

Improving agricultural policies to enhance food security in Tunisia: A retrospective and prospective analysis

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Abstract

This paper explores the evolution and future perspectives of agricultural policies in Tunisia, focusing on their role in enhancing food security. The agricultural sector, while contributing around 9% to GDP and employing 16% of the active population, faces numerous challenges including water scarcity, climate change, and economic pressures from international trade. The study identifies that despite economic diversification, agriculture remains crucial for rural livelihoods and food security. Also, the paper critiques existing policies, particularly the inefficiencies in subsidies and the complexity of administrative procedures, which disadvantage small farmers. The analysis underscores the need for policy reforms aimed at improving farmers' incomes, reducing policy costs, and enhancing efficiency. Recommendations include developing infrastructure, promoting modern agricultural technologies, and adjusting trade policies to better balance export promotion with import substitution. The study concludes that a dynamic and transparent agricultural policy, responsive to international changes and inclusive of all farmer categories, is essential for sustainable agricultural development and food security in Tunisia.

Keywords: *Agricultural policy, Food security, Retrospective and prospective analysis, Tunisia.*

1. Introduction

The agricultural sector in Tunisia plays a vital role in the country's economy, despite its relatively small contribution to GDP compared to other sectors. Indeed, agriculture contributed around 9% to GDP during the period 2019-2023, with an additional 3.2% coming from the agri-food industry (AFI). However, the share of the agri-food sector in the GDP has decreased from about 16 to 9 percent in between 1996 and 2023 (ONAGRI). Despite the diversification observed

in the Tunisian economy, the agricultural sector remains economically and socially important for its contribution to the achievement of national objectives as regards to food security and employment. Agriculture represents 10% of total investments and employs 16% of active population, with half working in the cereals sub-sector (ITES, 2017).

The agricultural sector is made up of three main sub-sectors: crop production, animal production, and fisheries/aquaculture production.

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Crop production represents 64% of total output, while the rest is split between animal and fisheries production at an average of 28% and 8% respectively. Domestic production is estimated to fulfill nearly 50% of the nation's cereal needs, all livestock product needs, and more than 80% of its oil needs (ONAGRI, 2020).

According to FAOSTAT, Tunisia has about 10 million hectares of agricultural land, with around 4 million hectares utilized, 90% of which is rain-fed. Irrigated agriculture, the biggest water consumer, uses 82% of the available resources (World Bank, 2020). Primary crops by area include olives (49%), wheat (17%), barley (13%), almonds (5%), and dates (2%), and by production quantity: tomatoes (15%), wheat (14%), olives (12%), barley (6%), watermelon (6%), potatoes (5%), and chilies& pepper (5%).

In terms of foreign trade, the food balance made up 12% of Tunisia's overall trade balance between 2019 and 2023. Agricultural and agri-food products constitute 9.6% of total imports and 10.8% of total exports. Key imports include durum wheat, bread wheat, maize, and soya cake, with wheat alone accounting for over 51% of food imports. On the export side, major agri-food products include olive oil, fishery products, dates, and citrus. The food balance coverage rate was around 75% between 2010 and 2023 (ONAGRI, 2023).

However, Tunisia's agricultural sector faces challenges such as water scarcity (357 m³/capita/year), climate change, soil degradation. Indeed, the majority of farms are small. Around 75% of farmers manage less than 5 hectares (ONAGRI, 2020). This can make modernization and mechanization of farming difficult. The lack of storage and transport infrastructure can also cause problems for product marketing. The Tunisian agricultural sector has also faced significant exogenous shocks, challenging its openness to external markets and highlighting the importance of food security. Notably, these include the COVID-19 health crisis and the war in Ukraine.

This paper provides a retrospective analysis of the Tunisian agri-food policies. It also identifies the new challenges and future perspectives of these policies for improving the agricultural sector's performance and promoting food security in Tunisia.

