



Awareness Level on Nuclear Energy and Utilization of Different Mass Media Resources by the Farmers of Jind District of Haryana

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Abstract: Energy is an essential input for the sustainable growth and development of nation. The development of nation depends on its energy resources but now-a-days conventional energy resources are experiencing constraints to meet the increasing demand of energy. The conventional energy resources such as coal, oil and natural gas massively pollute the atmosphere and contribute to the global warming by increase in greenhouse gases in the atmosphere. Nuclear energy is a safe, reliable and eco-friendly energy source and it offers the long-term energy security. Nuclear energy is mainly used for electricity production but it has various other applications in different fields such as preservation of food, enhancement of shelf life of fruits, pest control, water desalination, determination of pollutants in the environment, formulation of nuclear medicines and diagnosis and therapy of various diseases etc. Mass media resources such as radio, television, newspaper and magazines are important tool in creating awareness to large masses. The importance of nuclear technology for the farmers to a large extent depends upon the effective sources of information to which they are exposed directly or indirectly. The present investigation was conducted in Jind district of Haryana to study the awareness level of the farmers and extent of utilization of different mass media resources by them for receiving knowledge about the nuclear energy. A brief interview and group discussion were made with the farmers about the nuclear energy and questionnaire was used during the study for analysis of the opinion of the farmers about nuclear energy. The present study reveals that approximately 37% of the farmers were aware about the use of nuclear energy in electricity production but almost all the farmers of Jind district were unaware about the application of nuclear technology in agriculture.

Keywords: Awareness, Farmers, Knowledge Index, Mass Media Resources, Nuclear Energy.

1. INTRODUCTION

Agriculture is the mainstay of the Indian economy as it provides livelihood to almost two third of the population in our country. Food security, rural development and poverty alleviation are closely linked issues. Agriculture sector plays a significant role in supplementing family income and generating employment in the rural areas particularly among the small and marginal farmers and women, besides providing food and nutritional security to millions of people. The increase in population in our country has been tending towards alarming situation and it is expected to increase approximately 1.5 billion by 2050. The growing trend of population and consequent demand

for food and energy have considerably altered land - use practices and severely degraded the natural resources. These include pressure on land and forests, loss of biodiversity, rising demand for energy, global warming and environmental pollution. The problem of electricity in the rural areas is the major constraint for the rural development as it is related with irrigation and food security. The demand for electricity is going up all over the world continuously as energy is needed for a modern industrialized economy. The world consumption capacity of energy has increased roughly by a factor ten in the last one hundred years and continues to increase at a rate of about 2% per year. In the last century, world energy supply was mainly based on fossil fuels such as oil, coal and natural gas but the intensive consumption of coal and oil have produced negative impact on the environment. The conventional energy resources are not enough to keep up with the increasing demand of electricity. Report of Intergovernmental Panel on Climate Change (2000) indicates that the sudden increase in global temperature was mainly due to the emission of carbon di-oxide and other green house gases. Global warming due to CO₂ emission and current geopolitical situation with regard to oil and gas indicates that there is an urgent need to have a wide range of non - fossil energy options for the energy security in future. Renewable energy technologies such as solar, hydro, wind, biomass and geo - thermal energy are already being used in many countries but these options alone can not meet the global energy demand. There is a strong correlation between energy consumption and development as the standard of living of the people of any country is considered to be proportional to the energy consumption by the people of that country. The development of nation depends on its energy resources but unfortunately in our country more than 300 million people do not have access to electricity. Nuclear energy is the only source of energy that can replace fossil fuels such as coal, oil and gas which massively pollute the environment and contribute to the global warming by increase in greenhouse gases in the atmosphere. Nuclear energy is a viable solution as it is a clean, safe, reliable and eco-friendly energy source and it offers the long-term energy security. Nuclear energy is mainly used for electricity production but it has various other applications in different fields such as production of different varieties of seeds (Zelle, 1962; Alam et al. 2001), preservation of food (Farkasa and Mohácsi-Farkas, 2011), enhancement of shelf life of fruits, pest control, determination of age of

