Biological Forum – An International Journal **7**(2): 509-515(2015)

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Identify the Promoter Factors of Agricultural Researches in Universities: Opinions of Experts

Mohsen Alini
Assistant Professor of Agricultural Research,
Education and Extension Organization (AREEO), IRAN

(Corresponding author: Mohsen Alini)
(Received 18 June, 2015, Accepted 01 August, 2015)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: The main purpose of this survey was to investigate the promoter factors of agricultural researches in Iran's universities by using viewpoints of experts in this field. Design of this study obtained by using a modified Delphi technique to reach group consensus. Findings of this study indicated that Consensus reached on eight promoter factors of agricultural research in universities. These strategies included: develop systems and mechanisms for communication between the Ministries of Agriculture and Science, Research and Technology and research organizations, prioritized research projects according to the needs of country's research, and reviewed financial and administrative rules and regulations for approval of university research projects.

Keywords: Academic research, agriculture, promoter factors, Delphi Technique.

INTRODUCTION

Agricultural sector in Iran's economy due to having sustained economic growth, food security, yield of capital, foreign exchange earnings and Creating social justice In comparison with other parts of the country's economy has special capabilities so that can have a significant role in the country's economy. This sector plays a crucial role in Iran's economy, because it provides about 11 percent of GDP, 23% of employment and 80 percent of society foods (anonymous, 2006). To achieve both stability, profitability and productivity in the agricultural sector, is the result of integration and application of rational science, technology and experience. Obviously proper technologies have an important contribution in achieving these goals. Among these, agricultural research has a significant position in developing knowledge and proper technologies (Sharif-Zadeh *et al*., 2007 b). Shokohi and Torkamani's research (2007) also confirm this fact. Their research shows that one percent increase in investment in agricultural research has added 0.05percent of surplus Value in this sector over the period of 1971-2005.

Evidence and experience in the world the role of universities and centers of agricultural education in agricultural research in the framework of national agricultural research systems with the knowledge, information and available technology systems confirm the important strengthening cooperation in agricultural research systems and agricultural training. Despite the considerable potential that many universities in developing countries have, in some countries, including Iran, there is not much relationship between universities and Agricultural Research (Sharif-Zadeh *et al*., 2007 a). In academic agricultural research system activities and actions when will be success that this system could be answered issues, problems and expectations of beneficiaries and other stakeholders. It should be noted that the extent, diversity, multiplicity and complexity of the issues, problems and research needs of the agricultural sector on one hand and the limitations of facilities, resources and money, human resources and time constraints, on the other hand makes it impossible to respond virtually and comprehensive (Mortazavi *et al*., 2006). Thus, Dadkhah *et al* (2008) argue that the first step to organize research - including agricultural research - in society, is achieving a true understanding of the capabilities of existing facilities, as well as understanding the strengths and weaknesses of programs research. Understanding insufficiencies and awareness of how and the amount of achievement the goals of the research program are essential tools that should be available to decision makers, planners and policy makers that through it necessary decisions to achieve the objective of improving and increasing the efficiency of methods.

Clearly, issues and challenges that improve agricultural research activities, identify deterrent factors of scientific research activities of faculty members of the schools of agriculture. In other words, to achieve the desired state of research in agriculture, recognition of the existing situation and removing bottlenecks in faculty members from the schools of agriculture is necessary, because if obstacles and difficulties related to scientific research activities is recognized, it can provide favorable environment and necessary conditions for the activities by removing obstacle and improve research activities of faculty members, and Strengthening research activities can create prosperity of economic and social community.

Literature review (Feli *et al*., 2006; Ammani, 2007; Shams *et al*., 2009; Dadkhah *et al*., 2008; Kotrlik *et al*., 2002; Roland and Oliver, 2006; Bridgstock, 2006) shows that research and quantitative research on agricultural research did in the higher education system. Among these studies, can be noted to Feli *et al*. research (2006). Their study shows the most important problems of research in higher education system in agriculture as follows: weakness of relationship between university and research centers, applying personal style in evaluate projects, lack of a specific list of issues and research priorities related to the fields of agriculture, lack of an internal notification bank related to conduct researches and Not required research in universities. Ammani (2007) in his study is interpreted the problems of agricultural research in the higher education system as follows: Lack of access to equipment and facilities to carry out research activities, excessive bureaucracy and administrative issues troublesome, social and cultural infrastructure inadequate, exorbitant research activities, low skills on implementing research activities, lack of necessary connection between research centers and University, society doesn't valorize the scientific and research activities, Lack of attention to the findings of researches, lack of interest and lack of motivation to perform research activities and lack of enough time to carry out research activities. Shams *et al*. (2009) in their study show that six of supportive factors (57.16 percent), managerial policymakers (45.13 percent),research requirements (77.12 percent), relationship between researchers and implemented (39.10 percent), scientific communication (76.9%) and motivated researchers (06.8%) in total, 71% of the total variance explained the problems of agricultural research. Kotrlik *et al*.(2002) emphasizes the prohibition role of organizational culture and personal and social barriers on research and research faculty members of higher education institutions of agriculture in the United States.

