

Strategies toward Sustainable Development of *Echium amoenum* in Iran

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ABSTRACT: A study was carried out during 2012 to recognize the most important strategies for sustainable development of *Echium amoenum* Fisch and Mey in Eshkevarat region of Guilan province, Iran. For this purpose, Delphi technique was used, and in present study participants more totally including 7 experts. After data collection at two stages, results showed that improving the orchards and varieties of *Echium amoenum*, defining its expert price, establishing the processing and packaging companies to increase the added value of the product, expanding the mechanization across the orchard, increasing its cultivated area of land, encouraging the farmers to use new research techniques, suitable domestic and international marketing, creating sustainable, active selling markets, as well as guaranteed buying, adequate knowledge on the soil and suitable fertilizer were among most important strategies for sustainable development of *Echium amoenum* in the apt areas.

Keywords: *Echium amoenum*, Eshkevarat, Problems, Strategies, Sustainable Development.

INTRODUCTION

Presently, great concern is considered for herbal medicines and their origins i.e. herbal plants. This was mostly due to proving the side effects of chemical medicines and tendency of human to use as much as possible the natural products to maintain their health (Ghandali and Mirhosseini, 2008). In the recent years, worldwide trade of herbal plants was more than 43 billion dollars and is predicted as 5 trillion dollars for 2050. Monetary circulation of this trade has reached up to 100 billion dollars and the medicines derived from plants accounts for about 25% of global medicine market in 1996 equal to a value about 250 billion dollars. Iran's contribution in this market is about 60 million dollars. In addition, annually, production of extracts, except for the pine extract (300000 tons) is about 50000 tons 70% of which is consumed in the industrialized countries and greatest amount of which are used in the food industry (Ebrahimi, 2008). In this regard, it is required to define the target markets of preferred herbal plants of the country. Thus, it is necessary to define the target markets for exporting the herbal plants including *Echium amoenum* Fisch and Mey. *Echium amoenum* is an herbal plant from family Boraginaceae, prefers mountainous and Caspian moderate climate. In the altitudes between 1500 to 2000 m from sea level, it has desirable growth and flowering power (Zargari, 1996). *Echium amoenum* is distributed in a wide area from northern Iran including the altitudes of Roudsar (Eshkevarat), altitudes between Roudbar and Manjil (including northern parts of Harzavil), altitudes of Amarlou (Charmkesh, Kaboutarchak, Damash, Ispili), altitudes of Siahbishe (road of Karaj to Chalous), altitudes of Heiran between Ardabil and Astara, Kandovan and Pole-Zangoule forest, Chaloos valley Mirmahalleh, between Gorgan and Navadeh and in the hillsides of Alborz ranges widely, as well it is cultivated in these areas in limited scale (Akbarzadeh, 2008; Akbarinia et al., 2007; Zargari, 1996; Ghassemi et al., 2003; Gholamzadeh et al., 2008; Mehrabani et al., 2005a; Mehrabani et al., 2005b). In Iranian traditional medicine, the flowers of *Echium amoenum* were used by the people to cure the symptoms of cold and as an agent to increase the blood pressure, relaxer and perspire, thus it must be considered as an Iranian medicinal plant (Amin, 1997). Despite the mentioned issues, production and cultivation of medicinal plants such as *Echium amoenum* is still confronting many problems. Previous studies indicates that training specialist man power, expanding the applied research in the production, standard processing and packaging of medicinal plants, providing a systematic relationship to the purchase centers and institutions, organizing the professional societies, establishing a rapid and reliable export grid, applying the

applicable techniques and using the superior knowledge and technology are among most important factors effecting on the control of quality and quantity of achievement to the sustainable development management particularly in the major aspects of economic development (Ebrahimi, 2008).

In addition, defining the applied strategies for decreasing the regional problems of this plant could more greatly affect on its development. It was reported that issues such as holding the educational- promotional courses, increasing the number of experts in the villages, providing adequate facilities for orchard keepers, providing the agricultural inputs in equilibrium well in time, guaranteed purchasing of orchard products with real prices and regulating the market stability and using specialist authorities for proper policy making in the orchard keeping are among most important strategies to remove the problems of orchard keeping in Guilan province (Noorhosseini-Niyaki et al., 2012). Present study also was performed aiming to recognize the effective strategies to achieve sustainable development of *Echium amoenum* in Eshkevarat in Guilan province.

MATERIALS AND METHODS

Present study was performed in 2012 in Eshkevarat region in Guilan province, Northern Iran. Delphi techniques were used to perform this study. Delphi techniques are performed by participation of individuals with knowledge and specialty on the study subject. These individuals are considered as panel. Selecting the persons qualified for Delphi panel is among most important stages of this technique. Since the work reliability depends on competence and knowledge of these individuals. Contrary to what is common in quantitative surveys, they are not selected based on random sampling, but also they are selected through non-randomized sampling. In Delphi technique, where panel members must be from specialists on study subject, these limitations increase (Mashayekhi et al., 2005). Participants of Delphi study range 5 to 20 persons and minimum number of participants depends on how to plan the research method (Ahmadi et al., 2008). In present study, the number of participant members was totally 7 agriculture experts native to Eshkevarat region, Guilan province, each of them explained the most important strategies of *Echium amoenum* sustainable development in Eshkevarat region in Guilan province.

