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Sustainable marketing practices within the agricultural sector and their reality in Algeria - a standard study (1960-2020)

Bilal Saker [1*]

[1] PhD student, Larbi Tebessi University, Tebessa, (Algeria),
Bilal.Saker@univ-tebessa.dz

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Abstract:
The study aims to show the nature of sustainable marketing practices within the agricultural sector in Algeria, through a standard study based on annual data for the period from 1965 to 2020, depending on a number of variables, and the method for that is a time series with the use of reference points

The study found differences in the outputs of marketing practices in the time periods under study within the agricultural sector, while highlighting its contribution to national returns.

Keywords: Sustainable marketing practices, Agricultural marketing, Time series:Algeria.
JEL Classification: M31 ; Q01 ; Q13; Q56

[*] ***Corresponding author.***

Introduction

In recent years, the economic environment has witnessed many transformations, some of which were represented in the emergence of new forms of marketing practice and the ensuing consequences that the agricultural sector formed a field and a ground to that activities , due to its importance as an necessary area for the existence, and investment in it is part of the development process of the economies of countries It can also be a source of currency if it reaches the stage of export or at least achieve part of the basic needs, and then directing the marketing process in it to achieve the development that countries seek in various forms from optimal utilization of all available energies and work to improve the existing situation and increase opportunities to preserve resources. Although the matter is not easy in view of the lot of complexities, the search starts from realizing the importance of the situation and seriousness working to accomplish the required, and Algeria, with the changes it is witnessing, is not an exception to that, but rather it may be necessary to get out of its economic situation. that dependent on the energy sector to a large extent, and the damage and risks that this entails. Hence, the question posed is:

What is the reality of sustainable agricultural marketing practices in Algeria?

In order to address this problem, the following questions have been put:

- How do sustainable agricultural marketing practices contribute to Algeria's overall national revenues?
- Is there a difference in sustainable agricultural marketing practices over the time periods under study in Algeria?
- Is the relationship between agricultural marketing and GDP in Algeria stable?

To answer these questions, the following assumptions were formulated:

- Sustainable agricultural marketing practices do not contribute significantly to Algeria's overall national revenue.
- There is no difference in sustainable agricultural marketing practices over the time periods under study in Algeria.
- The stability of the relationship between agricultural marketing and total income in Algeria.

The tools

The study relied on the descriptive and exploratory analysis methodologies within the theoretical and applied side, respectively. Using visualization tools to display time series.

Objectives of the study

- The purpose of the study is to identify sustainable marketing practices and agricultural marketing, through:

- Identifying the strengths and weaknesses of agricultural marketing practices in Algeria
- Identifying the factors affecting agricultural changes in Algeria.
- Identifying the extent of transformation in the outputs of the marketing process during long periods of time in the international practice of Algeria.
- Predicting the impact of some factors on the environmental and economic aspects of Algeria

The Study importance

The importance of the study is due to the orientation it takes in addressing the issue of sustainable marketing practices and agricultural marketing in Algeria, through historical data to anticipate the results of holistic practices.

The limits

The limitations of this study are as follows:

- Objectivity borders

  This study was limited to identifying sustainable agricultural marketing practices as a topic and Algeria as a case
- The Spatial

  The study was limited to the state of Algeria and its agricultural space.
- The time

  This study relates to the time period from 1960 to 2020 by building a prediction model based on historical data

1-Definition of sustainable marketing practices

The definitions provided for sustainable marketing practices varied according to viewpoints, and The focus of sustainable marketing practices is the sustainability aspect

has been termed the third age' of green marketing, and is concerned with the ecological, equitable, and economic impacts of marketing practice (Baines, Fill, Rosengren, & Antonetti, 2017, p. 27).

Sustainable marketers seek to meet the needs of existing generations while not compromising those of future generations (Baines, Fill, Rosengren, & Antonetti, 2017, p. 27).

Sustainable marketing requires a consideration of environmental, economical and social issues in all elements of marketing strategy planning, from objective setting to target market selection to strategic and tactical decisions regarding each of the marketing mix variables (Pandey, Kumari, Shrivastava, & Rai, 2012, p. 02).

Accordingly, it can be said that they are activities that take place within specific frameworks based on economic, social, ethical and

environmental criteria aimed at achieving benefits for all parties in the marketing process and the parties affected or can be influenced.

