



# Possibility, Barriers and Requirements of Utilization Renewable Energy In the Greenhouses of Branch Flowers (Flowers and Ornamental Plants) of Khuzestan Province

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## Abstract

The purpose of this study is to identify the possibility, barriers and requirements of utilization renewable energy in the greenhouses of branch flowers (flowers and ornamental plants) of Khuzestan province. Due to high energy consumption and high costs in greenhouse production, this study was conducted to evaluate the possibility, barriers and requirements of using renewable energy. The research method was applied and survey and to do it, a researcher-made questionnaire, the validity and reliability of which was determined, was distributed among 165 greenhouse users of branch flowers in Khuzestan province as a statistical sample. Validity was obtained through the Patel of Experts and reliability was obtained through the Cronbach's alpha coefficient. Based on the research findings, all the requirements for the use of renewable energy were identified. Also, based on the results, 42.1% with a frequency of 59 people expressed the possibility of using renewable energy in greenhouses at a moderate level. Findings showed that there is a significant relationship between educational, technical, economic, social, policy and cultural requirements with the possibility of using renewable energy. The findings also showed that there is a significant relationship between educational, technical, economic, social, policy and cultural requirements with the possibility of using renewable energy. Further factor analysis of barriers to the use of renewable energy showed that educational and managerial poverty, poor support services, incompatibility with greenhouse conditions, lack of financial support, lack of technical facilities and lack of knowledge and awareness are the most important barriers and non-use of these energies.

**Keywords:** Renewable energies, Requirements, Energy use, Greenhouse

## 1. INTRODUCTION

The limited resources of fossil fuels and the problems caused by greenhouse gas emissions have highlighted the need to pay more attention to renewable energy, which is one of the most important alternatives to fossil fuels, which raises concerns about the country. It has eliminated the increase in pollution caused by its conversion into other energies. Research conducted in some greenhouses in Khuzestan province has shown that the amount of energy consumption in these exploitation units is high and most of it [about 80%] is related to providing the energy needed to heat the greenhouse and fuel the machinery. Also in economic studies, the supply of fuel [diesel], including the largest share of costs. However, taking into account the geographical and climatic conditions of the region, it is possible to maximize the use of renewable energy in order to reduce costs, increase economic profitability and contribute to the sustainable development of the environment, in greenhouse units.

In his article, Painuly [1] examines the barriers to the use of renewable energy. In this study, the factors affecting the non-use of these energy resources are divided into 7 groups: the first to third group of

market failure and distortion and financial and economic factors, the fourth group of institutional factors, the fifth group of technical factors, the sixth group of cultural, social and behavioral factors The last group of factors such as unclear government policies, high risk of using renewable technologies and lack of proper infrastructure for the use of these energies.

In their research, Edjekumehene et al [2] examined the opportunities and barriers to the implementation of renewable energy technologies in Ghana. This study states that in order to develop this technology, barriers such as technological, social, environmental, economic barriers including financial, institutional, policy, cost, and information barriers must be removed, and in order to remove these barriers, ways such as information and dissemination must be removed. Information on renewable energy technologies was used in a variety of ways, from delegate lobbying to mass media advertising. Also, due to insufficient uncertainty in the policies implemented in the framework of renewable energy and financing and investment plans, in most cases, it is heavily dependent on the allocation of government financial and budgetary resources, which are

inadequate and inadequate. Achieve the goals of developing renewable energy technologies, especially in rural areas, which make up about two-thirds of Ghana's population.

Torres Silva [3], in a study, examined the factors affecting the development of renewable energy in Loland and the island of Samsø in Denmark. According to the results of this study, the factors affecting the development of these technologies are political factors and policy variables and economic factors. It also introduces the variables of knowledge, information and the level of users' awareness as other important factors affecting the acceptance of these energies.

Yuan et al. [4], in their article, The Social Acceptance of Solar Energy Technology in China, stated that increasing energy demand has raised more concerns about the detrimental environmental effects of conventional energy applications and the replacement of renewable energy sources such as solar energy. It's a good way. The results of their research show that there is a high level of social awareness and acceptance of the use of solar energy, but in order to promote this technology as much as possible, useful resources are needed for policy makers.

