

## Assessing effective social, cultural and economic factors in applying biotechnologies in garden products of Ilam province

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**Abstract:** Role of technology is obvious and necessary as main element for economic stability and growth and will lead to more effective use of capital, human resources and natural sources. Aim of this research is to assess effective social, cultural and economic factors in applying biotechnologies in garden products of Ilam province in experts and researchers' view. Sample population of this research includes employed experts and researchers in Jihad Keshavarzi institute and the numbers are 150 persons. Value of calculated Cronbach Alpha equals 86% which represents acceptable validity of this questionnaire. Statistical methods which used, includes descriptive and inferential statistics. In descriptive statistics we used frequency, percentage, mean, standard deviation and coefficient of variations. In inferential statistics we used Pearson correlation test. Results of this research show that in their view, variables of increasing performance and number of farmers' reference to experts among different variables contain highest effect on applying biotechnologies. Results of correlation coefficient revealed that there is significant and positive relation between variables of performance increase, farmer's efficiency, status of farmer's ownership, farmer's income, effect of saving on using water and dependent variable (applying technology).

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**Key words:** biotechnology, applying, economic and social-cultural factors

### Introduction:

Considering science and resultant technology was considered by senior managers and decision-making centers of countries in order to reach borders of progress and independency. Solving economic and social-cultural problems and modifying development indexes, optimum usage of capabilities need to apply science in all political, social and economic aspects of nations' life (Kheirandish 2001). Bio-technology indeed includes production, changing products, optimizing plants or animals and making new micro-organisms using organisms of animates or part of that. Bio-technology is one of technologic progresses which passed three historical eras of classical bio-technology, industrial microbiology and modern era (Genetic).

In recent decades and after its quick growth, its great capabilities in the field of different sciences including farming, medicine, ranching, environment, mining and industry, military and ... and creating relatively high products in result of that consideration, attracted experts and statesmen from different countries (Sanati 2002).

We are in the period of the time that poverty and starvation and its consequences, is one of challenges which countries will face it that in spite of proper potential and capacity, they could not use existing capabilities properly. Agriculture part of Iran requires certain consideration and efficient support due to enjoying endogenous and continuous economic growth and key role in creating social justice, preparing food security and proper capacity for creating occupation in

society. One of bio-technologies, is agricultural biotechnology which includes genetic engineering, culturing cellular tissue and molecular markers. It is possible to overcome increasing needs of irregular growing population in century 21 due to potentials and capabilities of agricultural biotechnology to increase food productions and its other capabilities. So, agricultural biotechnology was considered specially. Properly use of agricultural biotechnology can play important role in sustainable development and also preventing social, political, economic threats and environmental pollution. Plant biotechnology can be instrumental for removing problem of food security, seriously (Sharma, 2002).

Many experts including international scientific and development community believes that doubling or tripling world food production, forage, and fibers for supplying food security for 8 billion population in 2030 would not fulfilled without biotechnology. They called next century as governance century and efflorescence of biotechnology and genetic engineering and agent of second green revolution in future (Sanati & Esmail zade 2001).

Anderson and Zehang (2000) said that opportunities which biotechnology prepared for beneficiaries of agriculture are varied and stated that the main ones includes producing agricultural commodities which resist against salinity, drought, pest and diseases, technologies of Sustainable production, on-time and cheap supply of agricultural inputs, increasing quality of productions, extensional services and efficient

technological helps, especial consideration to rural women' needs, improving agricultural and rural infrastructure and etc.

So, obviously developing agricultural researches in order to reach useful technologies can be highly instrumental and secure reaching food security.

Capacities of agriculture part of Iran were not utilized completely and has many shortcoming in spite of enjoying considerable capabilities of sources and production factors including more than 37 million hectares agricultural lands, varied weather and biologic climates and capability for producing broad range of cold and tropical productions, renewable human resources, skilled work forces, utilizers and producers (Qare Yazdi 2005).

Now, in case of using these capabilities, we can declare it as main basis of economic development of country by relying on continuous growing production, desirable efficiency, more investment and Exchange technology compared with other economic parts.

According to potentials and capabilities and potential capabilities of agriculture part of Iran, and at the other hand various barriers in the way of reaching favorite utilization of current capacities including dry and semi-dry climate of Iran, salinity of major part of lands, wastes before and after harvesting, pests and diseases, weeds, drought and other problems, developing agricultural biotechnology can be a milestone to solve that problem (Gould, 2000).

Various problems and barriers, also there are in the way of reaching modern biotechnologies which face applying and utilizing with challenge. So that modern biotechnologies have pros and cons which each of these groups have some reason for their claims. Some considerations about biotechnology includes human and livestock health, environment health, agriculture (Changing nutritional value of plant, creating new weed, decreasing crop varieties and ...), and also social economic, political, moral and finally public considerations (Leisinger, 2000).

