Agricultural and Rural Policies and Their Role in Achieving Food Security in Algeria 1974-2016

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The objective of this paper is to evaluate Algeria’s agriculture reforms, in order to evaluate the Algerian experience by trying to predict through a systematic study of the evolution of successive agricultural policies to achieve agricultural growth and food security, focusing on the historical context and rural policy dimensions. Algeria has created agricultural development through adopting a number of policies that began with the self-management system in 1963. It follows the central planning system, characterized by an agricultural revolution; a series of reforms began in 1990 reflecting the new direction of the Algerian state in building an economic system based on the rules of a market economy. To the Agricultural and Rural Renewal Policy and the five-year program (2010-2014), all these agricultural and rural policies since 1962 have always favored the growth of agricultural production, in order to maintain a dynamic of agricultural growth and to provide the basis for a continuous development of food security.

Keywords: food security, agriculture, food gap, agricultural policies

Introduction

The agricultural sector is one of the most important sectors in the economy of any country. Its main task is to provide the food needs of the population and thus to achieve food security. This requires a long-term agricultural approach aimed at developing the sector by exploiting all the available resources.

The development of this sector will lead to the development of other related sectors, such as food, transportation, services and other sectors. This sector is affected by other sectors, not to mention the absorption of high percentages of employment and provision of the food requirements of the community to dispense with dependence.

Algeria has been unable to guarantee its food security. Algeria is considered to be one of the most food-importing and agricultural countries in the world. It was the leading country in the colonial era. The authorities adopted a number of agricultural policies of a socialist nature, to reduce the import bill on the one hand and to achieve national sufficiency and food security on the other hand, and even export what is flowing abroad.

Therefore, Algeria being largely desert, its agricultural potential is concentrated in the north of the country,
The Algerian territory includes two types of regions: a dominant Saharan zone (84% of the territory) and a coastal zone (16%). The area of agricultural land covers 20% of the total area of the country, about 40 Mha, of which about 8.5 Mha of cultivated area and 31.5 Mha course, to which 4 Mha of forest and maquis. The irrigated area represents 13% of cultivated areas (1.1 Mha). Lack of infrastructure and regular droughts still make the country highly dependent on imports to meet its needs.

Thus, the objective of this paper is to evaluate Algeria’s policies on agriculture from 1974 to 2015, based on a literature review, covering all agricultural policies from independence to 2015, in order to know their impact on the development of this sector, the stakes and the challenges of Algerian agricultural policies, and the reasons for the failures of the agricultural policy during more than 40 years of reform, in particular to ensure food security.

The Historical Context and Rural Policy

State of the Algerian Economy in 1962

Algeria inherited after independence in 1962 a modern and productive agricultural sector. For example, Algeria was among the world’s largest producers and exporters of wine: 15 to 17 million hectoliters on about 400,000 hectares (Bedrani, 1992).

|                | 1961 | 1962 | 1963 |
|----------------|------|------|------|
| Cereals (Million quintals) | 9.52 | 23.57 | 24.44 |
| Wines (Thousand hectolitre) | 15,632 | 12,278 | 11,800 |

Source: Lequy (1970) & Despois (1965).

In all exports, its role has declined. Until 1961, it accounted for more than half the value of exports each year (53.5% in 1960); in 1964, it did not reach 20%. However, this percentage will fall further: the outlook is quite dark. Algeria exports almost all of its wine to France. Agreements between the two governments have set a decreasing quota for the next five years (Mutin, 1965). As early as 1964, petroleum products replaced agricultural products, which ranked first in the balance sheet of exports (Zouache, 2012).

Evolution of Agricultural and Rural Policies

Self-management and agrarian revolution (1962-1979). In the aftermath of independence, the situation created by the sudden and massive departure of settlers, led the state to focus its attention on these farms, the richest in the country, now collectively self-managed by former farm workers who had spontaneously remedied their abandonment (The Ministry of Agriculture, Rural Development, 2012). About 22,000 colonial farms (2.5 million ha) are grouped together in 2050 self-managed agricultural estates, built around the most equipped farms (Bennihoub, 2015).

The Agrarian Revolution (1971-1979) came to confirm the socialist orientation imprinted on the agricultural economy with the nationalization of large private properties belonging to nationals, undeveloped lands, and the adoption of a collective management mode imposed on beneficiaries of redistributions, as well as the state organization of input supply circuits, processing and marketing of production (The Ministry of Agriculture, Rural Development, 2012).

It should be noted that agricultural production has experienced relative stagnation during this phase of
industrialization from 1967 to 1978. It grew at an annual rate of 2.4%, much lower than the population (3.5%). The causes of such stagnation are numerous (Hachemi, 2015). From 1970 to 1977, 55% of the total public investments were centered in the fields of industry, mining, energy, and hydrocarbons (Chemingui, 2003). The weight of agricultural investment in total public investment increased from about 16% in the three-year plan to 8.10% in the first four years and about 5% in the second quadrennial (Hachemi, 2015).

