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Identifying Factors Affecting Beekeepers Empowerment of Alborz Province

Mina Moradi Sarab[1*], Hooshang Iravani[2], Hossein Shabanali Fami[3]

1* University of Tehran. Faculty of Agricultural Economics and Development, moradimina42@gmail.com

2- College of Agricultural economics & Management, University of Tehran

3- College of Agriculture and Natural Resources University of Tehran

Abstract

The modern agricultural industry relies extremely on pollination, especially pollination of the major horticultural crops. Reducing bee colonies causes recognition of factors determining activity of bee colony and helps beekeepers to better understand why bee colonies are destroyed sometimes and how they should concern about beehives to breed them in proper way for producing better honey. This research aimed at identifying factors affecting empowerment of beekeepers of Alborz province. The researcher used factor analysis to determine effective factors. Population of the research was beekeepers of Alborz province in which from among them 250 individuals were selected as the sample of the study using Morgan table. Results of factor analysis showed that about 62.846% of total changes occurred in four factors including queen bee, modern packaging, population of hives, and sub-products of honey bee and organic honey production determines the empowerment of beekeeping that was studied in this research.

Keywords: empowerment, beekeepers, and Alborz province

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Introduction

Today, China alone produces 102 thousand tons of the world's honey annually, while in comparison with Iran, the production of honey in our country is far from this number. One of the reasons led to honey loss in each hive is inefficient use of production factors and lack of management that having knowledge about them helps beekeepers to increase honey production and yield income.

Empowerment in this research refers to a condition that a beekeeper has environmental, organizing, Planning, procurement, implementation and evaluation capabilities and improves deficiency related to learning process of beekeeping , purchasing beehives, determining particular place for them, providing beekeeping equipment, like sugar and doing beekeeping activities. In 2012, the number of bee colonies was 75 million that produced 650 thousand tons honey. The average output of world honey from each colony is 21 kilograms and its per capita consumption 225g. Countries like China, Turkey and Ukraine are the major honey producing countries in the world. Since there are six million and 300 thousand modern bee colonies in Iran, it is in fourth place in the world. The per capita honey production in the country is 967 grams and the consumption 926 grams. In 2013, around 569 thousand and seven hundred queen bees were produced in country (Jihad agriculture, 2014).

According to Deputy Minister of Agriculture, the per capita production of honey from each beehive is 21 kilograms in the world; despite the fact that Iran was ranked in fourth place in number of bee colonies, it achieves only ninth place in honey production, that is, our country should get progress to increase efficiency of honey production (Rokni, 2013).

Human resource development is one of the most important factors in beekeeping growth. In beekeeping industry those who have the capability and knowledge of honey production they could manage in development of this sector. Training human resources not only plays an efficient role in creation of knowledge and related skills, but also causes effectiveness and efficiency to be more desirable (Kafraj et al, 2011).

Statement of problem

Nowadays, beekeeping was accepted as one of the world's agricultural majors (Dehganian and Koocheki et al. 2000 and Rastgar and Barani et al). Since agricultural activities depend on natural environment, human being has tried to reduce natural restrictions to the smallest possible degree (Dehganian and Koocheki et al, 2000). Studies show that the role of honey bee is 69 to 143 times more important than agricultural activities themselves in raising

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agricultural products (Tahmasebi and Poorgaraei, 2000). In addition to its indirect products, honey bee has provided work for large number of people through direct products (honey, pollen, royal jelly, bee venom, etc.) and their application in different industries like pharmacy food industry, paper making, etc. Since ancient times, Iran had desirable climate for beekeeping (Zolfagarian, 2009). Alborz province with the area about 5225000 km^2 consists of 32% of total area of country. Geographically, the province is located between 33 to 35 degrees north latitude and 50 to 51 degrees east longitude. It is between 900 and 1960 meters above sea level that is capable of cultivation. It is surrounded by Mazandaran in the north, Gilan in northwest, Markazi in the south, Qazvin in the west and Tehran in east. Alborz province is situated 20 km west of Tehran, at the foothills of the Alborz Mountains and mostly mountainous that includes Taleghan and Kandovan highlands, etc.

Proper climate conditions in various regions of Iran caused that agricultural activities and beekeeping to be carried out almost all seasons in most part of country. However, it should be considered that honey bee takes important role in pollination (Mahmoodi et al, 2011). In most countries honey bees are raised primarily to produce honey for its role in economical return through pollinating and increasing of agricultural crops and secondary to use sub-products like honey, bee wax, pollen, royal jelly (Shojaeian). Regarding the importance of honey bee in pollination it is not received more attention and our country deals with the problem of settlement of beekeepers by gardeners. One of the other problems is supporting seasonal migration of beekeepers. The present research aimed to investigate the factors effecting empowerment of beekeepers in Alborz province.

