# SURVEY ON KNOWLEDGE, ATTITUDE AND PRACTICE ON SUSTAINABLE AGRICULTURE AMONG RURAL FARMERS IN HAMADAN PROVINCE, IRAN

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## ABSTRACT

This research was conducted during 2003-04 with the aim of determining the extent of knowledge, attitude and practice of rural farmers in Hamadan province about sustainable agriculture. The questionnaire for this research was designed in four sections including: a section for personal and occupational particulars, a section for knowledge, a section for attitude, and a section for practice questions. There were totally 40 questions in the questionnaire. Applied sampling method was a two–stage cluster sampling with a size of 582 from the farmers in Hamadan Rural Area. The validity of questionnaire was examined and confirmed. Also in order to determine the reliability of the research, Cronbach's alpha coefficient was 0.92. Based on the results, the mean (SD) of interviewee's scores for their knowledge, attitude and practice regarding information about sustainable agriculture were 81.52(16.92), 73.46(15.20) and 58.04(14.13) (out of 100), respectively. There is a positive correlation between knowledge-score and attitude-score ($r=0.38$, $p<0.001$). Since the rural farmers are in fact soldiers who implement and expand sustainable agriculture, it is deemed a major and crucial task of agricultural authorities and decision-makers to promote knowledge, develop attitude, and improve practice of farmers.

## INTRODUCTION

Using modern technologies in agriculture has satisfied the societies' needs for food and nutrition, but it has also imposed many environmental problems and issues (Hatfield *et al* 1994). One of the main objectives of sustainable agriculture is performing agricultural activities without harming the environment and natural resources as well as focusing on environmental protection as a comprehensive and global strategy (FAO, 1991-a). A recent study in Iran has shown that Major barriers hampering adoption of sustain able agriculture practice, included little financial returns for farmers, low farmer knowledge respect to sustainable agriculture, low levels of farmer education, government rules and regulations, problems with soil erosion and lack of water, and low Extension agent knowledge with respect to sustainable agriculture (Chizari, 2001).

Minarovic *et al.* (2000) have reported that a positive response regarding the attitudes of North Carolina Cooperative Extension Service (NCCES) professionals towards sustainable agriculture. Ninety-eight percent agreed on the importance of using environmentally sound practices in all farming operations, large or small.

Agriculture contributes to many of the environmental problems for which Environmental Protection Agency (EPA) is seeking solutions; for example, no point source pollution, contamination of groundwater, air toxics, and loss of biodiversity (Olson, 992).

Hamadan Province, with an area of 19493 $Km^2$, is located 320 Km from Tehran, in the West of Iran. This province is one of the major agricultural centers of Iran, whose economy is strongly dependent on agricultural activities. Due to lack of enough investment in industry sector in Hamadan province, the basis of development of this region has been planned on agriculture (Reyahi khoram *et al,* 2004-a). In this research an attempt has been made to measure the status of knowledge, attitude and practice of farmers of this province regarding sustainable agriculture. Based on the findings of this research it would be possible to design and implement more detailed planning regarding compilation and priority of guidelines and methods of implementation of sustainable agriculture in the region.

## MATERIALS AND METHODS

This research survey was carried out on rural farmers of Hamadan province, Iran, during 2003 to 2004. A comprehensive questionnaire was designed for the purpose of collecting information (Dutta, 2000). The used questionnaire includes four sections; personal and occupational status of farmers as well as their knowledge, attitude and practice on sustainable agriculture. The questionnaire consists of four questions for personal characteristic of the farmers', twelve questions for knowledge, twelve questions for attitude and twelve for practice. Therefore, the total numbers of questions for this questionnaire were 40. Questionnaires were completed by expert interviewers. True/false questions were used for knowledge. Likert – type Scale designed for attitude

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questions. Also, multiple-choice questions were designed for practice. Statistical population of this research included all rural exploiters of Hamadan province.

In this research, a two-stage cluster sampling was used. Thirty villages (cluster) were randomly selected among 1101 villages. In order to select sample individuals in each village, systematic sampling method was used (Cohen, 2001). The minimum sample size was estimated 576 with design effect coefficient of 1.5 (Cochran, 1997). Therefore, 582 farmers were interviewed.

In order to determine validity of the questionnaire, it was decided to use opinions of experts and specialists in the field of sustainable agriculture. To determine the reliability of questionnaire, Cronbach's alpha coefficient was obtained as 0.84.

The total numbers of variables of this research were Forty-three. The most important of which were knowledge, attitude and practice of rural farmers regarding conservation tillage, green manures, animal and pasture balance, compost fertilizer, water resources limitation, necessity of limitation of using chemical fertilizer, preventing soil erosion, benefits of crop rotation, using modern irrigation methods, necessity of using Integrated Pest Management, etc. The Excel and Statistical Package for Social Sciences (SPSS) software were used for scoring and analyzing the data (Ambigapathy *et al,* 2003). In this research, in order to perform analysis of variance, the information related to age and size of agricultural lands of the interviewees, were classified (Levin, 1987). The item difficulty of questions was not equal. Therefore, a degree of importance has been defined for each of the questions. It means that the score of each question is multiplied by the relevant degree of importance to get a final score for each question.