Studying the proposed solutions to overcome these obstacles in those researches show that some of these researchers without offering suggestions and other researchers offer some impractical suggestions and recommendations. Studying these strategies shows that most of them due to exposure in the last section of research activities (thesis or paper) in general and with an academic view not practical are provided to remove barriers of academic agricultural research systems. Due to the weaknesses of recommendations and findings of academic research to remove barriers of academic agricultural research systems this study using consensus opinions as the Delphi technique to give solutions to overcome the problems of academic research in the field of agriculture. Hence, the main purpose of this study to identify effective factors of academic research in the field of agriculture.

METHODS

In this study, using the descriptive method and the Delphi technique to identify promoter factors of academic research. While the most studies try to answer the question "What is it?" Delphi responds the question of "what can / what should be?" (Ahmadi *et al*., 2008). This technique is already used in many educational researches to collect people's opinions and to determine priorities. In this technique, a group of experts responds a specific question or series of questions to develop their professional consensus (Boyd, 2003). Carrie *et al*. (2005) define that one of the goals of using this technique for gathering information to help improve the programs. They also mention Helmer's quotation that aim of Delphi technique is obtaining the most reliable consensus of opinion by an expert group. Witkin and Altschuld (1995) argue that use of this technique is appropriate when the aim of research discovery, identify and acquiring new information in the field of study. Therefore, they believe that it is meaningless using the theoretical framework and relying on theoretical structure in research that use these techniques. Delphi technique is an investigative approach for agreement and consensus by using questionnaire providing feedback to respondents who are expert in key scopes (Keeney *et al*., 2001).

Statistical population of this study consisted of all experts in the field of academic agricultural research. In this research, expert is assigned to University faculty member affiliated to the Ministry of Science, Research and Technology is an operator of at least one approved project at a university in the field of agriculture in the last three years.

Keeney *et al*. (2001) argue that the Delphi technique does not use random sampling, which represent the target population but use the opinions of experts. According to Characteristics of a knowledgeable person in the field of agriculture and he should have research at this time such as: type of responsibility and useful work experiences which led to limitations on the number of them by using purposive sampling or judgment of 30persons (faculty agricultural members of Tarbiat Modarres University, Razi in Kermanshah, Bu-Ali Sina in Hamedan, Shahid chamran in Ahvaz and Tehran University of agriculture and Natural Resources), which had the desired characteristics obtained by questionnaire. It should be noted that purposive sampling method or judgment is somewhat non probability sampling method is based on the assumption that the knowledge of researcher/s about society can assort members of the panel. On the sample size must be stated that isn't any exact mechanism for identifying the number of participants (sample size) in each study. The sample size may be different based on the topics covered, the nature of different views, time and available financial resources (Van Zolingen and Klaassen, 2003). Turoff (1975) argues that the least of 10 people and the most of 50 persons must be present in each panel.

The Delphi technique involves a series of steps survey or questionnaire that a questionnaire of next stage is formed after the first questionnaire (Ahmadi *et al*., 2008). In this technique, researchers usually use two up to four phases and two up to four types of questionnaires that the first and second phases is shared between all of them. In this study used two-step and two types of questionnaires to collect data. The first phase questionnaires of this research, was including an open-ended question as follows: In your opinion, what strategies can overcome the problems and difficulties facing to agricultural research in the universities? In this stage, 25 out of 30 respondents had to answer questions (questionnaire return rate was 33.88%). Similar items recorded as one item and finally 23 items used to assess inhibitors of academic agricultural research in the second stage.

In the second phase questionnaires, researchers summarize the responses from first questionnaire and remove similar comments then they return it to the population by Likert six-point scale (0 = none, 1 = very low, 2 = low, 3 = average, 4 = high, 5 = very high). At this stages, experts determined in front of each item (opinions), the important considering to proposed measure. This stage, items with less than one standard deviation (SD <1) considered by investigators as consensus items. In this stage, the 25 questionnaire sent to respondents who had participated in the first stage and all of them responded to the questionnaires and returned them.