The problem is that in spite of proper variation of garden productions and also existence of necessary field and Basis for developing them but efficiency and performance are low in this area which is due to some risks such as bad weather conditions (spring frost and hail), pests and plant diseases (due to using classical methods of Planting and harvesting with indigenous knowledge and local-unmodified figures and also lack of operational use of biotechnology).

According to above subjects, one of mechanisms which can push us forward toward goal is to apply and utilize agricultural biotechnologies that can be represented as favorite and efficient, dynamic and determinant technology in the way of national development and production, decreasing dependency

and reach to self-reliance due to creating significant economic, scientific and environmental conditions. So obviously, in such condition, importance of subject is clear. Different factors involved in applying innovations and these factors and features varies depends on type of society. Accepting and applying ideas, methods and modern technologies by peoples of one social system which indeed need to change human behaviors and visions, is affected by variation in humans' social, cultural, economic and other features and even in conditions and human and material resources in the social system of accepting this modern idea and technology.

Literature study of this research shows that there are many factors involved in applying this innovation and also there are many barriers in the future. Many researchers found main results in this area. Wheeler (2005) in the research as "affective factors for accepting biotechnology" at the northern Australian college found that social-economic factors, level of peoples' literacy, occupational impacts, knowledge and information (knowledge of biotechnology), environmental attitude, individual trends and type of peoples' attitude toward innovation are effective factors in accepting biotechnology. Baker & Burnham (2001) in the research in America found that there is significant relation between amounts of information and peoples' knowledge about biotechnology and also kind of people attitude toward biotechnology and accepting biotechnology. Koivisto & Magnusson in Sweden found that there is significant relation between education level, knowledge of biotechnology, peoples' attitude toward biotechnology, risk-taking and peoples' earnings and accepting biotechnology.

James & Burton (2003) in Australia found that there is significant relation between age, gender, risk-taking and peoples' earnings. Whoh (1980) did research about accepting innovations in Nigeria and found that level of literacy, amounts of contacts with propagator, economic condition and enjoying leadership role and accepting innovation. Igordand & Patric (1987), in the research with the aim of assessing affective structure on accepting agricultural technologies, after assessing individual, economic and social features found that factors such as level of formal and informal education, social participation, performance extent, access to information resource and numbers of contact with propagator have significant relation with accepting agricultural technology.

Arayesh (1998) while assessing effective factors on accepting and lack of continuing innovation of rainy irrigation among farmers of Ilam province concluded that there is significant relation between variables of Farm Experience, size of farming area, economic

factors (including income and access to agricultural inputs) and technical factors and accepting innovation. Musavi(2003) after assessing affective factors on accepting low-input sustainable farming by wheat growers of Sistan Baluchestan found that, there is significant relation between variables of city of residence, performance extent, social features, extent of cooperation with institutes, effect of extensional-educational classes, using connectional channels, extent of sharing farming issues with propagators and service centers, knowledge attitude toward low-input sustainable farming and technical knowledge in the field of wheat cultivation levels and accepting innovation. Pointed histories of this research shows that many factors play role in accepting biotechnology including economic, educational-extensional, cultural and social factors and individual features.

This research seeks to assess economic and social-cultural factors.

#### **Goals:**

Main goal: Assessing effective social, cultural and economic factors in applying biotechnologies in garden products of Ilam province

Specific goals:

- 1-assessing affective economic factors in garden products of Ilam province
- 2- Assessing affective social and cultural factors in garden products of Ilam province
- 3- assessing theoretical basics of research

#### **Methodology (materials):**

This research is applicable in term of aim and descriptive in term of data collection. Correlation method was used among descriptive researches and it is field research in term of audit extent and control degree. Sample population of this study includes experts and researchers of Jahad Keshavarzi institute which involve peoples whom have upper-diploma degree in agriculture courses.

The experts involved those who got bachelor degree in agriculture course and some from humanities related with research subject such as Technology management, sociology and ... which research in research center of Jahad keshavarzi institute of this province and includes 150 humans (so due to low number of sample population, we used census instead of sampling).

Independent variables of this research includes increasing production performance, farmer's efficiency, farmer's earning, extent of his capital, emphasizing on saving in agricultural inputs, exploitation system, extent of cultivation area, status of farmer's ownership, his/her beliefs, traditional values, and his membership in rural forums.

Dependent variable of this research is "accepting biotechnologies in garden products".

Used statistical methods includes inferential and descriptive statistics (Using SPSS software). We used frequency, percentage, mean, SD and coefficient of variation in descriptive statistics and Pearson correlation coefficient in inferential one.

We used Cronbach alpha method for reliability of questionnaire and the mean was calculated as 82% and shows acceptable validity.

#### **Results:**

Individual features of statistical sample are as following :

Most frequency of age group was for 30-39 age level and the mean was 35.8 years. 79.3% were males and 20.7% were females. Most frequency of work experience was for 1-5 years level and the mean equals 11.65 years. 94% lived in urban area and other 6% in village.