3. Importance of sustainable marketing practices

Sustainable marketing practices are so important that the field cannot track every part of it. The following are points that show this, according to different points of view:

The role of sustainability marketing in building a competitive advantage is perceived differently by enterprises operating in markets at different levels of socio-economic development (Rudawska, 2018, p. 295)

Sustainable thinking is an established long-term trend, not a short term fad. Customer sentiment and corporate practice worldwide suggest that a competitive advantage can be earned by implementing sustainable marketing practices. Conversely, a failure to do so may automatically position a firm as unresponsive, uncompetitive, and out of touch with emerging global markets (Fuller, 1999).

The principles and practices of the social marketing orientation provide solutions to environmental problems and to tackle climate change, such as recycling, composting, energy efficiency and sustainable transport use, and the promotion of sustainable lifestyles (Sequeira & Reis, 2019, p. 264).

One might easily assume that as pressures on ecosystems mount as the population increases, this will spur additional government regulatory initiatives. A failure to be knowledgeable and proactive in this area invites additional government regulation-tighter emissions standards (Fuller, 1999).

4. Definition of agricultural marketing

There are many definitions of agricultural marketing, some of which are listed below:

Involves many functions like assembling of farm products, grading, storage, processing, and preparation for market, transportation to market centers, financing, risk bearing and distributing to ultimate consumers through various marketing channels (Beohar, Tiwari, & Singh, 2006, p. 13).

Agricultural marketing is a composite and specialized economic process, the principal function of which is the determination of equilibrium prices of different agricultural products over space and time (Kumar, 2007, p. 202).

Consists of all the functions and services used in moving the commodities from the producer to the final consumer. It includes all activities that create different utilities-time, place and form—for the ultimate consumer (Krishnamacharyulu & Ramakrishnan, 2011, p. 490).

Agricultural marketing is a multi-stage economic activity that aims to create an exchange of agricultural commodities and services between its applicants and providers within the framework of a consensus of interests.

5. Importance of agricultural marketing

Agricultural marketing is really important because of many of the features it offers, like:

Agricultural marketing plays an important role in accelerating the pace of economic development in addition to stimulating production and consumption. Its dynamic functions are of primary importance in both agricultural and economic development. As such marketing has been described as the most important multiplier of agricultural development (Verma, 2014, p. 141).

also provide technologies and capital to contact farmers has gained importance and has helped the farmers in realization of better returns for their produce (Thorpe & Thorpe, 2012, p. 122).

Maintaining the pace of increased production through technological developments, assurance of remunerative prices to the farmers for their products to sustain the growth of the non-agricultural sectors (Verma, 2014, p. 142).

Realization of benefits by meeting the needs and desires, especially those necessary, within available material, in the sense of saving effort, time and potential cost, if no such marketing exists.

6. Data and processing methods

The data on Algeria were obtained from a number of sources, mostly from the World Bank website (The latest update is August 2021)**,** Exploratory data analysis (EDA) was adopted as a philosophy and as a method in this study, through some techniques that are included in this approach, such as the graphical representation of time series in a logarithmic way to clarify the change occurring on the item under study by comparing its states during a certain period or the neutral representation to compare more than one item. Using the ARIMA model as a tool to predict the outcome of a specific event based on the analysis of its past situations.

7. Data analysis

This part of the study illustrates several points related to the reality of agricultural marketing practices in Algeria:

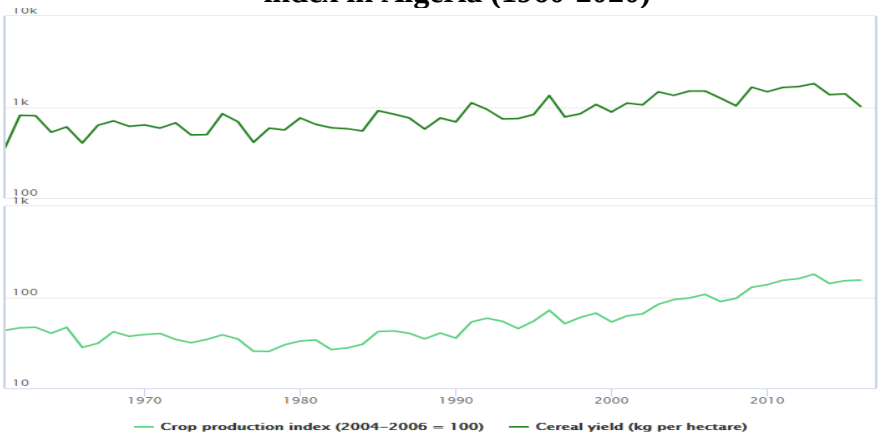
- The changes of Algeria's agricultural production over the years of study
- The added value of the Algerian agricultural sector
- The agricultural aspect of the commercial trade of Algeria, in the form of imports and exports of agricultural raw materials

- Time changes in food price and its relation to inflation
- Change in employment in the agricultural sector and its relationship to population growth
- The change in agricultural area and its relation to the instruments used
- Changes in the emission of greenhouse gases in Algeria, especially those resulting from agricultural practices
- Accordingly, a projection model for greenhouse gas emissions to 2028 has been developed

Figure No. (01) shows the change in cereal production during the years 1960 to 2020.

