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Farmer's Perception of Climate Change and Renewable Energy in Two Villages in Fayoum Governorate

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ABSTRACT

This paper aimed to identify the perception of farmers of some dimensions of the concepts of renewable energy and climate change in specific rural areas in Fayoum governorate. In addition, it aimed to examine the relationships between some of the farmers' demographic and socio-economic characteristics as independent variables and their degrees of perception of climate change and renewable energy as dependent variables.

The study was conducted on a random sample of 226 respondents in two villages (El-Hamidia El-Gdeda and El-Mazatly) in Fayoum governorate in Egypt. Data were collected during October and November 2022 using a pretested structured questionnaire through personal interviews.

The results showed that the majority of farmers belong to the middle level of perception for both climate change and renewable energy. Also there are significant relationships between both the total number of years the farmer spent in formal education and the total number of years spent working in agriculture with both the levels of farmers' perception of renewable energy and the degrees of farmers' perception of climate change at 0.01 and 0.05 level of significance respectively.

The other variables of the age, total area of owned land, and annual income did not prove to have any significant relationships with neither the degrees of farmers' perception of climate change nor with the farmers' renewable energy perception score.

KEYWORDS: : Farmers, Renewable Energy, Climate Change, Perception, Fayoum

1. INTRODUCTION

Climate change is a crucial challenge that requires immediate action due to its significant impact on all sectors, including agriculture which is highly susceptible to its effects. According to the World Bank (2021), agriculture represents one of the most vulnerable sectors to climate change. However, it also plays a significant role in contributing to climate change, as it is responsible for emitting 19-29% of total greenhouse gases (World Bank, 2021). Therefore, addressing climate change in the agricultural sector is paramount to mitigating its negative impact on the environment.

Climate change refers to the changes in weather patterns and temperatures that we've been experiencing, and it's primarily caused by the activities of humans, such as burning too much coal, oil, and gas. This has led to a phenomenon known as global warming which is causing all the extreme weather fluctuations we are facing. The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body which was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) for assessing the science of climate change. It highlights that human activities have significantly increased the amount of greenhouse gases in the atmosphere, causing temperatures to rise (IPCC, 2022). As a result, we're witnessing more extreme weather events, rising sea levels, and changes in precipitation patterns (IPCC, 2022).

Global warming refers to the gradual increase in the Earth's average temperature due to the emission of certain gases, such as carbon dioxide and methane, which trap the sun's heat within the atmosphere. This phenomenon has led to rising sea levels, increased frequency and intensity of natural disasters such as hurricanes, floods, and wildfires, and other adverse effects on the environment and human society. (NASA, 2023)

According to the United Nations, there are several sources of greenhouse gas emissions, but the largest contributor is the generation of electricity and power. In response, global efforts have been made over the past few decades to find sustainable and viable alternatives to fossil fuels in order to reduce greenhouse gas emissions. This is motivated by the urgent need to mitigate the effects of climate change, as well as to promote long-term environmental sustainability and human well-being. (United Nations, without date)

Climate change and renewable energy are interconnected in several ways. Renewable energy sources have been identified as a key solution to address the impacts of climate change as they offer a sustainable and environmentally friendly alternative to traditional fossil fuels. This means that using renewable energy can help to reduce greenhouse gas emissions and mitigate the adverse effects of climate change. (IRENA, 2014)

Overall, the relationship between climate change and renewable energy is complicated and dynamic as they are impacting and shaping each other in a continuous feedback loop. By promoting the use of renewable energy, it can help to mitigate the impacts of climate change and create a more sustainable future for ourselves and future generations

According to the IPCC sixth assessment report for 2022, there are several impacts of climate change including impacts on ecosystem and biodiversity, Food systems, food security and forestry, water systems and water security, health and well-being, and migration and relocation. The risks associated with climate change can be classified according to a specific time frame; short term (2021-2040), mid-term (2041-2060), and long term (2081-2100). In the short term, the focus is on limiting global warming to 1.5°C. The mid-term is concerned with global warming reaching 2°C. In the long term, global warming exceeding 2°C could result in even more severe impacts (IPCC, 2022).

Climate change influences various aspects of the agricultural sector such as production (quantity and quality), relevance of each species of crops, and environment. Africa as a continent is considered one of the most vulnerable continents to climate change in the forms of extreme events such as floods, droughts and irregular rainfalls that might occur in the same area. Agriculture is mainly depending on rainfalls which will affect crops productivity and quality, and may lead to the loss of the agricultural land due to the climate changes (UNFCCC, 2007).