Face validity of each stage was examined and approved by some of university professors in the areas of agriculture. Dalkey (1969) states about the reliability of this technique, when Delphi Group size is more than 13 experts, the reliability coefficient is greater than 80.0 ($\alpha \geq 0.80$).

RESULTS

A. Personal and professional characteristics of respondents

Research findings show that the majority of respondents are men (21 or 80.80%) with the last degree, PhD (22 or 60.84%) in the fields of Crop Science and plant breeding (9 or 60 . 34 percent). The average age of respondents is 42 (69.42) with a standard deviation 5 (52.5) year, which are mostly (14 or 80.53%) in the age group of 49 to 42 years. The number of academic research projects that respondents are operator and partners in it respectively, 4 and 3 times. Results also show that the majority of them have activated as operator in 3-1 academic research projects (16 or 50.61%) and as a partner in 2-1 academic research projects (10 or 50.38 percent).

The first step- Experts views about the promoter factors of academic research in the field of agriculture.

In this step, respondents debate 32 promoter factors of academic research in the field of agriculture that by combining some of them, 21 factors remained. There were mentioned Factors and the number of respondents in Table Two. As Table 2 shows most frequent answers about the allocation of resources and necessary funds for research projects are (14 Cases), compile systems and mechanisms for communication between the Ministries of Agriculture and Science, Research and Technology and research organizations (7 Cases), and prioritization of research projects according to the research needs of the country (6 Cases).

Also, these results show the lowest frequency of responses (1 Cases) about the considered question related to the items of Lack of fragmentation and specialization of each investigator in a specific product, academic centers Students visit from research activities in research centers, holding various meetings about the problems of the agricultural sector by higher education institutions, encouraging farmers to use outputs of academic research activities by displaying them through extension agencies and setting up research and development units in all executive agencies.

Table 1: Personal and professional characteristics of respondents (n=26).

Variable	Variable levels	Frequency	Percentage	Mean	Standard deviation
Gender	male	21	80.80	-	-
	Female	5	20.19	-	-
Educational level	MS	4	40.15	-	-
	PhD	22	60.84	-	-
Educational field	Biotechnology	1	80.30	-	-
	Agronomy and plant breeding	9	60.30	-	-
	Agricultural Extension and Education	4	40.15	-	-
	Animal Science	5	20.19	-	-
	Plant Protection	3	50.11	-	-
	Entomology	4	40.15	-	-
Age (years)	30-35	5	20.19	6	52.50
	36-41	7	90.26	9.41	
	42-49	14	80.53		
Research project executor (number)	1-3	16	50.61	7	98.20
	4-6	5	20.19	3.30	
	7-10	5	20.19		
Cooperative research projects (number)	0	1	80.30	15.	78.10
	1-2	10	50.38	30	
	3-4	9	60.34		
	5-6	6	10.23		

Table 2: The first stage of the Delphi technique: promoter factors of academic research in the field of agriculture (n = 27).

Promoter factors	Frequency
Allocation of resources and necessary funds to research projects	14
compile systems and mechanisms for communication between the Ministries of Agriculture and Science, Research and Technology and research organizations	7
prioritization of research projects according to the research needs of the country	6
conducting M.Sc. and Ph.D. students to farm researches	4
The practical application of academic research to motivate academic researchers	4
Support of top researchers at universities by the competent authorities for motivating	1
Changing regulation of promoting faculty members to increase the weight research related to solve the problems of the country.	4
Understanding this issue by managers that agriculture and agricultural research play an important role in Iran's economy	3
Review financial and administrative regulations for approved academic research schemes	3
Existence of specified organizations for monitoring academic research	2
Equipping academic information centers to access new books and journals in the field of agriculture	2
Avoid performing repetitive research schemes	2
Encouraged university professors to interact and work together for research	2
Strengthen skilled human force to cooperate performance of academic researches	2
Reduction of faculty member's teaching time and increasing research activities time	2
Motion toward achieving research findings and Economic income	2
Lack of fragmentation and specialization of each investigator in a specific product	1

Academic centers students visit from research activities of research centers	1
Holding various meetings about the problems of agricultural sector by higher education institutions	1
Encourage farmers to use outputs of academic research activities by displaying them through extensional references	1
Commissioning research and development units in all the executive agencies	1

The second step- prioritized expert's opinion on the promoter factors of academic research in the field of agriculture

