, that accelerated agricultural growth – thanks to the household responsibility system, market liberalization and rapid technological change – was largely responsible for the decline in rural poverty – from 53% in 1981 to 8% in 2001. The institution also concludes that agriculture remains a unique instrument of development, given that in addition to contributing to development as an economic activity, it constitutes a means of subsistence and a provider of environmental services (World Bank, 2008). At the same time, it attracts foreign direct investment and offers local entrepreneurs the opportunity to benefit from this investment; all of which promotes job creation and increased local production (Bella, 2009). All these theoretical writings analyzing the role of agriculture in the economic sphere are more or less convergent and generally lead to the conclusion that the sector contributes to economic development. However, this assertion is nuanced.

Indeed, for Gollin (2010), the impact of agriculture on economic growth depends on the level of development of each economy. While observing that for developing countries characterized by a high population density and limited access to international capital markets, the development of agriculture is fundamental to their economic growth, the author qualifies that for developed countries, the influence of this sector on the growth of developed countries depends on their imports and the prices of imported foodstuffs. Like this study, several other studies have questioned the ability of agriculture to stimulate economic growth (Byerlee et *al* ., 2009; Timmer, 1988) beyond a certain level of development. These authors explain that as an economy develops, the share of the agricultural sector in its Gross Domestic Product (GDP) diminishes. The argument put forward stems from the classical conception of political economy inspired by the works of Fisher (1939), Lewis (1955), Hirschman (1958) and Fei and Ranis (1964). Indeed, for these authors, agriculture cannot directly induce growth. It is prior to Industry for which it serves as a support for economic development. We understand through this reflection that agriculture, even if it ceases to be essential at a certain threshold of development, remains all the same necessary for the take-off of economies in a situation of poverty. However, these various positions, as varied as each other, do not have several authors to question the stylized facts.

2.3 Empirical approach to the impact of agriculture on the economy

Attempts to empirically verify the relationship between agriculture and growth have mostly addressed the issue in a comparative approach. Thus, the contribution of the agricultural sector is assessed in comparison with other sectors of the economy. The development of agriculture is one of the most powerful levers on which humanity intends to act to end extreme poverty, strengthen wealth sharing and feed the 9.7 billion people that will live on the planet in 2050 (World Bank, 2022). Compared to other sectors, agricultural growth has effects two to four times more effective in increasing the income of the poorest populations (World Bank, 2022).

It was with this in mind that research on Kenyan agriculture was conducted by Block and Timmer (1994). These authors showed in their study that the multiplier effect of agriculture is higher than that of other sectors. Indeed, finding that 1 dollar from agricultural income generates an additional income of 0.63 dollars while it only reproduces 0.23 in the case of the non-agricultural sector, the authors conclude that agriculture contributes more to Kenya's economic growth. Following on from

this study, Degado et al. (1998) estimated, in a study devoted to four African countries, the income multiplier at 2.50 dollars. This means that each additional unit of dollar invested in agriculture leads to economic growth equivalent to 2.50 dollars. In the same vein, Gollin et *al* . (2002), after using data from 62 developing countries in a panel data econometric approach, came to the conclusion that the agricultural sector better explains economic growth compared to other sectors. The authors found that agriculture contributes 54% to the formation of national wealth while the contributions of the non-agricultural sector and sectoral changes were estimated at 17% and 29% respectively, thus confirming the predominance of agriculture in the growth of national activity.

Agricultural development is also essential to maintaining a growing world population (Nerlove , 1994). Because 80% of the world's poor live in rural areas and remain primarily employed in agriculture, this sector can play a key role in reducing poverty, increasing incomes, and improving food security. (World Bank, 2022). Agriculture is also a key driver of economic growth: in 2018, it accounted for 4% of global gross domestic product (GDP) and, in some least developed developing countries, its share can exceed 25% of GDP (World Bank, 2022). For developing countries (Low-Income Countries) in general, agriculture remains socially and economically important in the national economy. It represents a significant source of employment (30% of the working population) and contributes approximately 23% to GDP (Berthelier and Lipchitz, 2005). In Tunisia, for example, its importance is distinguished by its knock-on effects not only downstream but also upstream with respect to the non-agricultural sector; the growth of the agricultural sector will continue to constitute the fundamental factor in the country's economic growth (Dhehibi and Lachaal , 2000).

