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## **Demographic transition and its implications for sustainable development strategies in Algeria: a prospective study of the age structure of the population using the DEMPROJ program until 2045**

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### **Abstract:**

This study analyzes the demographic transition in Algeria and its implications for sustainable development. It aims to monitor changes in the population's age structure until 2045 and their impact on future development policies. Using a prospective analytical approach and the demographic spectrum program, the study projects population trends and examines related indicators.

Findings indicate significant transformations in Algeria's age structure by 2045, with a decrease in the proportions of both the youth (0-14 years) and the economically active (15-64 years) groups, contrasted by a notable increase in the elderly population. This demographic shift will alter dependency ratios, prompting a need for a revised development policy framework.

The study emphasizes the necessity of a multidimensional development strategy that accommodates these demographic changes, focusing on investments in human capital, enhancing social protection systems, improving health and education services, and ensuring pension system sustainability. It proposes an integrated framework for formulating responsive development policies to address future demographic challenges

**Keywords:** Demographic transition, Age structure of the population, Population projections, Demographic dependency ratio, Sustainable development, Development policies, Algeria.

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### **1. INTRODUCTION**

Sustainable development, as envisioned in the post-2015 global agenda, is fundamentally anchored on two pivotal principles: intergenerational equity, which emphasizes the preservation of social, human, economic, and environmental capital for future generations, and intragenerational equity, which focuses on ensuring equitable distribution of well-being conditions within contemporary society, including access to healthcare, education, employment, and personal freedoms. This paradigm necessitates a comprehensive reformation of population policies through the systematic integration of both quantitative and qualitative demographic variables into the development process, recognizing their crucial role in shaping sustainable human development trajectories.

The analysis of demographic age structure dynamics has emerged as a critical component in prospective studies across various domains, serving as a fundamental cornerstone in development

policy formulation. This analytical framework enables the precise determination of population composition across different age cohorts (children, working-age adults, and elderly), facilitating both current needs assessment and future demand projections for essential services. Moreover, it provides crucial insights into dependency ratios and their implications for economic planning, thereby informing targeted development interventions for optimal resource allocation.

The ongoing demographic transition, particularly pronounced in developing nations, is characterized by significant shifts in age structure patterns. These transformations present substantial challenges across economic and social dimensions, necessitating strategic preparation to effectively address emerging needs in education, healthcare, employment, and social security systems.

### **Research Problem**

Algeria, amid this global demographic transformation, is experiencing significant population structure changes driven by evolving demographic parameters (fertility, mortality, and migration). These changes manifest primarily through shifting dependency ratios and working-age population proportions, with profound implications for sustainable development across temporal horizons. This leads to our central research question:

**How can Algeria effectively address the socio-economic challenges emanating from projected age structure transitions through 2045, while ensuring the achievement of sustainable development goals that meet the diverse needs of all demographic cohorts?**

### **Research Significance**

This study's significance lies in its comprehensive analysis of Algeria's future demographic challenges and their implications for sustainable development trajectories. The research is particularly relevant given the projected increases in elderly population proportions and their associated socio-economic implications. The findings provide essential insights for evidence-based policy formulation and program development, specifically designed to address emerging demographic challenges while advancing sustainable development objectives.

### **Objectives of the study:**

Through this study, we aim to address the following elements:

- Trends in population growth and demographic transition in Algeria.
- Identify the features and trends of expected changes in the age structure of the population in Algeria until 2045.
- Analyze the potential challenges of these changes to the achievement of sustainable development.

#### **- Study Methodology:**

The study relied on the descriptive analytical approach using statistics and relevant official reports to analyze the trends of change in the age structure and anticipate its future features and implications for sustainable development in Algeria.

## **2. Concepts related to the subject of study**

### 2.1) The concept of demography:

Scientific studies of population are included under the name of demography or demography, and this word consisted of the compilation of two syllables from the ancient Greek language, Demos, meaning people, and Graphia, meaning description, so that the meaning of the whole word is to describe the population and write about them. This is linguistically.

Achille Guillard defined it in 1855 as "the natural and social history of the human race or mathematical knowledge of population societies and their general changes and physical, civil, intellectual and moral conditions."

Demography is the social science that studies: \*the size, composition, and distribution of the human population of a given area at a specific point in time; \* the changes in population size and composition; \* the components of these changes (fertility, mortality, and migration); \* the factors that affect these components; and \*the consequences of changes in population size, composition, and distribution, or in the components themselves. Hence, demography may be more broadly defined as the scientific study of the size, composition, and distribution of human populations and their changes resulting from fertility, mortality, and migration. Demography is concerned with how large (or how small) are the populations; how the populations are composed according to age, sex, race, marital status, and other characteristics; and how the populations are distributed in physical space (Dudley L. Poston, Jr, 2017, p3).

### 2.2) Branches of Demography:

Demography, like other humanities and social sciences, consists of many branches, including:

- **Historical demography:** It is concerned with the retrospective study of population phenomena in ancient societies and the extent of their impact and reflection on civilized societies through the detection of factors and results, while mathematical demography is used more generally for mathematical treatment in this field, including the application of functions, rates and mathematical matrices to legal data such as demographic analysis and population projections, and there is a specific school for demographers that formulated the phrase demographic quantum to study the possibilities of life and its applications.
- **Economic demography:** It is concerned with the relationship between the population in terms of size and distribution and its relationship to economic phenomena such as income, employment, unemployment, savings, inflation and production.
- **Social demography:** studies the social characteristics of the population of gender and age, marital status, educational, vocational, religious, linguistic and ethnic in terms of providing statistics and standing on them from the sociological side.
- **Descriptive demography:** examines the description of the population in terms of its number, geographical distribution and general characteristics that distinguish it from others, using population statistics or demographic statistics.

