

## Original Research

## Food security and agri-food production in northern Saharan area of Algeria

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**ABSTRACT:**

The aim of the present work is to assess the food security in the south of Algeria, in particular the region of Ghardaia. Following the results of the evaluation process, the coverage rate of agri-food needs by the local production showed growing dependency in terms of supply. In fact, the aforesaid region imports 93% of cereals needs, 61% of fruits, 43% of meat, and 62% of milk need. The vegetables production is rather satisfying with a coverage rate of 96%. Those rates are, on the whole, below the national average in matter of, which prove the vulnerability of the Saharan area southern Algeria in terms of food security.

**Keywords:**

Agri-food, Needs, Ghardaia, Production, Food security.

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## INTRODUCTION

Algeria is among the countries whose agri-food production is insufficient in relation to needs. The production deficit is regularly covered by imports, including staple foods such as cereals and milk (Chabane, 2010; Bouazouni, 2008). Food availability in this country is estimated to 3600 kcal (kilocalories)/capita/day (Ferroukhi, 2009); however, the imports represent 75% of cereal needs and 60% of milk needs (CENEAP, 2010). Also, 30% of the feed necessities are imported (CNA, 2008). This situation poses the problem of the country's ability to continue to import, given the vulnerability of the national economy.

The local food production deficit is the result of several constraints. These constraints include the agricultural underdevelopment, low agricultural productivity and the harsh natural conditions (Bessaoud and Montaigne, 2009). The region of Ghardaïa, south of Algeria, is penalized by this type of constraints. Water resources are scarce and of poor quality, with a hyper-arid climate and often infertile soils (Bouammar, 2010). Agricultural land in this region is estimated at 32,000 ha (hectares), which represents only 0.7 ha/capita (MADR, 2016).

## MATERIALS AND METHODS

### Area of study

The area concerned for the study is a large deserted zone, situated northern to the Sahara, whose limited land is approximately compatible with those of the province of Ghardaïa (administrative prefecture). Its territorial surface area is nearly 86,560 km<sup>2</sup> with a population of 4,39,000 inhabitants (MICL, 2015). On the northern parts, it includes the M'zab area, a rocky zone, shredded by many Wadis (exceptional flow rivers) which are extremely ramified. We find one or many oasis on the main Wadis of this area, the M'zab valley which alone includes a group of five oasis, whereas as the southern region subject to present studies contain the El Golea area. Although the date palm is widely culti-

vated in Ghardaïa, the agriculture there is relatively diversified, we can find vegetable growing, fruit tree, cereals (barely, durum wheat) besides the peanut crops. Regarding the livestock, it includes sheep, goat and camel, as well as the dairy cows and chicken.

### Coverage rate of needs

In terms of food security, Algeria is facing independency problem of foreign supply. This independency is mostly concerned about the fast-moving consumer goods such as cereals and milk. This fact is weakening the food security of the country, especially since the international prices of food are more and more volatile, whereas, the importing capacity of the country is still full of uncertainty. We are trying in this study to evaluate the coverage rate of agri-food by the local production, or the self-supply rate. The needs evaluation is based on the food availability per capita statistics (FAOSTAT, 2017). The concerned date is related to 2013 and a projection was made for the years after 2014 and 2015; considering the evolution recorded during the period of 2004-2013. The agricultural production statistics of the region is given by the agricultural competent service (MADR, 2016). The present analysis covers 10 year period (2006-2015).

## RESULTS AND DISCUSSION

Figure 1 shows the average rate of self-supply collected in the studied zone. The rates are calculated also for the whole country in order to establish comparison. We noticed a shortage on the local production compared to the need. Four products on six have coverage rate  $\leq 40\%$  (cereals, potatoes, fruits and milk). In comparison to the respective national average, these rates are significantly lower and represent critical dependency situation. The only sufficient production, outside the production of dates, is that of fresh vegetables with 96.26% of the needs. The production of dates, characteristic of the Saharan regions is, in fact, very surplus (67.7% of needs) and this is the reason for which this

product is not represented on the graphic, in order not to unbalance it. In the following paragraphs, we will try to review the situation by the type of agri-food product.