All these works attesting to the contribution of agriculture to the growth of an economy nevertheless present the weakness of not internalizing in their approach the specific aspects concerning the structuring and organization of the economies studied. The degree of integration of agriculture into economic growth varies from one country to another and according to the level of development of each country. Indeed, as Malassis (1964) already pointed out, growth is a process of intersectoral transfers. Adzio-bika et *al* . (2004), had experienced this from a study in which they showed that the degree of correlation of agriculture with growth is higher in China than in sub-Saharan Africa. This same study noted that unlike Burkina Faso and Congo where agriculture has a positive effect on economic growth, in Cameroon, this influence is negative. The authors explained this kind of reaction by a strong rise in the general situation of the Cameroonian economy where the position occupied by agriculture is reduced. Abounding in the same sense but this time in a bivariate Granger causality test applied to a panel of countries, Tiffin and Irz (2006) arrive at the result according to which there is a strong causality between agriculture and economic growth for developing economies while for developed countries this causality is not proven. This kind of observation not very consistent with the theory can be explained by the fact that these studies in their approach have integrated the agricultural sector globally rather than focusing on a specific branch of the said sector. For example, in a study analyzing the sources of growth in Zimbabwe , Roméo and Marcelle (1998) showed, in an exercise of comparison between branches, that food production has a greater multiplier effect on GDP than that of export crops (traditional or non-traditional). Indeed, since agriculture is a very vast and varied field, it goes without saying that agricultural policies differ from one country to another, from one branch to another and from one production system to another. To this end, analyses integrating the sector globally can bias the results to the extent that the economies do not have the same potential, nor the same development strategies, much less the same comparative advantages.

The literature thus reveals an ambiguity about the role of agriculture in the development process of a country, especially those in development where the challenges to be met are so numerous and complex.

3. Challenges of agriculture in developing countries

Several risk factors jeopardize the ability of agriculture to drive growth, reduce poverty, improve food security and lead to development. Without going into too much detail and controversy, we can cite disruptions linked to low mechanization, low productivity, climate change, etc. in short, a whole set of challenges that seem to be the main ills undermining the agricultural sector in developing countries.

3.1 Low productivity

Agriculture in developing countries remains subsistence farming, characterized by small family farms, with low productivity, non-diversified and less intensive. Practiced in an archaic manner, it is partly dependent on natural hazards and therefore vulnerable to shocks. This image of agriculture in developing countries is well characterized by the often abusive use of labor. This is all the more true since in the agricultural sub-sector, the agricultural park remains almost non-existent. Agricultural activities continue to be carried out with obsolete tools such as the hoe and the machete. Human energy is in high demand without any possibility of substitution, due to lack of necessary financial means. It is in this context of non-existence of agricultural equipment that we perceive mechanization and modernization as a realistic alternative for increasing productivity and rational management of natural resources.

3.2 Low mechanization

Machines have the ability to increase and intensify production. They help simplify farming work. A small diesel pump is capable of propelling larger quantities of water to higher levels in the fields than several men could do, regardless of their combined energy at work. From this point of view, agricultural mechanization is understood as the replacement of manual labor by investment in more efficient agricultural equipment: cultivator, tractor, harvester, thresher, etc.

Alongside mechanization, developing countries will have to adapt to climate change, which has become a major risk factor for agriculture.

3.3 Climate deregulation

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as any change in climate over time caused by either natural variability or human activities (IPCC, 2007). Its manifestations are numerous and negatively affect agriculture. They mainly concern an increase in average temperature, changes in rainfall patterns and in water availability, rising sea levels and salinization of ecosystems, an increase in the frequency and intensity of extreme events (FAO, 2013). All these transformations have negative impacts on agricultural activity. The illustrative case of Haiti was revealed by a study conducted by the University of Montreal and Oxfam [1]. According to this study: "Haiti is facing profound climate changes, particularly concerning seasonal rains, the frequency and intensity of hurricanes and tropical storms that cause flooding and accelerate erosion; all aggravated by severe environmental degradation. Similarly, average temperatures have increased and the rainy season begins three months later than usual." Another prospective study conducted in Morocco (FAO, 2013) indicates that in this country where climate change seriously impacts the agricultural sector, there is a reduction in rainfall and an increase in temperature gradually leading to soil aridity and reduced yields. Climate change has also been the subject of research in Brazil, [2]where it has been shown that, depending on their distribution, various crops have lost their geographical advantages. According to this study, the increase in evapotranspiration has in turn led to an increase in high climate risk areas for cotton, rice, coffee, beans, sunflower, millet and soybeans and a decrease for cassava and sugarcane.

In short, climate change has adverse impacts on agriculture and therefore food security, through availability, accessibility, use and stability.

CONCLUSION

The plurality of roles of agriculture in developing countries gives it capital importance in their economies. Indeed, providing food for humans and animals, agriculture contributes to food security and exportable supply. It is at the same time:

[1]The Nouvelliste of June 5, 2014
[2]UNDP Climate Change Adaptation

- source of employment and income for the population, especially the most deprived.
- Supplier and customer of several sectors of economic activity.

In addition, it plays a role in the protection and regeneration of natural resources. Its importance in the development of low-income economies is therefore unequivocal. In short, due to the delay observed by these countries in the development process (Rostow, 1960), their economic growth depends in part on the agricultural sector, a sector that directly or indirectly supports several assets. Nevertheless, this sector is today faced with several challenges, mainly those related to productivity, mechanization and climate change. Policy makers and other researchers in developing countries will have to work to minimize the risks associated with these challenges in order to take full advantage of this vital sector of their economies.

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