Grouping the factors analysis in adopting integrated pest management (IPM) From the viewpoint of Garmsar city gardeners

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Abstract: This study aimed to determine the effective factors in IPM from Garmsar city gardeners view point. This was an applied, analytical- descriptive study. The statistical population was 1875 Garmsar city gardeners with 160 gardeners selected as samples. This number was increased to 180 and at the end 179 questionnaires were returned. Random proportional-layered sampling was used to select the samples. The research tool was a questionnaire that was prepared according to the literary background of the subject. In order to determine the validity of the subject, some questionnaires were given to agriculture professors, graduates and students of Azad University of Garmsar city, some Jahad agricultural management experts and some local professional farmers. Modification was applied after receiving their feedback. Preliminary test was conducted in order to determine the reliability and variance of research tool. In thus way 30 questionnaire were provided for Tehran city gardeners and after completing them, Cronbach's alpha coefficient was calculated (895%). Based on the factor analysis of IPM individual development as the main category (variance: 23/92, Eginevalue: 16/23), economical factor as the second category (variance: 17/4, Eginevalue: 12/71), innovation as the third category (variance: 14/75, Eginevalue: 10/25), tool factor as the forth category (variance: 11/12, Eginevalue: 8/25), management-regulation factor as the fifth category (variance: 7/04, Eginevalue: 5/82) and psychological factor as the last category (variance: 4/26, Eginevalue: 2/39) were determined.
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Introduction

Using fertilizers is estimated around 3 tons per hectare in Iran, creating hazardous condition in sustainable growth in agriculture. Pesticide and fertilizer distribution during 11998-2010 clearly shows the increase in utilization of these two inputs. According to statistics in non-chemical campaign against pesticides and diseases during 1381-1383, adoption of biological campaign in 1388 as compared to 1387 and former years is on the decrease (Agricultural Economic Planning Research Institute, 2006). The abuse of fertilizers and lack of efficient management in Garmsar city has caused severe land degradation in a way that many lands close to populated centers suffer from crop failure that is frequently reported by Jahad management experts (Amininasab, 2010). Knowledge transfer and sense of need are more required in solving this problem than capital investment. IPM is a sustainable agricultural approach that empowers farmers and also an environmentally and agriculturally compatible approach for maintaining crops. The effective development of IPM requires identifying the main approaches to IPM in order to design practical policy with farmers' contribution (Sharifi etal ., 2008). Motha (2005) believes that sustainable agriculture is no more than changing agricultural methods and should focus mainly on increasing knowledge and encouraging team work and individual and collective thinking. Today's modern agricultural development is closely dependent on the knowledge of technicians and experts and this is regarded as sufficient for emphasizing the importance of propagation in developing agriculture (Verschoor et al., 2000). The results of some studies conducted on important factors in adopting IPM are as follows: In a study conducted by Nouripour and Shahvali (2006) titled training campaign against grape cluster-eater worm with the help of local and academic knowledge (Dena city) shows that knowledge used by farmers was completely inappropriate. In Amhara region a study titled "the effective factors in sustainable agricultural development" focus mainly on the crucial role of agriculture in country development. In Ethiopia also a program has been conducted in which new technology transfer is considered the main factor in agricultural development. Developing technology can improve production and proper use of natural resources. The results show that skill and positive approach to changes are crucial for new technologies to be adopted. The results of a study conducted in Hamedan reveal that economical, social and technical factors are crucial in adopting and utilizing the innovations related to water, in a way that 60% of farmers have

used the above mentioned systems merely due to shortage of water (Amiriardakani and Zamani, 2004). In adopting IPM many factors such as innovation (Rogers et al,. 1969, Leewise, 2004, Fernandez et al., 2001), socio- cultural factors (Ghalavand, 2003, Shahbazi 2003, Swanson,1988), economical factor (Leewise 2004, Konesiga 2004, Kogagni et al., 2004 Weir and Knight 2000) and political factors (Government support, Policy makers, Arayesh et al., 2009, Sabouri et al,. 2009) are considered.This study aims to determine the effective factors in IPM.