The upper part referring to the grain crop per kilogram per hectare - as a general average - despite the fluctuations from year to other, but the general trend is significantly increasing, which is supported by the production index (lower part) - considering the 2004 to 2006 production as the basis for comparison - so that the fluctuations appear less sharp and the overall increase corresponds to what was mentioned earlier.

Fig.01. Evolution of both cereal production and the crop production index in Algeria (1960-2020)

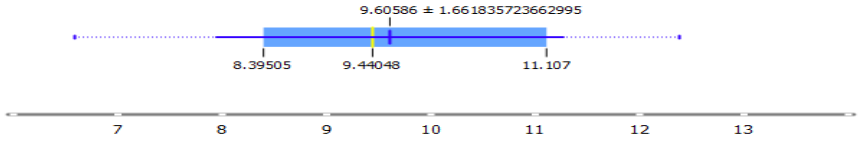


Source: Prepared by the researchers based on World Bank Data

Scheme in Figure 02,show the value added in agriculture, forestry and fishing sector that ranges from approximately 8% to less than 11.5% of the GDP.

Although values between less than 6% to about 12.5%, but considered to be extreme, the Interquartile Range from 8.4% to 11.11%, which is shown by the body of the box. The mean is 9.44% and the arithmetic mean is 9.61% with a standard deviation of 1.66%

Fig.02. Value added of the Algerian agricultural, forestry and fishing sector (1960-2020)

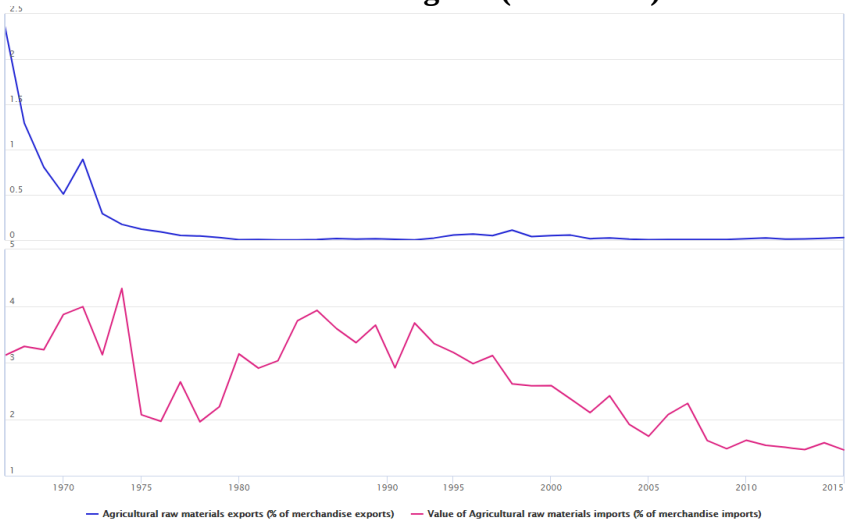


Source: Prepared by the researchers based on World Bank Data

Fig .03. shows the change in the percentage of exports of agricultural raw materials from the total export value in Algeria over the years (1960-2015 in blue), although fluctuating in some years, it can be noted that the decline in this percentage from the beginning of the 1980s Than it is subsequently stabilized, whereas the value of primary agricultural imports of the total imports during the same periods was characterized by upward and downward swings between each year.

Although the full trajectory is declining, as shown in red by the general trend, given the production of the period 2004-2006 as the basis for comparison, so that the fluctuations appear more sharply and are consistent with the previous trend.