### 2.3) Definition of population projections and their importance in formulating population policies:

- Population projections are defined as future estimates of a population, meaning that they are the calculation of future trends of the population based on a set of assumptions related to future trends in fertility rate, mortality rate and migration rate. This calculation is made based on demographic indicators.

- Population projections gain importance from the increasing demand from users, as planners and follow-ups in all areas of development need future estimates of the size of the population and their age distributions, and these estimates are logical and based on good and reliable scientific programs and methodologies, as they help the planner to assess the current situation of the population, develop population programs and plans, and form population policies, to meet the basic current and future living needs of the population, whether educational, health or service.

- Economics recognizes that changes in national income, wealth, resources, trade, income distribution, wages, employment, savings, investment, consumption and occupations may affect changes in population variables and vice versa.

- The scientists went that if the growth of the population is accompanied by an increase in population density in new regions and countries with an increase in the division of labor and also an increase in productive power and income, but this increase has limits, and when the increase reaches an optimal limit, the increase in population density within the country will result in a decrease in income and a decrease in the standard of living.

- There is no doubt that the size of the population in the future is one of the basic data in the development planning process, and we emphasize that the total population only does not meet the purposes of development planning, but it is important that population projections include the characteristics of this population, especially in terms of age and gender, and that development planning should not be seen as planning at the national level only, but it is important that the population projections be at the regional or local level as much as possible, and we market the following Some areas that depend on this data.

- In the field of health, the planner needs to identify the number of births in the coming years, the number of women of childbearing age and the number of the elderly in order to allocate material and human resources related to the number of doctors and health workers, the number of beds, the needs for vaccinations, family planning methods, primary health care centers, maternity and child centers, health and social services for the elderly.

- In the field of education, the plan needs to identify the evolution of the number of children and young people at different educational levels in the medium and long term in order to provide educational buildings, teaching aids and human resources that will achieve the State's educational policy in terms of absorption in the stages of nursery, primary, preparatory, secondary and university education.

**2.4) Age structure of the population :** It means the age distribution of the population groups, and the importance of the composition of the population according to age groups appears to know the working groups in society and the groups dependent on their pension over others, represented by children and the elderly.

- The population under 15 years of age: represents the category of young people and includes infants, children and some adolescents, and its percentage varies from place to place.
- Adults aged 15-64 years: It represents the economically productive group in society, and is more dynamic and demographically dynamic.

• Elderly category: includes the percentage of the population over the age of 65 years, and they are called the first citizens (Benzaid Rim, 2012, p. 49)

The study of the age structure of the population is essential for long-term strategic planning and policies, to ensure that the needs of all age groups are met and sustainable development is achieved.

**2.5) Definition of sustainable development :** Sustainable development aims to strike a balance between different and sometimes opposing needs on the one hand, and awareness of the environmental, societal and economic limitations we face as a society on the other (Salem Nashi, 2019, p. 4).

Sustainable development is a method of change in which

Exploitation of resources

Directing investments

Guiding technological development

Institutional Change

In harmony to enhance the current and future possibilities to meet people's needs and aspirations.

### 3. Demographic transition in Algeria

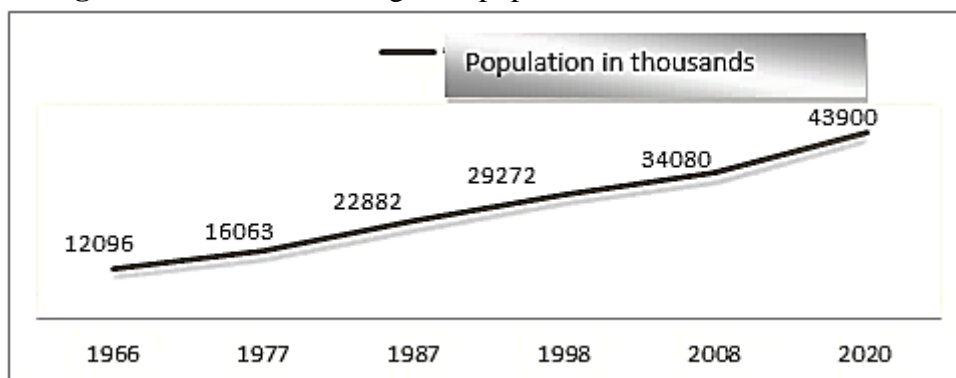
#### 3.1) Evolution of the size of the population in Algeria:

As represented in the figure below, since independence, Algeria has witnessed a rapid population growth, as the population moved from 12 million in the 1966 census to 16 million in the 1977 census, doubling the number in the 1987 census within 20 years, to reach the current equivalent of 44 million by 2020, an increase of 32 million people from the first census completed in Algeria after its independence.

This large population increase witnessed by Algeria by doubling the size of the population equivalent to 3 times within 40 years is mainly due to a set of factors, the most important of which are:

- o The blessing of independence and the desire of the Algerian people to compensate for the human losses during the war of liberation.
- o Improved health and living conditions compared to the past.
- o Early marriage.... Etcetera..

**Fig n° 01:** Evolution of Algeria's population size from 1966 to 2020.



Source: ONS, (1999), pp. 5, 6, 7, 15.

ONS, (2009).

ONS, (2018).

