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Analysis the agricultural potential of qazvin province to feasibility of oilseeds cultivation development (Apply Composite Index Technique)

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ABSTRACT

This study examined the Feasibility Study of oilseeds farming and development in Qazvine province (canola, safflower, sunflower…..). This research was a quantitative applied research and in terms of the data collection process was a non-experimental investigation. A well designed-questionnaire was used to collect the data through interview and observation. All oilseed farmers (378 farmers) in Qazvine province were surveyed as the statistical population of the study, out of which 169 farmers were taken randomly as the research sample. The research instrument was questionnaire that codified base theories literature review. Questionnaire validity confirmed by content validity method with a panel of expert's and its reliability confirmed by implication of pilot test and calculation of Cronbach's alpha coefficient (0.89). Data were analyzed by SPSS, V.$_{13}$ software. The result of feasibility study for oilseeds cultivation showed that Abyek township with higher index (CI=10.30) have the most possibility of oilseeds cultivation development in the provience, then respectively Qazvin (CI=9.44), Boeinzahra (CI=9.36), Alvand(CI=8.48) and Takestan (CI=8.45) have more possibility of oilseeds cultivation development in the Qazvin province .

Key words: Agricultural development, Feasibility Study, Farm management, oilseeds, Agri planning.

INTRODUCTION

Oilseeds have important role as second nutritional resource of world after grains. These products contain protein as well as rich stores of fatty acids. Using plant oil and proteins instead of animals protein lead to increasing importance of oilseeds [1]. The oilseed sector is comprised of a number of products, but the most important are soybeans, palm fruit, and rapeseed (or canola), which must be processed before the products can be used for animal, human or industrial use. The sector is complex, due to its joint products and the competing oil derived from oilseeds (hereafter referred to as “oil”) and protein sources arising from other agricultural sectors and commodity processing industries. Oilseed production and processing occurs all over the world, but important producing and processing countries are the United States, Brazil, Argentina and China for soybeans; Indonesia and Malaysia for palm oil; and China, the European Union and Canada for rapeseed [2,3]. The challenge is to identify the varieties, equipment and agronomic practices that work best in Vermont, and to design sustainable cropping systems/crop rotations. Experience suggests that canola and sunflower have the best potential as oil producing crops for our region, due to the high oil content of their seeds and the high quality (low cloud point) of their oil. Soybeans may be part of the oil seed cropping system mix due to the high value of the soybean meal as a livestock feed, even though soybean oil yields are relatively low [4,5].

In the other hand, around 300000 hectares of land have already been planted with oilseeds in Iran producing 316000 tons oilseeds and 230000 nutritional oil, in fact only 20% of need to nutritional oil is produced inside Iran and rest of

it is imported from other countries. In order to meet this shortcoming in agricultural sector, the government intends to increase promoting level of oilseeds planting and producing gradually[6,7].

In this regard, the review of production policies indicates that the oilseeds sector has not been an exception to the widespread progressive withdrawal of the public sector from direct market intervention in agriculture. During the review period there was a continuation of the longer term general tendency in developed countries to gradually substitute price support schemes with policies intended to make production more responsive to market signals. While income support measures decoupled from output (in use especially in developed countries) still had the effect of maintaining producer incomes and production at higher levels than would have prevailed in their absence, other factors had an overriding influence during the review period [8,9].

D.M.Hegde and R.Venkattakumar[10] in their research cited to the Weaknesses, srengths, threats and opportunities of implication of oilseed sector in india and released the magor options in this area. According to this swot for oilseed sector have been weaknesses(Dependence on vagaries of monsoon, Lack of adequate seed multiplication,Lower seed replacement ratio, Production under energy starved conditions, Vulnerability to pests and diseases, Gap in resistance breeding, Resource poor farmers, Weak infrastructure, Technical inefficiency of oil industry, Weak transfer of technology, Lack of regulatory and trade policy support); Strengths (Diverse agro-ecological situations, Strong research network, Strong first-line extension system, Strong public sector network for seed production, Strong HRD[1] facilities, Initiatives from oil industry); Implicative strategies (Public private partnership in varietal development, Developing self-reliant seed supply mechanism, Efficient input and MSP[2] support for oilseeds, Delineation and development efficient oilseed production zones, Developing and promoting of situation specific IPM[3] and INM[4] packages, Promotion of contract farming, Exploitation of niche areas for oilseed expansion, Value addition to oilseeds , oils and by-products, Gap-specific extension strategies, Providing effective market linkage, Favorable policy framework for oilseeds); Threats (MSP support for competing crops, Continuous cropping, Aberrant weather, Alarming demand for edible oil, Lack of linkage to assured market, High standards in the liberalized international trade); Opportunities (Biotechnological options for genetically enhanced germplasm, Huge exploitable yield reservoir, Exploiting niche areas of oilseeds cultivation, Value addition to oilseeds, oils and by-products, Scope for improving efficiency of oilseed processing (Exploiting supplementary sources of oil, Extension of retail boom to oilseeds). Attention to these views, researcher will guide toward the educational – extensional activity. Accordingly, a rational basis will develop for the cultivation and application of oilseeds and improve knowledge and skills needed in this area [10,11].