Fig.03. The evolution of exports and imports of agricultural raw materials for Algeria (1960-2015)



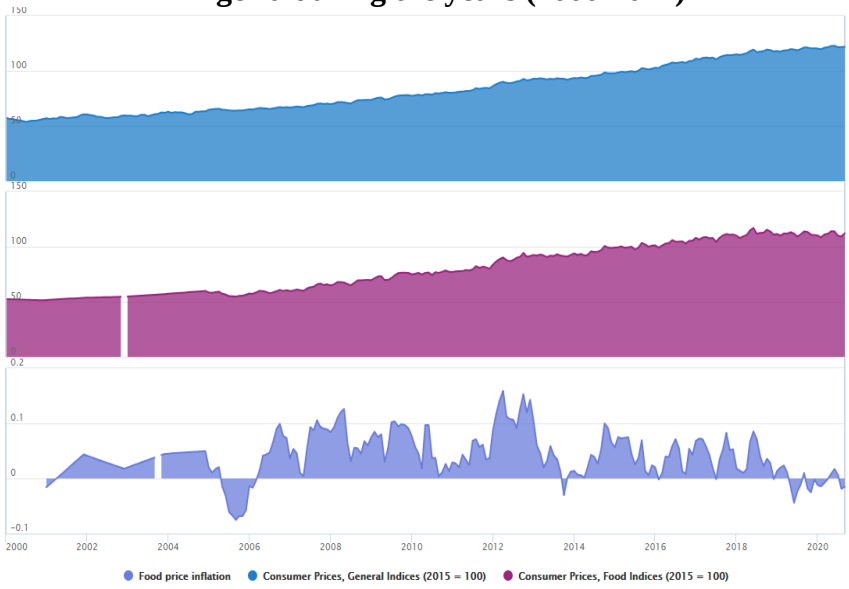
Source: Prepared by the researchers based on World Bank Data

Figure No. 04, show the area chart features the general index of consumer prices (blue area) based on 2015 prices as a reference basis.

The increasing frequency of the index is largely correlated with the increase in consumer food prices by adopting food prices for the same year as a comparative basis (purple area).

The last area highlights food price inflation as being irregular between years and generally the absence of a prominent pattern to judge the pace of change.

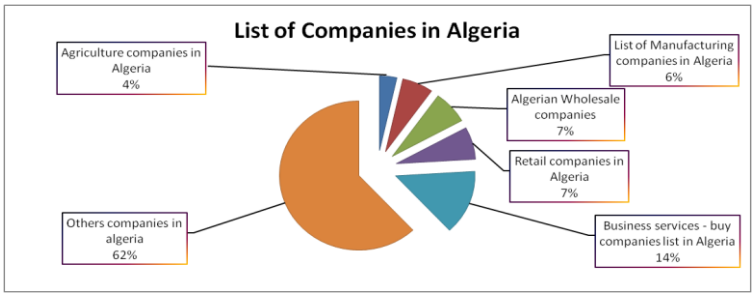
Fig.04. The general consumer price index (CPI), the consumer food price index (CPI) and the consumer food price index (CPI) changed in Algeria during the years (2000-2021)



Source: Prepared by the researchers based on World Bank Data

It appears from the relative circle (Fig. 05) for the list of companies operating in Algeria according to their type of activity for the year 2021 that only about 4 percent of the total number of companies is active in the agricultural sector, while companies buying business services are equal to 14%, i.e. More than 3 times the agricultural companies.

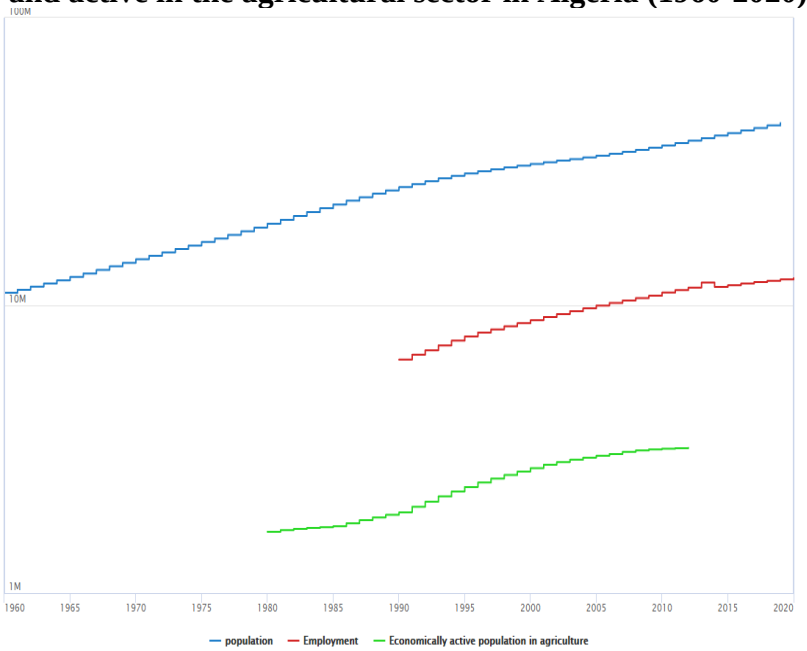
Fig.05. Percentage of active companies in Algeria by type of activity for 2021