rocks, water desalination, formulation of nuclear medicines, diagnosis and therapy of diseases and determination of pollutants in the environment etc. Among different mass media resources radio and television have been proved the most effective media in promoting agriculture and development in rural areas, particularly as a tool for the delivery of quick information. The wide spread use of the mass media resources has resulted in heightening the level of public awareness and knowledge in different fields (Buren, 2000). The major objective of the present investigation was to know the awareness level of the farmers of Jind district, Haryana about the nuclear energy and extent of utilization of different mass media resources by them for receiving knowledge and information. Unfortunately no effort seems to have been made till date to study the awareness and knowledge level of the farmers of Jind district about the nuclear energy. Thus, this study was undertaken to analyze the opinion of the farmers about the nuclear energy.

2. MATERIALS AND METHODS

Study Site: The present study was conducted in Jind district, Haryana, India during February, 2014 to assess the awareness and knowledge level of the farmers about the nuclear energy.

Geographical Position of the Study Site: Jind district is surrounded by Kaithal and Karnal districts of Haryana in the east and west respectively. It has a common boundary with Hisar district in south-west area, whereas in south and southeast it shares its boundary with Rohtak and Sonapat respectively. Jind district occupies an area of about 3,606 sqkm and the total population of the region is approximately 1,334,152 as per the 2011 census. Approximately 77.1% population of Jind district resides in rural areas whereas 22.9% population live in urban area. The Jind district is divided into three sub-divisions namely Jind, Narwana and Safidon and it has total 307 villages in its different sub-divisions. Jind sub-division comprises two tehsils namely Jind and Julana and one sub-tehsil Alewa. Narwana sub-division comprises as Narwana tehsil and sub-tehsil Uchana and Safidon sub-division comprises Safidon tehsil and PilluKhera sub-tehsil.

Selection Criteria of the Respondents: Due to large number of villages and huge rural population in the Jind district, this district was selected as a suitable and significant area for the awareness related study. The mass awareness programme on nuclear energy was conducted in Krishi Vigyan Kendra of Jind district, Haryana during February, 2014 and eighty farmers were selected as respondents from different villages of Jind district of Haryana for the study. The entire study was based on the interview and group discussion with the farmers of Jind district of Haryana to assess their awareness and knowledge about the nuclear energy. All the respondents were male and they were in between the age - group of 25 - 70 years. All the participants were involved in agriculture related activities. During the study, respondents were identified mainly on the basis of the

following criteria: (a). a person who was resident of Jind district (b). willingness of the farmers for participation in the study.

Interview and Group Discussion with the Respondents: A brief interview and group discussion were made with the farmers of Jind district for the documentation of their knowledge about the nuclear energy. The questionnaire was used during the study for collection of the opinion of the farmers about nuclear energy. To measure the level of the awareness and knowledge of the farmers of Jind district a 'knowledge index' was prepared by taking different dimensions of nuclear energy. For each of the knowledge dimension different scores were assigned to the farmers participated in mass awareness programme. A low level score was assigned when the farmer had no knowledge or very less knowledge, a medium score was assigned when the farmers expressed their awareness and a high level score was assigned when the farmers expressed their knowledge about the different aspects of nuclear energy. Finally, the questionnaires were collected and responses of the farmers were summarized as given in the Tables (1 - 5).

3. RESULTS

The mass awareness programme on nuclear energy was organized in the Jind district, Haryana during February, 2014 and eighty farmers were selected as respondents from different tehsils of Jind district for the study. Interview and group discussion were conducted to assess the awareness and knowledge level of the farmers of Jind district about the nuclear energy. During the present investigation, it was observed that about 77.1% population of Jind district resides in rural areas whereas 22.9% population live in urban areas and agriculture was the main occupation of the rural people of Jind district.

Table 1. Educational status of the farmers of different tehsils of Jind district, Haryana.