Climate change has severed impacts on agriculture such as increase of evaporation and crops water requirements, reduction of Crops Production, plant disease and pests, drought and decrease of precipitation, rising sea level, and changing land use. (Mahmoud, 2017)

As mentioned before, climate change and energy are strongly interconnected terms. Energy is vital and fundamental for development no matter the source of energy. In the light of the increasing world population reaching 7.9 billion in 2023 with growth rate below one in 2020 , the global demand on energy is increasing. To fulfill this demand it becomes essential to substitute the traditional energy sources with renewable ones. (U.S census bureau, 2023) (UN, 2022).

By the beginning of the new millennium and as efforts to preserve the environment the renewable energy became a must to achieve sustainable development in developing countries. In rural areas the traditional sources of energy are not enough and not suitable to implement all the planned projects. Therefore, the need to find new sources for providing new sources of energy with low cost of money and no negative impact on the environment is necessary. The general assembly of the UN (United Nations) adopted the new Sustainable Development Goals (SDGs) in September 2015 till 2030 which includes 17 goals as a step to enter a new era of global sustainable development.

Renewable energy as defined by the CAPMAS, Energy Balance is "A divine grant of renewable and inexhaustible resources and it is known as eco-friendly such as wind energy and solar energy". Fatthallah agreed on the previous definition and also added that "Sustainable Energy is mainly concerned with environmental dimension, availability of energy for periods of time which leads to its sustainability in addition to the interest in energy efficiency and the best use of the available resources".

IRENA in February 2013 stated that "renewable energy includes all forms of energy produced from renewable sources in a sustainable manner, including bioenergy, geothermal energy, hydropower, ocean energy, solar energy, and wind energy. "Also IEA defined renewable energy resources as "those derived from natural processes" and "replenished at a faster rate than they are consumed" (IEA, 2002).

Regarding Egypt, the Egyptian government started to set a new Energy strategy as a sort of adopting global SDGs. This strategy consists of 4 main aspects which are ensure security of energy supply, maintain sustainability, improving institutional and corporate governance, strengthen competitive market and regulations. The previous 4 aspects are directly connected and interacting with each other which refers to that Energy Sustainability is unreachable without one of the four. In the light of the new energy strategy, Egypt set new targets regarding generating electricity from applying R.E. technologies reaching 20% increase by 2022 and 42% by 2035.

2. PROBLEM STATEMENT

Energy is considered one of the five key sectors proposed by the World Bank Group to address the effects of the current rapid climate change (Climate Risk Country Profile: Egypt 2021). The other sectors, including gender, agriculture, water, and health, directly impact the livelihood of rural farmers. As a result, rural areas in Egypt are particularly vulnerable to the impacts of climate change. Furthermore, these areas are seen as a starting point for adapting to these impacts.Renewable energy has emerged as a significant, reliable, clean, and sustainable alternative to conventional, environmentally harmful sources of energy that contribute to climate change. However, the successful implementation of renewable energy in rural areas depends on the willingness of farmers to participate in the necessary social and collective actions. Various factors, such as education, income, age, and understanding of climate change and renewable energy concepts, influence rural farmers' willingness to transition to renewable energy sources.This study aims to examine the level of farmers' perception of climate change and renewable energy. Additionally, it seeks to explore the relationship between farmers' demographic and socio-economic characteristics and their perception of climate change and renewable energy. To achieve these objectives, the following questions have been raised:

1.1. What is the connection between farmers' demographic and socio-economic characteristics and their perception degree of climate change?

1.2. How do farmers' demographic and socio-economic characteristics relate to their perception score of renewable energy?

3. STUDY OBJECTIVES

3.1. Identifying the relationship between the farmers' perception degree of Climate Change (CC) and the farmers' demographic and socio-economic characteristics (Age of respondent, years of formal education, years spent in agriculture, area of owned land, yearly income, gender, marital status, and family type).

3.2. Identifying the relationship between the farmers' renewable energy perception score and the farmers' demographic and socio-economic characteristics (Age of respondent, years of formal education, years spent in agriculture, area of owned land, yearly income, gender, marital status, and family type).