Leading research questions are as follows:

1- What are the most important educational requirements of the use of renewable energy by greenhouse owners?

2- What are the most important economic requirements of the use of renewable energy by greenhouse owners?

3- What are the most important management requirements of the use of renewable energy by greenhouse owners?

4- What are the most important social requirements of the use of renewable energy by greenhouse owners?

5. What are the most important technical requirements of the use of renewable energy by greenhouse owners?

6. What are the most important policy requirements of renewable energy use by greenhouse owners?

7- What are the most important cultural requirements of the use of renewable energy by greenhouse owners?

8- What is the role of educational, economic, managerial, social, policy and cultural requirements in the use of renewable energy from the perspective of greenhouse owners in Khuzestan province?

9- What are the barriers to the use of renewable energy by greenhouse owners in Khuzestan province?

10- What is the possibility of using renewable energy by greenhouse owners in Khuzestan province?

11- What is the knowledge and attitude of greenhouse owners about renewable energy?

## 2. MATERIAL AND METHOD

From the point of view of classification, purpose-based research, the present research is of the type of applied research and in terms of research method is causal CORRELATION. In this research, the relationship between independent variables and its role on dependent variables is analyzed. The study area in this study is Khuzestan province. The statistical population used in this study is the greenhouse owners of flowers in Khuzestan province and since the flower and ornamental plants exploitation units are concentrated in Dezful, Andimeshk and Shousha counties, the statistical population is 286 greenhouse operators in these cities. The sample studied in this study was selected through Krejcie and Morgan table, which is used to determine the sample size, and its number is 165 greenhouse users of branched flowers in Khuzestan province. Stratified random sampling method was used for sampling. In this study, in order to determine the validity of the questionnaire, the questionnaire was provided to faculty members, experts and after confirming and summarizing their opinions, the final questionnaire was prepared. Cronbach's alpha coefficient is used to assess the reliability of the questionnaire. In this study, SPSS20 statistical software was used to analyze the data. In the analytical statistics section, Spearman correlation coefficients have been used to investigate the relationship between variables. In the following, regression will be used to investigate the role of independent variables on the dependent variable. Then, using factor analysis, the most important barriers to the use of renewable energy are identified.

## 3. Conclusions

In order to evaluate the attitude of the users of flower and ornamental plants greenhouses in Khuzestan province, 10 items were designed and the audience was asked to express their answer about each item in a range of 5 options [strongly agree, agree, have no opinion, disagree and strongly disagree]. According to the results, 5% of operators with a frequency of 7 people in the very high group, 9.3% with a frequency of 13 people in the high group, 23.6% with a frequency of 33 people in the medium group, 55.7% with a frequency of 78 people in the group Low group and 6.4% with a frequency of 9 people were in a very low group in terms of attitudes towards the use of renewable energy in the greenhouse.

In order to evaluate the requirements of using renewable energy in flower greenhouses and ornamental plants in Khuzestan province, technical dimensions of 7 items; Educational 10 items, managerial 7 items, economic 7 items, social 5 items, policy 7 items and cultural 8 items, designed and the audience was asked to give their answer about each item, in a range of 5 options [very, high, medium, low And very few] express. Mean, standard deviation and

coefficient of variation are given in Table 7. Then, using the coefficient of variation, the items were prioritized according to the opinions of the respondents. For example, in the technical dimension, the option of "locating and measuring the possibility of using the desired energies in the region" with an average of 3.92, standard deviation of 0.95 and coefficient of variation of 0.242 is the first priority.