## RESULTS AND DISCUSSION

### *Results related to personal and occupational Status*

Based on the obtained results, the mean age (Standard deviation) of interviewees was 47.9 (13.4) years; the maximum age 92, the minimum 18, the Median age 47.5 and the mode was 45 years.

The mean (SD) size of farm to each farmer was equal to 11.9 (23.4) hectares. The Frequency distribution of size of private farms is shown in Table 1.

### *Results Related to the Level of Farmers Knowledge's*

Based on the research findings, the obtained mean (SD) score to the knowledge of interviewees was 81.52 (16.92) with the range of 0-100. The maximum amount of knowledge was related to the result of spring tillage in preserving soil moisture. The least amount of knowledge was related to applying non-chemical methods to combat plant pests. Table iv shows classification of knowledge scores of interviewees, which shows the level of knowledge of rural farmers of Hamadan province, is assessed as a very good level.

### *Results Related to the Characteristics of Farmers' Attitudes*

Based on research findings, the mean (SD) score for attitude of interviewees was 73.46 (15.20) (out of 100). The scores on attitudes of individuals changed from 35 to100. The best attitude of these people was concerned with the necessity of soil preservation and erosion control. The worst attitude was concerned with the role of Fallow in crop rotation. Table 5 classifies scores of the interviewees obtained on attitude scores, according to which the level of attitude of Hamadan province rural farmers is assessed as good level.

### *Results Related to the Characteristics of Farmers' Practices*

Based on research findings, the mean (SD) score of the inter viewees about practice was 58.04 (14.13) (out of 100). The practice score of people changed "between" 15-95. The best practice of these individuals was in the field of interaction with specialists when combating plant pests. The worst practice was related to the necessity of changing the traditional irrigation methods to modern irrigation methods. Table vi classifies attitude scores of interviewees. Based on the results practice level of Hamadan province rural farmers is assessed as fair.

Based on the results of this research there is a positive correlation between knowledge-score and attitude–score ($r=0.38$, $p<0.000$) there is a direct linear relationship between attitude-score and practice-score ($r=0.24$, $p<0.001$) as well as a positive correlation between knowledge-score and practice-score ($r=0.39$, $p<0.001$).

Also, there is a multiple linear regression between knowledge-score and attitude-score with practice-score ($F=55.38$, $p<0.001$). Based on the results of analysis of variance, the level of literacy has a positive effects on attitude-score ($P<0.001$) and on practice-score ($P<0.01$). Whereas the level of literacy has not any significant effects on knowledge-score ($P=0.23$).The results of ANOVA were shown on Table VII.

**Table I** ***The Frequency distribution of private farm size***

| Farm size (As hectare) | Frequency | Percentage |
|---|---|---|
| 0-1 | 39 | 6.7 |
| 1-5 | 386 | 66.3 |
| 5-10 | 62 | 10.6 |
| 10-15 | 28 | 4.8 |
| 15-20 | 33 | 5.7 |
| 20-30 | 11 | 1.9 |
| 30-40 | 12 | 2.1 |
| 40-50 | 4 | 0.7 |
| 50-100 | 6 | 1 |
| 100-200 | 0 | 0 |
| 200 to up | 1 | 0.2 |

**Table II** ***Frequency and Percentages of farmers literacy***

| Statement | Frequency | Percentage |
|---|---|---|
| Illiterate | 180 | 30.9 |
| Able to read and write | 207 | 35.6 |
| Had certificate of junior high school | 118 | 20.3 |
| Had certificate of senior high school | 21 | 3.6 |
| Had certificate of completion of secondary high school | 38 | 6.5 |
| Academic studies level | 18 | 3.1 |

**Table III** ***Frequency and Percentages of major jobs related to farmers***

| Statement | Frequency | Percentage |
|---|---|---|
| Farming | 12.6 | 73 |
| Gardening | 6.0 | 35 |
| Animal husbandry | 0.7 | 4 |
| Farming and gardening | 13.2 | 77 |
| Farming and animal husbandry | 37.1 | 216 |
| Gardening and animal husbandry | 1.9 | 11 |
| Farming, gardening, and animal husbandry | 27.1 | 158 |
| Other | 1.4 | 8 |

**Table IV** ***Classification of knowledge-score about sustainable agriculture***

| Class | Knowledge characteristics | Score range | Percentage (%) | Number |
|---|---|---|---|---|
| 1 | Very good | 100 -81 | 57.7 | 336 |
| 2 | Good | 80 - 61 | 28.9 | 168 |
| 3 | Fair | 60 -41 | 10.8 | 63 |
| 4 | Poor | 40 -21 | 1.9 | 11 |
| 5 | Very poor | <20 | 0.7 | 4 |