Methods

The current study is an applied study and in terms of gathering data a descriptive study. It aims to determine the effective factors in IPM from the point of view of gardeners and determine which factors must be highly considered by decision makers. The population of the study was 1875 Garmsar gardeners. Samples were estimated 160 gardeners. This number was increased to 180 and at the end 179 questionnaires were returned. Random proportional-layered sampling was used to select the samples. The research tool was questionnaire that was prepared based on the literary background of the subject. In order to determine the validity some questionnaires were given to professors, graduates and Ph.D students of agriculture in Azad University of Garmsar, dome Garmsar Jahad management experts and some professional farmers. Modifications were applied after receiving their feedback. Preliminary test was conducted in order to determine the validity and variance of the study. In this study 30 questionnaires were provided for gardeners and after completing them Cronbach's alpha coefficient was calculated (895%).

Results

Based on the results of the study the highest level of age distribution was among 41-50 years and the lowest level among 20-30 years. The youngest farmer was 20 years old and the oldest one was 70 years old. The average was 49/5 years old which indicates good farming experience among farmers. Studying the distribution of experience indicates that the highest distribution was 21/30 years, the average gardening experience 23/1 years and the standard deviation was 28/90. These figures reveal the appropriate practical experience of Garmsar gardeners in gardening activities. The highest income was between 60/1-80 million Rials, the average income 73/3 million Rials, the lowest income 17 million Rials and the highest income 500 million Rials. The income level was not encouraging, hence, an economically compatible technology is recommended to introduce modern technology. The highest level of distribution among farmers' education was the ability to read and write. Around 60% of gardeners are not at desirable level of education, so educationally based innovations must be carefully introduced.Factor analysis was used base on the involved factors in adopting IPM by gardeners and also better understanding of factors in terms of features and quality of each category. KMO and Bartlett's tests were used to determine the appropriateness of research variables. The results are as follow: The calculated KMO and Bartlett's tests were calculated 893% and 7632/825 respectively. According to above table the calculated KMO reveals data appropriate condition for factor analysis. Varimax rotation was also used in factor analysis. Data were grouped in 6 categories. Based on the Eginevalue these categories determine 77/49 percentage of total variance of effective factors in IPM adoption by gardeners.Human development as the main factor (variance: 23/92, Eginevalue: 16/23), economical actors as he second category (variance:17/4, Eginevalue: 12/71), innovation features as the third category (variance:14/75, Eginevalue: 10/25), tool factors as the forth category (variance:11/27, Eginevalue: 8/25), management-regulation factor as the fifth category (variance:7/047, Eginevalue:5/82) and psychological factor as the last category (variance:4/26, Eginevalue: 2/39) were determined by factor analysis.

Discussion

Based on the factor analysis, human factor is the main factor in adopting IPM. One of the most important variables in this part is knowledge of IPM. Farmers' knowledge results in increasing their level of knowledge and adopting modern technologies. Combining these factors with other factors such as visiting farms, training courses and other developing factors like agriculture extension and education result in adopting IPM and most importantly positive approach to favorable changes. This is similar to the results of Wielinga (2000), Saiyid (2003), Swanson (2006) and Fernandez et al., (2001) study. Economical factors come after human factors. Technologies must be compatible with farmers' economical conditions, otherwise adopting and utilizing innovations will not be possible. Government support through investment or agriculture loans is also crucially important. This is similar to the results of Kojaghiet al., (2004), Kogwanja (2001) and Samiee et al., (2009). Innovation is another factor that has important roles in adopting and utilizing IPM (Lewvais 2004). In this study these factors are included in the third effective factors in adopting IPM. This is similar to the results of Kagwanja (2001). Tool factors, if provided, results in increasing the utilization of IPM by gardeners. This is similar to the results of Yaghouti et al., (2004), Mariyono (2007), Ofuoko et al., (2009) and Kessler (2006).

Table 1. Individual Characteristics of Garmsar City Gardeners

Individual characteristics	Range	abundance (person)	Percentage	Total percentage
Age: n=179	To 20 yrs	2	1.1	1.1
The lowest: 20	21-30	29	16.2	17.3
The highest: 70	31-40	43	24	41.3
SD: 21.8	41-50	67	37.4	78.7
Average: 49.5	Over 50 yrs	38	21.3	100
Farming experience	To 10 yrs	13	7.3	7.3
n=179	11-20	51	28.5	35.8
The lowest: 1	21-30	89	49.7	85.5
The highest: 57				
SD: 28.9	31-40	15	8.4	93.9
Average: 23.1	Over 41 yrs	11	6.1	100
Income level	To 20 Million Rls	3	1.7	1.7
n=179	20.1-40	33	18.4	20.1
The lowest: 17 Million Rls	40.1-60	35	19.6	39.7
The highest: 500 Million Rls	60.1-80	75	41.9	81.6
SD: 20097.8	Over 80 millions	29	16.2	97.8
Average: 73.3	----------	4	2.2	100
	Illiterate	26	20.1	
	Reading & writing	51	28.5	
Education level	Lower than high school diploma	18	10.1	
n= 179	High school diploma	21	11.7	
	Associated diploma	28	15.6	
	B.A & higher	22	12.3	
	----------	3	1.7	

Table 2. KMO and Barlett's test results of IPM adoption:

Test type	calculated amount
KMO test	846%
Barlett's test	5632/825
Significant level	0/002

Table 3.