After defining the members of panel, Delphi technique was performed in two rounds. In the first round, open ended questionnaire was sent to the participants. And each specialist was asked to discuss any personal idea and view freely, and to give the list of their considered subjects. It is not necessary to completely develop the ideas and no attempt is performed to evaluate and judge the ideas. In this stage, all the relevant answers are gathered as much as possible, since other steps are formed based on the first step. After gathering the questionnaires of first step and analyzing the contents of provided responses, another questionnaire was designed for second round where participants were asked to explain their agreement for each given strategy in the likert scale range (1=completely agreed to 5=completely disagreed).

According to the fact that multiple replies is a suitable technique to analyze the data provided by open-ended questionnaire, thus this statistic technique was used to analyze the questionnaire of the first step. In the first step, all the answers provided for this question were studied precisely. Then maximum numbers of answers were defined by studied persons. Based on the maximum answers provided individually, the numbers of variables were defined by experts. They were analyzed by SPSS₁₆ software. Output data for this analysis were including responses frequencies, responses percentage, cases frequency and cases percentage. In the second step, above mentioned software was used to achieve the mean, standard deviation and variance ratio to grade the data. In addition, in this study Kendall's Coefficient of Concordance was used to define the panel members consent rate.

RESULTS

Results of this study indicated that defining the expert price of *Echium amoenum* was the most important among the strategies mentioned to expand the production of this plant. Such that, each case accounted for 7.45% of all the responds, each one was explained by 100% of experts. Establishment of processing and packaging companies to increase the crops added value, expansion of mechanization across the orchards of this plant, increasing the cultivated area and encouraging the farmers to use novel techniques for research were also mentioned separately by 6 experts (85.71%) which these strategies were placed in second importance rank. Desirable domestic and international marketing for *Echium amoenum*, creating sustainable active selling markets as well as guaranteed purchase and adequate knowledge on the kind of soil and fertilizer suitable for this plant are other important cases explained by experts, each of these cases were mentioned by 71.43% of them and accounted for 5.32% of all the answers. In addition, training the specialist man power in production and processing sector of this plant, creating dynamic, efficient production cooperatives for this plant, suitable advertisements for

selling, changing the taste of consumers, improving the orchards and varieties of this plant, providing the welfare supportive services for farmers, creating the policy making required for preventing the migration of young people from villages to the city and increasing the relationship of educational and promotional centers to the farmers, each one were separately explained by 4 experts (57.134%) and each of these cases accounts for 4.24% of all the answers. Factors such as performing applied research in the production and postproduction, creating more relationship of research centers and the farmers, providing the low interest loans for farmers, increasing the educational level up to the minimum level of science of current time to accept novel ideas, increasing the health care, educational, welfare and employment services in the region and diversity of productions derived from harvested yield also were mentioned by the experts, each one accounted for 3.19% of total answers. One of the experts mentioned correct planning based on completely compiled and precise study (Table 1).

Table 1. Frequencies of effective strategies for sustainable development of Echim amoenum in Iran

Rank	Strategies	Responses		Percent of Cases
		N	Percent	
1	Defining the expert price	7	7.45	100
2	Establishment of processing and packaging companies to increase the crops added value	6	6.38	85.71
3	Expansion of mechanization across the orchards	6	6.38	85.71
4	Increasing the cultivated area	6	6.38	85.71
5	Encouraging the farmers to use novel techniques for research	6	6.38	85.71
6	Desirable domestic and international marketing	5	5.32	71.43
7	Creating sustainable active selling markets as well as guaranteed purchase	5	5.32	71.43
8	Adequate knowledge on the kind of soil and fertilizer suitable	5	5.32	71.43
9	The specialist man power in production and processing sector	4	4.26	57.14
10	Creating dynamic, Efficient Production Cooperatives	4	4.26	57.14
11	Suitable advertisements for selling, changing the taste of consumers	4	4.26	57.14
12	Improving the orchards and varieties	4	4.26	57.14
13	Providing the welfare supportive services for farmers	4	4.26	57.14
14	Creating the policy making required for preventing the migration of young people from villages to the city	4	4.26	57.14
15	Increasing the relationship of educational and promotional centers to the farmers	4	4.26	57.14
16	Applied research in the production and postproduction	3	3.19	42.86
17	Creating more relationship of research centers and the farmers	3	3.19	42.86
18	Providing the low interest loans for farmers	3	3.19	42.86
19	Increasing the educational level up to the minimum level of science of current time to accept novel ideas	3	3.19	42.86
20	Increasing the health care, educational, welfare and employment services in the region	3	3.19	42.86
21	Diversity of productions derived from harvested yield	3	3.19	42.86
22	Planning based on completely compiled and precise study	2	2.13	28.57
Total		96	100	1342.86

After analyzing the questionnaires of first stage and summing up the questions, 22 strategies were achieved from statistic sample; these numbers of strategies were mentioned by experts. Then by completing the questionnaires of second stage, containing based results were achieved as follows:

Based on the results presented in table 2, most important strategies for developing Echim amoenum growing from experts point of view were improving the orchards and varieties, desirable domestic and international marketing and creating sustainable active selling markets as well as guaranteed purchase. At the end, respondents believed that increasing the educational level up to the minimum level of science of current time to accept novel ideas and providing low interest loans are next preferences.

