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A Systematic Literature Review on the Marketing of Agricultural and Medicinal Plants in Algeria

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Abstract:
This study aims to explore opportunities for Algeria to shift from agricultural marketing toward the marketing of medicinal plants, with the objective of strengthening the Algerian pharmaceutical industry, addressing the issue of access to medicines, and boosting the gross domestic product. Drawing on the experiences of emerging economies, we adopted a systematic literature review methodology. The findings reveal a lack of scientific research related to the marketing of medicinal plants and insufficient biological protection of these resources. The study recommends investing in research, development, and innovation, as well as strengthening the legal framework to encourage the transition from agricultural marketing to medicinal plant marketing.
Keywords : Agricultural marketing, Medicinal plants, Pharmaceutical industry, R&D, ALgeria
Jel Classification Codes : O13, O31, Q13, Q17

1. INTRODUCTION

Agricultural products are utilized in many aspects of human daily activities, with their origins rooted in farming and plants as raw materials. They serve as inputs in the pharmaceutical industry, which has increasingly attracted the attention of many countries, including emerging economies such as China and India. Moreover, for centuries, these products have constituted deeply embedded cultural practices among the local populations of these countries.

Therapeutic plant plays a crucial role in the treatment of numerous diseases and in the formulation of pharmaceutical cosmetics, which enjoy widespread acceptance within society. The growing preference for pharmaceuticals derived from natural plant-based ingredients has become a cultural trend in contemporary societies, largely due to the side effects and complications often associated with synthetic pharmaceuticals lacking natural compositions. Statistics indicate that approximately 50% of modern medicines are of natural origin. Nevertheless, despite their vital importance, medicinal plants have not received adequate attention in terms of marketing strategies and legislative frameworks.

The COVID-19 pandemic highlighted the challenges faced by developing countries in accessing medicines, even though some of them are rich in therapeutic plants that constitute essential components for many drugs. In contrast, other countries—most notably China and India—capitalized on these resources to address shortages in pharmaceuticals and even became major exporters.

This study seeks to examine the importance of leveraging medical agriculture for the marketing of medicinal plant in Algeria, as a developing country, by drawing lessons from the experiences of certain emerging economies. To achieve this, the study employed a Systematic Literature Review (SLR) methodology covering the period from 1981 to 2024, resulting in the selection of 104 relevant scholarly articles.

Research problem:

- What are the determining factors for Algeria’s transition from agricultural marketing to therapeutic plant marketing?

2. LITERATURE REVIEW

2.1 From Agricultural Marketing to Plant-Based Marketing

Agricultural marketing is defined as the set of commercial functions related to the marketing of agricultural products, including crops, horticulture, and others, from producer to consumer. It encompasses all activities associated with the movement of agricultural products, which are influenced by factors such as time, distance, and form. The marketing of agricultural products constitutes a cornerstone of economic growth in many countries, particularly in developing and emerging economies (U-Rehman, Shakeel, Selvaraj, M., 2012).

For instance, Indian agriculture has witnessed remarkable growth at an annual rate of 2.6%. India ranks first globally in milk production, second in the production of rice, wheat, peanuts, and tobacco, and third in coffee production. This is largely attributable to the country's extensive arable land resources, as India occupies the second position worldwide in terms of cultivable land (S. Karthick et al., 2020).

In the context of the rise of traditional medicine and the growing importance of phytotherapy, the shift from agricultural products to the utilization and commercialization of natural plant-based products (healing products) has become essential, particularly in a setting where international competition had previously focused on agri-food products. At present, due to the invaluable role of healing plants in treating various diseases, several studies have demonstrated the importance of exploiting this natural resource, particularly in Africa, as shown in the works of Datoussaid et al. (2021) and Bergquist & Dinerstein (2020).