Extension sector deals with the strategy for accelerating the production of oilseeds, through two broad measures : the first, to develop more efficient technology and secondly, reaching such technology as well as the needed farm inputs and services to the farmers, so that the latter can utilize them for more efficient and cost effective oilseeds production[12,13].

Modern agriculture is technology driven. The precise objectives of oilseeds research are identified, so that purposive scientific plans can be drawn up to achieve each one of them. The actual advances in oilseed cultivation are then set out, particularly for the rational expansion of oilseeds cultivation area, crops zoning, use of improved seeds, efficient irrigation and nutrient use practices and overall crops management.

In a research conducted by *Agajani* [14] in order to study and determine the most adequate extension methods to develop under cultivation land of Canola in Lorestan province in Iran, it was found out there is meaningful relationship between independent variables such as individual education, visit from exhibitory farms, participating in training classes and dependents variables of Colza under cultivation land [14,15]. Also, The University of Vermont take The goal of their Extension program in to develop best practices for oilseed production in a temperate climate [4].

In the Dakota University, the oilseeds Extension program is part of an overall research and SDSU Extension project which seeks to provide growers with essential information to aid them in successfully integrating oilseed crop production in their cropping systems. The research component of the project includes a sunflower breeding program. The overall goal of the breeding program is to develop sunflower germplasm of high yield, quality, and pest resistance and make it available to the South Dakota and regional seed industry for development of South Dakota adapted varieties. Cooperative research with the USDA-ARS sunflower entomology and breeding programs has

[1] *Human resource development*
[2] *Minimum Support Prices*
[3] *Integrated Pest Management*
[4] *Integrated nutrient management*

identified sunflower germplasm with resistance to the red sunflower seed weevil, and this resistance is currently being incorporated into lines with a good agronomic background [16].

Overall FAO concluded from its discussion in oilseeds sector among the word, the Group may wish to recommend that:
a) Governments should review their policies affecting the production of oilseeds and related products with a view to obtaining reasonable incomes for farmers and protecting them against excessive fluctuations in world market prices;
b) Governments should provide long term incentives for investment in economically viable oilseeds production, particularly in developing countries, to meet future demand at equitable prices;
c) International aid-giving agencies and bilateral donors should assist developing countries in their efforts to improve the efficiency of their production, processing, domestic marketing and regional trade of oilseeds and derived products;
d) Governments and national producer and trade associations should consider what measures might be pursued to improve the stability of supplies, including through state reserves and long-term contracts;
e) Analysis should be undertaken, within available resources, of impacts on the market for oilseeds, oils and meals of policies supporting biofuels.
f) While encouraging the development of new end-uses for oilseeds and their products, such as biofuels, Governments should ensure they do not hinder the orderly development of supplies for food use;
g) Trade policy measures should continue to facilitate the expansion of trade, including by keeping tariff and non-tariff barriers low; in addition, when recurring to fiscal and other restrictions on exports, governments are reminded to give due consideration to the effects of such measures on global trade and to possible implications for importing countries' food security;
h) Temporary trade policy measures should be implemented with caution: provisional export restrictions to protect domestic supplies carry the risk of further aggravating price hikes in international and national markets;
i) Producing countries should consider promoting production and trading systems that take account of growing market attention to environmental sustainability in oil crops production [8]. With regard to previous notes about the importance of oilseeds cultivation development, and also to achieve food security in local, national and international level, studying the ways of development for oilseeds cultivation is inevitable. For better planning in farm management, decision making and also better recognition of the surveyed area this research has carried out. The main purpose of this study was investigating the Qazvin province (as a polar in agriculture) for better delivery of agricultural extension and education and other services.