Review of related literature

Sarban (2014) noted that empowerment is the basis of rural development through several ways such as: Improving management skills, applying compatible technology with the environment of rural areas, improving quality of rural life, introducing villagers with problems of marketing products (Sarban, 2014).

In an era where competition has increased worldwide and political, social and economic competition is rife, the importance of qualitative development and increased empowerment of human resources has become progressively more pronounced (Erisen et al., 2009).

There is no question that empowerment of human resources is one of the One of the effective tools to increase productivity and optimal use of individuals and group capabilities and capacities to achieve organizational purposes. Empowerment is a process through which

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individuals and groups influence and capability result in continuous improvement of performance (Azainiya 2008).

According to Robbins and his colleagues (2002) empowerment is an individual's intrinsic motivation and has direct relationship with attitude style, feeling or perception of him from the working environment, power distribution or resources and information. In fact, empowerment is a continuous process that is analyzed in a dynamic (Robbins al el., 2002).

Research method

The present study was conducted in Alborz province. In terms of the nature and purpose is an applied research and in terms of monitoring and control is a survey research. This research is used descriptive method in data collecting and it is correlation type. The population included beekeepers of Alborz province. Stratified sampling was used in this research with Proportional allocation.

The number of samples allocated to beekeepers

province	Type of beekeeping	Size of population	Size of sample
Alborze	modern	700	250

Inferential statistics

Inferential statistics makes researcher infer from the sample data to make decision and generalizations about a population. Inferential techniques used in the research are factor analysis it is used to find out underlying variables of a phenomenon or summarize the data set (Sarmad et al, 2003).

Research findings

Factor analysis

The present research applies factor analysis with summarizing approach. The main purpose of this method is to describe a large number of variables on the basis of series of original structures with fewer elements. The purpose of applying factor analysis is determining managerial capacity beekeepers. The steps used in factor analysis are as follow:

Identifying properness of data for factor analysis

In order to identify that data are appropriate for factor analysis, KMO coefficient (Olkin-Kaiser-Meyer) and Bartlett test were used to represent how much the studied variables produce internal correlation. When the value of KMO is less than 0.5, data are not proper for

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factor analysis. When KMO value is calculated between 0.5 to 0.7 data are proper for factor analysis. If the value of KMO is over than 0.7, variable are more appropriate for factor analysis. The value of KMO in Bartlett test is represented in table (57-5). According to the table, data are more proper for factor analysis.

Value of KMO and Bartlett test

Factor analysis	KMO	Bartlett	Sin.
Level of management empowerment	0.731	2702.127	0.000

Determining number of factors

One important decision is the number of factors to extract. Although there are a few criteria to make decision about number of factors extracted, there are standards to determine the number of factors extracted. These criteria are Eigenvalue criterion, prior criterion, criterion of percentage variance and Scree Test Criterion (Kalantari, 2003). To determine number of factor, eigenvalue criterion was applied in the research. According to this criterion, the factors are only accepted that their eigenvalue is greater than 1(Mansoorfar, 2000).

Rotation of factor analysis

An important feature of factor analysis is that the axes of the factors can be rotated around the center of coordinate. In reality the matrix is not easy to interpret that requires rotation (Mansoorfar, 2000).

There are several methods of factor rotation that varimax is used in this study.

Factor analysis of variables related to beekeepers empowerment management

To identifying level of beekeepers' empowerment management, certain variables were applied in factor analysis. According to data collected, the value of KMO is 0.731 and the fixed value of Bartlett is 2702.127 that is significant at level 0.00, that is, data are proper for factor analysis. Table 58-5 shows number of factors and the related characteristics. According to table, the highest eigenvalue is related to first factor which is 5.247; in fact this value makes 24.984% of variance. The variables available in these 5 factors indicate 62.846% of total changes related to the level of beekeepers' empowerment management in this field and the variance remained in the research is related to variables that are not predicted in the study. Identified variables related to 5 factors are represented at table (2):

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line	factors	eigenvalue	Percentage of determined variance	Percentage of cumulative variance
1	*First*	*5.247*	*24.984*	*24.984*
2	*second*	*3.268*	*15.562*	*40.546*
3	*third*	*1.837*	*8.746*	*49.292*
4	*fourth*	*1.595*	*7.595*	*56.887*
5	*fifth*	*1.251*	*5.595*	*62.846*