Perception can be defined as the process of registering sensory stimuli as meaningful experience, though the meaning of perception defers depending on the context, there are several factors that may affect perception such as expectations, needs, unconscious ideas, values and conflicts (Britannica, 2003). In sociology, perception refers to how people make sense of what they experience and encounter in their surroundings. It's about how individuals interpret sensory information and organize it to form a meaningful understanding of the world. This understanding is influenced by social and cultural factors, such as the norms and values of their society. In essence, perception in sociology is about how people comprehend and interpret the world around them, and how this interpretation is shaped by the broader social and cultural context in which they live. (Berger, et al.1966)

Gibson divided perception into two ways bottom-up process and top-down process. The bottom-up process means our brain starts with the basic information we receive from our senses and puts it together to form a bigger picture, while the top-down process refers to that our brain uses what we already know to help make sense of what we are seeing.(Gibson, 1979). Perception is a broad subject that can be split up into several types one of these types is sensory perception which depends on sensory information (visual perception, auditory perception known as sense of hearing, olfactory perception or sense of smell, haptic perception or sense of touch, and gustatory perception or known also as sense of taste). (Galotti, 2008). Another type of perception is cognitive perception is a field of study that investigates how individuals understand and interpret information about other people and themselves. It is also concerned with exploring the ways in which everyday people perceive and experience interpersonal interactions and relationships. (Fiske and Taylor, 2013)

4. STATISTICAL HYPOTHESIS

To reach the study objectives, the following statistical hypothesis have been formulated:

- There is no relationship between the farmers' demographic and socio-economic characteristics and the farmers' perception degree of climate change.
- There is no relationship between the farmers' demographic and socio-economic characteristics and the farmers' renewable energy perception score.

Farmer's degree of perception about Climate Changes as a dependent variable can be assessed by asking them if they have heard of the concept of climate change before and their understanding of it. Furthermore, their perception of various climate change phenomena can be measured using table of 7 statements with a 3-point scale (Agree, Partly, Disagree). Farmers who fully perceive the phenomena receive a score of 3, those who partially perceive them receive a score of 2, and those who disagree receive a score of 1. Additionally, a table can be used to evaluate farmers' perception of the negative impacts of climate change on agriculture and their adaptation strategies.

Farmer's renewable energy perception score as a dependent variable can be assessed by asking them about their knowledge of the concept of renewable energy, the different types of renewable energy, and the positive and negative impacts of implementing renewable energy technologies. This can be done using a table containing 9 statements with a 3-point scale (Agree, Partly, Disagree). Farmers who agree receive a score of 3, those who partially agree receive a score of 2, those who disagree receive a score of 1, and those who are unaware receive a score of 0.

5. METHODOLOGY

The data were collected through personal interviews using a pretested structured questionnaire. The study was conducted in two villages in Fayoum governorate during October and November 2022

5.1. Sampling

The study was conducted in the two villages using a simple random sample of 10% of the total number of farmers in each village provided by the agricultural organization of Fayoum.

The population of farmers of the two villages was 2879 farmer (606 in El Hamidia El Gdeda and 2273 in El Mazatly). The calculated total sample was 289 approximately (61 from El Hamidia El Gdeda and 228 from El Mazatly). Due the refusal of some respondents to fill out the questionnaire and after excluding some questionnaires, only 226 questionnaires were collected.

5.2. Data Collection

The study collected field data by conducting personal interviews with farmers and using a questionnaire to measure research variables. The questionnaire was designed based on previous studies on the subject, and the researcher conducted a pre-test with some farmers in El Mandara village, affiliated with Zawyat El Karadsa local unit, Fayoum district. Based on the results of the pre-test, the researcher made necessary amendments to delete ambiguous questions and modify some of the questions that were difficult for farmers to understand. This allowed for the provision of data required to test research hypotheses. The data were processed and analyzed using SPSS software.

5.3. Statistical Analysis Tools

Statistical methods were used to analyze the variables of the study objectives including frequencies, arithmetic mean, percentages, Pearson's correlation coefficient, Kruskal Wallis, and Mann Whitney.

5.4. Characteristics of the sample

a. About 91% of the sample was males, while about 9% only of the sample was females.

b. The average mean of respondent's age was 52 years.

c. About 90% of the sample was married, while the remaining 10% divided between single, divorced and widow. No marriage contract or separated cases.

d. The average mean of years the farmers spent in education is 6 years (Primary school) where 44.2% of the sample was illiterate, 10.6% reached primary school, 4.4% reached preparatory school, 29.6% reached secondary school, only 3.5% finished diploma, while 7.1% reached university and only 0.4 post graduate studies.

e. The family type category divided into three types, more than half the sample belongs to the nuclear type with 59.7%, while 38.5% in the extended type and only 1.8% in the compound type.

f. The mean of family members from males and females is similar which is 3 in each, and the mean of the total number of family is 6.

g. The majority of the sample 62.8% depends on farming as a main occupation with 58.4% have no secondary occupation, while 20.4% in government and public Sector, 7.5% freelance, 6.6% retired, and only 2.7% private sector.

h. The majority of farmers with a secondary occupation work as farmers with 36.7%, 4.4% work as freelance, while only 0.4% work as in trading as a secondary Occupation.

i. The majority of the sample interviewed owned their land with 84.4% while only 14.2% and 5.3% rented and shared their lands respectively. The average mean of The owned land is 37.02 kirats.