2. Main features of the Tunisian agriculture sector

2.1. Importance of agricultural sector

Agricultural sector in Tunisia is a fundamental source of economic growth. Despite the change and diversification observed in the Tunisian economy (industrialization, growth of service sector and expansion of tourism), the agricultural sector remains important for its contribution to food security, economic and social development. The importance of agriculture to the country's economy is highlighted also by its contribution to supporting rural livelihoods and controlling urban migration as it employs about a quarter of the Tunisian workforce (Touayri, 2004).

Over recent decades, most indicators show that the relative importance of Tunisian agricultural sector in the overall economy has been declining. The share of agriculture in Tunisia's Gross Domestic Product (GDP) has been significant changes over the decades, reflecting the country's economic transformations. Historically, agriculture was a major pillar of the Tunisian economy. However, with the development of the industrial and service sectors, the relative share of agriculture in GDP has declined. From the 1960s to 1970s, agriculture made up over 20% of Tunisia's GDP, with the economy being largely agricultural and the population predominantly rural. Since the 1980s, the share of agriculture in GDP began to decline due to economic diversification and the growth of industrial and service sectors, yet it still contributed around 15-20%. In the 1990s and 2000s, this share further decreased to about 12-15%, then to around 10-12%, as economic reforms and the rise of tourism and ICT became more prominent. By the 2010s, the agricultural share stabilized at 8-10%, continuing to be important for rural employment and food security. Between 2017 and 2022, agriculture accounted for approximately 10% of GDP, remaining vital for rural communities and significant for exports like olive oil, dates, citrus, and seafood (Boudiche *et al.*, 2022). This evolution, economic diversification and the growth of industrial and service sectors reduced reliance on agriculture.

Table 1 - Indicators of agriculture sector in Tunisia.

	2011	2015	2016	2017	2018	2019	2020	2021	2022	Average 2017-2022
Share of agriculture GDP in total GDP	8	9	8	9	10	10	10	10	11	10
Share of agriculture in total investment %	7.5	7.8	7	7	7	6	6	5	6	6
Share of agriculture employment in total %	16.4	14.9	14.8	14.8	14.3	14.3	14.4	14.5	14	14.4
Share of agriculture exports in total %	7	7	13	8	8	11	11	10	8	9
Share of agriculture imports in total %	6	9	9	8	8	9	11	9	8	9
Covering rate in food balance %	75	98	72	71	91	75	85	70	67.4	77

Source: BCT, 2023.

The major challenge facing the agricultural sector, in addition to climate change and limited production resources, is the competition from imported products, which can reduce the price of local produce. Traditional farming practices and the use of chemical fertilizers can also exacerbate the degradation of soil and water quality.

2.2. Main agricultural commodities

Agriculture in Tunisia is characterized by a wide diversity of crops, including cereals (wheat, barley), fruits and vegetables (olives, dates, citrus), dairy products, and meat. The country's land, spanning approximately 16 million hectares, is classified into three primary types: one-third arable land, one-third forests and rangeland, and the remaining third as desert. The arable land, of about 5 million hectares, is typically allocated to three main activities: one third to cereals, one third to olive trees and the rest to everything else. The irrigable areas in this country has increased from 200 thousands ha to 420 thousands ha in 2020. The heads (numbers) is declining over last decade due to low productivity and profitability.

The major crops grown in Tunisia are cereals, food legumes, forages and trees crops. This later covers 2 million ha, with the dominating activity being olive production (3/4). Regarding the livestock activities, the heads (numbers) is de-

Table 2 - Total land use.

	Average (ha) (2017-2022)
Cereal	1,154,828
Driedbeans and legumes	87,570
Root crops	23,237
Nuts	9,196
Freshvegetables	144,264
Total fruit products	340,934
Citrus fruits	21,444
Grapps	26,576
Total Olive	1,675,554
Dates	43,477
Total industrial plants	15,636
Raw tobacco	1,976
Feedirrigated	429,701

Source: Elaborated from MARHP, 2022.

clining over last decade due to low productivity and profitability.

Tunisian farm structures are dominated by small farmers. Fam sizes of less 5 hectares are increasing in numbers while large ones are declining. This is indication of the increasing agricultural land fragmentation process that is taking place in the country, which represents a major constraint to the agricultural development in the country.