Variability characteristics of factor extracted from factor analysis of the beekeepers' empowerment management level:

Factor title	variable	Factor loading
queen	Substitution of queen in apiary	0.798
	Breeding male bees to improve the performance of hives	0.658
	Effect of queen replacement	0.775
	Using healthy and active queen in the hive	0.569
	Using modern packaging on product sales	0.838
	Considering stylish packaging design	0.835
Modern packaging	Try to take a brand label	0.807
	Using marketer for selling products	0.579
	Noticing marketing techniques of honey	0.838
	Considering marketing techniques of sub-products	0.830
	use of labels for honey	0.720
Population of hives	Integration of weak hives	0.631

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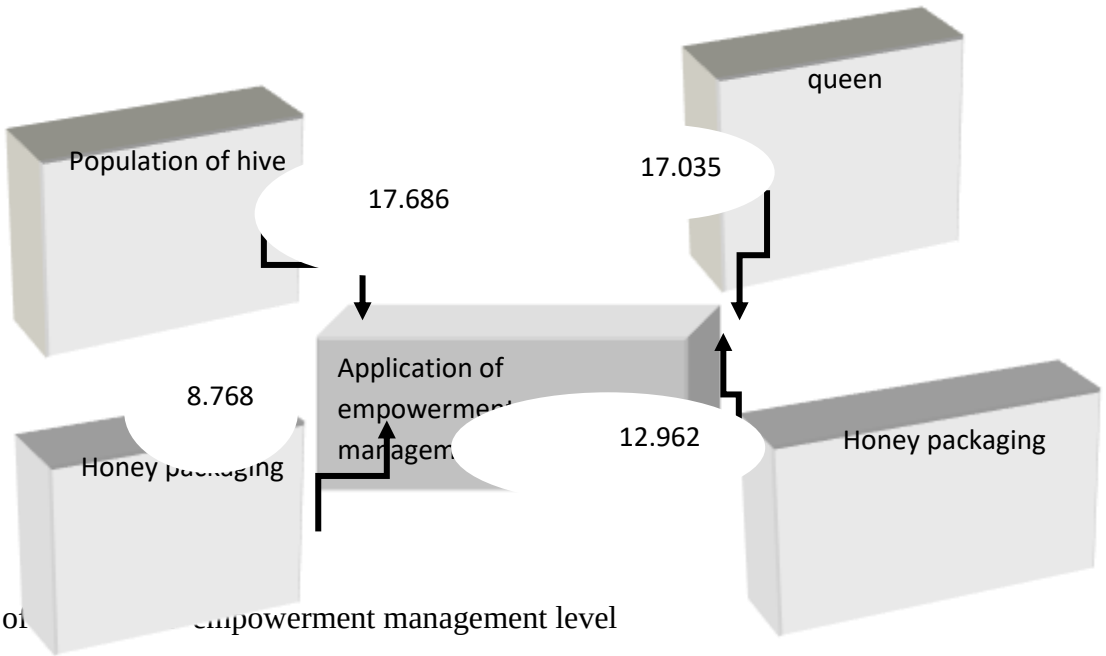
	Displacing hives after sunset or night	0.837
Sub-products of honeybee	Gathering royal jelly	0.659
	preparing Propolis	
	Collecting pollen	0.567
	Collecting bee venom	0.698
	Preparation of bees from other apiary	
Producing organic honey	Heating honey after collecting	
	The number of months or days that is probably sprayed on the margin of gardens and farms	
	The number of months or days that is not sprayed in meadows or forests	
	Using a layer of natural wax inside the hive	
	Considering the period that hives have to be coated with a layer.	

Characteristics of factors extracted from factor analysis of beekeepers' empowerment management level



Application of empowerment management level

Conclusion

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This part deals with the information related to dependent and independent variables in the form of descriptive statistics.

Individual characteristics of respondents

- Gender

Based on the findings of research, the highest frequency is related to men who are 244 (97.6%) individuals of the population.

- Age

Results of the research indicate that the average age of respondents is 45.221in which the highest frequency is related to ages between 31-40 and the lowest frequency to ages 41-50.

- Marital status of respondents

According to achieved information, 90% of population got married.