5.5. Operational Definitions

To fulfill the objectives of the study, the following variables were selected for measurement:

5.5.1. Farmers' age: measured by the age of respondent in years at the time of the data collection**.**

5.5.2. Farmers' educational status: measured in the total number of years the farmers completed in formal education and then divided into categories (0 years) illiterate, (6 years) Primary, (9 years) preparatory, (12 years) Secondary, (14 or 15 years) Diploma, (16 or 17 years) University degree.

5.5.3. Total number of years in agriculture: measured by the years of experience the farmer spent in agriculture.

5.5.4. Marital Status: measured by the social situation of the farmer and it is categorized into six categories as follows: Single, Married, Divorced, Widow, Marriage contract and Separated were given codes: 1, 2, 3, 4, 5 and 6 respectively.

5.5.5. Farmer's Family type: measured by identifying the farmer's family type, whether nuclear, compound, or extended were given codes: 1, 2, and 3 respectively.

5.5.6. Farmer's Farm size: measured by asking about the total land size in feddans regardless of the type of land holding.

5.5.7. Farmer's yearly income: measured in the amount of money the farmer pays yearly in EGP for each category such as food, clothes, education, rent, electricity, potable water, transportation, medications, compliments, entertainment, and miscellaneous.

6. RESULTS AND DISCUSSION

This section presents and discusses the results of analyzing the collected field data. The research objectives are to explore the levels of farmers' perception of climate change and renewable energy and to examine the relationship between the farmers' socio-economic characteristics and their levels of perception of climate change and renewable energy.

6.1. To explore the relationship between the farmers' demographic and socio-economic characteristics and the levels of farmers' perception of Climate Change (CC).

6.1.1. Farmers' perception of climate change: Table (1) shows the levels of farmers' perception of climate change divided into two main categories which are perceive farmers of climate change and not perceive farmers that represent 58.4% of the sample and the perceive farmers were divided into three categories. The three categories represent 41.6% of the sample and were divided as follows: farmers with low perception (4%), middle perception (30.1%), and high perception (7.5%). The previous results showed that about one third the farmers have medium perception of climate change with 30.1%.

- **Farmers' perception of climate change (weather fluctuations).**

As shown in table (2), most of the farmers with 90% were perceive of both extreme heat waves and extreme cold waves, while about 6% were not perceive and only 4% were partly perceive of both phenomena. More than half of the farmers agreed on that the number of rainy days is less than before, while 21.7% and 20.4% of the farmers disagreed and partly agreed respectively. About 82% of the farmers agreed on irregular rain phenomena, also 85% of the farmers agreed on the abnormal variations in temperatures over the year. On the other hand, 42.5% of the farmers disagreed on the increasing number of hurricanes and floods over the last year and this result is because research area was not exposed to this type of natural phenomena, while 40.7% of the farmers agreed with a slight difference of 1.8% between both categories and this result is due to the hearing of such phenomena but in other regions.

Table 1. Farmers' levels of perception of climate change.

Climate Change perception Categories	Frequency	Percent %
Not perceive	132	58.4
Low	9	4.0
Medium	68	30.1
High	17	7.5
Total	226	100.0

Source: collected field data

Table 2. Farmers' perception of weather fluctuations

Climate Change Phenomenon	%		
	Disagree (1)	Partly (2)	Agree (3)
Extreme heat waves are more than before	5.8	4.0	90.3
Extreme cold waves are more than before	5.3	4.4	90.3
Number of Rainy days is less	21.7	20.4	58.0
Irregular Rain	4.0	14.2	81.9
Amount of rain at one time increased	15.0	26.5	58.4
Hurricanes and floods increased from the last year	42.5	16.8	40.7
Temperatures throughout the year vary over time	4.4	10.6	85.0

Source: Collected field data

6.1.2. Relationship between the farmers' perception degrees of climate change and the farmers' demographic and socio-economic characteristics.