Table 3 - The most important agricultural products (1000 t).

	<i>Before-revolution</i>	<i>Post-revolution</i>	<i>Current</i>
<i>Products</i>	<i>Average 2010-2011</i>	<i>Average 2012-2017</i>	<i>Average 2018-2022</i>
Total cereals	1,133.5	1,400	1,843
Durum weat	700.5	840	1,109
Bread wheat	169.5	141	127
Barley	245.5	390	582
Olive oil	1.350	933	1,238
Grapes	180.1	177.3	178.3
Dates	310.1	351	358
Citrus	403	351	363
Apples	135.3	131	138
Potatoes	443.5	422	424
Tomatoes	1,553.5	1,238	1,297
Meats	237.1	233.6	237.7
Milk	1,370.4	1,332	1,341
Fishery products	101.4	129	149

Source: Elaborated from ONAGRI, 2022.

2.3. Agricultural products trade

The most exported agricultural products in Tunisia are olive oil, dates, citrus and fish. In fact, olive oil, dates and fish exports represent together about 50 percent of the value of Tunisian agricultural exports (Table 2). A major share of all exports of agricultural commodities goes to traditional markets of the UE. Tunisians pattern

of exports is dominated by olive oil. The other large products of exports are the fishery products and the dates.

Among the typical products that are imported, the cereals are evidently at the top, represented about 50% percent in value of its agricultural imports.

The Annual Performance Project (MARHP, 2022) report highlights that family farming is

Table 4 - Structure of agricultural exports (%).

	<i>Before-revolution</i>	<i>Post-revolution</i>	<i>Current</i>
	<i>Average 2010-2011</i>	<i>Average 2012-2017</i>	<i>Average 2018-2022</i>
<i>Exports</i>	100	100	100
Olive oil	23	33	40
Fishery products	12	10	11
Dates	16	16	15
Citrus	1	1	0
Cereal preparations	9	7	6
Vegetable and fruit preparations	5	4	3
Fresh vegetables and legumes	5	4	5
Other products	30	24	19
Coverage ratio %	75	72	78

Source: Elaborated from INS and FAO data.

Table 5 - Structure of agricultural imports (%).

	<i>Before-revolution</i>	<i>Post-revolution</i>	<i>Current</i>
	<i>Average 2010-2011</i>	<i>Average 2012-2017</i>	<i>Average 2018-2022</i>
<i>Imports</i>	100	100	100
Durum wheat	13	13	11
Soft wheat	16	13	16
Barley	5	6	9
Corn	13	12	10
Total cereals	47	44	46
Milk and derivatives	2	2	2
Vegetable oils	18	14	10
Potatoes	1	1	1
Tea and coffee	3	4	4
Sugar	15	11	7
Other products	13	25	30

Source: Elaborated from MARHP, 2023.

predominant in the Tunisian agricultural sector, with 75% of farmland being under 10 hectares in size. Approximately 15% of the workforce is engaged in agriculture, along with a significant portion in seasonal roles. This sector offers stable income to about 470.000 farmers, contributing to rural population stability, with women comprising 35% of the agricultural workforce.

3. Retrospective analysis of past and current agricultural policies in Tunisia

Since independence, Tunisia's economic policy has focused on four main objectives: I) achieving food self-sufficiency, which has evolved into the broader concept of "food security"; II) promoting agricultural exports such as olive oil by subsidizing vegetable oils to preserve more olive oil for export; III) conserving natural resources (water and soil); and IV) enhancing the competitiveness of agricultural products in international markets (Laajimi *et al.*, 2012; Boudiche *et al.*, 2022).

To achieve these objectives, various economic instruments have been employed at different stages of the agri-food chains. Internal price policies, border protection, input use subsidies, financial and fiscal incentives and trade policies are the main tools used by public authorities to support agricultural producers.