Source: Prepared by the researchers based on (bolddata, 2021)

In the following figure (No. 06), the gradient represents the population and labor force in all sectors and the labor force in the agricultural sector, respectively. All follows the same pattern, noting that the differences between the grades are significant so that the difference between the population and the labor force in the agricultural sector visibly , and it's clear that the agricultural workers proportion in the total labor force increased in the 1990s and then declined by the beginning of 2000.

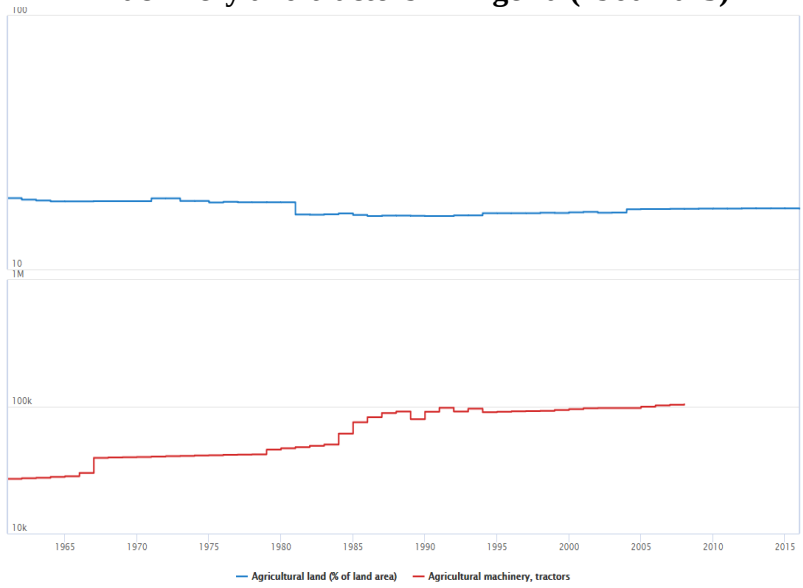
Fig.06. The Change in the number of population, Total Employment and active in the agricultural sector in Algeria (1960-2020)



Source: Prepared by the researchers based on World Bank Data

From the following fig, it is clear that the agricultural land proportion in the total area in Algeria tends to decrease somewhat slowly, in a contrast to the number of the agricultural machinery and tractors, which witnessing a rapid increase and sometimes leaps, such as the one during the period between 1985 and 1988, with an increase of a nearly half of its previous number , with some imbalance at times, but it is not continuous in the long term.

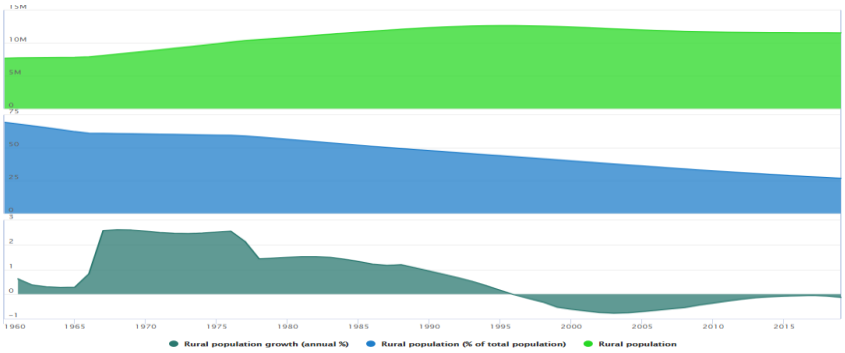
Fig.07. Proportion of agricultural land and number of agricultural machinery and tractors in Algeria (1960-2015)



Source: Prepared by the researchers based on World Bank Data

On the other hand, it is noted from the following statement that while the population of the rural areas increased from the 1960s until the mid-1990s, followed by a stage of a slight decline, the percentage of the rural population compared to the total number of Algeria is declining, changing from 70% in the 1960s to nearly 25% in 2020. Their rate of growth is unstable and varies considerably between each year