This objective aims to explore the relationship between the levels of farmers' perception of climate change and some of the demographic and socio-economic independent variables such as (Age, total years of formal education, total number of years the farmer spent in agriculture, total owned land area, farmers' yearly income) through using spearman correlation coefficient at levels of significance of 0.05 and 0.01.

The following table (3) highlights that there is a significant relationship at level of significance of (0.01) between the farmers' perception of climate change and the farmers' total years of formal education. It also shows that there is a significant relationship at level of significance of (0.05) between the farmers' levels of perception of climate change and the total number of years the farmer spent in agriculture.

Corresponding with the results of the previous objective and the results of table (3) the following results emphasize that there is a positive relationship between the total number of years the farmer spent in formal education and the levels of perception of climate change, which means that the higher years the farmer spent in formal education, the higher level of perception of climate change the farmer reaches. This result is logic, due to the exposure to more information about climate change during the years of school.

In addition, the results indicate that there is a negative relationship between the total numbers of years in agriculture and the levels of farmers' perception of climate change, which means that the more years the farmer spent in agriculture, the lower level of perception of climate change the farmer reaches. Also, the more years the farmer spent in agriculture means that the farmer might not get enrolled in a formal education school, which consequently leads to more years in agriculture.

However, the results indicate that there is no relationship between the farmers' perception of climate change and 3 of the independent variables which are the age of respondent, total area of owned land, and the yearly income.

Table 3. Relationship between the farmers' socio-economic characteristics and the farmers' perception degrees of climate change

Farmers' socio-economic characteristics	Correlation Coefficients
Age of respondent	-0.076
Total years of formal education	.384**
Total number of years in agriculture	-.135*
Total area of owned land	0.047
Yearly income	0.126

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The previous results show that there is a relationship at level of significance (0.01) between the farmers' levels of perception of renewable energy and farmers' levels of perception of climate change (0.671), which is supported through the previous results of the two objectives.

6.1.3. The significant differences between the farmers' perception degrees of climate change and the farmers' demographic characteristics.

The following table compares the farmers' levels of perception of climate change with some demographic characteristics such as gender, marital status, and family type. The table uses Kruskal Wallis and Mann Whitney non-parametric tests to identify independent variables. Table (4) shows that there are no

Table 4. Relationship between the farmers' demographic characteristics and the perception degrees of climate change.

Farmers' demographic characteristics	Level of significance
Gender	0.040
Marital Status	0.391
Family Type	0.548

significant differences between the farmers' levels of perception and marital status (39%) or family type (54%). However, the results in the following table indicate that the null hypothesis related to gender cannot be accepted (0.040).

6.2. To explore the relationship between the farmers' demographic and socio-economic characteristics and the levels of farmers' perception of Renewable Energy (RE).

6.2.1. Farmers' perception of renewable energy: Table (5) shows the levels of farmers' perception of renewable energy divided into two main categories which are perceive farmers of renewable energy and not perceive farmers that represents 70.4% of the sample and the perceive farmers were divided into three categories. The three categories represent 29.6% of the sample and were divided as follows: farmers with low perception (5.8%), middle perception (14.2%), and high perception (9.7%). The previous results showed that the majority of the farmers have medium perception of renewable energy with 14.2%.

Table 5. Farmer's perception levels of Renewable Energy.

Renewable energy perception Categories	Frequency	Percent %
Not Perceive	159	70.4
Low	13	5.8
Medium	32	14.2
High	22	9.7
Total	226	100.0

Source: Collected field data

6.2.2. Relationship between the farmers' renewable energy perception score and the farmers' socio-economic characteristics.

This objective aims to explore the relationship between the levels of farmers' perception of renewable energy and some of the demographic and socio-economic independent variables such as (Age, total years of formal education, total number of years the farmer spent in agriculture, total owned land area, farmers' yearly income) through using spearman correlation coefficient at levels of significance of 0.05 and 0.01.

The following table (6) shows that there is a significant relationship at level of significance of (0.01) between the farmers' perception of renewable energy and the farmers' total years of formal education. It also indicates that there is a significant relationship at level of significance of (0.05) between the farmers' levels of perception of renewable energy and the total number of years the farmer spent in agriculture.

The following results highlight the importance of education in increasing the perception of farmers. It also shows that there is a positive relationship between the total number of years the farmer spent in formal education and the levels of perception of renewable energy, which means that the higher years the farmer spent in formal education, the higher level of perception of renewable energy the farmer reaches. This result is logic, due to the exposure to more information about renewable energy during the years of school.