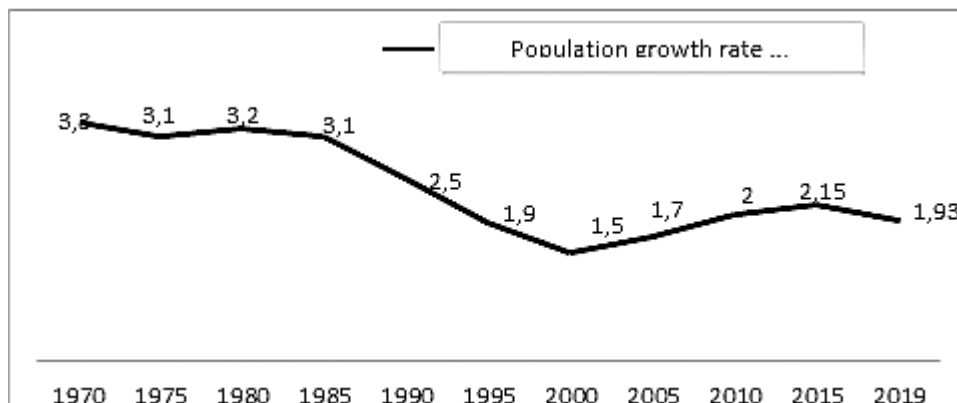
### 3.2) Evolution of population growth in Algeria:

Algeria is among the countries in the world that witnessed a significant increase in the population growth rate, which exceeded 3% in the seventies until the eighties, due to the early marriage that was witnessing in this period, and the lack of widespread use of contraception and family planning, as the rate of women's use of contraceptives in the seventies was estimated at 8% (ONS, 2007, p59), which contributed significantly to raising reproductive rates, as the synthetic fertility index was estimated at more than 7 children per woman (Benzaid rim, 2012, p43).

To witness the population growth in Algeria starting in 1985 to decline to reach 1.5% at the beginning of the new millennium as seen in Figure 02, and this is due to the adoption of Algeria at the beginning of the period 80 of the program to control population growth, which caused a significant change in the demographic field in Algeria, where during the two decades slowed the level of population growth, and the fertility rate decreased in Algeria, as we do not forget that the economic crisis that touched Algeria with the eighties had a great impact on The reproductive behavior of the population, where the reluctance to marry due to the shrinking jobs and the spread of unemployment, in addition to the social and economic status witnessed by Algerian women by learning and reaching a high level of education and entering the labor market had a great impact on their reproductive behavior, as the average age of marriage for them was delayed, as it moved from 18.3 years in the 1966 census to 29.9 years (ONS, 2007, p55) in the 2008 census. Women lost almost 12 years of their reproductive life.

But at the beginning of the new millennium, what has been observed is the return of population growth rates due to high fertility rates.

**Fig n° 02:** Population growth in Algeria evolved from 1966 to 2019.



**Source:** Personal account based on data from the National Bureau of Statistics

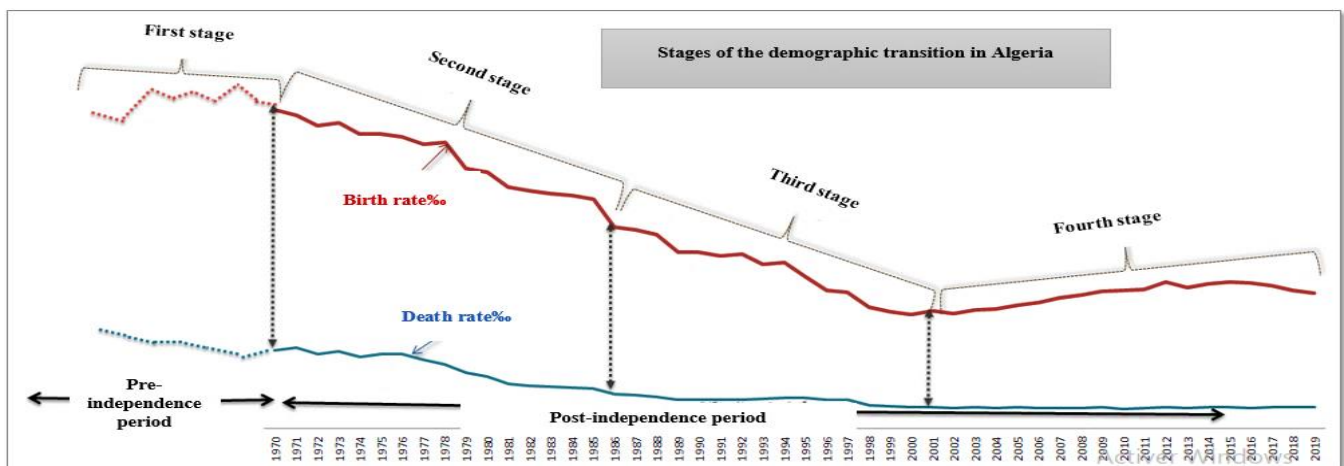
### 3.3 Demographic Transition in Algeria:

The theory of demographic transition appeared in 1929, it was not a coincidence, but rather the result of demographic changes experienced by most Western countries at the beginning of the 20th century, and the aim of it is to try to generalize it to other societies and to make the Western model the ideal pattern for other societies by following this path.

Algeria is among the countries that have undergone major shifts in the path of demographic growth from the beginning of the 20th century to the present day, and the following figure represents the most important stages of the demographic transition in Algeria.

By observing this graph, we see that the evolution of the crude rate of births and deaths has undergone significant changes, so according to the graph, the demographic transition in Algeria can be divided into four stages:

**Fig n°03:** Stages of demographic transition in Algeria.



**Source:** Prepared by the researcher based on the data of the National Bureau of Statistics.

### • Phase I: 1901-1970

According to the theory of demographic transition, this stage was characterized by a natural or primary demographic system.