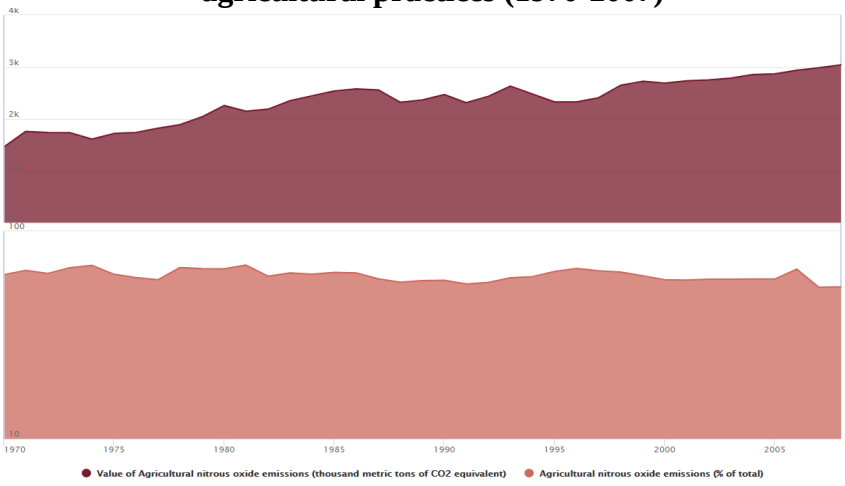
Fig.08. Comparison of the number and percentage of the rural population with the total population in Algeria (1960-2020)



Source: Prepared by the researchers based on World Bank Data

In general, it appears that the emission rate of nitrous oxide resulting from agricultural operations (nitrous oxide (N2O) Nitrous oxide is a greenhouse gas whose main source is agricultural practices) (the lower part of the figure) is almost constant despite the irregularity between each year and it ranges between 57% and 65% and the higher rates are considered abnormal As for the values of this emission, they are increasing (which appears in the upper part of the figure) to more than double in 2008 from the value of 1970, with a drop between each year.

Fig.09. Value and percentage of nitrous oxide produced from agricultural practices (1970-2007)



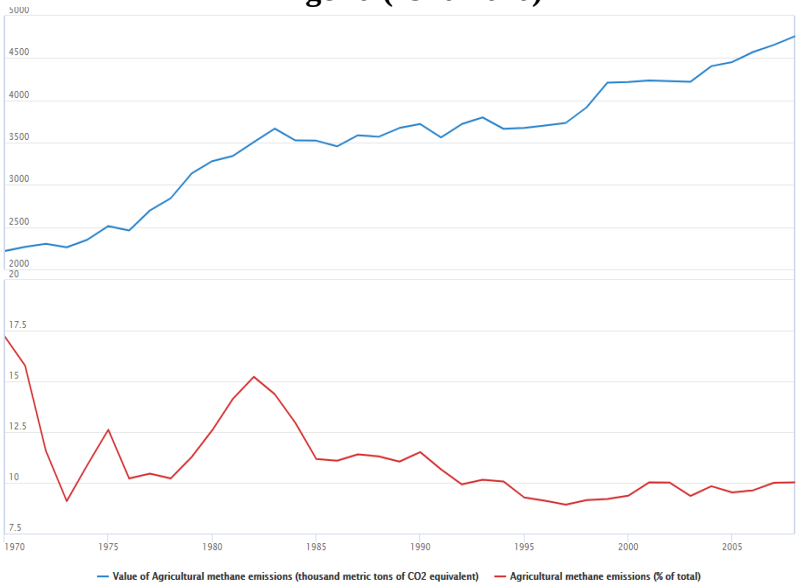
Source: Prepared by the researchers based on World Bank Data

As for the following figure, the total increase in methane emissions resulting from agricultural practices(prominent in the upper section of the

Fig) and equivalent to the emission of one thousand metric tons of carbon dioxide is clear even if this is accompanied by stages of difference between time periods, such as the growing increase between 1976 and 1983 or stability between 1999 and 2003.

As for what these quantities constitute of the total emissions, it is witnessing a relative decline across the entire time range, with the possibility of a shift to a positive trend, as happened between 1978 and 1982 (obvious in the lower part of the Fig).