2.2 The Role of Medicinal Plants in Emerging Markets

Herbal therapy has long been established as a traditional practice in many regions across the globe, with roots tracing back thousands of years. Healing plant are characterized by their abundance, affordability, and relatively low levels of toxicity or adverse side effects in clinical applications, Owing to these attributes, traditional medicine has been widely adopted in various countries. In China, for instance, traditional medicine constitutes a distinctive therapeutic system underpinned by a long-standing history of study and practice in the diagnosis and treatment of human diseases. The literature further highlights that herbal remedies served as the

primary form of treatment for psychiatric disorders until the introduction of antipsychotic drugs in the 1950s. Consequently, herbal medicines continue to demonstrate therapeutic potential, even for patients with schizophrenia, particularly when administered in combination with antipsychotics (Boudjelal et al, 2013; Ru Zhang et al. 2021).

Recent advances in pharmacological research have increasingly highlighted the therapeutic potential of active compounds derived from healing greens. These bioactive substances have shown promising results in addressing complex neurological disorders such as Alzheimer's disease, where they appear to contribute to cognitive improvement and the slowing of neurodegenerative processes. In addition, a wide range of healing herbs has been recognized for their role in enhancing cerebral circulation and protecting neural tissues, which makes them valuable in the prevention and management of stroke-related complications. Such findings underscore the importance of traditional medicine as a complementary approach to modern healthcare, particularly in the field of neurological and age-related disorders (ELAINE K. PERRY et al., 2010; Djamel Miara et al., 2019).

Beyond their applications in neurological health, medicinal greens have also demonstrated significant potential in oncology and chronic disease management. Natural extracts from certain herbs have been found to exert cytotoxic effects on malignant cells, thereby offering a basis for the development of plant-based anticancer therapies. Furthermore, herbal preparations have proven effective in alleviating the adverse side effects commonly associated with conventional pharmacological treatments, such as those used for gout and other metabolic diseases. This dual capacity—both to target pathological processes and to mitigate treatment-related complications—positions healing plants as a vital resource for integrative medicine, bridging the gap between traditional practices and contemporary biomedical innovation (Julia Prakofjewa et al., 2022).

During the SARS epidemic in 2003 in Hong Kong, thanks to innovative herbal formulas, the intervention of traditional medicine achieved remarkable therapeutic effects (Lau et al., 2005). However, during the current rapidly evolving 2019-nCoV epidemic, several clinical practice results revealed that Traditional Chinese Medicine (TCM) is an important means to delay disease progression, improve recovery rates, and reduce

mortality rates (Ling Ren et al., 2020). Indeed, it provides new hope for the prevention and control of COVID-19 (Susmita Poddar et al., 2020).

3. METHEDOLOGY

A systematic literature review (SLR) was used to collect scientific information related to the aim of the study. Search terms were created to extract sources from peer-reviewed literature on the Web of Science: google scholar, scopus and Elsevier. The search terms were "medical botany", "medicinal plants", "medical botany marketing", "medicinal plants marketing", "agricultural marketing ", "medical botany OR medicinal plants in Algeria" and "medical botany or medicinal plants in developing countries", agricultural marketing AND medical botany marketing.

The articles published between 1981 and 2024 were collected due to the historical significance of curative greens in medical applications, with a focus on papers that integrate marketing, medicine, and pharmacy, while excluding papers that do not address the research question and those that are repetitive. 22 papers were published between 1981 and 2004, 37 papers were published between 2005 and 2014, and 45 papers were published between 2015 and 2024 as shown in table 1.

Table 1. The number of articles published each year (1981-2024)