Because it witnessed an increase in the birth rate between 37.6‰ in 1901 and 50.16‰ in 1970, and this is due to the lack of contraception, early marriage and illiteracy, which results in high fertility, as well as a high mortality rate between 32.8‰ and 19.45‰ during the same period, due to the harsh conditions experienced by the population from the deterioration of the standard of living and health during the colonial period, in addition to the poor health coverage of the population in Algeria in the early years of independence. Therefore, this stage can be divided into three periods:

✓ The first period of 1901-1920 What characterized this period was the high rate of births and deaths, as they were almost at the same level, and this was limited to (37.6‰ and 34.9‰) for births, while deaths were confined between 32.8‰ and 31.4‰, which resulted in a weak population growth rate, which was confined between 0.5% and 0.35%.

✓ The second period of 1921-1945 recorded a slight increase in the natural growth rate of the population from the previous period, where it was confined between 0.78% and 1.7%, starting from 1921, the death rate witnessed a gradual decline with the birth rate remaining high between 37.2‰ and 42.9‰, but by the end of World War II, the crude death rate recorded a significant increase of 43.1‰, and this is due to the victims of the liberation war (incidents of May 8, 1945). In addition to the cholera epidemic that spread during that period(Aissa DELEND, 2004,p178).

✓ The third period from 1946-1970, starting from 1946, the mortality rate gradually decreased in this period between 32‰ to 17‰, while births witnessed a significant increase from 42‰ to 50‰, which is the highest value witnessed by Algeria, as fertility remained normal in this period, while the natural growth rate has seen a significant rise after it was up to 0.5% at the beginning of the century and 1% in 1945, It rose to 2.8 percent between 1951 and 1955 and more than 3 percent after independence.

• **Second phase: 1971-1985**

This phase witnessed a significant decrease in the mortality rate from 16‰ in 1971 to 9‰ in 1985, thanks to the improvement of the standard of living and health of the population thanks to the social and economic development programs carried out in this period, in addition to the fact that Algeria in the period of 80 began to expand the program to control population growth, which is based on health prevention, the provision of vaccine and the protection of maternal and child health.

However, fertility remained so high that the crude birth rate was over 40‰, resulting in a rise in the natural growth rate that at this time was 3%, what distinguished this stage was that contraception was largely unused.

• **Phase III: 1986-2000**

What characterized this stage is a significant decrease in the crude rate of births starting in 1986, where it decreased from 35‰ to 19‰ in 2000, and this is due to the generalization of the birth control policy and the use of contraceptives, so that the rate of use of contraceptives by women of reproductive age was estimated at more than 61% in 2006, after it was estimated at 8% in 1970(ONS, 2007, 140), in addition to the delay in the age of marriage for both sexes. According to the theory of demographic transition, this stage is characterized by a modern system in which the use of various contraceptive methods is widespread.

• **Fourth phase: from 2001 to the present day**

If we compare the number of births from the period 2001 to 2010, we find an increase in births, the number of births increased from 618,380 births in 2001 to 888,000 births in 2010, an estimated increase of 269,620 births during this period. This increase in the number of births is probably due to an increase in the number of marriages between 2000 and 2010, from 177,548 to 345,000, an estimated increase of 3.74 points, at a rate of 64% during this year(ONS, 2010).

**4. A forward-looking study of future needs For the major age groups with the horizon of 2045 in Algeria.**

Through this axis, we aim to anticipate the future needs of the major age groups that will witness an increase in the future, and we can only do this by knowing the population projections by the beginning of 2045 using the synthetic method, which is considered one of the best methods for estimating the population in the long term, and the latter is based on developments in population growth vehicles (births, deaths, migration).

Relying on the demographic spectrum program for population projections, and as the researchers used to do, the results of population projections are in general and the age structure and size of the population in particular are among the main pillars on which development plans and programs depend in various economic, social and demographic fields, aimed at achieving a decent standard of living, improving the health situation and ensuring education and well-being for all residents.

**4.1) The concept of the Spectrum Program:**

[www.psychologyandeducation.net](http://www.psychologyandeducation.net)

It is a system consisting of a set of integrated models designed to determine the future results of current policies and growth programs, and it mainly concerns the following areas:

- Demproj - Family planning Famplan - Costs and benefits of family planning programs Benefit-Cost - Economic and social effects of population growth Rapid.

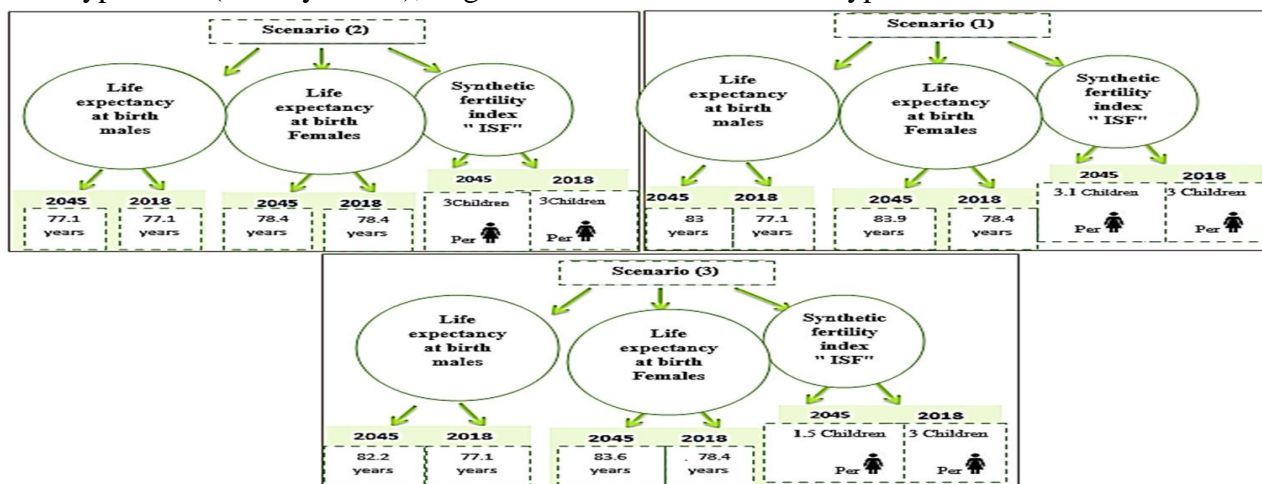
#### 4.2) Demproj model definition:

It is a comprehensive program used for the purpose of population projections and is used as a basis for projections other programs in Spectrum such as Rapid, Famplan and others, as this program depends on the introduction of a set of data and assumptions related to the population, which are mainly on births, deaths, and migration.

#### 4.3) Hypotheses or scenarios based on in the program:

The hypothesis data on fertility and life expectancy according to the three scenarios for the time period (2018-2045) were placed as follows:

The first hypothesis (fertility is high), the second hypothesis (fertility is constant or medium), the third hypothesis (fertility is low), migration is non-existent in all hypotheses.



Scheme 1: The most important scenarios based on the study

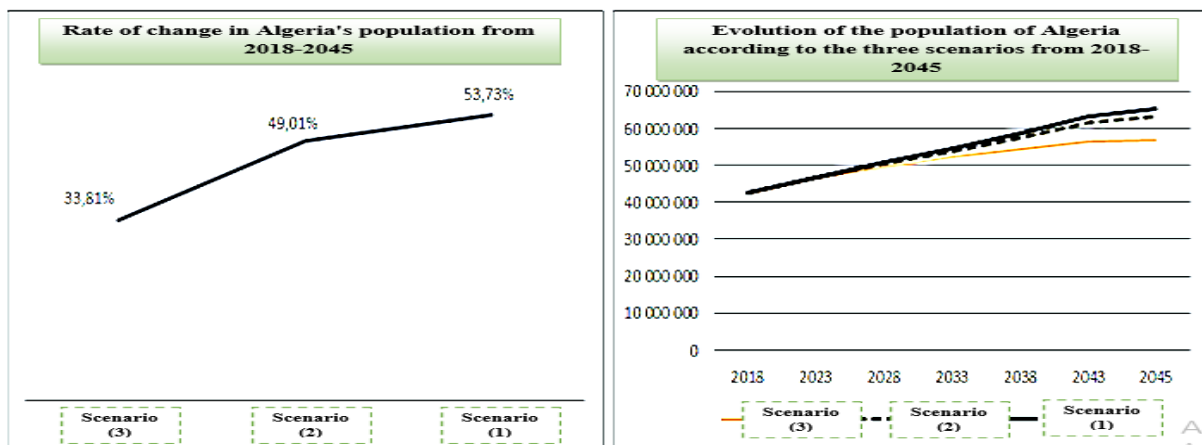
#### 4.4) Results of Algeria's demographic projections from 2018-2045

The results of the projections vary according to the hypotheses regarding future developments of fertility and life expectancy.

##### 1. Future development of the population:

Through Figure No. 04 related to the population projections of Algeria from 2018 to 2045 according to the three scenarios, it is clear that the population size is expected to increase from about 42.6 million people in 2018 to about 65.45 million people for 2045 according to the first scenario of the fertility rate is high with an estimated change rate of 53.73%, and 63.45 million people for 2045 according to the fixed fertility scenario with a change of 49.01%, and according to the results related to the low fertility scenario, the total will become 57 million people with Horizons 2045, a change of 33.1%, a difference of approximately 8.5 million people less than scenario (1) and about 6.5 million people less than scenario (2).

**Fig 04:** Projections of the population of Algeria from 201 to 2045 with rates of change according to the three scenarios.



**Source:** Prepared by the researcher based on the outputs of the Demographic Spectrum Program

**2. Future age structure:**

According to the data related to the age structure of the population in Algeria produced by the results of population projections, it is expected that there will be significant developments in the age structure of the population with the horizons of 2045, and the results indicate that the median age will increase in all scenarios from 28 years 2018 to 30 years with 2045 according to scenario (1) and (2) and from 28 to 35 years according to scenario (3), which means that the general trend of the population has taken in reconstruction.

**Fig n° 05:** Percentage distribution of the population by major age groups from 2018 to 2045.



**Source:** Prepared by the researcher based on the outputs of the Demographic Spectrum Program

According to the data on the relative distribution of the broad groups in Algeria, the young people 0-14 years old, we note that it represented 30% in 2018, so that this percentage began to decline by 26% with the horizon of 2045 for scenario (1) and (2) and does not exceed 18% for scenario (3), which is evidence of the shrinking size of this category in the future and the minimum dependency rate will decrease.