At this stage, the members of the panel recognized that all 21 promoter factors that had introduced in the first step by members, effect "moderate to high" on academic research in the field of agriculture, also strong consensus (SD <1) in 8 items had arisen among members of the panel (see Table 3). These eight factors are consisted of: support of top researchers at universities by the competent authorities to motivate (SD=0.97), compile systems and mechanisms for communication between the Ministries of Agriculture and Science, Research and Technology and research organizations (SD=0.21), Encourage farmers to use outputs of academic research activities by displaying them through extensional references (SD=0.97), Changing regulation of promoting faculty members to increase the weight research related to solve the problems of the country (SD=0.89), prioritization of research projects according to the research needs of the country(SD=0.88), Review financial and administrative regulations for approved academic research schemes(SD=0.95), Motion toward achieving research findings and Economic income(SD=0.99), Commissioning research and development units in all the executive agencies(SD=0.79).

Table 3: The second stage of the Delphi technique: promoter factors of academic research in the field of agriculture (n=26).

Promoter factors	mean *	SD
Allocation of resources and funding for research schemes	26.4	1.31
Support of top researchers at universities by the competent authorities for motivating	07.4	0.97
Understanding this issue by managers that agriculture and agricultural research play an important role in Iran's economy	03.4	1.03
compile systems and mechanisms for communication between the Ministries of Agriculture and Science, Research and Technology and research organizations	03.4	0.21
Encourage farmers to use outputs of academic research activities by displaying them through extensional references	3.96	0.97
Avoid performing repetitive research schemes	3.96	1.18
The practical application of academic research to motivate academic researchers	3.96	1.34
Changing regulation of promoting faculty members to increase the weight research related to solve the problems of the country.	3.92	0.89
Lack of fragmentation and specialization of each investigator in a specific product	3.88	1.10
prioritization of research projects according to the research needs of the country	3.84	0.88
Review financial and administrative regulations for approved academic research schemes	3.80	0.95
Equipping academic information centers to access new books and journals in the field of agriculture	3.76	1.24
Reduction of faculty member's teaching time and increasing research activities time	3.76	1.24
Academic centers students visit from research activities of research centers	3.76	1.27
Holding various meetings about the problems of agricultural sector by higher education institutions	3.61	1.23
Motion toward achieving research findings and Economic income	3.61	0.99
Encouraged university professors to interact and work together for research	3.61	1.32
Strengthen skilled human force to cooperate performance of academic researches	3.61	1.55
conducting MSc and PhD students to farm researches	3.57	1.39
Commissioning research and development units in all the executive agencies	3.23	0.79
Existence of specified organizations for monitoring academic research	3.19	1.47

*: 0 = none, 1 = very low, 2 = low, 3 = average, 4 = high, 5 = very high

CONCLUSION

Agricultural development requires, using practical technology that is achieved through scientific research. Most of these agricultural researches conduct in the centers of higher agricultural education by faculty members. Identify strategies to resolve the existing problems in agricultural research to achieve the ideal situation of this kind of research are inevitable.

So, this research effort on strategies to resolve these problems by using the Delphi technique. These results show that the strong consensus (SD <1) in 8 promoter factors of academic research in the field of agriculture among the panel members is as follows:

1. The establishment of research and development units in all executive agencies:

Universities are the Place of doing fundamental and applied research. These researches, particularly applied research should be ordered by the executive agencies to universities. Obviously, lack of research and development units in the executive agencies causes that order of doing applied research in universities be very low or almost zero.

2. Compile systems and mechanisms for communication between the Ministries of Agriculture and Science, Research and Technology and research organizations: the Agricultural Research conducted by higher education institutions mainly based on theoretical and classical academic science that Educational sectors of universities have an extensive communication with administrative organizations outside of universities. Academics can do research projects in partnership with other ministries and agencies to resolve some of their problems in this field.

3. Motion toward achieving research findings and economic income: For example, we can note Navid Cultivar (irrigated wheat) which is the product of the American University of Oregon research projects.

4. Encourage farmers to use the outputs of academic research activities by displaying them through extensional references: Agricultural Research activity products can directly affect on increasing the value of this field. Unfortunately, many farmers still haven't enough confidence about agricultural research. Presentation and advertising of these products through agricultural extension services could encourage farmers to use them.

5. Changing regulation of promoting faculty members to increase the weight research related to solve the problems of the country: Of course the contribution of research activities in promotion of faculty members considered, but is insufficient. On the other hand, if faculty members don't present any proper research projects Limitations should be considered for them.

6. Prioritization of research projects according to the research needs of the country

7. Review financial and administrative regulations for approved academic research schemes: Fundamental changes in policies in research, renewal and redefining of national research structures with participation of all faculty members through the allocation of adequate financial resources at least double to triple of GDP, to different sectors on the basis of their role in producing GDP as one of the promoter factors can be partly fixed the problems.