**Cereal production**

The produced quantity of cereals in Ghardaia, mostly durum wheat doesn't cover only small part of the needs of the inhabitants (7% in average); the requirements of this matter are enormous whereas the local production is still weak. The cereals are the base of the food ration and the most consumed food group with 21.789 kg/person/year, which represent 28% of the ration. Thus, in 2015, there was an exceptionally productive year due to the coverage rate that had reached 14%, the need was 9,74,689 quintals, while the production obtained has reached only 1,36,404 quintals (MADR, 2016). The insufficiency of the local production of cereals is related to the lack of planted area. During the period studied, the area devoted to cereals cultivation was growing, but in 2015 it reached only about 31.34 ha, or 7% of the useful surface area of the Province. On the other hand, the recorded crops yields averaged 42.58 quintals/ha and 26.41 quintals per hectare, respectively, for durum wheat and barley; whereas common wheat crops are partially absent (MADR, 2016). The relative weakness of barley grain yields can be ex-

plained by the fact that it is often ranked as a second crop after durum wheat and the fact to be a subject of grazing.

In fact, the cereal farming in the Saharans area is delicate and a costly activity, it require permanent irrigation with center-pivot systems covering a surface of 30 to 50 hectares in one piece. This requires the mobilization of huge quantities of water, sources of electrical energy and rigorous maintenance of the watering machines. The necessary investments are therefore important and for irrigation, the crop needs deep drilling, pumping equipment and large sprinklers. In addition, the relative importance of the areas developed require a complete mechanization of the farming operations.

**Production of potatoes**

The production of potatoes in Ghardaia is very insufficient and it doesn't cover just 11% in average of the local needs. It is the same for cereals, this production deficit seems linked to the lack of surface areas, since the average yields per hectare are relatively good and are, evaluated at 235.65 quintals/ha. In fact, the area dedicated to the potato crop in 2015 was only 116 ha. During the period 2006-2015, an average area of 145.7 ha was planted with potatoes each year. It is considered as a very small area regarding the importance of these

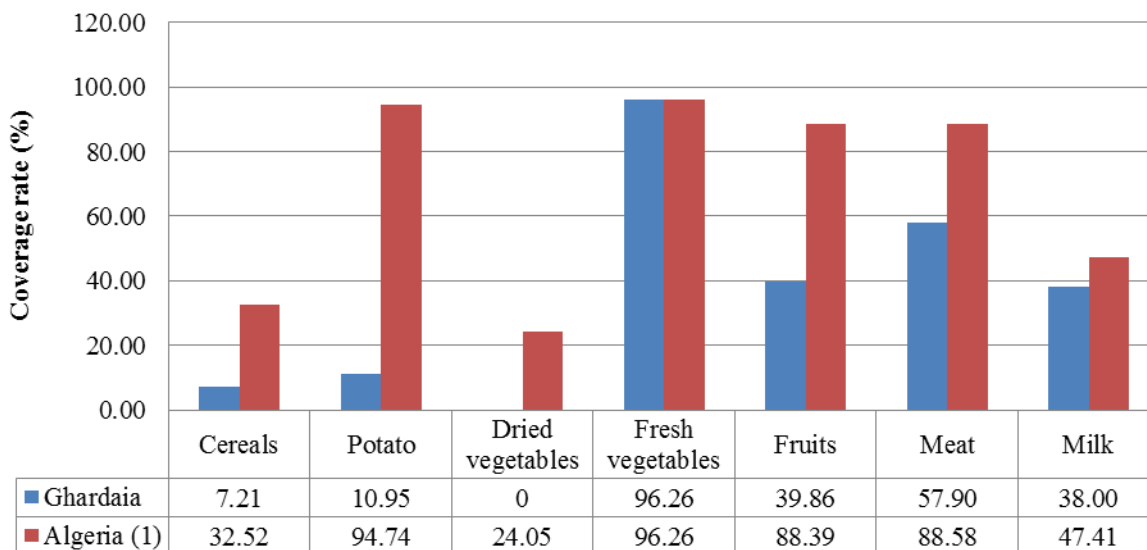


Figure 1. Coverage rate of agri-food needs in Ghardaia (2006-2015)

crops for purpose to ensure the food security and for farmers' income. The potato crop in Algeria is considered strategic because of its quality as energy food, which can substitute a part of cereals ration.