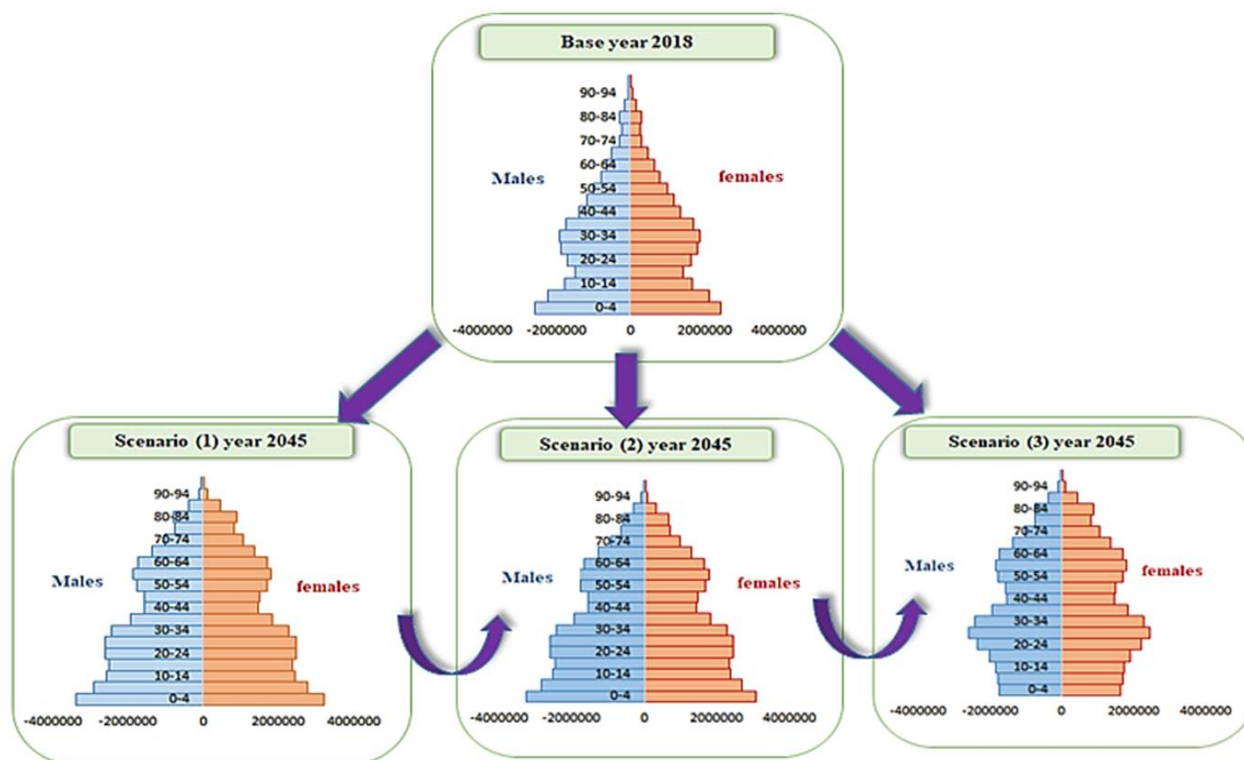
For the active group 15-65 years, it will know a kind of stability for scenario (1) and (2) and an increase for scenario (3) from 63% in 2018 to 68% by 2045, as well as the major age group 65+ will witness an increase in all scenarios due to the transition of large numbers of the population to the elderly group, and this is called aging, as the high percentage of this group will require preparation to support them and take care of their health needs significantly.

### 3. Population pyramid:

The population pyramid is a graphic representation, designed to give a detailed picture of the age and qualitative structure of the population in a country, it has a serrated shape that gave it the name of the pyramid, and it consists of two repeated scales representing the population structure by age and sex, the base of the pyramid represents the number of inhabitants, while the vertical peaceful connected to half of the teachers where they learned respectively the numbers of males and females by age groups represented in the pyramid, It is drawn in the same style as horizontal bars for both males and females, and is drawn in two ways on a relative basis or on the basis of absolute numbers.

The shape of the population pyramid is greatly affected by the high and low mortality and fertility and even migration, so we find that there are population pyramids characterized by a wide base and this is evidence that the population group is young, and vice versa in the case of aging population

**Fig n° 06:** Projections of the population pyramids of Algeria from 2018-2045.



**Source:** Prepared by the researcher.

Through the graph, it is clear to us that the pattern of development of the Algerian population according to the three assumptions of population projections will be clearly reflected in the shape of the population pyramid, which will change according to the data of 2018, which is characterized by [www.psychologyandeducation.net](http://www.psychologyandeducation.net)

a broad hierarchical base to a pyramid similar to the pyramids of European countries by the beginning of 2045, and this is due to the high percentage of the elderly age group and the decrease in the younger age groups (children and youth).

