REMSES Revue des Études Multidisciplinaires en Sciences Économiques et Sociales

ISSN : 2489-2068 Vol 6 – Numéro 3 (2021)

ECONOMIC ANALYSIS OF THE "ARGAN" SECTOR IN MOROCCO

ANALYSE ECONOMIQUE DU SECTEUR DE L'ARGANIER AU MAROC

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Abstract:

The market opening at national and international level and the current context of globalization have had the main effect of increasing the prices of argan oil and almonds. In order to meet the challenges of marketing, the organization of producers and the use of labels to be identified in the market are of crucial importance. This work first aims to provide a diagnosis of the argan sector through an economic analysis of the value chain. A SWOT analysis was also established in order to determine the development paths of the sector and to be able to propose relevant interventions upstream and downstream of the value chain. The results of this analysis show that the development of the sector must be carried out within the framework of an integrated strategy, which will allow organizing the producers upstream of the value chain in the form of cooperatives. These last ones organized in a group or a union, to better promote the products of the argan tree at the regional level by setting up a legal regulation which prohibits the export of argan bulk products in order to maintain the added value related to the valorization of the argan tree products at the local level.

Keywords: Market, producer, economic analysis, value chain, Argan tree, cooperative.

Résumé :

L'ouverture du marché au niveau national et international et le contexte actuel de la mondialisation ont eu pour effet principal une flambée des prix de l'huile d'argan et des amandons. Afin de relever les défis liés à la commercialisation, l'organisation des producteurs et le recours aux labels pour être identifiés sur le marché est d'une importance cruciale. Le présent travail vise dans un premier temps un diagnostic de la filière de l'arganier par une analyse économique de la filière en question. Une analyse *SWOT* a été établie afin de déterminer les voies de développement de la filière et de pouvoir proposer des interventions raisonnées en amont et en aval de la filière. Il ressort des résultats de cette analyse que la mise en valeur du secteur doit être menée dans le cadre d'une stratégie intégrée qui permettra de mieux organiser les producteurs en amont de la filière sous formes de coopératives, elle-même organisés en groupement ou union et de mieux valoriser les produits de l'arganier à l'échelle régional en mettant en place une règlementation juridique qui interdit l'exportation du vrac afin de conserver la valeur ajoutée liés à la valorisation des produits de l'arganier au niveau local.

Mots clés : Marché, producteur, analyse économique de filière, Arganier, coopérative, valeur ajoutée.

1. INTRODUCTION

The argan tree, a tree endemic to Morocco, is mainly found in the public forests of southwestern Morocco. For centuries, the argan tree has been associated with the local tribes (Amazigh) of southwest Morocco who depend on its oil and associated common products, for culinary and cosmetic purposes (Jenzano et al., 2014; Benchekroun, 2011).

The argan tree is of great socio-economic interest because it is a multipurpose tree which provides the subsistence of some 3 million people: the wood is used as fuel, the leaves and fruits constitute fodder for goats and camels and the oil extracted from the almond is used in cosmetics and human food (Faouzi 2011). In addition, the argan forest constitutes a biological bulwark in the fight against desertification. Its ecosystem protects the soil against wind erosion and against runoff, thus promoting water supply to groundwater (ADS, 2005).

However, the argan tree is currently threatened and the various surveys carried out among authorities in relation to the argan biosphere also reveal a fear concerning the disappearance of the traditions of the local population towards the exploitation of the argan grove. Authorities and industry representatives indicate (without official data) that natural argan

forests have decreased from around 1.4 million hectares at the turn of the century to around 820,000 hectares today (Jenzano et al., 2014; Arrahmouni et al., 2018). While the customary systems of user rights for harvesting argan fruits continue to exist, access to these forests is prohibited and enforced for three months of the year by the Water and Forests administration, in order to restrict grazing during the fruit production season. Yet despite this defense strategy, illegal grazing and illegal logging of argan trees for charcoal production is still increasing. Likewise, the overgrazing of argan forests by "Sahrawi" camel herders in southern Morocco provokes social conflicts and serious confrontations with local populations (rights holders) (Ottmani, 1995; Larbi et al., 2013; Sinsin et al., 2017).