In the educational dimension, the option of "holding periodic training courses and providing appropriate services for greenhouse owners" with an average of 4.11, standard deviation of 0.97 and coefficient of variation of 0.236 is the first priority. In the management dimension, the option of "employing skilled personnel to use and maintain the relevant equipment" with an average of 4.37, standard deviation of 0.92 and coefficient of variation of 0.211 is the first priority. In the economic dimension, the option of "creating initial investment of the government and private centers for the use of renewable energy" with an average of 4.40, standard deviation of 1.04 and a coefficient of variation of 0.237 is the first priority. In the social dimension, the option of "paying attention to the real conditions of greenhouses from a sociological point of view in order to implement the relevant plan" with an average of 3.93, standard deviation of 1.34 and a coefficient of variation of 0.262 is the first priority. In the policy dimension, the option of "legislation on the establishment of cooperatives and organizations needed in the field of renewable energy" with an average of 4.39, standard deviation of 0.96 and coefficient of variation of 0.219 is the first priority. In the cultural dimension, the option of "creating theatrical farms and voluntary cooperation of farmers in the implementation of projects" with an average of 3.97, standard deviation of 1.18 and a coefficient of variation of 0.297 is the first priority.

In order to investigate the relationship between the research variables, according to the scale of each, the correlation coefficient was calculated and their significance levels were examined.

The results showed that according to Spearman correlation coefficient obtained between the variables of educational, economic, social, technical, policy-making, cultural, attitude, familiarity of users of flower greenhouses and ornamental plants in Khuzestan province and the possibility of using renewable energy according to the level of significance [ 0.01] With 99% confidence, there is a positive and significant relationship between the variables.

In order to identify barriers to the use of renewable energy in greenhouses in Khuzestan province, factor analysis technique was used. After examining the variables and the factor load, the factors were named as follows: educational and management poverty, poor support services, incompatibility with conditions, lack of financial support, lack of technical facilities, lack of knowledge and awareness. According to the results of

factor analysis:

The first factor, educational and managerial poverty, with a value of 6.431, explains approximately 35.725% of the variance related to barriers to the use of renewable energy. The second factor explains the weakness of support services, with a specific value of 2.241, about 12.44% of the variance related to barriers to the use of renewable energy. The third factor explains the incompatibility with the conditions, with a value of 1.489, about 8.227 % of the variance related to the barriers to the use of renewable energy. The fourth factor explains the lack of financial support, with a value of 1.337, about 7.303% of the variance related to barriers to the use of renewable energy. Fifth factor, the lack of technical facilities, with a value of 1.301, explains about 7.302% of the variance related to barriers to the use of renewable energy. The sixth factor, the lack of awareness and knowledge, with a value of 1.048, explains about 5.824% of the variance related to barriers to the use of renewable energy.

According to the results, it is suggested:

Training courses should be held in order to educate users in the field of renewable energy and to identify the type of training needs in the field of renewable energy and familiarize them with the relevant technology and how to access these technologies.

Financial support from the government and private organizations in the form of initial investment or subsidies for the use of renewable energy.

In the field of project implementation, more attention should be paid to the real conditions of the greenhouses and the financial conditions of the users, and they should be assisted and informed in all stages of evaluation and promotion of the desired energies. Renewable energy planners should consider the problems of greenhouse owners and organize them as active organizations in the application of new technologies and spread the culture of participation among them to facilitate the acceptance of new technologies by users.

In order to use renewable energy in the region, the feasibility of use as well as suitable places to start the relevant systems and the amount of proper sunlight and wind in different seasons should be examined. In accordance with the structure of greenhouses, more attention should be paid to the implementation of these projects, and experts should be trained in the desired field, and the fields of access to technologies related to solar and wind energy should be paved.

More commitment and attention from the government to improve support services [greenhouse insurance, insurance of used tools, etc.] and create security for investment in the use of renewable energy.

In order to raise the culture of exploiters in the field of renewable energy, the relevant demonstration farms should be set up and farmers should be used to cooperate in the projects.

In general, the results showed that the level of education of users is very low and there is no good

knowledge in the field of renewable energy. Also, according to the interviews conducted with the beneficiaries and also from the research findings, the lack of training courses in the relevant field, has led to a lack of information in the field of renewable energy, confidence and desire to replace these energies with traditional energy supply methods. For this reason, it is suggested that in the future, more research be done in this field and more attention be paid to the issue of training users and specialized personnel.

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Uncorrected Proof