- Education level of respondents

The beekeepers participated in the research are represented on the basis of the education. 8% of them were illiterate, 2% of individuals were only able to read and write, 7.2% graduated from secondary school, and 17.6% high school, 37.6% completed diploma, 12% had associate degree, 16% graduated with a bachelor of science and 6.8% had master's degree and higher than it. Also, the beekeepers studied different educational field; 15.2% individuals studied mathematics, 30.4% natural science, 7.2% human science and 20.4% professional and technical field. And others were without any field of education.

- Member of institutions

The results show that most of the beekeepers (74.8%) were member of beekeepers cooperative, 19.6% member of honey bee association, 2% member of beekeeping development support fund, 2.8% member of perfect example beekeeper, 0.8% member of organic association and 23.2% were not member of any organization.

- management experience in beekeeping unities

Based on the information, the minimum and maximum management experience of beekeeping unities among the individuals was respectively 0 and 45 years. The lowest management experience was 41 years and the highest management experience in the group was 10 years. In general, average management experience of individuals was 15.204.

- Beekeeping activity experience

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Based on the information, the minimum and maximum beekeeping activity experience among the individuals was 1 and 45 years. Average beekeeping activity experience was 16.308. Meanwhile, results indicated the most frequency was related to less than 10 years.

- Beekeeping experience

Findings of the research showed that among the intended beekeepers community only 46.8% individuals had experience and 53.2% of people had no previous experience of beekeeping.

- Number of beehives

Findings of the research showed that the minimum and maximum of hives in beekeeping unities were respectively 0 and 1000. The lowest number of hives in group was 801-1000 and the largest number of hives in the group was up to 200 ones. The average number of hives was 176.952.

- Species of bees

According to findings, 91.2% of bees are hybrid, 4.8% Caucasian and 4% Carniolan. The average was calculated 3.784 and standard deviation 0.712.

- Insurance status

Based on the information, 26% of beekeepers enjoy insurance while 47% of them are not covered by insurance.

- Number of work force

Findings of the research show that 68.8% of the intended beekeepers enjoyed family work force, 10.4% of them used day worker, 7.2% of beekeepers used contractual workforce and 19.2% seasonal workforce.

- Different ways of selling honey

Results of research indicated that 240 (96%) of unities do not sell produced honey to processing factories and the remained intended unities sell factories different percentage of honey produced in beekeeping.

73 unities (29.2%) of beekeeping sell different percentage of produced honey in bulk, however 117 ones (70.8%) do not. The average produced honey sell in those unities is 350.816 in bulk.

237 unities (94.8%) of beekeeping sell to cooperatives different percentage of produced honey while 13 unities (5.2%) do not sell their produced honey to them.

218 unities (87.2%) of beekeeping consume 100% of honey themselves and 32 unities (12.8%) do not personally consume it.

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220 unities (88%) the produced honey after packaging is sold by beekeepers themselves. 30 unities (12%) do not sell by retail.

192 unities (76.8%) of beekeeping, the produced honey is presented to relatives and friends and in 58 unities (23.2%) it is not presented to relatives. The average presented honey to friends and relatives is 1.852.

Regarding the results of factor analysis, four factors including queen, honey colonies, sub-products of honey bee and production of organic honey consist 62.846% of total changes related to empowerment management level of beekeeping. The variance remained in the research is related to variables that are not predicted in the study.

Suggestions

1. The average of producing bee via other apiaries was 5.180 that it is the first priority of beekeepers. Since integrating species of bees make some problems and producing bee by beekeepers themselves is easily possible, it is suggested some training classes to be held by Jihad agriculture organization and beekeeping cooperative to encourage beekeepers to produce their own bees.
2. The average of the studied beekeepers that separated the hives with antibiotic was 1.892; that it was one of the first priorities of beekeepers. Therefore, it is suggested that the hives with antibiotic to be kept away for one year from other beehives to produce organic honey.
3. The average of stimulating nutrition and supplement in honey production season was 5.080 that it was selected one of the first priorities of beekeepers. So, it is suggested some training classes to be held by Jihad agriculture organization and beekeeping cooperative to prevent beekeepers using stimulation sugar and supplement in honey production season but in the season of increasing colonies of honeybee.
4. 64.8 percentages of beekeepers located apiaries at farms sprayed insecticides surrounded the hives. It is suggested that they should become aware of farmers' plan of spraying before finding the exact place of hives and take precaution. As well, farmers should inform beekeepers about their spray program and risk of toxicity. Educational organizations should introduce gardeners and beekeepers proper using of agricultural pesticides and the way of dealing with bee poisoning through the mass media and conducting training courses to prevent losses in apiaries.

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