3.1. Price policies

Regarding price policy, public intervention distinguishes three regulatory regimes. For the first regime (cereals and milk), the state sets a guaranteed minimum production price at the beginning of each agricultural season. This aims to provide farmers with a signal of future market prices to help them make optimal production and resource allocation decisions. The set prices are those that farmers are assured of receiving when they sell their produce. For a long time, these prices were higher than world prices, but they fell below world prices following the 2007-2008 food crisis. This downward trend accelerated with the depreciation of the Tunisian currency. Between 2012 and 2022, the Tunisian dinar depreciated by 34.5% against the Euro and 38% against the US Dollar. Since 2016, this depreciation has had increasingly severe impacts on farmers' incomes and the expenses of the compensation fund, widening the gap between domestic production prices and global prices for several basic agricultural products.

The milk production price administration policy showed its limits for the first time in 2015 and especially in 2016 due to a decline in local demand and dairy product exports, which severely affected the capacity of industries to absorb milk production despite state subsidies. For the sec-

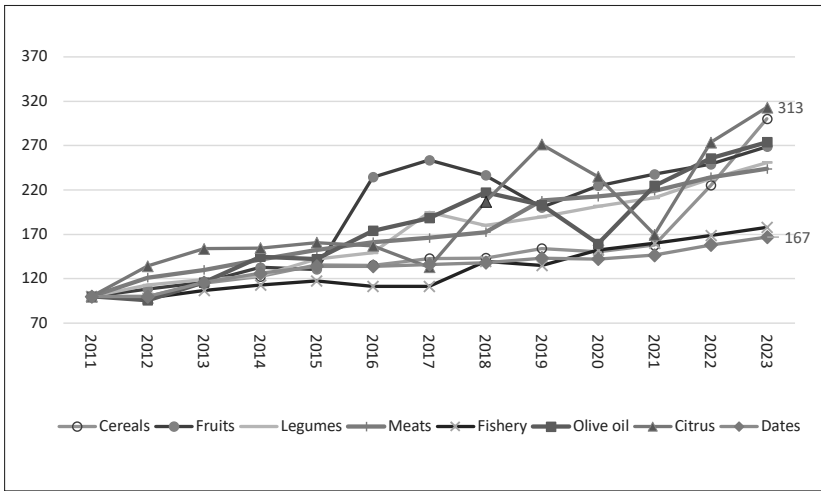


Figure 1 - Average price indices of agricultural products (2011=100).

Source: Elaborated from BCT, 2023.

ond regime (sugar beet and raw tobacco), prices are also fixed, but the state intervenes directly through a public body that regulates domestic prices by releasing the necessary product quantities to absorb any excess demand that would drive prices up, thereby aligning the market price with the pre-set institutional price. This policy requires the government to maintain sufficient stocks. Guaranteeing a minimum production price ensures a certain level of remuneration for producers and protects them against global price fluctuations.

Lastly, for vegetables and meat prices, which are supposed to be governed by market mechanisms, public intervention has been heavily criticized for its economic rationality. When national production is limited for a given product, prices naturally tend to rise. Public authorities intervene whenever these prices reach a level deemed too high by setting a ceiling price without compensating producers or even by prohibiting exports. Conversely, when prices are very low due to abundant national production, no measures are taken to safeguard producers' incomes. This type of intervention, aimed at controlling inflation at the expense of certain categories of farmers, has significantly affected their incomes and the overall development of the agricultural sector in recent years.

The figure illustrates the trend of various food production price indices from 2011 to 2023. All food production prices show an increasing trend

over the years, with some categories like Fruits and Citrus exhibiting more variability than others. This general upward trend indicates growth or an increase in these categories' prices from a base index of 100 in 2011 to 2023. Cereals prices (represented in blue) start around 100 in 2011 and show a steady increase, reaching approximately 167 by 2023. Fruits prices display a more variable trend, peaking at about 270 in 2018, and then reaching their highest point of around 313 in 2023.

