

## *Investigating the Role of Solar Energy in Protection and Revitalization of Pastures in Dry Region*

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Received: July, 2011 Accepted: Nov., 2012

### **Introduction**

Perhaps one of the great causes of migrations of Aryan tribes, five thousand years ago, from the territory of northern Asia, Iran, India and Europe which caused great changes in human life and civilizations was to reach new pastures. Since human food supply is mainly from agriculture and animal husbandry, and water resources, land, livestock and pasture are limited, providing food products from these resources needs proper use and scientific attention to these resources and to maximize the utilization and maintenance of them. Natural resources have an important status in social and economic development of the world. Unfortunately, in many countries especially in developing countries, increasing population, rapid urbanization, lack of knowledge about importance of natural resources along with inappropriate planning resulted in rapid degradation of forests and rangelands.

Rural energy is generally recognized as an important element of rural socio-economic development, not as an end in itself, but through the demand for the services made possible through energy inputs, such as potable water pumping, extension of the day by lighting and cooking. As a general trend, an increasing energy demand-both in quantity and quality is highly correlated with socio-economic development. Yet, the rural populations in many developing countries have been excluded from most of the benefits of economic development and the transition to better (quality) energy services. Renewable energy is considered to be a basis for sustainable energy supply systems. Population growth, key incidents and movements in the development of sustainable energy technology, different available forms of renewable energies and today's economic crisis have led to the introduction of renewable energy as a clean option that can have major roles in our common future. The main purpose of this study was assessing the role of solar energy in protecting pastures in dry region (Case Study of the South Khorasan Province), and the specific goals are:

- 1-Assessing the tendency and satisfaction with solar energy
- 2-Identifying the rural attributes in order to protect pasturage and extension using solar power
- 3-Assessing the information of rural people about the importance of pasturage, solar energy and the Carbon Sequestration Project

### **Methodology**

This study was quantitative and applied research that conducted through descriptive -survey method. The total population for this study was 310 residents of Hossein Abad who used solar energy for heating purposes. Data were collected through interview schedules. A series of in-depth interviews were conducted with some senior experts in the Departments of Energy and Agriculture in South Khorasan Province to examine the validity of the questionnaire.

A questionnaire was developed based on these interviews and relevant literature. The questionnaire validity was confirmed by content validity method used by a panel of experts.

Also, the questionnaire reliability was confirmed by the implication of a pilot test and the calculation of Cronbach's alpha coefficient (0.75). The respondents were asked to indicate their agreements by marking their response on a five point Likert-type scale. All 340 users of solar energy in Nazdasht rural of South Khorasan Province were taken into account as the statistical population of the study. The data have processed through SPSSwin13 software.

### Results

The results of the respondents' Satisfaction about solar energy and the respondents' trend to use solar energy are shown in Table 1.

**Table 1: Respondents' view about some research variables**

variable	Mean	S.D	Maximum	Minimum	Mode	C.V
Trend to use solar energy as new and safe energy in next years	4.50	0.732	5*	1*	5	0.162
Satisfaction of solar energy	4.39	0.783	5	2	1	0.178
Effect on the income by using solar power	4.39.64	1.21	5	1	4	0.332
Using shrub after application solar power	1.88	0.948	5	1	2	0.504

\* 1=very low and 5=very high

Results of the priorities of respondents' views about the importance of extension activities, which help them to adopt solar energy, showed that contact with natural resources extension agents and contact with public organizations were among the most important activities in this regard (Table 2).

**Table 2: Priorities of respondents' views about the importance of extension activities which help them to adopt solar energy**

Methods	Mean	Sd.	CV.
Contact with natural resources extension agents	4.44	0.768	0.173
Contact with public organizations	4.25	0.931	0.219
Lecture	4.08	0.826	0.202
Educational classes	4.04	0.882	0.218
Visiting the sample sites	4.22	0.815	0.193
Educational films and slides	3.081	1.197	0.388
Extension /education publications	3.52	1.271	0.361

Also the priorities of respondents' views about the activities which help them to protect pastures showed that the conservation of pastures (CV=.093) and the collection of pasture seeds (CV=.153) and the planting of pot Atriplex (CV=.163) were the third important priorities (Table 3).

**Table 3. Priorities of respondents' views about the activities which help them to protect pastures**

Activities	Mean	Sd.	CV.
Conservation pastures	4.77	.445	.093
Collecting pasture Seeds	4.47	.686	.153
Planting pot Atriplex	4.60	.752	.163
Planting bare root Haloxylon	4.48	.865	.193
Planting Haloxylon pot plant	4.61	.917	.199

The result indicates that 31% of the variance in the perception of respondents about the role of carbon sequestration project in protecting pastures could be explained by being aware of pastures importance, the amount of people's trend to use solar energy as a new and safe energy in the next years and the amount of lectures about the importance of carbon sequestration project (Table 4).

**Table 4: Multivariate regression analysis (Role of solar energy in protecting pastures as an dependent variable).**

variable	B	Beta	T	Sig.
Awareness of pastures importance( $x_{10}$ )	.345	.330	6.451	.000
Amount of people trend to use solar energy as new and safe energy in next years( $x_{17}$ )	.338	.291	6.103	.000
Amount of lecture importance in carbon sequestration project( $x_{20}$ )	.222	.215	4.244	.000
Constant	.529	--	1.570	.117

$$R^2_{Ad} = .314 \quad R^r = .321 \quad Y = .33x_{10} + .291x_{17} + .215x_{20}$$

**Conclusion**

The results demonstrated that the success of solar energy will depend on informing people about its benefits. In this regard, the authorities should provide accurate and on time information. There is no single and appropriate intervention for developing and protecting solar energy in rural areas and in view of the numerous and varied constraints and opportunities, there is a need to develop location-specific strategies. The experience of the application of solar energy for rural areas in Iran is still limited. However, the carbon sequestration project shows that there is potential for solar energy that should be pursued.

**Key words**

Renewable energy, rangelands, carbon sequestration project, South Khorasan Province