To achieve this goal we follow these specific goals:

- Codify the appropriate indicators that can be used for oilseeds cultivation feasibility.
- To identify the farmers awareness about oilseeds production.
- To identify outcome of oilseeds cultivation in the province.
- To study the feasibility and status of the province for oilseeds cultivation.

MATERIALS AND METHODS

This study was quantitative research, based on survey method. Statistical population of study consisted of 378 farmers of Gazvin province(this province consisted of 5 township: Abyek, Takestan, Boeinzahra, Qazvin and Alvand) that had cultivated oilseeds (canola, safflower and sunflower). The stratified random sampling has been used in this study. The sample size was estimated through morgan table 169 farmers were selected for the study. Study instrument was a questionnaire which includes 3 sections, personal characters in the first section, General variables about oilseeds farming in the second section, and oilseeds cultivation consequences in the third one were measured. Questionnaire validity was evaluated by using the content validity method. And its reliability was confirmed by Cronbach's Alpha coefficient that was calculated 0.89 after pre testing on 30 farmers. The data collected through personal interview with farmers and then was analyzed by using appropriate statistical procedures include descriptive statistic (mean, median, and percent) and appropriate inferential statistic with $SPSS_{win13}$ software. Indicator making technique were Used for measurement of Agricultural Potential of Qazvin Province to Feasibility of oilseeds cultivation Development. In this research because that the variables were not appropriate scale for measuring potential and comparison different districts then attempted to codify indicators that carried out in following steps:

- Determining the research variables by theoretical framework and intereview.
- Changing the variable to indicators by dividing them to an appropriate index
- Measuring the validation of indicators(being appropriate for measuring potential, remove the unusable indicators, adding another indicators with considering experts view)
- Changing the negative to positive indicators

- Use of division by mean method for elimination of scale bias for all indicators
-Determination of importance of indicators by weighting to them, in this way Principlre Component method was used.
- Multipled the measur of Indicator to it's weight
-Adding weighted indicators with eachother and making composit Indicators for all townships.
21 indicators codified for study (table1) and Finlly hierarchical cluster analysis were used for groping the townships bae on thir potential for oilseeds coltivation.

Table1 : The Research Indicators, Weights, Minimum and Maximum of Each Indicator

Id.	Indicator	weight	Min.	Max.
X_1	Percent of appropriate land for oilseeds cultivation	47.01	0.25	0.80
X_2	Include of oilseeds in crop alternation	0.87	0.37	0.51
X_3	Average allocated land to oilseeds	14.68	0.10	0.09
X_4	Experience of oilseeds cultivation in the region	0.29	0.02	0.04
X_5	Amount of delivered education about oilseeds cultivation	0.44	0.35	0.42
X_6	Private sector tendency to investment in oilseeds in the region	2.75	0.32	0.44
X_7	Timely transferring inputs and facilities through supportive institutions	2.76	0.51	0.60
X_8	Public and private supports of oilseeds cultivation	2.72	0.58	0.65
X_9	Public capabilities to support oilseeds cultivation	3.09	0.61	0.74
X_{10}	Farmers belief to oilseeds cultivation feasibility in the region	3.15	0.64	0.76
X_{11}	Availability of technical support for oilseeds cultivation in region	3.41	0.33	0.41
X_{12}	Economic advantage(s) for oilseeds cultivation	2.57	0.30	0.40
X_{13}	Feasibility of canola cultivation with regard to water recourses in the region	8.40	0.57	0.91
X_{14}	Farming talents of lands that have belonged to oilseeds cultivation	6.39	0.38	0.45
X_{15}	The current situation of inputs' and feasibilities for oilseeds cultivation	11.58	0.38	0.45
X_{16}	Amount of farmer's familiarity with oilseeds cultivation	32.81	0.28	0.65
X_{17}	Educational needs of farmers about oilseeds cultivation	4.92	0.10	0.13
X_{18}	Expert's awareness and expert encouragement to oilseeds cultivation	9.55	0.38	0.46
X_{19}	Technical power of public sector to support oilseeds cultivation	9.06	0.39	0.47
X_{20}	Practical planning and projects to development oilseeds cultivation	6.04	0.60	0.88
X_{21}	Technical power of advisors to educational support of farmers	7	0.72	0.84

RESULTS AND DISCUSSION

Research findings indicated that average age of farmers was 45 years old. Sixty four percent had under diploma and only 1 percent had bachelor degree. The average work experience of farmers was 17.7 years. Results showed that average farm land was 7 hectares and the average land size of oilseeds includes: canola about 5 hectares, sunflower 6 hectares and safflower were 4 hectares. The minimum agriculture experience of farmers was 2 years and the maximum agriculture experience was 54 years.