Table 2. Mean and Standard Deviation of effective strategies for sustainable development of *Echium amoenum* in Iran

Rank	Strategies	Mean	S.D	VR
1	Improving the orchards and varieties	4.571	0.535	0.429
2	Desirable domestic and international marketing	4.429	0.535	0.571
3	Creating sustainable active selling markets as well as guaranteed purchase	4.429	0.535	0.571
4	Establishment of processing and packaging companies to increase the crops added value	4.429	0.535	0.571
5	Increasing the cultivated area	4.429	0.535	0.571
6	Applied research in the production and postproduction	4.429	0.535	0.571
7	Adequate knowledge on the kind of soil and fertilizer suitable for <i>Echium amoenum</i>	4.429	0.535	0.571
8	Increasing the health care, educational, welfare and employment services in the region	4.429	0.535	0.571
9	Encouraging the farmers to use novel techniques for research	4.429	0.535	0.571
10	Planning based on completely compiled and precise study	4.429	0.535	0.571
11	Defining the expert price of <i>Echium amoenum</i>	4.286	0.756	0.571
12	Creating the policy making required for preventing the migration of young people from villages to the city	4.286	0.756	0.571
13	The specialist man power in production and processing sector of <i>Echium amoenum</i>	4.286	0.756	0.571
14	Creating dynamic, efficient production cooperatives for this plant	4.286	0.756	0.571
15	Diversity of productions derived from harvested yield	4.286	0.488	0.714
16	Increasing the relationship of educational and promotional centers to the farmers	4.286	0.488	0.714
17	Creating more relationship of research centers and the farmers	4.286	0.488	0.714
18	Expansion of mechanization across the orchards of <i>Echium amoenum</i>	4.286	0.690	0.714
19	Suitable advertisements for selling , changing the taste of consumers	4.143	0.378	0.875
20	Applied research in the production and postproduction	4.143	0.378	0.875
21	Increasing the educational level up to the minimum level of science of current time to accept novel ideas	4.143	0.378	0.875
22	Providing the low interest loans for farmers	3.875	0.690	0.857
Test Statistics (Kendall's Coefficient of Concordance)				
N		7		
Kendall's Wa		0.178		
Chi-Square		11.502		
df		21		
Asymp. Sig.		0.052		

DISCUSSION AND CONCLUSIONS

Generally, results of this study indicates that improving the orchards and varieties of *Echium amoenum*, defining its expert price, establishing the processing and packaging companies to increase the added value of the product, expanding the mechanization across the orchard of this plant, increasing its cultivated area of land, encouraging the farmers to use new research techniques, suitable domestic and international marketing for this plant, creating sustainable, active selling markets, as well as guaranteed buying, adequate knowledge on the soil and suitable fertilizer to cultivate this plant are among most important strategies for sustainable development of this plant in the apt areas. In general, on the issue of sustainable development, this fact must be considered that firstly all involved components take benefit proportionately to their contribution in performing the process. Secondly, this interest is not from selling the wealth but also it is from real production in a sustainable development system and the role of marketing for medicinal plant is just suitable management of this potential (Niroumanesh et al., 2008). Despite the fact that our country had maximum exploitation of chemical of chemical imported or domestic for about one country, but it doesn't forget its belief to traditional medicine and even new generation i.e. individuals between 15-30 years old believe it. Part of this produce was related to talking pattern from developed and industrialized countries but most important challenge to answer this demand is making the medicinal plants supply system i.e. groceries systematic and on the training of traditional medicine and herbal medicine and raising the significant level of physicians, druggist and health care involved persons. Attempts to recover the traditional medicine and upgrading it by the universities and studying the contribution of herbal medicine and medical plants in the country's economy also could help in this area (Ghandali and Mirhosseini, 2008). Additionally, according to the high risk taking nature of agriculture sector, it is necessary to support this sector by government. To enter in the global

space and actualizing the prices in the global competitive market, agriculture must be managed in such a way that being profitable and this will not be realized unless by increasing the productivity of production factors. For this purpose, for production of this plant, investment must be performed with high security rate. Among the strategies for this security raising is creating competition with other sectors i.e. industry and services. In addition to supportive measured such as supplying the inputs required to produce *Echium amoenum* assigning the loans and credits, guaranteed purchase, providing the modern installation along with skilled experts may be among most important government measured for its development.

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