Table 2

| Planned Investments in Agriculture (Billion DA) |
|-----------------------------------------------|
| Pre-plan 1967-1970 | First plan 1970-1973 | Second plan 1974-1977 |
|-------------------|----------------------|----------------------|
| Investment in agriculture | 1.9 | 4.1 | 12 |
| Total investment program | 10.3 | 30.6 | 109.4 |
| Allocation of agriculture in % | 17 | 14.5 | 15 |

Source: Temmar (1986).

**The first reforms (1980-1984): Economic restructuring and after.** In 1980, a restructuring of the public agricultural sector (1981 to 1983) carried out followed by the standardization of the legal ownership of the public sector (1984). The first aimed at a land restructuring of farms through a reduction of areas, the new entities formed are called “socialist agricultural domains”. The second objective was to standardize ownership in the public sector and to dedicate the right of enjoyment to the lands allocated in a context of liberalization (Temmar, 1986).

Table 3

| Distribution of Investments |
|-----------------------------|
| Years | Millions of DA | % |
|-------|----------------|---|
| 1980-1984 | 29,000 | 7.23 |
| 1985-1989 | 30,000 | 5.45 |

Source: Anseur (2009).

In the period 1980-1984 and as a consequence of choices made earlier, Algerian agriculture was still unable to ensure the equilibrium food self-sufficiency possible with the country’s potential. The imports of other consumer goods are a safety valve designed to reduce the social tensions that might be engendered by the shortages due to national industry’s shortcomings (World Bank, 1987). This growing dependence on imports for the satisfaction of ever-growing food requirements elicited renewed attention on the part of the Government to the performance and constraints of the agricultural sector on the occasion of the First Five-Year Development Plan (1980-1984). An analysis and diagnosis of the situation made by the Government indicates that the basic factor explaining the sluggishness of agricultural performance was probably insufficient attention to the managerial and technical human capital during the intervening years. Agricultural physical investment had indeed been accorded a relatively minor and declining share in successive development plans and there were deficiencies in deliveries and on occasion in the quality of key farm inputs such as fertilizers. The crucial factor, however, was that the level of technical proficiency at the farm production level was inadequate to make full use of available resources, let alone move agriculture on the path of innovation and increased productivity (World Bank, 1987).

**Period 1987-1999 economic crisis and difficult transition.** A new farm was restructured. In 1987, Algeria began taking major steps towards the economic transformation of the agricultural sector. The state
farms were dismantled and transformed into collective state farms (22,356 EAC farms) and individual state farms (5,677 EAI farms) consisting of at least three individual farms. In 1990, the state restituted the nationalized land of the agrarian revolution to its former owners (under decree 90-25 of November 18, 1990). The new system resulted in higher production as early as 1988. The authorities’ concern with improving agricultural production to prepare the country for “life after oil” was found in the 1985-1989 plan. The plan allocated higher percentages of public funds to the agricultural sector, especially water projects. Investment in such projects rose from 10% of the total budget in 1985 to 14.5% in 1990, and the government announced its intention to add 20,000 irrigated hectares a year. Another important step was the liberalization of agricultural markets. A 1988 decree allowed private farmers to purchase inputs from any suppliers they chose (Khaled & Masahiro, 2012).

The period 1989-1999, was characterized by the implementation of economic reforms which reduced the intervention of the public authorities in terms of direct investments and made it difficult to assess investments, in order to remedy this situation (Anseur, 2009).

The national agricultural and rural development program. The third period comes from the year 2000. Thanks to a very favorable oil situation, Algeria undertakes a vast program of support for the economic recovery (PSRE). Like the other sectors, agriculture has under the PANDA government program (Akerkar, 2015).

The NADP was expanded in 2002 to integrate rural support and was therefore renamed the National Agricultural and Rural Development Program (PNDAR). A new step has been taken. With PNDAR, broader objectives have been defined to include: (i) consolidation of the contribution to food security; (ii) the valuation of all available resources and; (iii) the protection of the environment (The Ministry of Agriculture, Rural Development, 2012).

Agricultural and rural renewal. The implementation of the Agricultural and Rural Renewal Policy in its first phase was part of a five-year plan (2010-2014), which will cost nearly 1,000 billion dinars (10 billion euros), the objectives are as follows:

- the improvement of the average agricultural production rate and its integration;
- the establishment of 360,000 hectares of tree plantations, 70,000 hectares of grazing areas, and one million hectares of olive trees;
- the wide-spread use of water-saving irrigation equipment;
- an increase in the production of seeds and plants;
- the development of regulation systems and new storage silos;
- the strengthening of sustainable and balanced development of rural areas, in particular through the launch of 10,200 projects in 2,174 towns, which aim to facilitate the preservation and development of over eight million hectares in mountain regions, steppe zones, and Saharan areas;
- the establishment of support measures for the increasing number of programmes for the development of the agricultural industry and the introduction of a network of SMEs responsible for the provision of inputs and agricultural services (www.algerianembassy.org).