Index price of fishery exhibits a gradual and steady rise over the years, reaching around 200 by 2023. Index price of olive oil experiences moderate fluctuations, peaking around 2017 and 2018, and stabilizing at around 200 by 2023. Legumes price demonstrates a steady increase from around 100 in 2011 to approximately 200 in 2023. Meats also show a consistent upward trend to about 230 in 2023. Citrus has the most variability price peaking sharply at about 320 in 2018, then fluctuating significantly before stabilizing at around 250 in 2023. Finally, index of Dates prices shows moderate fluctuations but an overall increase from around 80% between 2011 and 2023.

3.2. Input use subsidies

In addition to controlling product prices, the government intervenes in input prices to support farmers' incomes and enhance the inten-

sification of agricultural activities by encouraging irrigation and increased use of industrial inputs (fertilizers, pesticides, machinery, higher-yield varieties, animal feed, etc.). Almost all these inputs have been “officially” provided to farmers at prices below their respective market prices. However, in reality, subsidized inputs were available in very limited quantities and often sold through parallel channels at much higher prices than those set by the government. This systematic intervention, in effect during the 1970s and the first part of the 1980s, aimed to maximize production without optimizing input use and without considering farmers’ potential reactions to these incentives or other related environmental issues. Consequently, progress towards achieving quantitative objectives was modest (Elloumi *et al.*, 2012). Since the mid-2000s, this policy, instead of controlling production costs in certain agricultural activities, has led to accelerated transfer of rents to few importers and input distributors (Laajimi *et al.*, 2012; La Rovere *et al.*, 2010). This situation has worsened since 2016, with even millers no longer supplying animal feed to agricultural cooperatives, despite the entire supply chain being controlled and subsidized at every level. These products are now sold on the black market at nearly double the administered prices.

Regarding irrigation, the government has implemented further measures to boost the irrigated areas and water efficiency improvement. The State programs involve subsidies of modern irrigation equipment (drip) up to 60% of total investment costs and irrigation water pricing at lower price mainly for cereal crops.

3.3. Institutional framework

The institutional framework plays a crucial role in economic development and has a significant impact on agricultural performance. The state can influence, either directly or indirectly, agriculture’s contribution to various development goals through series of measures and price interventions, facilitated by different institutions. For example, the Office of Cereals regulates cereal transport and once held a

near-monopoly on collection and importation. However, since 2005, with the liberalization of competitive commercial activities, the participation of private collectors has steadily increased, rising from 0.7% in 2005 to 42% in 2010 and 60% in 2023.

The Office of Commerce holds a monopoly on importing sugar and several other food products such as potatoes, coffee, and tea. The National Oil Office imports edible oils and exports olive oil. It is the sole exporter under agreements with the EU for bulk olive oil, which has a fixed quota of 56,700 tons per year. Private actors are allowed to export under this quota only when the quantity collected by the National Oil Office is below the allocated amount. Furthermore, the quota allocation process is ambiguous and can lack transparency.

Serious questions arise about the effectiveness of these offices, which are increasingly criticized for their impact on the agricultural sector’s development. Issues such as prolonged olive oil export crises, grain quality evaluation procedures for price setting, the efficiency of monopoly-controlled agricultural product imports, and the rise of black markets for various products, particularly livestock feed, underscore the need for profound institutional reforms. These institutions no longer meet the new demands of supporting and developing the sector in a highly competitive global environment that presents both opportunities and risks. They appear incapable of playing a pioneering role in the sector’s modernization and transformation. Only through modernization and genuine adaptation of the sector can Tunisia hope for a more significant contribution from agriculture to the country’s economic and social development.

3.4. Financial and fiscal policies

As for other transfers to producers, they are granted with the approval of the Agricultural Investment Promotion Agency (APIA), established in 1983. These measures primarily take the form of direct investment grants and tax benefits for farmers. The new investment code distinguishes between two categories of investment grants

based on the total investment amount: 30% and 15% for smaller and larger investments, respectively. Additionally, any investment component deemed to improve farm competitiveness receives a 50% grant. This includes, among other things, agricultural mechanization and irrigation equipment. However, there is a significant gap between goals and reality, as subsidies are now almost exclusively directed to large enterprises, which are very few in number. Small and medium-sized farms are nearly excluded from the new subsidy administration system, which has become much more complicated in terms of procedures and limits subsidy payments to the realization of 40% of the planned investments. This new code and its implementation regulations represent the greatest danger to the Tunisian agricultural sector, as they fail to consider the characteristics of Tunisian agriculture, which is predominantly based on small farms that produce almost all of the country's dairy, meat, and vegetable output.