This farming is being benefited from a set of development programs, financial incentives and market regulation measures aimed at its development. Moreover, a remarkable dynamic of production is observed at the national level and especially in the Saharan regions, which raises questions about the development constraints of potato growing in Ghardaia.

### **Fresh vegetables productions**

Fresh vegetables farming in the study area provides an average 96% of the needs. After the excess production of dates (677%), this result is considered the best and represented a high degree of local self-sufficiency. In terms of produced quantities, market gardening is, in fact, the most important production of the region. The production of fresh vegetables in 2015 was 7,62,240 quintals against 571,000 quintals of dates (MADR, 2016), the difference between these two commodities lies in the quantities consumed by a person. Indeed, vegetables are the majority in the ration with more than 176 kg/year, while dates generally do not exceed 23 kg/year (FAOSTAT, 2017).

In fact, the high percentage of needs coverage calculated here should not be understood as self-sufficiency for all market garden vegetables. It is rather a global result, which does not take into account the diversity of the products. Moreover, the local market indicates the opposite, regarding the dominance of products from other parts of the country. We knew, however, that Ghardaia also provides significant amounts of vegetables to neighboring areas. In short, it is more accurate to estimate it as relative self-sufficiency, through the exchange of its market gardening products, and not exclusively from its local production.

### **Fruit production**

Locally produced fruits cover on average 40%

of the needs. During the period under review (2006-2015), fruit production increased significantly, but growth in demand has masked this growth. In fact, local fruit production had increased by nearly 82% to reach 173,306 quintals in 2015 (MADR, 2016), while needs have almost doubled. This had prevented the improvement of self-supply rates. The growth of local fruit production was mainly the result of new plantings, which represents 51% of the total area of arboriculture. To further improve production, it is also necessary to improve productivity.

The average yields recorded are 84.39 quintals/hectare for citrus fruits and 49 quintals/ha for apple trees (MADR, 2016), which is quite low. In fact, most farmers do not maintain their trees properly. Apart from the specialized producers, the farmer's lack of expertise on the arboriculture justify the lower productivity of the trees. The public authorities have invested a lot in this area through the development of planted areas, but not enough in the training course of agriculture on the basic production techniques and in the incentive to do so.

### **Production of dates**

Ghardaia is a phoenicultural region and produces excess quantities of dates (around 677%). The surplus is usually directed to other parts of the country, including the surrounding areas. Deglet Nour is mainly eaten as a fruit, while several other varieties are considered as energy food, especially in rural Saharan and steppe areas, hence their importance for food security. The importance of the date is also due to the fact that it is an easy commodity to conserve and that its export constitutes an interesting resource and a valuable means for the coverage of national food imports. On the other hand, the date palm is a hardy, perennial tree that can produce under the most unfavorable conditions, which is not possible with other less resistant crops.

During the period 2006-2015, local production of dates almost doubled (95% increase), producing more and more important surpluses, moreover, new planta-

tions has been achieved until 2015 which are not still in full production represent 11.6% of the total number of palm trees, estimated at 1,262,510 trees (MADR, 2016). In these conditions, it becomes necessary to think of ways to enhance the value of surplus production and to make the best of it, in favor of farmers' income and the country's food security.

#### **Productions of meat and milk**

The local meat production either red or white, cover around 58% of consumption. During the period under review, meat production increased by about 13.5% from 42,140 quintals (MADR, 2016). We can also see that the self-supply rate varies between 51% and 63%, due to the annual variation in production. Regarding milk production it is estimated that it is sufficient for 38% of the needs of the province with seven dairies in the area, local raw milk requirements are generally covered by local production. However, consumption requirements also include powdered milk whose production of which is not yet initiated.