This research work, carried out in the Souss-Massa area, falls within the framework of the orientations of the Green Morocco Plan which aims to support solidarity in small-scale agriculture and promote better productivity, greater enhancement of production, sustainability of agricultural income and promotion of local products. Indeed, the argan tree is a local product which has created great dynamism in the area and constitutes an asset for the local population. The purpose of this study is to carry out a socio-economic diagnosis on the argan tree sector using an economic analysis value chain method which firstly allows the delimitation of the sector, the identification of the main actors and the determination of the opportunities and threats of the sector through a S.W.O.T analysis (strengths, weaknesses, opportunities and threats).

2. MATERIALS AND METHODS

2.1 data collection

The aim of this study is to highlight, among other things, the current situation of the Argan tree sector through an in-depth diagnosis from upstream to downstream of the sector. In addition, we will endeavor to identify the dysfunctions that exist in the sector and propose ways of restructuring and organization. The analysis of these different elements can only go through a descriptive and critical analysis. It was carried out on the basis of a survey with the main players involved in the argan sector.

Regarding this, a questionnaire has been drawn up. This questionnaire targets in its first part the upstream side of the sector, in other words farmers and Argan cooperatives. The second block of questions focuses more on the packaging and marketing of argan by-products (Group, union, private company) in addition to the main constraints and development prospects of the sector.

The choice of sites and cooperatives was made according to precise criteria in order to allow representativeness of all production processes and valorization of the argan tree. Surveys have been established for this purpose among farmers, cooperatives and Economic Interest Groups (GIE). The criteria related to the choice of interviewers are, the geographical area, the type of production unit or actor and the mode of production (traditional or modern). 9 cooperatives aggregating farmers were surveyed in addition to two economic interest groups and a private production unit.

This diagnosis allowed identifying the strengths, weaknesses, opportunities and threats of the sector through a "SWOT" analysis. In this study, we will limit ourselves to the production and marketing of argan products as well as a few ways of the sector development.

2.2 The value chain analysis approach

The economic analysis of a given sector essentially aims to identify and categorize all the activities of all the actors - called "agents" - who contribute to the production and / or processing of a given product. This desegregation work requires understanding the flows that link agents together, in order to identify the outlines of the sector and to draw up the economic accounts corresponding to the activities of agents within the sector (Tallec & Bokcel, 2005). To do this, we had to carry out surveys and interviews with public and private organizations, beneficiaries (generally organized within the framework of cooperatives), cooperatives and groups.

The value chain analysis approach is relatively recent in the economic study. It was in the second half of the 1970s that this type of analysis began to be used in agricultural economics. Used in France first to deal with industrial economy problems, the concept of value chain analysis was transposed to agriculture, then to aid projects for developing countries. The use of the term 'value chain' reveals significant differences between French and English speaking researchers, as well as among funders. World Bank experts see in this notion the justification for a monopolistic type of trade organization with government intervention. This vision is opposed to that of economists, specialists in sector analysis, for whom the value chain is rather a concept of analysis; it is therefore not a type of organization (Terpend, 1997).

All of the economic agents who directly contribute to the production of a final product are called the production chain. The value chain therefore traces the succession of operations which, starting upstream of a raw material (or an intermediate product) ends up downstream, after several stages of transformation / upgrading to one or more finished products at the consumer level (Fabre, 1994).

The value chain study provides an in-depth understanding of the ins and outs of the entire environment of a product. It allows to highlight the strengths and weaknesses of the system and, from there, to precisely establish the policies and actions to be carried out to strengthen the positive aspects and remove the constraints; the actors who intervene directly or indirectly in the system; synergies, external effects, relations of cooperation and/or influence; bottlenecks and inter-sectorial linkages; the degree of competition and transparency of the different levels of trade; the increase in share-per-share costs in order to determine price formation (Tallec & Bokcel, 2005; Terpend, 1997). This approach is not only economic, in the strict sense of the word, or accounting; it can also be geographic, political or sociological. Many factors affect the life of a product, from its initial phase (design-production) to its final phase (consumption) and the choice of the type of analysis in this case will depend on the research question.