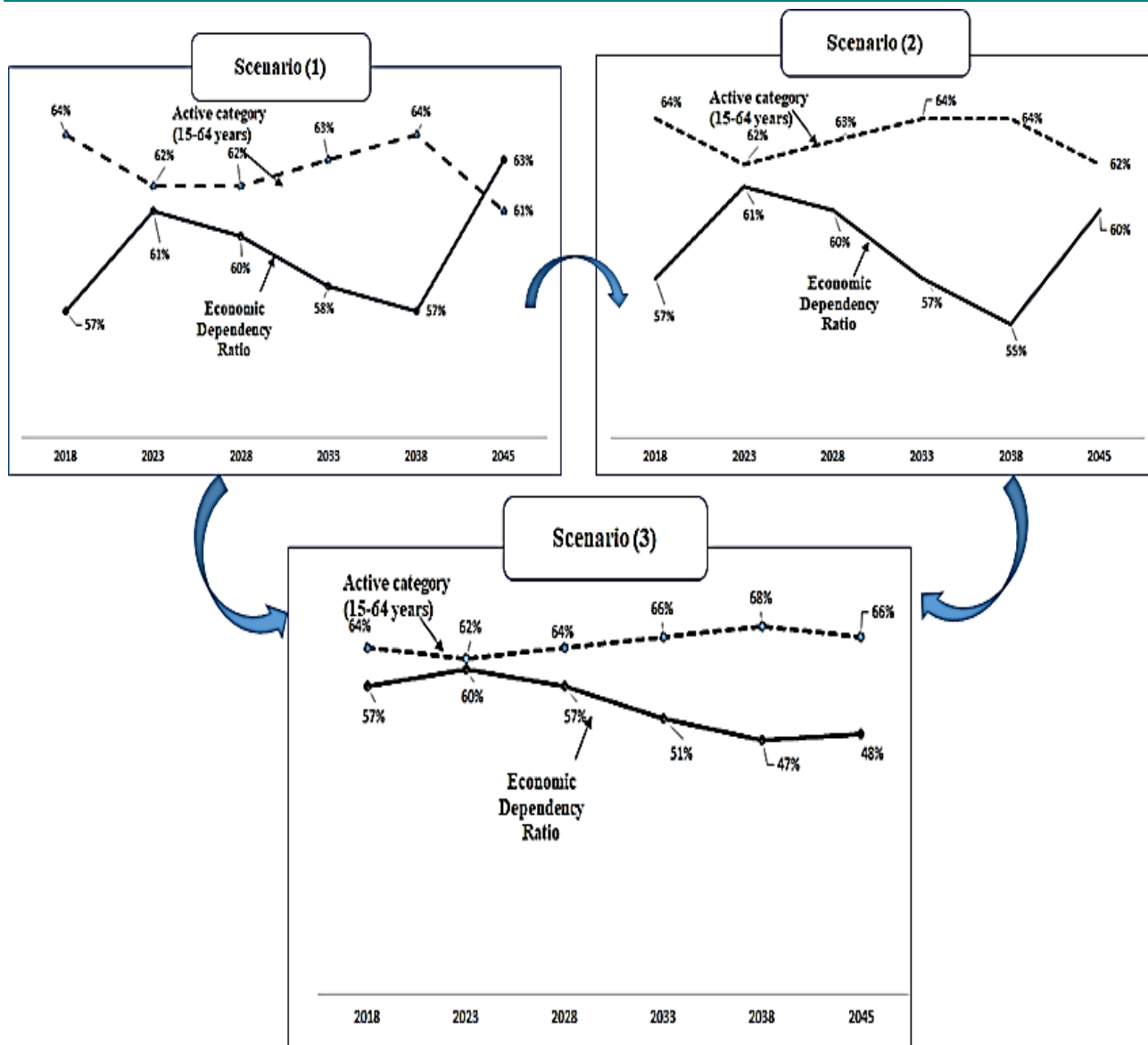
#### **4. Future path of the economic dependency ratio :**

There is an impact relationship between the dependency ratio and the active group, the higher the economic dependency ratio, the greater the burden on the economically active group to support the inactive. Thus, an increase in this rate means that fewer active populations bear the burden of supporting more than the inactive.

A high economic dependency ratio has repercussions on the economy and society, increasing pressure on public resources and services, and affecting economic growth, savings and investment.

The economic dependency ratio is influenced by factors such as fertility rates, migration patterns, survival rates, and population distribution by age group.

**Fig n° 07:** Future projections of Active population ratio compared to economic dependency ratio from 2018 to 2045



Source: Prepared by the researcher

The results obtained for population projections in the period 2018 to 2045 indicate the upward curve of the age dependency ratio for scenarios 1 and 2 as a result of an increase and stability in fertility rates, moving from 57% in 2018 to 60 and 63% for 2045 for scenarios 1 and 2 respectively, while the rate will decrease for scenario 3 as a result of the decrease in the fertility rate to 45% for 2045, while the active group will maintain its rate above the dependency rate, This explains to us that Algeria has labor reserves, and that the number of young people qualified to join the labor market is increasing year after year, which requires attention and future planning of the labor market to provide job opportunities for this segment.

Understanding the relationship between the dependency ratio and the active category rate and predicting its future trends has become vital for policymakers to take action to adapt to demographic changes and ensure the sustainability of economic growth and social welfare in the long term.

## **5. Changes in the age structure of the population and their impact on economic and social policies in Algeria.**

The significant changes that Algeria has witnessed in the age structure of its population will have significant development effects in the long and short term, and economic and social policies must be adapted to these transformations by relying on the most important needs that each age group of the population may need, the opportunities available to it and the most important challenges it faces.

### **5.1) Economic challenges facing Algeria:**

The changes in the age structure that Algeria is witnessing, which is accompanied by the increase in the proportion of the population of working age, have a series of repercussions on the level of the economy, which are represented in unemployment, income disparity and poverty, the problem of illegal immigration, pressure on public expenditures... Etcetera.

Therefore, it is necessary to adopt appropriate policies at the macroeconomic level in order to benefit from the transformation in the age structure of the population, by employing it in improving the growth of per capita income, and thus in improving economic performance and the performance of markets and institutions, so the government must take into account factors related to the age structure when formulating economic policies, so that these policies meet the actual needs of the population, especially with regard to the labor market, which is directly and indirectly related to the transformations of the age structure, especially since Algeria is like the rest of the Arab countries. They share a set of characteristics related to the labor market, the most important of which are: high unemployment rates and the expansion of the informal sector - the huge increase in the number of young people - the high rate of employment in the public sector and low productivity - gender inequality(ESCO, 2014, p. 19), Current policies have been unable to deal with these problems, and sometimes have contributed to their exacerbation, so it is necessary to strengthen the state's ability to benefit from the transformations and open the way for the best employment of this young human potential, as the economic participation rate for the 15-64 category.