Most frequency of education level was for bachelor level with 55.3% and the least for P.H.D with 2.7%. the course of 24.7% of peoples was farming and others studied in ranching and extension courses with 13.3% and 11.3% respectively. Three courses altogether forms 50.3% and 49.7% relates to other courses (Breeding - Soil Science - machinery - Gardening - weeds and ...). in term of class and organizational post, executive experts had 63.3% and propagator and extension expert, manager and official affairs, and researcher had 16.7% , 10.7% and 9.3% respectively.

In term of employment status, 42.7% were Hired, 22% were Contract, and 35.5% were contractual.

Results of this research show that in respondents view, variables of increasing performance and extent of farmer reference to experts had most effect on accepting biotechnology.

Table1 shows prioritizing extent of assessing affective economic factors in accepting effect of biotechnology in garden products.

Table1- prioritizing extent of assessing affective economic factors in accepting effect of biotechnology in respondents view

priority	statement	Range of assessment					mean	SD	C.V	n
		Very low	low	To some extent	high	Very high				
1	Increasing production performance	1.	6.	20.	69.	51.	4/11.	0/837.	20/364.	147.
2	Farmer efficiency	0.	6.	29.	63.	48.	4/05.	0/833.	20/567.	146.
3	Farmer income	2.	11.	17.	61.	58.	4/09.	0/859.	21/002.	149.
4	Farmer reference to experts	3.	14.	49.	69.	15.	3/53.	0/872.	24/702.	150.
5	Farmer capital extent	5.	8.	21.	66.	48.	3/97.	0/996.	25/088.	148.
6	Farmer beliefs	2.	12.	37.	58.	40.	3/82.	0/966.	25/090.	149.
7.	Emphasizing on saving in agricultural inputs	2.	12.	44.	53.	38.	3/76.	0/970.	25/797.	149.
8.	Exploitation system	1.	17.	42.	52.	32.	3/67.	0/974.	26/539.	144.
9.	Extent of cultivation area	2.	16.	44.	48.	37.	3/69.	1/011.	27/398.	147.
10.	Emphasizing on water saving	3.	19.	41.	50.	36.	3/65.	1/046.	28/657.	149.
11.	Farmer ownership status	5.	13.	46.	48.	35.	3/65.	1/046.	28/657.	147.
12.	Farmer traditional values	4.	24.	52.	48.	22.	3/40.	1/010.	29/705.	150.
13.	His/her membership at rural forums	7.	17.	56.	48.	22.	3/41.	1/024.	30/029.	150.

7 questions were asked about strategies for facilitating acceptance from contacts and the results were represented at table 2.

Table2- prioritizing effect extent of strategies for accepting biotechnology

priority	variables	Range of assessment			mean	SD	C.V	n
		low	moderate	high				
1.	Creating best farms and gardens using seeds and plants resulting from biotechnology	7.	29.	112.	4/71.	0/550.	11/672.	148.
2	Giving bank facilities and other agricultural inputs provided that using seeds and plants resulting from biotechnology	8.	29.	110.	4/69.	0/569.	12/132.	147.
3.	Government incentive policies	8.	31.	109.	4/68.	0/572.	12/222.	148.
4.	Giving facilities to graduated students of agriculture and relative courses in the field of biotechnology	7.	41.	100.	4/63.	0/575.	12/419.	148.
5.	Establishing non-governmental cooperation and forums	11.	73.	64.	4/36.	0/617.	14/151.	149.
6.	Using extensional-educational programs	9.	49.	68.	4/53.	0/644.	14/216.	126.
7.	Extending biotechnology research centers	12.	47.	89.	4/52.	0/644.	14/247.	148.

Results of pearson correlation test between dependent and independent variable of research

Results of Pearson correlation test show that there is direct relation between variables of increasing

production performance, farmer efficiency, emphasizing on saving in agricultural inputs,

emphasizing on water saving and status of farmer ownership and dependent variable (acceptance).

Table3 shows results of Pearson correlation test.

Assessed independent variable	Correlation coefficient	Significant level
Increasing production performance	0/270**	0/001
Farmer efficiency	0/218**	0/008
Farmer income	0/137	0/098
Farmer reference to experts	0/112	0/178
Farmer capital extent	0/097	0/241
Farmer beliefs	0/076	0/363
Emphasizing on saving in agricultural inputs	0/192*	0/020
Exploitation system	0/121	0/145
Extent of cultivation area	0/152	0/067
Emphasizing on water saving	0/163*	0/049
Farmer ownership status	0/225**	0/006
Farmer traditional values	0/006	0/945
His/her membership at rural forums	0/063	0/450

#### Suggestions:

According to whole results of this research we can represent these suggestions in order to accept and apply biotechnology:

- 1- Since that production performance and consequently increase in income is one of main basis for accepting biotechnology so it is suggested that actions which lead to increase in income and production be done by authorities.
- 2- Causes for increasing farmer efficiency be prepared from different ways.
- 3- Giving required facilities in order to increase farmers capital which are able to develop their work

- 4- And finally it necessary to analyze economic, farmers social-cultural conditions before extend and impart biotechnologies and it be possible to prepare better conditions for accepting biotechnology.

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