The result of frequency distribution showed that respectively 31.6, 24.3, 15.4, 17.6 and 11 percent of farmers were reside in Abyek, Takestan, Boeinzahra, Qazvin and Alvand township (Table 2).

Table 2: Farmer Frequency Based on Township

Township	Frequency	Percent	Cumulative Percent
Abyek	43	31.6	31.6
Takestan	33	24.3	55.9
Boeinzahra	21	15.4	71.3
Qazvin	24	17.6	89
Alvand	15	11	100
Sum	136	100	--

Based on the research findings the main farm activities of farmers was agronomy. Also in, Qazvin, Abyek, Takestan and Alvand township the second priority was horticulture and the third priority was husbandry. But in Boeinzahra the second and third priorities were respectively husbandry and horticulture (table 3).

Table 3: Farmers Frequency Based on Main Agricultural Activities in the Provience

Township	Qazvin		Abyek		Boeinzahra		Takestan		Alvand	
Main Agricultural Activities	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %
Horticulture	8	3.33	4	9.3	6	28.6	11	33.3	7	46.7
Agronomy	23	96	40	93	17	17	29	88	12	80
Husbandry	4	17	1	2.3	6	6	6	18.2	3	40

The findings showed that farmers have learned oilseeds farming techniques through various ways includes: visit demonstration farms, watching educational films, contact with advisors (extension agents) in farm, Individual experience, Attend in educational classes, contact with expert farmers, contact with extension agent in office. The frequencies of farmer's were showed in table 4.

Table 4: Frequency of Farmer's by Learning Method

Learning method	Frequency	Valid Percent
Visit demonstration farms	56	37.3
Watching educational films	68	45.3
Contact with advisors	68	45.3
Attend in educational classes	38	25.4
Contact with expert farmers, friends and colleagues	31	21.7
Individual experience	35	30.43

Table 5 showed the frequency of farmer's by field characteristic. Table 4 indicated that filed characteristic for different producers includes: garden 7.3 hectares, wheat 24 hectares, barely 8.5 hectares, alfalfa 5.6 hectares, corn 4.6 hectares, canola 24.6 hectares, sunflower 13.7 hectares, sesame 0.66 hectares, cottonseed 1.19 hectares and safflower 1.02 hectares.

Table 5: Frequency of Farmer's by Field Characteristic

Field Characteristic: Amount of...	Mean (hec)	SD
Garden	7.3	18.7
wheat	24	29.4
barley	8.5	15.75
alfalfa	5.6	9.72
corn	4.6	6.51
canola	24.6	26.1
sunflower	13.7	29.1
sesame	0.66	3.04
cottonseed	1.19	5.06
safflower	1.02	3.65

Frequency of farmer's by oilseed cultivation experience showed that in 73 percent of the province hadn't any experience in oilseeds and 26 percent of farmers had previous experience in oilseeds cultivation. In order to identify the main Outcome and effects of oilseeds cultivation in Qazvin province 11 items were selected and farmers were asked to prioritize them. Using means as indicators, the table 6 illustrates the perception of experts about outcome of oilseeds cultivation.

Table 6: Outcome of Oilseeds Cultivation in Qazvin Province

Item	Mean Rank	SD	CV
Agricultural development	3.75	0.94	0.25
Land reform with crop rotation	3.73	1.04	0.29
Developing farmer Entrepreneurship spirit	3.23	0.97	0.30
Increase remaining farmers in the rural sector with decrease farmers migration to the city	3.09	0.99	0.32
Getting public and private grants	3.09	1.04	0.33
Spread disease and pests in the region	3.50	1.20	0.34
Waste groundwater's and develop drought	3.35	1.19	0.35
Developing supplementary activities (Beekeeping, construct factory…)	3.04	1.23	0.36
Attraction experts and advisor	2.89	1.087	0.38
Increasing employment	2.96	1.16	0.39

The result of comparison between townships based on outcome of oilseed cultivation showed that in all items we have meaningful relationship except "Increase remaining farmers in the rural sector with decrease farmer's migration to the city" (Table7).