**Table V** ***Classification of attitude -score about sustainable agriculture***

| Class | Practice characteristics | Score range | Percentage (%) | Number |
|---|---|---|---|---|
| 1 | Very good (strongly positive) | 100 -81 | 37.1 | 216 |
| 2 | Good (positive) | 80 - 61 | 40.6 | 236 |
| 3 | Fair (hermaphrodite) | 60 -41 | 21.8 | 127 |
| 4 | Poor (negative) | 40 -21 | 0.5 | 3 |
| 5 | Very poor (strongly negative) | <20 | 0 | 0 |

**Table VI** ***Classification of practice-score about sustainable agriculture***

| Class | Practice characteristics | Score range | Percentage (%) | Number |
|---|---|---|---|---|
| 1 | Very good (strongly positive) | 100 -81 | 4.1 | 24 |
| 2 | Good (positive) | 80 - 61 | 44 | 256 |
| 3 | Fair (hermaphrodite) | 60 -41 | 41.2 | 240 |
| 4 | Poor (negative) | 40 -21 | 10.3 | 60 |
| 5 | Very poor (strongly negative) | <20 | 0.4 | 2 |

**Table VII** ***The results of ANOVA 0n KAP of farmers based on literacy, age and farm size***

| No. | Dependent variables | Factor | F | SIG |
|---|---|---|---|---|
| 1 | Knowledge –Score | Literacy | 1.363 | 0.236* |
| 2 | Attitude–Score | Literacy | 8.674 | 0.000* |
| 3 | Practice–Score | Literacy | 4.152 | 0.001* |
| 4 | Knowledge –Score | Age | 0.257 | 0.970* |
| 5 | Attitude–Score | Age | 1.706 | 0.105* |
| 6 | Practice–Score | Age | 1.644 | 0.120* |
| 7 | Age | Literacy | 83.087 | 0.000* |
| 8 | Age | Farm Size | 2.228 | 0.019* |
| 9 | Knowledge –Score | Farm Size | 1.858 | 0.056* |
| 10 | Attitude–Score | Farm Size | 3.011 | 0.002* |
| 11 | Practice–Score | Farm Size | 4.624 | 0.000* |

* *Significant; p<0.05*

## CONCLUSION AND RECOMMENDATIONS

This research has been carried out to identify and introduce a part of software factors related to sustainable agriculture in Hamadan province.

According to the findings of this research, the level of literacy of the rural farmers is low so that more than 30% of the interviewees are illiterate. About 35% could only read and write. These results support the findings of the other studies indicating that the thirty-three percent of wheat farmers in Lorestan province in Iran were illiterate (Chizari *et al,* 2001). The present study showed that the level of literacy of farmers influences the attitude and practice of farmers. Therefore, by promoting level of education of these individuals, the status of their attitude and practice toward fundamentals of sustainable agriculture increases.

According to the findings of this research, the age of rural farmers of Hamadan province is almost high so that the average age of farmers is more than 47. This indicates that although during the recent years, farmers' incomes have increased but the young generation has no interest in agricultural activities. This may be compared with another study done in Tennessee and has been reported that the average farm operators was 54.5years old with 29.4 years of experience (Pompelli *et al.,* 1995). In order to promote sustainable agriculture, it is necessary to have more investments on the youth in the villages to encourage them to involve in more agricultural activities. Based on the findings of this research, the size of private farms that belonging to the farmers is very small means the farm size of more than 70% of individuals is less than 5 hectares. Therefore, it is necessary that the government adopt serious measures for consolidation of private farms. Implementation of this plan could be one of the major strategies of expansion of sustainable agriculture.

This research showed that the farmers expressed their agreement with implementation of consolidation plan as follows: 17% of the farmers agreed voluntarily, more than 54% expressed their agreement in case of using bank loan, and 23% agreed if more exploitation is observed. Findings of this research showed that rural farmers have very good information regarding fundamentals of sustainable agriculture. This is due to the educational activities of the expert of agricultural extension, expansion of communications and also expansion of information technology during the recent years.

Based on this fact, the status of attitude of rural farmers regarding fundamentals of sustainable agriculture is in a good level. Also practice status of rural farmers regarding fundamentals of sustainable agriculture is in a fair level.

In this research it was known that there is a linear relation between knowledge score and attitude score among rural farmers about fundamentals of sustainable agriculture. Therefore, attempt to increase knowledge of rural farmers could lead to their developed attitude. Also, it was known that there is a multiple linear regression between knowledge score and Attitude score with practice score among rural farmers about fundamentals of sustainable agriculture. Therefore, any attempt to promote the farmers knowledge could improve their practice and any attempt to promote the farmers Attitude could improve their practice. Therefore rural farmers are in fact soldiers who implement and improve sustainable agriculture, so promoting their knowledge, improving their attitude and also increasing their practice are all the important duties of the authorities and officials in charge of sustainable agriculture.

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