### **5.2) Social challenges:**

Social policies help individuals maintain their standard of living in certain situations such as illness, maternity, disability, old age, and risks that may face the labor market such as unemployment, economic crises, disasters... These policies are critical in the short and long term.

The change in the age structure in Algeria requires assessing the needs and potential of different age groups, and evaluating ways to respond to them.

✓ **Children:** Children are the most sensitive group that needs great care and care throughout this period, especially with regard to providing health services to this category during the birth period, increasing coverage for vaccination against communicable diseases that affect children and educating the family about its necessity and the need for proper nutrition and treatment of the child, in addition to compulsory education for this category is one of the basics and the legitimate right to ensure the future of future generations and exploit their capabilities and potentials.

This social policy aimed at protecting children cannot be achieved in isolation from improving the status of the family as a whole.

Algeria provides free pre-university education opportunities, provides basic health services (immunization, health insurance for school-age children) and subsidies for the destitute, which has resulted in a reduction in infant mortality rates and has made significant progress in improving educational opportunities for the 6-14 age group.

✓ **Youth category:** The youth stage is a transitional stage in life that witnesses intense demographic events, as individuals at this stage move from school to university or to the labor market and become economically productive after they were dependents and become heads of families after they were members of them, and this stage is full of huge potential. If successful, this transition will be one of the solid foundations of long-term sustainable human development and, if faltered, expose young people to lifelong barriers.

Social protection must be provided to this group in order to support them in this transitional period by providing services related to the quality of higher education, vocational and technical education and training, adequate health services, including sexual and reproductive health services, and support for the unemployed and first-time job seekers.

Algeria, like many Arab countries, is witnessing difficulties in supporting young people, especially with regard to job creation, and difficulties in educating young people regarding sexual and reproductive care, and has also failed to achieve a balance between the outputs of higher education and the labor market.

✓ **Elderly:** It is likely that the elderly group will put the Arab countries in front of two main challenges in the future, namely the ability to finance pensions and secure health services, the needs of the elderly are changing and progress in the health care sector for them allows the possibility of living a longer life full of activity and vitality, unlike the younger age groups, the elderly often develop chronic non-communicable diseases such as diabetes, asthma, blood pressure and cardiovascular diseases, while the elderly are most vulnerable to osteoporosis, breast cancer, obesity and these Diseases greatly affect the ability of older persons to live independently, so social service systems should provide health support for older persons, as well as support for caregivers, as well as educational opportunities for older persons who have not had access to literacy learning opportunities.

## RESULTS AND DISCUSSION

Based on the results obtained from the population projection process for the period 2018-2045 through the Spectrum program according to the proposed scenarios, it was concluded as follows:

- The decrease in the percentage of young dependents due to the shrinking size in all scenarios, especially the scenario of low fertility, where the decline reached almost half, from here decision-makers and bodies authorized to plan and foresee based on these future data should direct a share of the resources or financial appropriations that were directed to meet the needs of this age group to serve other age groups most in need in a rational manner.
- The increasing size of the youth group (15-30 years) Thus, governments should intensify efforts to develop and implement policies and strategies targeting young people, development planning must take advantage of the opportunity to improve the quality of education, secure productive employment opportunities for young people, improve the qualification of young people to join the

labor market and thus improve productivity, and improve youth health services and reproductive health in particular.

- The increase in the population in the economically active group (15-64 years), so it is necessary to create job opportunities, reform the labor market and formalize the informal economy, which contributes to increasing income and reducing poverty for families, improving the status of women, empowering them and upgrading their level, ... Etcetera

- The increasing number of older persons, which requires development plans in terms of providing them with health services, health insurance, pension systems and creating a suitable environment for life for this group.

## 6. CONCLUSION

In general, the study of the age structure of the population is a valuable tool for long-term strategic planning and achieving sustainable development that meets the needs of present and future generations. Therefore, policymakers should pay close attention to this issue when developing their development plans and strategies.

Forecasting labor market needs: By studying the expected changes in the age structure, it is possible to predict the needs of the labor market in the future and take the necessary measures to meet them.

Planning for infrastructure and public services: The study of age structure helps determine future needs for infrastructure and public services, such as schools, hospitals, nursing homes, and public transport. Governments can use this information to plan infrastructure investments effectively.

Ensure the sustainability of health care and pension systems: As the proportion of older persons increases, the demand for long-term healthcare and pensions will increase. The age structure study helps to estimate these future needs and ensure the sustainability of funding and resources to meet them.

Education and Training Planning: Age structure changes affect the demand for VET. For example, low fertility rates may reduce the demand for primary and secondary education.

**The following are some recommendations for decision-makers and planners on the importance of the age structure of the population in achieving sustainable population development in Algeria:**

- Establish a specialized national body to study changes in the age structure, assess their effects on various sectors, and issue periodic reports to assist in the decision-making process.
- Integrate data on changes in age structure into the long-term strategic planning process of all relevant ministries and sectors, such as education, health, labor, housing and infrastructure.
- Develop proactive plans to meet the challenges expected as a result of demographic changes, such as a shortage of manpower and an increased demand for health care for the elderly.
- Allocate sufficient financial resources in the annual budgets for the implementation of projects and programs aimed at adapting to changes in the age structure.

- Invest in the development of an education and training system adapted to changes in skills demand, focusing on higher education and vocational training.
- Strengthening the preventive and rehabilitative health care system, and increasing investment in

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