3. RESULTS

The argan grove of southwestern Morocco occupies an important place in the regional economy. In this geographical area, nearly 90% of the rural economy of the argan region depends on the agro-forestry system of the argan tree. More than 2 million people are affected by the exploitation of traditional agro-forestry systems based on the argan tree. For the past twenty years, efforts have been made to define the conditions for sustainable development by adopting participatory approaches. Argan oil is certainly the production on which a socio-economic development project could be based (Faouzi H. and Martin J., 2014).

According to our study, the argan value chain is organized in three essential parts, namely: production, processing and marketing. For the production of argan oil, we have identified three main segments: traditional family production, modern production of cooperatives and unions, and private enterprises (fig. 1).

3.1 The extraction processes

We present in this section the results of surveys carried out in order to collect data related to the production and organization of the argan sector. The vast majority of argan oil production goes through women's argan oil cooperatives. This oil, whose virtues are known throughout the world, follows well-identified production processes and marketing channels.

Argan oil is extracted from the seeds of the fruit of the argan tree. There are two methods of oil production, namely, traditional extraction and modern extraction (Charrouf, 2002; Fellahi,

2005; ADS, 2006). The traditional extraction where the oil is produced from dried fruits according to a traditional recipe very intensive in work, according to the following steps:

- Pulping by hand or by digestion of the pulp by goats;
- Manual nut crushing;
- Low heat roasting;
- Manual crushing in a grinding wheel;
- Manual mixing of the dough;
- Pressing of the dough by hand.

Traditionally, the oil obtained through this process is used both for food purposes and for cosmetic purposes (massage and skin and hair care).

In the modern process (mechanical and semi-mechanical), several steps have been mechanized throughout the production process. Extraction by the modern production process includes the following steps:

- Pulping of dried fruits: often mechanized and followed by sorting / separation of the nut and the pulp.
- Crushing and cleaning: this step generally remains manual in most cases because mechanized crushing is not satisfactory for most producers
- Mechanical roasting (exclusively for the production of edible oil)
- Pressing and settling. Generally, after mechanical pressing, a settling step is introduced.
- Filtration and bottling: mechanical filtration is introduced and improves the yield and quality of the argan oil.

Based on surveys, we confirm that cooperatives that use the modern extraction process are better organized and have more information on the valuation of their products intended for sale (raw material price, cost price, marketing channel, etc.). For the preparation of the oil intended for cosmetic use, the roasting step is not present which gives the oil a neutral color and a less accentuated taste.

- Accounting analysis

This part is devoted to the study of the production cost price for artisanal and modern cooperatives. The cost of argan oil varies depending on the production process and the quantities produced and sold.

• Artisanal cooperative: According to our survey, the average cost price of a liter of oil is 180 Moroccan dirham MAD (1 USD= 8.94 MAD). Labor represents nearly 70% of the overall cost and 30% formed by the purchase of raw materials.

• Modern cooperative: The average cost price of a liter of oil is 150 MAD. The cost of labor represents 55% of the overall cost, the women members of the cooperative only deal with the crushing and they are paid at the rate of 40 MAD per kg of kernel produced.

This modern process is normally the same for the other producer's agents such as economic interest groups or private companies. Mostly, they use the same process and they buy the seeds directly after pulping and crushing by woman workers. It should be noted that the main component of the cost is that formed by labor. It is a more important ratio for artisanal cooperatives where the whole work is achieved by woman workers. For modern cooperatives, it represents less than 60% of the overall cost thanks to the mechanization of pulping and extraction operations, while for artisanal cooperatives, the cost of labor is over 60%. Other overheads have been taken into account when calculating the average cost price. Overheads related to mechanization and depreciation of equipment are higher for modern cooperatives while they are very low for artisanal cooperatives.

