In the name of Allah

THE DIFFERENTIAL CHARACTERISTICS OF FARMERS WITH REGARD TO THEIR INNOVATIVENESS IN FARSI PROVINCE, IRAN

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ABSTRACT

The main objective of this paper was to explore the social and economic characteristics which differentiated agricultural innovators from non-innovators among farmers of the Fars province of Iran. A total of 241 farmers were interviewed. It was found that high innovative farmers had higher family education, owned larger farms, were more productive, and used credit more often than low innovative farmers. The implication of these findings for agricultural development is discussed.

INTRODUCTION

Agricultural development and the larger rural development depend upon a system of related functions: production, supply, marketing, governance, research, and education/extension. The rate of agricultural development has been said to be dependent on the degree of effectiveness of the various components in the rural social system and on the degree to which they function as an integrated system.

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Identification of innovators is important for extension agents in developing countries since many programs are designed to stimulate technological change, the acceptance of which depends on a few individual farmers. In Iran, little data have been collected on the social and economic characteristics of farmers with regard to their degree of innovativeness. However, a good deal of research has been done in other countries regarding the characteristics of innovators and laggards. Copp (5) and Plogel (6) used multiple correlation analysis of socio-psychological and physical variables such as gross-farm income, professionalism, mental flexibility, level of living, familialism, information contact, and attitude towards innovation to explain variation in farm practice adoption. Moulik et al. (14) concluded that four variables, i.e. attitude towards nitrogenous fertilizers, knowledge about them, self-rating on innovation proneness, and closeness to extension agents, significantly influenced the adoption of nitrogenous fertilizers among Indian cultivators. Chaudari et al. (4), using data collected in two villages in Pakistan, found that adoption was significantly related to age, education, and size of holdings. Some researchers have noted a positive relationship between education and adoption (10), while others have found no such relationship (2, 7, 23). The relationship between farm size and adoption behavior has been studied frequently, but the findings have not been consistent. Some researchers have observed a positive relationship between farm size and adoption (22, 24). McMillion (13) found that the capital value of a farm was positively related to adoption.

Using number of wives, number of children, literacy, number of years in cocoa growing, advisory role, cocoa production, correctness of growers' knowledge, and formality of growers' sources of information as independent variables, Opare (15) found that growers' knowledge of principles underlying recommended practices was the most important
predicator of adoption variance. The study by Greene (8) in Thailand indicated that fertilizer adopters had higher indices of water availability, fertilizer availability, and motivation. Fertilizer adopters also had larger gross farm incomes, higher village, urban, and government exposure indices, were somewhat younger, had higher family education, and greater yields per rai (1/6 ha) than those not adopting.

An attempt was made by Singh and Saini (18) to identify the factors affecting the adoption of improved technology by a sample of 60 farmers selected from Amritsar in Punjab, India. Their analysis showed that formal education of farmers was not an important factor in adoption of improved farm practices. About 67% of the total variation in the case of the adoption of wheat, maize, and rice and 80% of the variation in the adoption of tube-well, tractor and thresher, respectively, were explained by family size, age of the head of household, operational holding, and education in the family.

Hiriyannaiah (11) stated that the adoption behavior of the graduate, non-graduate, and illiterate farmers of Dharwar district of India was significantly associated with their respective age groups, landholding status, income status, material possession group, social participation group, and high mass-media group.

The objective of this paper is to determine the social and economic characteristics which differentiate agricultural innovators from non-innovators among farmers of three counties (Fassa, Namassani, Eqlid) and one district (Kavar) in the Fars province of Iran.

METHODOLOGY

Sample

The data for this paper was taken from a project designed to study different aspects of farm innovations in sugarbeet
growing areas of the Fars province. Three counties (Fassa, 
Mamassani, Eqlid) and one district (Kavar) each with a 
sugarbeet refinery plant were selected. Within each of 
these areas, villages were divided into three strata on 
the basis of their population size. Thirteen villages were 
selected in proportionate stratified random samples within 
these areas. Within the selected villages, a proportionate 
random sample of farmers was selected for interviews. A 
total of 241 farmers were interviewed during the summer and 
autumn of 1982.

Measurement

Innovativeness, the tendency of an individual (or a unit of 
analysis) to be relatively early to adopt new practices or 
ideas, was measured in this study by the number of years 
prior to the interview at which the farmer reported having 
first used an innovation. It was then weighted based on 
the procedure of Presser (15). This was done for seven 
practices with regard to wheat cultivation which were re-
levant to most of the farmers in the study. The practices 
consisted of tractor plowing, use of fertilizer distributor, 
improved seed, and pesticides, grain drilling, row planting, 
and combine harvesting. The general innovativeness scores 
were derived by summation of the seven innovativeness 
scores. Information collected from sugarbeet cultivation 
was not included in determining the general innovativeness 
scores because many of the farmers had shifted from sugar-
beet to rice production at the time of data collection.

Farmers were divided into three strata on the basis of 
their general innovativeness scores. Operationally, the 
three strata were defined as (a) high innovative farmers 
(innovators and early adoptors, the upper 16% of the 
farmers on the basis of innovativeness scores), (b) medium 
innovative farmers (early majority and late majority, 
farmers with innovativeness scores between upper and
lower 16%), and (c) low innovative farmers (laggards, the lower 16% of farmers on the basis of innovativeness scores). Analysis of variance was used to compare different characteristics of the above farmer groups.

RESULTS AND DISCUSSION

Age

There were no significant differences in age of farmers with regard to their innovativeness (Table 1). This is consistent with generalization of Rogers and Shoemaker (17) who found inconsistent evidence about relationship between age and

Table 1. Mean age, education, and farmer's family education.

<table>
<thead>
<tr>
<th>Variable‡</th>
<th>Degree of innovativeness</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Farmer age</td>
<td>46.90a*</td>
</tr>
<tr>
<td>Farmer education</td>
<td>0.29a</td>
</tr>
<tr>
<td>Family education</td>
<td>1.50a</td>
</tr>
<tr>
<td>Education of all over 12 years old</td>
<td>1.21a</td>
</tr>
<tr>
<td>Education of males over 12 years old</td>
<td>1.79a</td>
</tr>
<tr>
<td>Education of females over 12 years old</td>
<td>0.23a</td>
</tr>
</tbody>
</table>

‡See the text for units.

*Means for each group within rows followed by the same letter are not significantly different (P < 0.05).
innovativeness. About half of the 228 studies reviewed by them on this subject showed no relationship, 20% showed that earlier adopters were younger, and 30% indicated that they were older. Based on these data they generalized that "earlier adopters are no different from later adopters in age."

Education

Although the economics of education has an ancient heritage (19), the idea of using education to accelerate the rate of economic growth is relatively new. In recent years, the educational sector of most countries has received increased attention from economists and a large share of national resources.

It is generally assumed that literacy is a pre-condition for any technological change. In this paper, instead of limiting the study of literacy standard to the farmers alone, the literacy of the whole farm family was studied. To compare the three groups in this respect, a literacy index for the farm family was devised. An index was prepared using the following arbitrary scores: College 15, high school diploma 10, high school 7, middle school 5, primary school 3, and illiterate 0.

The family index was prepared by summing the individual scores of family members and then dividing the total by the number of family members subdivided by age and sex (Table 1). Although high innovative farmers had higher individual education scores, this difference was not statistically significant. This finding corroborates results reported by Graham (7), Belcher (2), Verner and Millerd (23), Singh and Saini (18), and 72 of 203 studies reviewed by Rogers and Shoemaker (17) on this subject. Average family education of high innovative farmers was significantly higher than low innovative farmers.

The education score of over 12 year-old males and females