8. Support of top researchers at universities by the competent authorities for motivating

REFERENCES

Ahmed, F., Nasiriani, Kh., And Abazari, P. (2008). Delphi technique: a tool in research. *Journal of Medical Sciences*, Vol. **8**, No. 1. pp: 185- 175.

Dadkhah, B., Mohammadi, M.A., Pournaseri, Sh., Mozaffari, N., and Adham, D. (2008). Viewpoints of faculty members of universities in research and barriers to study at the university in 2003. *Journal of Ardabil University of Medical Sciences*, Volume **VIII**, Number One. Pages: **44**. 37.

Sharif-Zadeh, A., Hosseini, S. M., Kalantari, Kh., Asadi, A., and Shariffi, M. (2007 A). The pattern developing new paradigm for agricultural research system. *Agricultural Extension and Education Sciences*, Vol. **3**, Number 2, pp: 83-69.

Sharif-Zadeh, A., Kalantari, Kh., Hosseini, S. M., Asadi, A., and Abdullah Zadeh, Gh. (2007 b). Investigate effective factors on performance of faculty members in higher education institutions of agricultural research. *Journal of Agriculture*, Volume **9**, Number 2, pp: 62-47.

Shokohi,M., and Torkamani, J. (2007). Investigate the impact of agricultural research investment in equipment and value-added in agriculture sector. Economy and agriculture, the first, third number. Pp: 410-403.

Shams, A., Iravani, H., Rezvanfar, A., Kalantari, Kh. (2009). Factor analysis of problems of agricultural research. Modern technologies in agriculture (*SPECIAL ISSUE Agricultural Extension and Education*), Issue II. Pages: 106. 91.

Omani, A. (2007). Investigate the agricultural faculty members' attitude toward scientific and research activities and the study of barriers to agricultural higher education system. Proceedings of the first regional conference on agriculture in the north of the country: barriers, problems and solutions, pp: 84-80. Rasht: Islamic Azad University.

Feli,S., Pezeshkirad, Gh., and Chizari, S. (2006). Investigate effective Factors on student participation in research activities and knowledge production. *Journal of Research and Planning in Higher Education*, Vol. **12**, No. 4, pp: 107-63.

Mortazavi, M., Zarei, A., and Ranaei, H. (2006). Prioritize agricultural research projects with an emphasis on analytical hierarchy process. *Research and development of the Agriculture and horticulture*, No. **72**. pp: 14. 2.

Anonymous. (2006). Iran. Federation of International Trade Association. Available at: http://www.fita.org/countries/iran.html

Bridgstock, R. (2006). Project report: research staff benchmarking project. Centre for Learning Innovation.

Boyd, B. (2003). Identifying Competencies for Volunteer Administrators for the Coming Decade: A National Delphi Study. *Journal of Agricultural Education*, **44** (4), 47-56

Carrie, A., Fritz, A. C. & Mantooth, J. L. (2005). Challenges Expressed by Cooperating Teachers When Working With Student Teachers in Agricultural Education: A Delphi Study. *Proceedings of 21 American Association for Agricultural Education Southern Region Conference. Louisiana*: 195-204.

Dalkey, N. C. (1969). The Delphi Method: An Experimental Study of Group Opinion. Santa Monica, CA: The Rand Corporation.

Keeney, S., Hasson, F. & McKenna, P. H. (2001). A critical review of the Delphi technique as a research methodology for nursing. *International Journal of Nursing Studies*, **38**: 195-200.

Kotrlik, W. J., Bartlett, E. J., Higgins, C. C. & Williams, A. H. (2002). Factors associated with research productivity of agricultural education faculty. *Journal of Agricultural Education*, **43(**3):110-116.

Rowlands, I. & Olivieri, R. (2006). Journals and scientific productivity: a case study in immunology and microbiology. Publishing Research Consortium Summary Papers 1. London: The Publishers Association.

Turoff, M. (1975). The policy Delphi, In, H. A. Linstone & M. Turoff (Eds.). The Delphi method: Techniques and applications. London: Addison-Wesley.

Van Zolingen, S. J. & Klaassen, C. A. (2003). Selection processes in a Delphi study about key qualifications in Senior Secondary Vocational Education. Technological Forecasting and Social Change, **70**: 317-340.

Witkin, B. R., & Altschuld, J. W. (1995). Planning and conducting needs assessment: A practical guide. Thousand Oaks, CA: Sage Publications, Inc.