Even the Tunisian tax system, which allows for VAT exemption and suspension on certain agricultural equipment, remains difficult to implement and very costly for both farmers and the tax administration itself. Two measures are effectively in place. The first suspends VAT on two lists of agricultural equipment, specific equipment parts, insecticides, and fungicides. The second authorizes specific exemptions (fuel tax exemption) under the investment code. However, over the past few years, restrictions on VAT exemption and suspension have been gradually introduced. To benefit from VAT exemption on inputs and equipment, a "local origin" standard is now required, covering an extensive list of products. These restrictions are costly for the agricultural sector as they force farmers to source from local suppliers, who often provide inferior quality products or sell at relatively higher prices. In practice, these measures effectively grant local producers a competitive advantage equivalent to the VAT rate on a list of products whose selection and annual revision are questionable. This VAT regulation is illegal considering Tunisia's commitments under various trade agreements, which specify that VAT

should not be used as an equivalent to customs duties to discriminate against products based on their local or foreign origin. To circumvent this, the current regulation states that it is a suspension, not an exemption, of VAT.

Viewed from one angle, such a measure might seem beneficial for the national economy. However, considering farmers' well-being, the picture changes as they are penalized and forced to buy local products, often with insignificant local added value, instead of accessing potentially more competitive and suitable imported products. In this context, such a policy also diverts the initial fiscal benefits intended to encourage agricultural investment by creating a captive market for local producers of inputs and equipment, disregarding the farmers' interests. Besides these system failures, the procedures required to benefit from these advantages are often very complicated and costly, preventing small farmers from taking advantage of them.

3.5. Trade policy

One of the main objectives assigned to the Tunisian economy is to ensure that agriculture contributes to improving the balance of payments. To achieve this, export promotion policies are implemented for products where Tunisia has a comparative advantage (olive oil, seafood, dates, citrus fruits). However, given the national goal of increasing food self-sufficiency, import substitution policies for food products that are socially and economically important, such as cereals, milk, and beef, are also implemented. Consequently, the current issue is finding an appropriate mix of export promotion and import substitution policies to improve the country's food security.

The majority of Tunisia's agricultural and agri-food trade is conducted with the European Union (EU). Overall, 70% of Tunisian agricultural and agri-food exports are sold on the EU market, and 40% of imports of these products come from the EU. However, the agricultural trade between Tunisia and the EU is currently governed by the provisions of the Association Agreement which, for these products, provides

a specific regime based on the exchange of reciprocal concessions (agricultural protocol).

The concessions granted for Tunisian agricultural exports depend on their nature and the sensitivity of the products for the European market as well. Four cases are provided: I) full exemption from customs duties, without restriction on the quantities traded neither on the export period; II) a total exemption from customs duties, with limitations regarding the export period; III) total exemption of customs duties for a certain quota, and IV) a partial reduction of tariffs, without any quantitative restrictions. In contrast, Tunisia has committed to provide the EU preferential access to its market for cereals, meat and dairy products and also consolidate its concessions according to the WTO agreements.

Negotiations on agricultural trade between Tunisia and the EU in the frame of the CD-FTA should take into account the recent developments of the Tunisian economy and encompass a more global vision regarding the fact that the agricultural sector is supposed to play a role within the economic diversification strategy in addition to the improvement of social and economic performance, especially in the integration chain of regional and international values.