Factor	Eginevalue	variance	Total variance
Human development	16/23	23/92	23/92
Economic factor	12/71	17/4	41/32
Innovation factor	10/25	14/75	56/07
Tool factor	8/29	11/12	67/19
Management factor	5/82	7/04	74/23
Psychological factor	2/39	4/26	77/49

Management- regulation factors were one of those categories placed at the end of effective variable list in IPM and this shows that a set of rules are required for adopting new technology or other important factors mentioned above have not been well provided. This is similar to the results of Arayesh et al., (2009) and Sabouri et al., (2009).

Psychological factors are the last effective factors in adopting IPM. Individual factors examined in psychology are better considered after adopting IPM.

Recommendation

One of the most important variables included in factor analysis was knowledge of IPM. This shows that knowledge of an innovation advantage or damaging effects of current activities in adopting the innovations.

So use of extension tools such as different courses seasonal exhibits and media are recommended. Visiting successful gardens and counseling is also one of the most important factors in adopting IPM. These two methods are recommended to the managers for rapid development of the innovation. Based on the factor analysis,

psychological factors were the last category in IPM. Regarding inadequate consideration for psychological studies, they should be conducted based on standard psychological tools in order to have more favorable results. Economical factor such as income level is also one of effective factors in IPM. So, one way to increase income and facilities is developing cooperatives which increase the state of farmers' finance. Establishing these cooperatives is highly recommended to related government development.

Categorizing innovations show that farmers only approve of those technologies that are better than current technologies. So, farmers' contribution and extension courses are recommended in introducing new technologies, in this way farmers experience significant benefits.

References

1. -Arayesh,B. Hosseini Farajollah,S.G and Malak Mohammadi,A. (2009). Planning public contribution in revival, development and exploitation of renewable natural resources in Ilam province. Proposal of agricultural extension. Tehran. Azad university of Science and Research.
2. -Amiri Ardakani, M.Zamani,Q. (2003). Pressure Irrigation Problems in Kohkilouye Bouyerahmad province. Journal of soil and water. 17(2).
3. -Amini Nasab, S,M.(2007). Soil as national resource, with emphasis on prevention of soil waste. The first journals on prevention of other national resources.
4. -Torkmani, G. Jafari, A.(1998). Effective factors on pressure irrigation in Iran. Journal of agricultural economics and development, 22:6-17.
5. -Shahbazi, A.(2003). Rural extension and development. Second edition. Tehran: Tehran university press.
6. -Soltanian Qalife, F.S, Pezeshki Rad, Q. (2009). Comparative study between the effects of technological factors on adopting pressure irrigation system by farmers in Isfahan city. Journal of agricultural extension and development, first year, No.44.
7. Sabouri, M.S, Malek Mohammadi, A, Chizari,M and Hosseini, S. M.(2009). The role of extension in agricultural development from the view of agricultural knowledge system. Journal of agricultural extension and development. Tehran: Azad university. Science and Research.
8. -Rogers, U.F.Shoemaker.(1969). Innovation: cross-cultural approach. Translator: Karami Ezatollah and Fanaee Aboutaleb. Shiraz: Shiraz university perss.
9. -Qalavand, K. (2002). Effective factors on accepting agricultural product insurance among Tehran and Mazandaran farmers. Unpublished master thesis. Tehran: Trabiat Modarres University.
10. Kohansal, M.R. Qorbani, M, Rafiee, H 1388. Considering environmental and non-environmental factors on adopting IPM. study in Razavi Khorasan province. Journal of agricultural economics and development, seventeenth year, 65: 97-112.
11. Planning institute of agricultural economics. (2006). National certificate in agriculture and natural resource development in the Fourth Five-Year Development Plan. Tehran: agricultural economic planning institute.
12. -Nouri Pour Sisaqt, Sh and Shahvali, M. (2009). Campaign against grape cluster eater with the help of local and academic knowledge (Dena city). Journal of research and development .68: 68-57.

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