In December 2011, Algeria confirmed its willingness to join the European Neighborhood Policy and developed an action plan with the EU. A program, with a budget of €172 million for the period 2011-2013, has been set up and includes: (i) a support component for the sustainable development of the fisheries and aquaculture sector, complementing the program to support the diversification of the economy (DIVECO I of
€20 M) in the sectors of agriculture, agri-food, and tourism; (ii) a support component for the implementation of the Association Agreement, which includes institutional twinnings in the agricultural sector. As a continuation of DIVECO 1, a DIVECO 2 program now supports the fishing and aquaculture sector (DGPAAT, 2014).

**Econometric Study to Forcast the Food Gap**

To forecast the food gap of Algeria over the next 20 years, i.e. 2017-2036, and we calculated the Composite Index of Food Dependency of Algeria i.e. 1974-2016 and we took this series to predict.

Between 1974-2014 Algeria can only guarantee the food supply of less than half of its present-day population. With a more than 45% rate of dependence on food imports in 2016, 66% for dairy products, 95% for cooking oil, 75% of its cereal needs, and 60% of milk requirements, to mention only traditional agricultural products produced in the Algerian countryside (The Ministry of Agriculture, Rural Development, 2002), that mean the Algerian Food insecurity is characterized by a high dependence on foreign markets and a lack of local food production.

### Studying the Stability of the Time Series

| 1st difference | Level |
|----------------|-------|
| None           | Trend & intercept |
| None           | Intercept |
| None           | Trend & intercept |
| Intercept      | Intercept |

Critical values: -8.125814, -0.021825, -8.130426, 0.195429, -2.837471, -2.862361

Conclusion: The time series is stationary at the 1st level and thus we accept the alternative hypothesis that the time series does not unit root.

**Automatic ARIMA Forecasting**

- The degree of legs

After studying the stability of the time series, the degree of legs of the auto correlation model (AR) and the moving averages (MA) model should be determined.

The results show that the appropriate model for forecasting contains three legs in moving averages and two legs in auto-correlation. Therefore, the best results are shown in the model shown in previous forms.
ARIMA (3, 2)(0, 0) shown in Figure 3.

![Actual and Forecast](image)

**Figure 2.** Actual forecast.

![Forecast Comparison Graph](image)

**Figure 3.** Forecast composition graph.

- Selection criteria (Akaike information criteria)

The Model Selection Criteria Table shows that the appropriate model for forecasting is ARIMA (3, 2) (0, 0), because it has the lowest value of Akaike information criteria between 20 top models. AIC value is \(-1.54284546252\)
Results

It is apparent from Figure 2 that Algeria was considered to be in the category of food dependence with risk, based on this indicator. Within the scope of regular food dependence, the index percentage for 36 years (1974-2016) was more than 30 percent except in 2008, which amounted to 26.7 percent, within the scope of regular food dependency. This is due to the fact that in 2005, 2006, 2007, and 2008, agricultural imports accounted for only 7.8%, 6.95%, 8.23%, and 9.8% respectively of total exports.

Moreover, according to the proposed model:

\[ CFDI_t = -0.499 CFDI_{t-1} - 0.120 CFDI_{t-2} + 0.721 CFDI_{t-3} + 1.213 CFDI_{et-1} + CFDI_{et-2} + \epsilon_t \]

The ratio will be between 30 and 40 percent within the next 20 years if the same economic situation remains for agriculture.

Conclusion

According to what the study showed about the production of agricultural in Algeria since independence and the result of food gap for many food groups, especially those related to grain, where Algeria is one of the ten most global importers of agricultural resources, the second in terms of grain imports in addition to imports for milk, olives, and other Product..

What the proposed model expected was that Algeria would remain a food dependency if it did not move quickly to reduce the food gap.

The main reasons why the Algerian agricultural sector was not developed are:

- Giving it a socialist color that was more social than economic, which made agriculture slowly recede;
- The non-serious economic reforms carried out by the state during different times;
- Lack of desire to create a strong economic sector that can be bridged and rely solely on hydrocarbon
revenues;

- The spread of all aspects of bureaucracy as well as structural problems related to the inability to absorb modern methods and not to provide support to those who need it.

To overcome these constraints:

- Integration of agriculture into industry through food processing policies;
- Supporting the actual producers with the necessary funding and training and providing more reclaimed land;
- Creating raw materials supply and storage infrastructure;
- Facilitating the export of agricultural products that are abundant;
- Livestock and dairy production and financial and moral support;
- Expansion and intensification of irrigated grain production in high production areas;
- Supporting desert agriculture and providing the necessary funds for land reclamation in the south.

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