4. Emergence of new challenges

Tunisia's agricultural policy development must consider several forward-looking factors affecting agricultural production and trade: I) Anticipated impacts of climate change: Higher temperatures and more frequent extreme weather events will complicate resource management, leading to land and groundwater degradation. II) Effects of increased national and international demand for higher-quality agricultural and food products: This trend poses supply risks for Tunisia but also offers export opportunities. III) Fluctuating international agricultural prices: Price spikes may encourage greater production, yet market volatility raises investment risks. IV) Expected rises in energy and agricultural input costs, influencing production and marketing expenses. V) Global

conflicts and geostrategic issues (e.g., Ukrainian-Russian conflict, Palestine) that can disrupt food availability. VI) Challenges like pandemics, diseases, and crop pests exacerbated by climate change.

Actually, the agricultural sector faces a multitude of challenges and issues. At the agricultural investment level, the dominant approach to agricultural investment tends to favor large enterprises while largely neglecting small and medium-sized farms. Additionally, ineffective input subsidies and cumbersome administration contribute to the complexity of the situation. The reluctance of financial institutions, notably the national bank responsible for financing the agricultural sector, given the absence of land titles for the majority of agricultural operations and the status of farmers.

Moreover, in terms of marketing, an oligopoly exerts control over milk prices, and grain prices often fall below global standards. Similarly, the lack of transparency in the marketing system poses a significant obstacle to the sector's profitability. The presence of unfavorable logistics, coupled with a money laundering sector that increases agricultural production costs, exacerbates the difficulties faced by the sector. Agricultural incomes are declining, and the capacity for processing and adding value to agricultural products is low. Markets for agricultural equipment and inputs suffer from imperfect competition. The sector lacks a clear agricultural policy, faces continuously rising production costs, and has no credible commercial policy. Controlling the loss and wastage of agricultural along the entire value chain covers a large part of food deficits (FAO, 2022; Ben Becher, 2016).

The existence of significant regional imbalances has led to considerable exodus and migration of rural populations, with approximately one million people leaving rural areas over a six-year period. The inefficiency of natural resource management and governance policies for water and soil conservation, coupled with agricultural research disconnected from real development issues, exacerbates the situation, consequently threatening the sector's sustainability.

5. Prospective analysis of agricultural policies in Tunisia

The entire current policy for encouraging the agricultural sector has become unclear and should be reformed to ensure better efficiency in both spending and expected outcomes. This policy became obsolete when Tunisia started subsidizing imported products at the expense of locally produced ones, effectively imposing a new tax on the sector, leading to a continuous decline in agricultural incomes. This phenomenon began in 2008 but significantly increased in 2016 and especially during 2017-2019. This observation is particularly relevant to bovine milk, for which production and consumption prices are set by the government. Despite significant rises in production costs due to increased prices of concentrated feeds—most of which are imported—the government has repeatedly refused to raise the price paid to local producers. To address the milk supply shortage, the government imports milk at prices significantly higher than those received by local producers. In other words, the government opts to import milk at higher prices rather than raising consumer prices, hoping for a future decrease in global feed prices.

The reality is that the country lacks an effective agricultural policy, which should ideally achieve three main objectives: increase and diversify production, ensure sufficient profitability for producers, and preserve the country's main natural resources, especially water and land. Currently, these objectives are far from being achieved, and the sector is confronted with contradictory instruments resulting in decreased agricultural incomes, reduced productivity, and capacity to adjust, and above all, depletion of natural resources. Meanwhile, significant public expenditures continue to be allocated to the agricultural sector, albeit with very low efficiency. In Tunisia, the state budget allocated to the Ministry of Agriculture and its public enterprises reaches between 10 and 15% of agricultural value added, a substantial amount compared to other countries. Thus, the issue is not to increase spending but rather to better manage current resources for improved economic and social efficiency of the sector.

Even with the most favorable conditions for the development of the Tunisian agricultural sector, economic benefits remain limited due to the low capacity for reallocation and adjustment within Tunisian agriculture. It seems to possess a comparative advantage in arboriculture and its derivatives (specifically olives), but its production capacities are constrained by the very nature of this type of cultivation (which has a very long return on investment) and by the limitation of natural resources.