#### **CONCLUSION**

The current research work showed a shortage of agri-food production in the study area compared to needs. Apart from the production of dates, the only group of products that are sufficient is that of fresh vegetables, with 96.26% of requirements. In fact, the region imports 93% of its cereal requirements, 90% of the potato needs, 61% of the fruit needs, 43% of the meat needs and 62% of the milk needs. In addition to the absence of the cultivation of pulses and some other products which the whole Algeria is hard to produce, like sugar and edible oils. This dependence explain the vulnerability of the food security, hence the importance of looking for opportunities to increase local production. In fact, the biggest challenge in this area is that of cereal production, which is the basis of food, requires developing local agriculture which has the largest deficits, the food security require developing local agriculture

for better coverage of needs.

#### **REFERENCES**

**Bessaoud O and Montaigne E. 2009.** Quelles réponses au mal-développement agricole? Analyse des politiques agricoles et rurales passées et présentes. *Options Méditerranéennes*, B(64): 51-91.

**Bouammar B. 2010.** Le développement agricole dans les régions sahariennes, étude de cas de la région de Ouargla et de la région de Biskra. In: Thèse de doctorat, Université kasdi Merbah, Ouargla, (Algérie), 1-296 p.

**Bouazouni O. 2008.** Bureau régional du PAM au Caire pour le Moyen Orient, l'Asie centrale et l'Europe de l'est-Etude d'impact des prix des produits alimentaires de base sur les ménages pauvres Algériens» [Enligne] <http://documents.wfp.org/stellent/groups/public/documents/ena/wfp194575.pdf> (consulté le 29 Septembre 2013).

**[CENEAP] Center National d'Etude économiques Appliquées à la Population. 2010.** Eléments de la problématique. Séminaire international sur la sécurité alimentaire, 12-13/02/2011 : Quelles politiques de sécurité alimentaire pour l'Algérie à l'horizon 2025. CENEAP, Alger.

**Chabane M. 2010.** Le réchauffement climatique menace la sécurité alimentaire : quelle vision et quelle politique pour l'avenir en Algérie. In : 6<sup>ème</sup> colloque international: Stratégies de développement, Quel chemin parcouru? Quelles réponses face aux nouvelles contraintes économiques et climatiques? 21-23/06/2010. Association des Economistes Tunisiens, Hammamet (Tunisie).

**[CNA] Conseil de la Nation. 2008.** La défense économique. Synthèse des 4<sup>èmes</sup> journées d'études parlementaires: la défense nationale, 07-08/06/2008. Conseil de la Nation Algérienne, Alger, Available from: <http://www.majlislouma.dz/!4emeJep/!!>

communications/Synthese.doc. [Last accessed on 2016 Mar 09].

**[FAOSTAT] Food and Agriculture Organization Corporate Statistical Database. 2017.** Disponibilité alimentaire par groupe d'aliments en Algérie, Données par domaine. Bases de données de la FAO, Rome. [Internet] Available from <http://www.fao.org/economic/ess/ess-fs/fs-data/ess-fadata/fr/>

**Ferroukhi SA. 2009.** La politique du renouveau agricole et rural en Algérie, une réponse aux défis de la sécurité alimentaire. In : séminaire de la sécurité alimentaire en Méditerranée, 17-19/12/2009. CIHEAM ; IPE-MED, Paris. [Internet] Available from <http://www.ipemed.coop/spip.php?rubrique100>

**[MADR] Ministère de l'Agriculture et du Développement Rural. 2016.** Recueil des statistiques du secteur agricole de la wilaya de Ghardaïa (2006-2015). Direction des services agricoles, Ministère de l'agriculture et du développement rural, Ghardaïa (Algérie).

**[MICL] Ministère de l'Intérieur et des Collectivités Locales. 2015.** Annuaire statistique de la wilaya de Ghardaïa (Statistiques au 31/12/2014). Direction de la planification et de l'aménagement du territoire, Ghardaïa (Algérie).

**Mouhoubi S. 2008.** Les vulnérabilités de l'Algérie. In : 4<sup>èmes</sup> journées d'études parlementaires : la défense nationale, 07-08/06/2008. Conseil de la Nation Algérienne, Algeria.

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