Table 7: Mean Comparison (kruskal-Wallis) Outcome of Oilseeds Cultivation between townships

Item	Mean rank of townships					Chi-square	Sig
	Abyek	Takestan	Boeinzahra	Qazvin	Alvand		
Attraction experts and advisor	72.12	52.50	72.86	86.98	51.20	15.286	0.004*
Increasing employment	75.05	47.47	78.00	78.00	42.75	21.192	0.00**
Developing supplementary activities (Beekeeping, construct factory…)	85.63	44.36	68.60	71.98	48.07	27.026	0.00**
Land reform with crop rotation	91.14	48.03	70.07	65.48	41.93	33.718	0.00**
Agricultural development	80.37	55.20	69.88	64.43	54.20	11.344	0.023*
Waste groundwater's and develop drought	48.00	82.00	72.64	68.64	76.90	17.807	0.001*
Spread disease and pests in the region	46.80	74.67	74.79	78.12	77.89	18.246	0.001*
Increase remaining farmers in the rural sector with decrease farmers migration to the city	68.74	85.11	68.31	78.95	66.67	4.336	0.362
Developing farmer Entrepreneurship spirit	71.77	53.38	83.14	72.00	57.83	10.552	0.032*
Getting public and private grants	66.92	60.92	74.79	83.82	49.50	8.804	0.044*

*, ** *Respectively significant at 5% and 1% level.*

In this research to codifying the indicators related to development and cultivation of oilseeds in five townships. The measures of indicators were showed in table 8.

Based on the result of indicators in the five townships, Abyek township (CI=10.30) have the highest amount of cultivation and development oilseeds feasibility. Then respectively Qazvin (CI=9.44), Boeinzahra (CI=9.36), Alvand (8.48) and Takestan (CI=8.45) have high oilseeds cultivation and development feasibility in the province.
With using the hierarchical cluster analysis the surveyed townships were categorized in three clusters. Based on table 8, Abyek township is in the first cluster with high feasibility of oilseeds cultivation (mean=10.30). Qazvin and Boeinzahra townships have moderate oilseeds cultivation feasibility (mean=9.4) and Takestan and Alvand townships (mean=8.445) have low oilseeds cultivation feasibility (table 9 and dendrogram 1).

Table 9: Fasibility of Oilseeds Cultivation

CI	Township potential	Mean	Township name
Feasibility	High	10.30	Abyek
	Moderate	9.4	Qazvin, Boeinzahra
	Low	8.445	Takestan, Alvand

Dendrogram 1: using Average Linkage (Between Groups)