The reform of Tunisian agriculture will only bear fruit if it is accompanied by increased access to the European market for its export products as well as other markets. Within the framework of deepening its partnership with the EU, Tunisia would be entitled to demand such a counterpart since the liberalization of Tunisian agriculture significantly favors the EU. The main recommendations to improve performance of this sector are as follows:

Revise the investment code to facilitate procedures and ensure it contributes to achieving development goals.

- Review the process for granting drilling permits to better conserve water resources.
- Ensure more effective transmission of global prices to local prices for products with regulated prices.
- Revise the agricultural development strategy for better use of natural resources.
- Reassess the role of public offices and ensure greater private sector participation on competitive bases for supplying inputs and marketing agricultural products.
- Establish a foreign marketing strategy for agricultural products and develop a common commercial vision based on a national strategy.
- Simplify procedures for acquiring equipment.
- Reorganize wholesale markets.
- Promote better competition to facilitate the establishment of agricultural product processing units.
- Stop subsidizing inputs and favor a system of direct transfers according to objectives.
- Clarify the role of the Ministry of Agriculture, which should, in our opinion, protect farmers' incomes rather than "consumers."

- Encourage the formation of Mutual Agricultural Services Societies (SMSA). This would reduce transport costs and losses, subsequently lowering consumer prices, stimulating both consumption and production.
- Resolve the financial problems of small farmers who have been unable to meet their repayment commitments on previous loans.
- Modify the consumption model of Tunisians through appropriate policies to stimulate domestic production by changing consumer diets. For example, reduce the consumption of soft wheat (flour used to make bread, which is largely imported), vegetable oils, and sugar, which also pose public health issues and increasingly strain the state budget.

6. Conclusion and policy recommendations

Tunisia agricultural sector is facing new challenges such as water scarcity, climate change, soil degradation, land fragmentation, deterioration of farmers' income and consumers buying power. The present agricultural policies are not efficient to address these challenges. Hence, new policies for sustainable food system are needed. This comprehensive vision should take into account the following interventions:

- Improving the income of farmers in order to increase the role of agriculture in reducing the unemployment rate, fighting against poverty, and strengthening the balance between the different country regions. If it wants to achieve these objectives, Tunisia should abandon the indirect taxation policy in the agricultural sector now in place in favor of a policy which aims to improve the growth of farmers' income based on a greater level of transmission of world prices to local producer prices.
- Reducing the cost of agricultural policy and improving its efficiency, because actually the policy of controlling the prices for certain goods, such as cereals and dairy products, appears to be heavy and expensive whereas its impact remains limited. In general, there is an urgent need to assess the effectiveness of the agricultural policy in Tunisia and to find alternative mechanisms

that has to be less expensive, but also more effective for the development of the sector and improvement of farmers' income.

- Shifting the efficiency of agricultural policy through the development of infrastructure (water, transport network, electricity, distribution channels...) instead of instruments of subsidies to the private direct investment currently into existence, which largely contributed to introduce heavy disturbance of the agricultural sector without taking into consideration the need to improve equal opportunities for different categories of farmers.
- Enhancing the transparency and adaptability of agricultural policy to effectively respond to international changes impacting the sector.
- Reforming the agricultural trade policy should be placed in the broader context of the profound reform of the Tunisian agricultural policy.
- Empowering programs focus on small farmers with access to affordable credit, technical training, and modern agricultural technologies.
- Enhancing sector efficiency and productivity through the adoption of smart agriculture using drones, sensors, and hydroponic techniques.
- Developing investments in the agro-industry and cold storage facilities to reduce post-harvest losses and improve agricultural product management. This helps create integrated value chains by processing raw materials locally, adding value, generating employment, and ensuring price stability for agricultural products.
- Promoting organic production to enhance the competitiveness of export products.
- Promoting reused water and improving water use efficiency by implementing high technologies such as hydroponics and smart irrigation.
- Adjusting cereal producer prices, especially to align with world prices.
- Enhancing the importance of insurance and the National Risk Fund.
- Promoting the roles of institutional structures like GDAs, SMSAs, and private companies.

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