Furthermore, the results indicate that there is a negative relationship between the total numbers of years the farmer spent in agriculture and the levels of farmers' perception of renewable energy, which means that the more years the farmer spent in the

Table 6. Relationship between the farmers' socio-economic characteristics and the renewable energy perception score

Farmers' socio-economic characteristics	Correlation Coefficients
Age of respondent	-0.092
Total years of formal education	.429**
Total number of years the farmer spent in agriculture.	-.132-*
Total area of owned land	-0.010
Yearly income	0.129

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

agriculture, the lower level of perception of renewable energy farmer reaches. Also, the more years the farmer spent in agriculture means that the farmer might not get enrolled in a formal education school, which consequently leads to more years in agriculture .

However, the results highlight that there is no relationship between the farmers' perception of renewable energy and three of the independent variables which are the age of respondent, total area of owned land, and the yearly income.

6.2.3. The significant differences between the farmers' renewable energy perception score and the farmers' demographic and socio-economic characteristics.

The following table aims to clarify the differences between the farmer's levels of perception of renewable energy and some of the demographic characteristics as independent variables such as (gender, marital status, and family type) through using Kruskal Wallis and Mann Whitney non parametric tests.

Table (7) shows that the null hypotheses is accepted as the results showed that there are no significant differences between the famers' levels of perception of renewable energy and gender with level of significance 13%, marital status with level of significance 49%, and family type at level of significance 19%.

In conclusion, the previous results showed that the rural areas need more exposure to information about climate change and renewable energy in the form of awareness campaigns and in a more practical intervention. The negative relationship between the number of years spent in agriculture and farmers' perception of climate change may be attributed to some potential reasons and may be influenced by various contextual and individual factors such as limited exposure to climate change information, resistance to change, or lack of access to information and resources.

Table 7. Relationship between the farmers' demographic characteristics and the renewable energy perception score

Farmers' demographic characteristics	Level of significance
Gender	0.130
Marital Status	0.496
Family Type	0.193

Source: Collected field data

In conclusion, the previous results showed that the rural areas need more exposure to information about climate change and renewable energy in the form of awareness campaigns and in a more practical intervention. The negative relationship between the number of years spent in agriculture and farmers' perception of climate change may be attributed to some potential reasons and may be influenced by various contextual and individual factors such as limited exposure to climate change information, resistance to change, or lack of access to information and resources.

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الملخص العربي

إدراك المزارعين لتغير المناخ والطاقة المتجددة في قريتين بمحافظة الفيوم

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هدفت هذه الورقة البحثية إلى التعرف على إدراك المزارعين لبعض أبعاد مفاهيم الطاقة المتجددة والتغير المناخي في مناطق ريفية بمحافظة الفيوم. كما هدفت إلى دراسة العلاقات بين بعض الخصائص الديموغرافية والاجتماعية والاقتصادية للمزارعين كمتغيرات مستقلة ودرجات إدراكهم لتغير المناخ والطاقة المتجددة كمتغيرات تابعة.

أجريت الدراسة على عينة عشوائية مكونة من ٢٢٦ مستجيبا في قريتين (الحميدية الجديدة والمظاطلي) في محافظة الفيوم في مصر. تم جمع البيانات خلال شهري أكتوبر ونوفمبر ٢٠٢٢ باستخدام استمارة استبيان تم اختبارها مسبقا من خلال المقابلات الشخصية.

أظهرت النتائج أن غالبية المزارعين ينتمون إلى المستوى المتوسط من الإدراك لكل من تغير المناخ والطاقة المتجددة. كما أن هناك علاقات معنوية بين كل من إجمالي عدد السنوات التي قضاها المزارع في التعليم الرسمي وإجمالي عدد السنوات التي قضاها في العمل في الزراعة مع كل من درجات إدراك المزارعين للطاقة المتجددة ودرجات إدراك المزارعين لتغير المناخ عند مستوى معنوية ٠,٠١ و ٠,٠٥ على التوالي.

كما اظهرت النتائج عدم وجود علاقة معنوية بين كل من العمر والمساحة الإجمالية للأراضي المملوكة والدخل السنوي و درجة إدراك المزارعين لتغير المناخ ودرجة إدراك المزارعين للطاقة المتجددة.

الكلمات المفتاحية: المزارعون، الطاقة المتجددة، تغير المناخ، إدراك، الفيوم