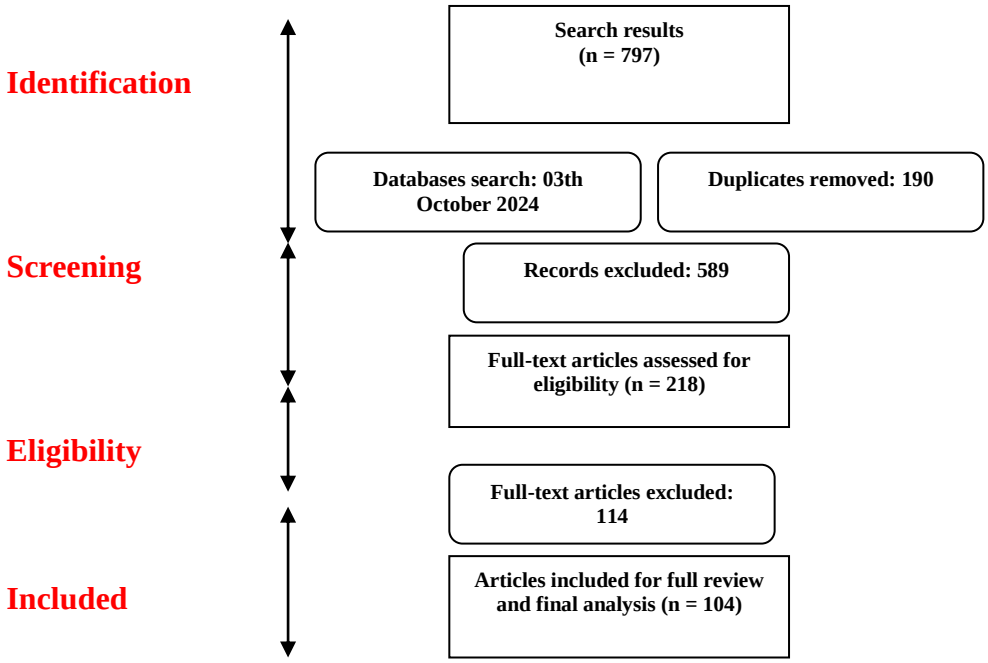
year	N	year	N	year	N	year	N	year	N
1981	02	2001	03	2007	02	2013	07	2020	02
1985	01	2002	02	2008	06	2014	04	2021	05
1990	03	2003	01	2009	01	2015	06	2022	04
1993	01	2004	05	2010	02	2017	06	2024	14
1998	04	2005	05	2011	07	2018	07	Total	104
2000	02	2006	02	2012	03	2019	03		articles

Source: author's name, year, page

The screening phase involved applying these criteria to the titles and abstracts, followed by a detailed evaluation of the full texts in the eligibility phase. Ultimately, 104 papers met the inclusion criteria and were incorporated into the systematic literature review. As depicted in Fig. 1, the

initial keyword search yielded a total of 997 records. After eliminating 190 duplicates, 807 titles and abstracts were reviewed. Of these, 589 failed to meet the required criteria, leading to a full-text evaluation of 218 papers. Out of these, 114 studies were excluded, leaving 104 selected papers.

Fig. systematic literature review (SLR) flow chart



4. RESULTS AND DISCUSSION

4.1 RESULTS

Most of the studies addressing the topic of curative plant marketing were conducted in Asia and Africa, with a strong focus on emerging economies (India and China in Asia, and South Africa in Africa). The Himalayas, the majority of which are located in India, have been the subject of extensive research due to the resources and diversity of curative greens found there, with more than 25 papers dedicated to India (Pradeep S, et al 2024; afnan khan S et al. 2024). In contrast, studies in China and South Africa primarily focused on curative greens in specific regions and ethnic groups (with over 15 papers in China and 20 papers in South Africa). The

remaining studies were conducted in developing countries such as Algeria, Morocco, Nigeria, Malawi, Pakistan, Iraq, North Macedonia, Bolivia, Suriname, Brazil, and Mexico. Additionally, other studies were carried out in developed countries such as the United States, South Korea, and the European Union.

As a result of the literature review, it became clear that Africa lags behind Asia and Europe in marketing curative plant products, despite having the potential and resources. This is largely due to the advantage these regions have in investment in R&D, as well as the high volume of scientific research related to these greens, particularly in India, China, and developed countries such as the United States and some European Union countries. Another factor that has enabled these nations to enter global markets is the adoption of environmental legislative policies aimed at preserving biodiversity.

4.2 CHALLENGES AND RECOMMENDATIONS

4.2.1 The challenge of insufficient scientific data on the efficacy and side effects of medicinal plants

The increasing demand for curative herbs during COVID-19 revealed that Algeria and many developing countries in Africa and Asia faced the challenge of lack of scientific data on these greens, and the difficulty of determining their effectiveness or identifying their side effects (Neelima Y et al, 2024). In line with the prevailing cultural practice of excessive use of these greens, a government policy should be adopted to research and classify thearpeutical species through field surveys of various species, discover new therapeutical species, and work on marketing them after ensuring their safety and efficacy.