Fig.10. Value and percentage of methane from agricultural processes in Algeria (1970-2010)



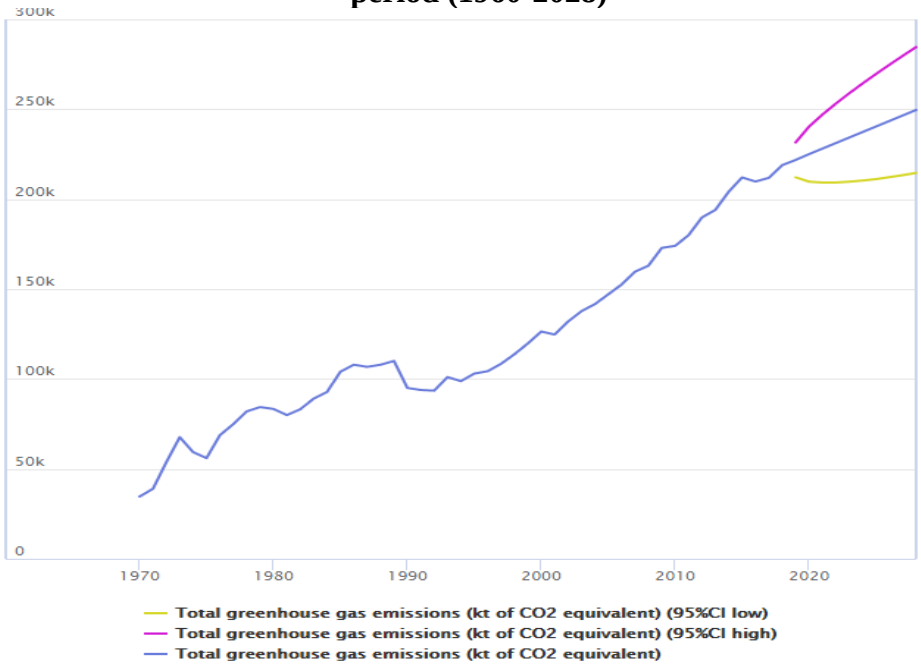
Source: Prepared by the researchers based on World Bank Data

As regards the curve shown below, the total greenhouse gases emissions of witch equivalent to 1 kiloton of carbon dioxide, Based on the evaluation of the model shown in the appendix, ARIMA(0.1.2) is the most suitable for prediction because it has the least error among them.

The final part shows the expected value using the model and it is clear that the value of total emission increase over time, and if otherwise noted, is in the form of a mutation and has no effect on the overall shape, and it is expected to reach about 249 thousand tons In 2028, compared to about 219 thousand tons in 2018,a likely increase of 14%.

However, the value of the change may be greater or less than that between the limits of the 95% confidence interval.

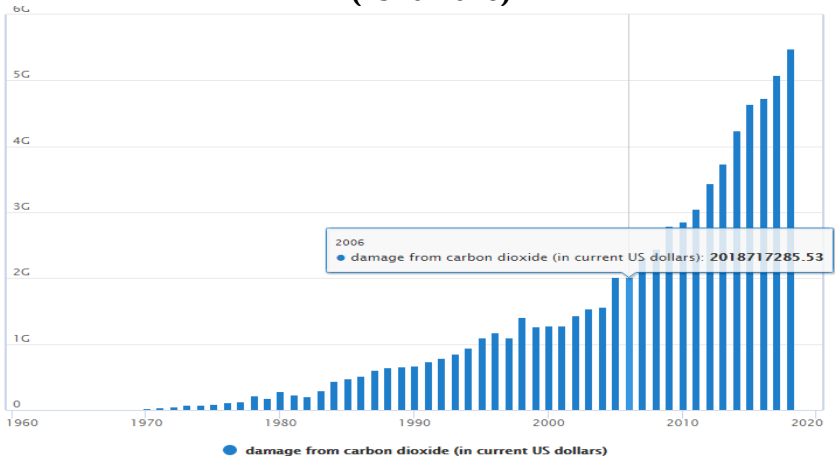
Fig.11. Actual and expected greenhouse gas emissions in Algeria for the period (1960-2028)



Source: Prepared by the researchers based on World Bank Data

Through the graph of the value of the damage resulting from the emission of carbon dioxide, it appears that it is increasing taken form of time function, which is shown by the transformation between years; in other words, the damage estimated in dollars over time grows in a direct pattern with some anomalies at times; such as the apparent stability at the beginning of the second millennium, and it is worth noting that 2006 is considered a transitional stage, as the total damage after it is greater than before by calculating the arithmetic mean and standard deviation for before and after the mentioned year and then comparing the values.

Fig.12. Amount of damage from carbon dioxide emission in Algeria (1970-2016)



Source: Prepared by the researchers based on World Bank Data

CONCLUSION

Despite the importance of agricultural activity and the marketing practices it entails, which is an imperative for the human existence, the interest it receives is declining in favor of the rest of the sectors, driven by the change in the nature of life.