S. No.	Educational status of the farmers	Number of respondents
1.	Illiterate	15 ± 0.04 (18.75)
2.	Primary level	34 ± 0.13 (42.5)
3.	Secondary level	21 ± 0.09 (26.25)
4.	Higher secondary level	7 ± 0.06 (8.75)
5.	Graduation	3 ± 0.02 (3.75)

Values are mean of three replicates ± sem

Figures in parentheses indicate percentage of the respondents.

Table 2. Land - holdings of the farmers of different tehsils of Jind district, Haryana.

S. No.	Land- holdings of the farmers	Number of respondents
1.	Small	24 ± 0.07 (30)
2.	Medium	37 ± 0.08 (46.25)
3.	Large	19 ± 0.05 (23.75)

Values are mean of three replicates ± sem

Figures in parentheses indicate percentage of the respondents.

The awareness level of the farmers of Jind district on the nuclear energy was analyzed by conducting the interview and group discussion with the farmers and they were in between the age group of 25 - 70 years (Table - 3). Among the participants, 18.75% people had no formal education as they were uneducated. 42.5% farmers had primary level school education, 26.25% had secondary level school education, 8.75% had higher secondary level school education and only 3.75% of the respondents had university level education (Table - 1). Most of the farmers (46.25%) had medium size of land holdings and only 23.75% of the respondents had large size of land - holdings (Table - 2).

Table 3. Age of the farmers of different tehsils of Jind district, Haryana which were participated in the mass awareness programme.

S. No.	Age of the farmers (Years)	Number of respondents
1.	25 - 40 years	22 ± 0.08 (27.5)
2.	40 - 55 years	50 ± 0.04 (62.5)
3.	55 - 70 years	8 ± 0.02 (10)

Values are mean of three replicates ±sem
 Figures in parentheses indicate percentage of the respondents.

During the interview, most of the farmers (97%) said that nuclear power plants are unsafe and 37% farmers said that nuclear power plants are hazardous source of electricity production and establishment of such nuclear power plants are not safe for the environment. The results of the present study clearly indicate that the farmers of Jind district had very less awareness on nuclear energy issues. Most of the farmers got the information about the nuclear power plants through the local news papers and fellow farmers but they had no information about the applications of nuclear energy in agriculture sector (Table - 4 and 5). They were not properly informed about the use of radiation technology in agriculture and food security and safety measures used in the nuclear power plants. Unfortunately there was a huge gap among the media resources, farmers and government officials and due to this gap, respondents residing in different tehsils of Jind district were not aware about the applications of nuclear energy and they have various misconceptions about the nuclear energy (Arulchelvan, 2013).

Table 4. Utilization of different mass media resources by the farmers of different tehsils of Jind district, Haryana.

S. No.	Mass media resources	Number of respondents
1.	Radio	78 ± 0.35 (97.5)
2.	Television	69 ± 0.16 (86.25)
3.	Fellow farmers	57 ± 0.08 (71.25)
4.	Newspaper	21 ± 0.04 (26.25)
5.	Magazine	4 ± 0.02 (5)

Values are mean of three replicates ±sem
 Figures in parentheses indicate percentage of the respondents.

Table 5. Knowledge level of the farmers of different tehsils of Jind district, Haryana about the application of nuclear energy.

S. No.	Application of nuclear energy	Number of respondents
1.	Electricity generation	30 ± 0.05 (37.5)
2.	Seed production	0 ± 0.00
3.	Estimation of moisture content in soil	0 ± 0.00
4.	Preservation of food	0 ± 0.00
5.	Enhancement of shelf life of fruits	0 ± 0.00
6.	Water purification	0 ± 0.00
7.	Pest control	0 ± 0.00
8.	Diagnosis and therapy of diseases	0 ± 0.00

Values are mean of three replicates ±sem
 Figures in parentheses indicate percentage of the respondents.