Algeria's policy towards digital transformation, through the adoption of a centralized and local digitization strategy for all government sectors (Tiour S et al. 2024), represents an opportunity to establish a digital database under the supervision of the Ministry of Agriculture. The Chinese experience is noteworthy, as research continues there to discover new therapeutical species and incorporate them into the national database (Ruyu Y et al, 2024).

4.2.2 The challenge of protecting biodiversity

Therapeutical species may face the risk of extinction, particularly those yet to be discovered, due to overharvesting or environmental neglect and the absence of clear governmental environmental policies specifically aimed at protecting the biodiversity of medicinal species (Ruyu Yao et al, 2024). In Algeria, there is an environmental policy that addresses biodiversity in general, such as Law No. 03-10 of July 19, 2003, concerning the protection of the environment within the framework of sustainable development, especially Article 03, which mentions the biodiversity of ecosystems in general, without referencing therapeutical plants. Despite amendments through Law No. 07-06 of May 13, 2007, and Law No. 22-17 of July 20, 2022, as well as the issuance of important regulatory texts, therapeutical species have yet to receive specific legislative attention.

Given that medicinal species represent an emerging market, it is essential to accompany it with appropriate legislative policies. Such policies would safeguard consumer safety, encourage farmers to invest in the production of therapeutical flora, and preserve the biodiversity of these flora. This is especially important considering that many local regions in Algeria prefer therapeutical flora as alternative remedies to pharmaceutical drugs, a phenomenon widely recognized across most societies globally. This has been noted in the scientific studies we have reviewed.

4.2.3 Investment Challenge: Investing in Intangible Assets

- Knowledge of herbalists

In today's economies, there is a notable increase in the focus on intangible capital, which has become an effective indicator of the success of any economy or organization. Alongside traditional capital investment, there is a growing investment in intangible assets, such as knowledge, leading to the emergence of what is referred to as a knowledge-based economy (Dmitry L. Volkov, Tatiana Garanina (2006). The historical development of sanative uses and sanative herbs once again emphasizes the importance of the knowledge of herbalists, and thus the knowledge of herbalists cannot be excluded or ignored in the process of discovering and developing sanative plant products. The traditional knowledge of sanative flora has proven its importance among local populations in Algeria (Madani S et al., 2014).

-Challenge of integrating R&D

Investment in research and development facilitates the discovery of new products derived from sanative flora, as well as the development of existing products. Furthermore, it contributes to consumer protection against dangerous products that are used and traded without adequate consideration, particularly in light of certain products marketed online with unknown compositions, although they are often the most widespread and marketed (Charles A, 2003).

The secret that has led India (Vinita, Morya et al., 2018; afnan khan, 2024, S. K. Jain, 2007), China (Ru Zhang, 2021) the United States (Antoine Al-Achi, 2012), and Europe (Aalt Bast, R.Frank Chandler et al. 2002) to seek global markets for marketing sanative plant products, considering them part of their government strategies, lies in their investment in research and development, as confirmed by various relevant studies. Chinese research has even begun to recommend adopting these approaches as core educational methodologies in scientific research (david S. senchin A, 2006), which is something Algeria should embrace as part of its national strategy for research and development.

4. CONCLUSION

The study revealed that Algeria, as a developing country, possesses all the agricultural and botanical resources that enable it to strengthen its pharmaceutical industry and thereby contribute to increasing the gross domestic product, while benefiting from the experiences of emerging economies, particularly China and India. Our study demonstrated that all the literature addressing the transition from agricultural marketing to medicinal plant marketing has been concentrated in emerging countries. However, in order to achieve similar results, the study recommends that Algeria invest in research and development, with a strong focus on innovation, as well as adopt protective policies for biodiversity and reinforce the legislative framework with laws that encourage the marketing of remedial flora. It also highlights the need to raise awareness of their importance in the production of natural cosmetics, particularly among start-ups. At the same time, traditional local herbal medicine should not be neglected, given its effective

contribution to economic growth, as evidenced in the aforementioned international experiences.

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