Table 2: Cost price per by-product

Product	Cost price
Fruit (Woman paid at 40 Mad / day)	1-2 (DH / Kg)
Almond	60-65 (DH / Kg)
Edible oil	140- 200 (DH / l)

Source: author

3.2 Value chain actors' strategies

The importance of the value chain approach is to identify the different channels of a product from production to consumption. This approach allows better understanding actors' strategies and price formation mechanisms and to detect and characterize trade constraints, in order to design actions to remove these constraints. The main actors who intervene at the level of the sector are presented in this section (Fig.1).

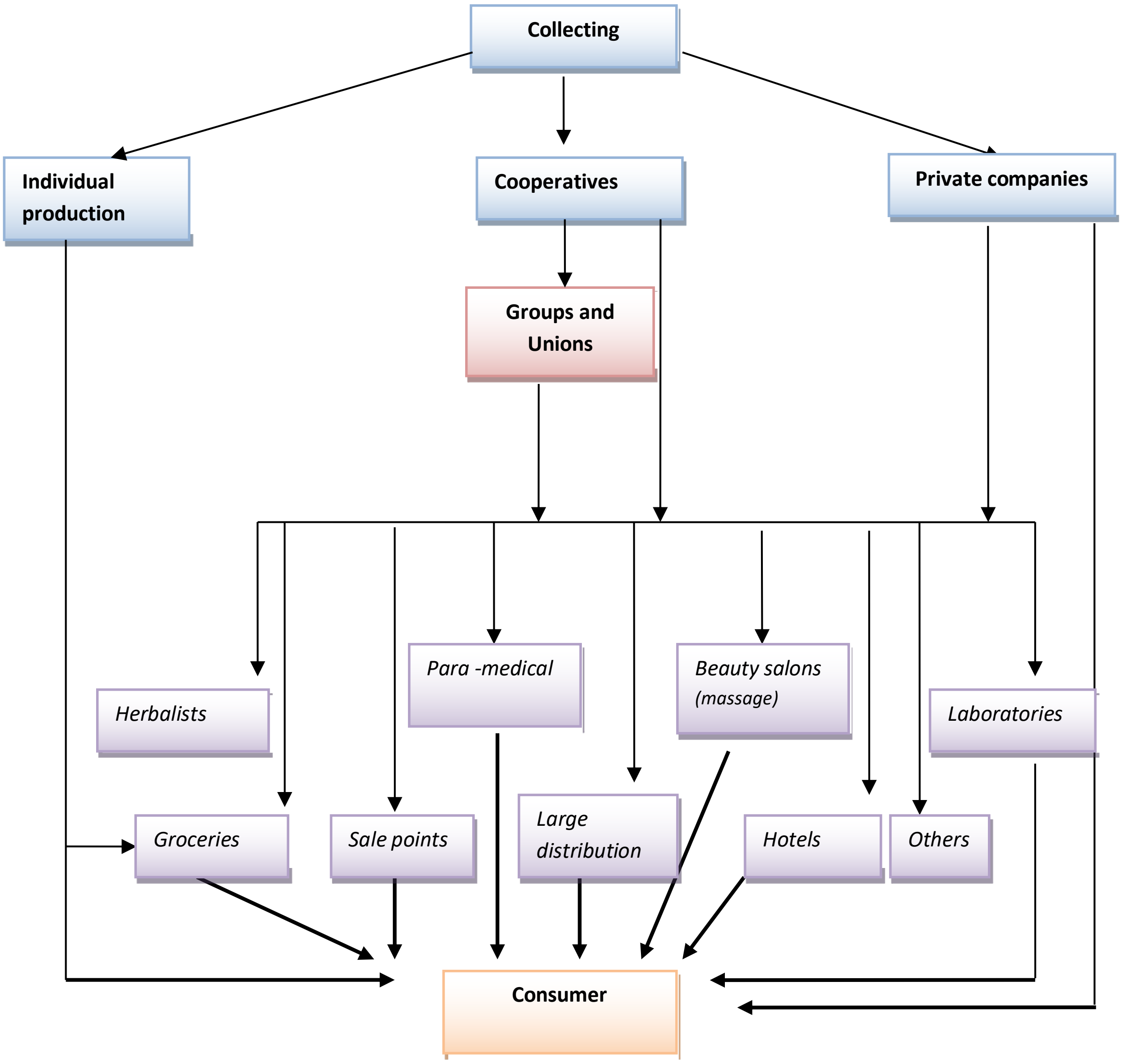

Figure 1: Argan products marketing channels

- Households: represent the first segment in the value chain. Their role is crucial since they ensure the collection and supply of raw material (Argan fruits). Right holders represent the indigenous population of the Argan ecosystem. They enjoy the right to collect and use the fruits of the Argan tree which come either from argan trees found on private plots, private or collective forests (Fellahi, 2005; Benali, 2006). The collectors ensure the supply of Argan fruits as a raw material. The harvest of the fruit by the collectors is practiced in two ways. Collecting which consists of picking it up the fruit after if falls to full maturity. This is the most abundant technique. Galling is the second collecting method, which involves exerting a vibrating action using sticks or stones to drop the fruit.

- Women's cooperatives: are groups of rural women who operate and benefit from the valorization of Argan products. They are involved in the collection, crushing, extraction and marketing of Argan oil and its derivatives.
- Economic interest groups and union: this is a grouping of cooperatives whose main objective is to jointly practice packaging, labeling and marketing under the same brand. This kind of grouping makes it possible to strengthen the position of member cooperatives with regard to the negotiation of contracts and prices, the promotion of products and the defense of the interests of members.
- Private companies specializing in the production of Argan oil: these are semi-mechanized industrial units specializing in the production and marketing of Argan products, namely, food and cosmetic Argan oil as well than other derivative products). Large quantities of Argan oil are marketed by private companies; this is explained by an increase in demand for this oil, particularly on the international market, but above all by a high level of mechanization making it possible to produce more efficiently.