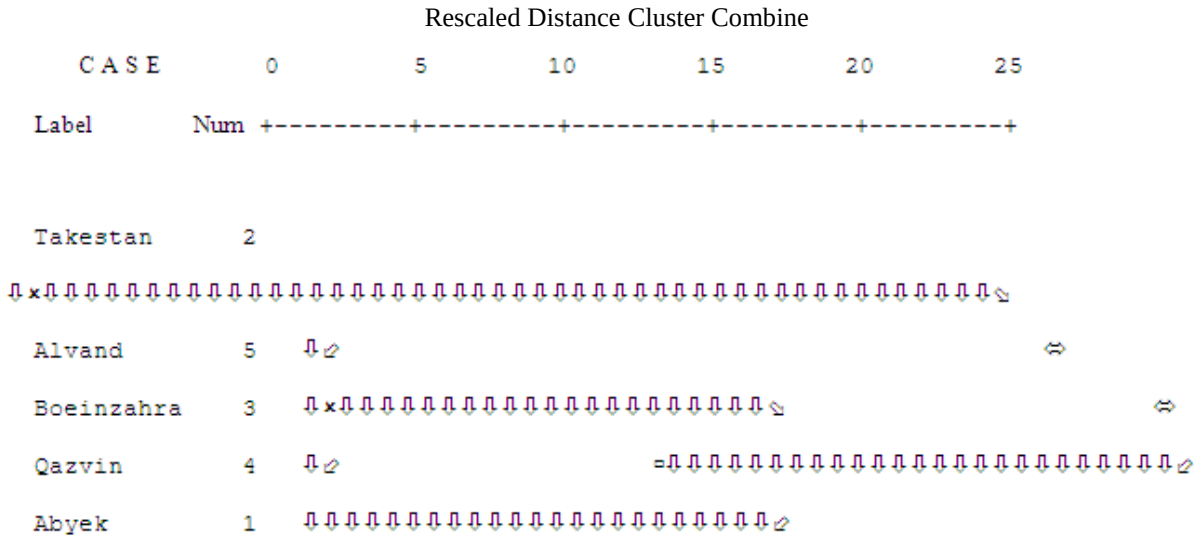

Table 8: Oilseeds Cultivation Development Indicators

Township	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}	CI
Wight	47.01	0.87	14.68	0.29	0.44	2.75	2.76	2.72	3.09	3.15	3.41	2.57	8.40	6.39	11.85	32.81	4.92	9.55	9.06	6.04	7	--
Abyek	0.80	0.48	0.21	0.01	0.04	0.35	0.35	0.54	0.65	0.71	0.76	0.34	0.40	0.91	0.38	0.65	0.13	0.46	0.42	0.88	0.84	10.30
Takestan	0.25	0.37	0.21	0.05	0.04	0.35	0.44	0.57	0.60	0.62	0.67	0.37	0.30	0.57	0.42	0.28	0.12	0.42	0.45	0.60	0.76	8.45
Boeinzahra	0.37	0.51	0.10	0.09	0.03	0.42	0.40	0.60	0.62	0.74	0.71	0.41	0.32	0.74	0.45	0.35	0.10	0.41	0.47	0.72	0.80	9.36
Qazvin	0.47	0.47	0.44	0.07	0.02	0.40	0.34	0.53	0.53	0.67	0.72	0.36	0.37	0.72	0.42	0.41	0.13	0.38	0.43	0.78	0.73	9.44
Alvand	0.42	0.37	0.30	0.02	0.02	0.38	0.32	0.51	0.51	0.61	0.64	0.33	0.35	0.61	0.38	0.36	0.13	0.43	0.39	0.62	0.72	8.48
Sum	2.31	2.19	1.25	0.25	0.15	1.90	1.85	2.75	3.05	3.35	3.5	1.80	1.75	3.55	2.05	20.5	0.6	2.10	2.15	3.6	3.85	46.03
Mean	0.46	0.44	0.25	0.045	0.03	0.38	0.37	0.55	0.60	0.67	0.70	0.36	0.34	0.70	0.40	0.41	0.12	0.41	0.43	0.72	0.76	9.2
SD	0. 05	0.064	0.13	0.033	0.008	0.031	0.049	0.033	0.028	0.059	0.046	0.033	0.038	0.133	0.029	0.143	0.014	0.030	0.030	0.115	0.05	0.77
CV	0.44	0.37	0.52	0.73	0.26	0.08	0.13	0.06	0.04	0.08	0.06	0.09	0.11	0.19	0.07	0.34	0.12	0.07	0.07	0.15	0.065	0.009

CONCLUSION

Oilseeds have important role as second nutritional resource of the world after grains. Based on the research findings the majority of farmers don't have any literacy and suitable education about oilseeds farming. In this study we found that the oilseed farmers had been learned the principles and techniques of oilseed farming from different methods includes (visit demonstration farms, watching educational films, contact with advisors, Individual experience, Attend in educational classes, contact with expert farmers,…..). From the extension educational methods, the group education methods can be mentioned that includes those methods in which the trainer is always engaged in relationship with a group of trainee clients. There are numerous and important features distinguishing the group methods from other extension methods, i.e. individual and mass education methods. These features include increase in the number of contacts between extension worker and the farmers [11, 13].

Solving oilseeds cultivation problems like adaptation with the weather situation and preparing the land and soil position to oilseed cultivation and establish management irrigation system for using water have a major role to play in development feasibility of oilseeds cultivation. As we know educational factor is conducive to sustainable agricultural development and cultivation [5, 7] Approaching to this purpose, agricultural extension and education have been established as executive tools of the government to accomplish agricultural products developing which is almost impossible to study their effects on under cultivation land and mere performance of each product regarding the nature of these activities in promoting various product cultivating is neglected and remains unknown.

Then preparing financial input and enacting insurance supportive [6,8] and providing appropriate machinery especially in post harvest activities for oilseeds can help to solve this problem. Also technologies in sustainable agriculture programs, enacting proper criteria in sustainable agricultural development, elucidation agricultural policies, prepare appropriate facilities to implementation sustainable agriculture policies are noticeable in this regard.
At the end design strategic plan in agricultural development programs, establish responsible institution in management structure of agriculture sector, establish unique policies in agriculture in different institutions, enact native and local politic in national policies frame can help to resolve some supportive and technical-financial problems .

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