In this study, the concept of agricultural marketing and its impact on economic growth was presented in theory, and the nature and importance of sustainable marketing practices was explained. As for the practical aspect, we used statistical methods, the majority of which were a graphical representation of time series, and the results were presented and discussed. This enabled us to achieve the following:

Increased production of cereal crops and yields versus cultivated crops due to the development and greater use of agricultural machinery, and the consequent improvement of both the producer and the consumer situation through financial returns and satisfy the needs, respectively (with other factors remaining constant).

The small size of the agricultural sector's contribution to the national total compared to other sectors, such as the fuel sector or the service sector, shows the lack of interest in marketing and sustainable development within the sector, which contributes to the decline of the labor force in agricultural fields and the trend towards urbanization and the decline in the number of rural residents in recent years. This leads to new challenges (such as

overcrowding cities), including the emergence of new trends and commitments.

The decline in Algeria's international exchange in agricultural raw materials means an increased dependence on the domestic product in agricultural development processes, which helps stability and prevention of external disturbances, but at the same time prevents from benefiting from marketing opportunities such as importing materials with advanced agricultural techniques.

The rise in food prices, although consistent with general prices, is not attributable to total inflation due to a disproportionate gap between the two, which is a burden on consumers, to future construction and to the rights of generations if the situation continues as it is.

The decline in agricultural areas and the increase in the emission of greenhouse gases as a result of agricultural operations, This is driven by the use of machines that are not environmentally friendly which pose a threat on the present and future development situation and the consequent risks to human health and safety.

- Therefore, despite the contribution of agricultural marketing practices to the total Algerian national returns to achieve sustainable development, it is a small contribution, which negates the first hypothesis.
- With a difference in agricultural marketing practices in Algeria across the time periods under study. Hence, the second hypothesis is denied.
- The unstable relationship between agricultural marketing and economic growth, so that increased economic growth has not resulted in increased marketing orientation within the agricultural sector or vice versa because of that the third hypothesis is rejected.

Recommendations:

- Paying attention to sustainable marketing practices within the agricultural sector of Algeria in order to confront future challenges and build the necessary capacities for this;
- The necessity of amending the adopted policies in line with the development taking place in the agricultural field and in a manner that meets the aspirations of Algeria and preserves the environment;
- Work to increase awareness of the impact of agricultural marketing practices and commitment to preserving natural resources;
- The inevitability of the active and comprehensive participation of all parties in Algerian society for a favorable healthy agro-environmental development by being open to and enabling sustainable practices;

- Rewarding efforts made in the field of agricultural marketing to achieve sustainable development in Algeria;
- Working to direct all sectors to sustainability by including high-level standards for this within the performance measures.
- Alert to the harms of some practices such as relying on energy sources that have a negative impact on the environment in order to avoid them
- The need to work proactively to improve marketing practice in the agricultural sector
- Advocating for the commitment of practices that support and strengthen the environment while meeting the requirements of all by adopting a responsible approach.

It is also possible to follow the study through the following points:

- Identify strengths and weaknesses in agricultural marketing orientation
- Study of the impact of agricultural marketing on per capita GDP.
- Mechanisms for achieving sustainable development in Algeria.

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Annex

Figure number (01):Model Evaluation

MODELS	**EVALUATION**
ARIMA(0, 0, 0)	MSE=656698625099567232.000
ARIMA(0, 0, 1)	MSE=167316853758849536.000
ARIMA(0, 0, 2)	MSE=41532273132088488.000
ARIMA(0, 0, 3)	MSE=8593417456557300.000
ARIMA(0, 1, 0)	MSE=1384264549.685
ARIMA(0, 1, 1)	MSE=651224289.090
ARIMA(0, 1, 2)	**MSE=324378319.143**
ARIMA(0, 2, 0)	MSE=3634096598.575
ARIMA(0, 2, 1)	MSE=1452930063.116
ARIMA(0, 2, 2)	MSE=676209118.768
ARIMA(1, 0, 0)	MSE=1038753571353970.875
ARIMA(1, 1, 0)	MSE=1258993839.688
ARIMA(1, 2, 0)	MSE=2773866802.825
ARIMA(2, 1, 0)	MSE=1019940623.335
ARIMA(2, 2, 0)	MSE=2494926534.409

Source: Prepared by the researchers based on World Bank Data