4. DISCUSSION

Nuclear energy is clean, safe and reliable source of energy but due to lack of knowledge about its application in agriculture and safety measures used in nuclear power plants, farmers of Jind district had several misconceptions about the nuclear energy (Beatty, 1997). Nuclear technology is effective, safe and eco-friendly technology because it releases no toxic chemicals in the environment (Deolalikar, 2008). It was observed that the news disseminated in the villages of Jind district was related with the hazardous effects of radiation and dangers of the nuclear power plant. Unfortunately in our country some of the environmental groups and non-governmental organizations (NGO) which are funded by developed countries are opposing the establishment of nuclear power plants without knowing the reality of the safety measures used in nuclear power plants and benefits of nuclear technology for the society. It has been observed that the perception of a person is always influenced by the environment in which communication takes place as it is not intrinsic quality of the individual. The problem is not only due to the news disseminated in the Jind district about the dangers of nuclear power plants but unfortunately it is due to the gap among the media resources, farmers and experts who could not explain properly the benefits of nuclear technology in agriculture sector to take away the fear of the farmers of Jind district.

Strategies for Increasing the Effectiveness of Media Resources: Mass media have played a pivotal role in imparting knowledge in various fields to the common man. Communication through mass media resources is a powerful tool and can be used effectively to communicate scientific knowledge to the farming community as it is essential for development and social change. Mass media offers effective information channels for communicating agricultural messages which can increase knowledge and influence the perception and behaviour of the intended

audience. Efficacy of different tools of communication have been tested by many researchers (Nazari and Hasbullah, 2010).

Among the different mass media resources, radio and television have been considered as the best education media due to their wide range of audiences and viewers (Tancard and Verner, 2005). Radio is a powerful mass medium having reach up to the unreached mainly because of its low cost and it can be used everywhere. Radio has been considered as effective tool in communicating the agricultural technology to needy and remote area farmers as it delivers information quickly and help to bridge the gap between the scientists and farmers. Television is an electronic audio-video medium for telecasting programme to the viewers. Both of the tools are suitable for communication to millions of people widely dispersed and situated in remote areas (Badodiya and Chaudhary, 2011). Most of the farmers of Jind district have owned radio and television sets and they listen and watch several agriculture related programmes such as Choupal, Kisanvani and Krishiparicharcha etc. The literacy level of the farmers also play an influential role in the extent of use of available media resources. It has been observed that the preference of mass media as information source varies among the farmers as it depends on various factors such as source of availability, credibility of source and economic status of the farmers (Chauhan and Kansal, 2014). The farmers of Jind district suggested that there should be fixed timing and duration of broadcast of agriculture related programmes and other significant informations. Most of the respondents (82%) preferred the broadcast of the agriculture related programmes should be in the dramatized form, 11% farmers preferred in discussion form whereas only 7% of the respondents preferred lecture by the experts. All the respondents suggested the use of local language during broadcasting of the programme and there should be no technical or scientific terms. Similar findings were also reported by Badodiya et al. (2010) and Badodiya and Chaudhary (2011). In our country, dissemination of agriculture related information is not seen as a major priority at state or national level and the role of the media for agricultural and rural development is undervalued (Garg et al. 2014). Hence, it is necessary to identify the different mass media sources and channels of information available to the farmers and to locate the most utilized information sources by the farmers for the development of suitable communication strategy.

In the mass awareness programme on nuclear energy at Jind district, Haryana the lectures were delivered by scientists and experts of Department of Atomic Energy and it was observed that due to the information provided by scientists and experts, farmers changed their mind set and they could know the significance of nuclear technology in agriculture and food security. The government and non-governmental organizations should provide appropriate opportunities for the development of formal and informal education system in the villages to educate the farmers and to decrease the illiteracy level in

the rural areas. Further, awareness programmes are required by the utilization of different media resources in different districts of Haryana state to enhance the knowledge of the farmers regarding the applications of nuclear energy for the development of society and future strategies.

5. CONCLUSION

It can be concluded that there is an urgent need to improve the awareness level of the farmers residing in different tehsils of Jind district of Haryana about the nuclear energy as most of the farmers were unaware about the applications of nuclear energy. Some functional action plans have to be chalked out by government and non-governmental organizations in order to increase the awareness level of the farmers at grass root level to educate them about the utilization of radiation and nuclear energy in agriculture sector. Massmedia resources can play a significant role in generating awareness among the farmers but there is need of proper coordination between the farmers and scientists with the utilization of media resources.

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