- Resellers, suppliers and wholesalers: these are professional sedentary traders who work, in their great majority, on several agricultural products; they manage in most cases a warehouse. Wholesalers and suppliers are located at the level of urban centers. They generally have sufficient financial capital to buy the fruits and almonds from local dealers and collectors to sell them during off-harvest periods. Their ability to obtain supplies is strong since they benefit from sufficient capital and resources (vehicles, warehouses, etc.) for the purchase and transport of raw materials.
- Retailers: These chain players are generally based in towns and souks. They stock up their Argan oil directly from cooperatives and private companies, or from wholesalers. Some city-based retail traders are adopting an artisanal processing system in their shops to produce edible oil. The products are intended for the local market as well as for tourists passing through weekly markets and towns.
- Governmental and non-governmental organizations: The state is represented in the Argan oil sector by a set of institutional units for research and development (government departments, high commission for water and forests, ORMVA, ANDZOA…). The role of all these institutions and organizations is to draw up support programs through research, development and service projects. As for non-governmental organizations, there are several national and multinational actors active in the field of research and development to support poverty

reduction projects, the preservation of the Argan biosphere and the promotion of Argan products.

3.3 SWOT analysis of the argan value chain

The argan tree is of a great socio-economic interest for southwestern Morocco. It plays an important role in rural life since it rules most agricultural and pastoral activities. The argan tree provides users with a significant income through its production of oil, fodder and wood, in addition to under-forest crops. It provides wood for heating, charcoal and is also used to make utensils and tools for family or agricultural use (Nouaïm et al., 2007; MAPM, 2012; Chriqi et al., 2003; Erraoui, 2017).

In order to be able to offer reasoned interventions upstream of this value chain, it is essential to know how it works and to study the role played by the argan tree, in the plains and mountain areas, and its derived productions on income family in the study areas. A strengths and weaknesses analysis was established and the results are shown in Table 2.

Table 2: Result of the SWOT analysis

Weaknesses	Forces
- Poorly developed organizations in terms of marketing and insufficient concentration - High certification cost - lack of dialogue between cooperatives -Development of quality signs leads to market congestion by juxtaposition and overlap. - weak direct sale following the lack of control of conditioning, packaging - Lack of experience in the international market: export and its formalities (markets, laws, standards)	- The argan tree is an endemic species of Morocco - Recognized Protected designation of origin quality product which keeps its geographical origin, its typical character and its identity to differentiate it. - Establishment of national standards based on demanding specifications and rigorous control over the entire chain. - The Souss area has been recognized as the region par excellence for "organic" production in Morocco. - Creation of a Group to strengthen the marketing channel
Opportunities	**Threats**

-The Souss region is home to the only argan forests in the world. - Growing demand for argan oil (consumption) - Development of other uses than the food destination - Product of high value-added and a growing demand for organic products on the market -Strengthening of the marketing circuit through the development of solidarity tourism and fair trade - Possibility of benefiting from supplier-buyer contracts with well-defined terms.	- Soaring prices on the world market lead to the search for a substitute product - Weak capacity of the agro-food sector to adapt to trade crises - Regression and degradation of the argan forest in terms of area and density - Absence / weak collaboration between the main actors concerned - Liberalization of agricultural markets and stronger competition on the international market.

The two areas where the argan tree is concentrated are experiencing a notable decline in the argan grove reserve. The plain area is subject to the gradual intensification of agriculture, urbanization and infrastructure development on the one hand. The mountain area is subject to climate change impacts, deforestation and overgrazing by animals on the other hand.

The upstream analysis of the value chain shows that there is a great shortfall in the fruit and almond supply chain. Indeed, we noted that several intermediaries intervene at this level, particularly, the link between the collection and the supply at the level of the cooperatives which directly influences the price of the raw material and it is the main reason why we have seen an increase in raw material in recent years. At the downstream level of the value chain, it would be appropriate to develop the marketing of these products by seeking other marketing channels knowing that several cooperatives are unable to sell all their production. The aggregation of cooperatives into unions or Economic Interest Groups will have a positive impact on the restructuring of the value chain. Likewise, these groups will help defend the interests of producers, disseminate information between members, promote and improve the product image, and facilitate membership in markets that require investments from high costs through the development of distinctive quality signs and designations of protected geographical origin.

On the other hand, decision-makers can also intervene by banning the export of bulk and almonds, which will remain the only way to secure national production and ensure better valuation of the product by Argan cooperatives. Indeed, the export of bulk represents the large part of exports (more than two thirds) which negatively influences the value-added created by

the products of the argan tree and therefore a significant gain of earnings could be realized by prohibiting the export. Bulk and consequently the value-added will be kept at the local level. In addition to the legal regulation of bulk exports, the government must maintain these efforts in terms of reforestation, defenses and encouraging local actors in order to preserve the biosphere of the argan tree.

Finally, the Argan tree and its products, especially oil, are not valued as they should be. In addition, some interest conflicts still exist between the various users and managers, which prompts questions about the organization of this sector, whether upstream or downstream.

Conclusions

The analysis of the Argan value chain has allowed identifying several ways for improvement and actions to be taken for a better organization of this sector, especially for production cooperatives. This analysis showed that several intermediaries intervene at the upstream level of the value chain, in particular, the collection and supply of raw materials, which influences the oil prices in the market. At the downstream level of this value chain, it would be appropriate to develop the marketing of Argan products by seeking other marketing channels. On the other hand, the export prohibition of bulk and almonds would be the only way to secure national production and guarantee better added value for Argan cooperatives. Finally, strengthening economic interest groups would be a wise choice since their objectives are the defense of the interests of producers, the promotion of Argan oil, the dissemination of information, the improvement of image of the product, and facilitates the adhesion to markets which require investments at high costs and this through fair trade, the development of distinctive signs of quality and designations of geographical origin products.

ISSN : 2489-2068 Vol 6 – Numéro 3 (2021)

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