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## Changes and Problems of Agricultural Development in Iran<sup>1</sup>

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**Abstract:** There has been a big debate on the evolution of agricultural development (AD), the challenges and problems hindering AD in Iran since last decade. This study was implemented in the province of Esfahan and a number of 130 out of 212 agricultural experts from 13 different townships were selected as the target group. Totally 70 experts returned the completed questionnaires. The findings of the study revealed that most of the AD changes have been positive but in a very slow rate. Respondents unanimously claimed that the sustainability in agriculture and maintenance of agricultural lands are the most deteriorating issues during last ten years. With regard to AD problems, they stressed the lack of adequate fund allocated to the Ministry of Agriculture (MAJ) and lack of its power to control beneficiary dealers within the sector, unfair political influence, lack of international contacts and also untrustworthiness of agriculture for private investors as the most problematic obstacles for AD in Iran. They perceived that MAJ has not sufficiently addressed the problems so far, although, there are some promising movements. Experts believed that MAJ is not able to solve the majority of problems alone due to their extrinsic nature.

**Key words:** Agriculture % Development % Farmers % Problems % Iran % Changes % Extension

### INTRODUCTION

Agriculture is the bedrock of development and core of the export market and it is accountable for one-fourth to one-half of (GDP) gross domestic product in developing countries. Dependence on agriculture is remarkably higher for more than half of the Asian countries. The Ministries of Agriculture of these countries have taken the lead in planning, financing and implementing strategies for Agricultural Development (AD).

This trend continues in all countries; although private sector participation in agriculture has increased in the last two decades [1-2]. Generally speaking, three different periods can be identified for AD. These are the pre-industrial intensification period, the industrial period and finally the science-based period, in which the rate of output has increased from one to over four percent per year [1]. Meanwhile, many AD models have emerged and been used by various countries so far. They have mainly focused on the technology transfer and green revolution,

which started in Mexico in the mid-1940s and was then applied by developing countries in the late 1960s.

In some countries, such as Japan, AD was proceeded by the industrial revolution in the 19<sup>th</sup> century. In the US and a noticeable number of western countries, AD was boosted during the post-war period with dramatic yield and productivity increases and from that time AD became an increasingly global process. However, AD, like industrialization, systematically drew from western countries; although some eastern characteristics of AD such as small and family farming did not change [3-4]. More recently a new tendency in AD has been growing, which is using “sustainability” as a criterion for agricultural changes. Sustainability has increasingly been considered by many countries as a means of increasing production and simultaneously being environmentally and natural resource friendly [5-7].

Another dominant AD philosophy that is attracting the attention of researchers and policy makers is the “systematic approach” which aims at the development of new strategies of thinking, knowing and learning in the

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area of AD. In this view, the systematic approach must be translated into presenting innovative curricula, research methodologies and extension strategies [8-12]. In sum, various worldwide AD models and strategies have focused on the following dimensions:

Improving the productivity and sustainability in agriculture, rural poverty reduction, developing biodiversity; retaining and protecting water resources in a sustainable manner, preserving, rehabilitating and renewing forests and reducing land degradation [13]. In spite of the progress already made in agricultural research, the gap between AD models and professional practices has steadily increased and repeatedly been a challenging issue for different researchers and practitioners in this field. AD is consequently a complicated concept and not easily achieved by the majority of countries [14].

In Iran, like other developing countries, agriculture is one of the most important economic sectors and comprises a considerably high percentage of production and employment. About 25% of the Gross National Product (GNP), 33% of employment, 25% of non-oil exports and 80% of food requirements have been provided by the agricultural sector in Iran [15].

Nevertheless, there is various evidence that agriculture still lags far behind its real potential in Iran considering the country's available resources. In addition, sustainable land use has not yet been achieved. For instance, about 30% of the forests located in the North of Iran were destroyed during the last two decades. Furthermore, large portions of pastures and grasslands were rendered unproductive because of overuse by the cattle of the nomadic population and farmers [16].

Karshenas [17] contends that a great number of AD problems originate from deficits in HRM and not from shortages of natural resources. Foltz [18] also claimed that mismanagement is the major reason for the water crises that occurred in the previous years in Iran although he believed that they were partly drought-related. who documented his claim with a quote from Iran's former Deputy Energy Minister, Rasul Zargar, when he said "...up to 37% of Iran's drinking water is lost because of outdated, leaking distribution systems..." [19].

Similarly, 60% of the 82 billion cubic meters of water used in the agricultural sector fails to reach crops. Many academics also support the idea of a faulty irrigation system in Iran in their studies [20-23].

Kalantari [24] pointed out the most important problems hindering productivity increase in the agricultural sector of Iran and listed them as follows: the small size of agricultural lands and production scales,

the restrictive macro policies in the agricultural sector, financial difficulties of the majority of farmers, the need for greater funds, insufficient investment in infrastructure, low quality of products and insufficient technical skills of farmers and the inefficiency of governmental supports in promoting agricultural extension schemes.

As illustrated by a qualitative comparative case study [25], socio-economic characteristics and environmental conditions of the farm have lead to the relative impoverishment of Iranian farmers. Smallholder farmers in unfavourable socio-economic and environmental conditions are relatively poorer. Their findings also illustrated that poverty is a major cause of unsustainable agriculture. Poor farmers' insufficient management competencies lead to higher soil erosion, over-fertilization, inadequate application of manure, lack of fallow, overgrazing, burning of crop residue and over-use of pesticides. Therefore, it is evident that AD in Iran needs to be facilitated in order to address farmers' demands. As a result of these inadequacies farmers are not appropriately informed, skilled and competent to do their jobs efficiently. It must be said that although rural areas are the most important regions for agriculture in Iran, unfortunately, little attention has been paid to these productive areas and, consequently, to rural farmers by policy makers. Barichello [26] also reported this fact when he said: "for most developing countries, the bulk of their poverty is found in rural areas, which raises questions about the structure of these economies, specifically the relative size and importance of the agricultural sector." Moreover, Ashley and Maxwell [27] stressed that this phenomenon is not just a matter of developing countries but it is a worldwide problem. Many other scientists support this belief too [28-30].

In Iran, rural economic activities are based on three focal sectors (agriculture, industry and services). In total, about 50% of active rural people are working in the agricultural sector, 27% in industry and 23% in the service sector. The total cultivated land area is about 18 million hectares, while the total number of rural livestock amounts to 92 million [15].

All these phenomena confirm the crucial situation of villagers in the context of AD and the necessity of supporting them to be more productive and achieve a better outcome. Similarly, another study Bageri and Shahbazi [31] discovered that many Iranian farmers lack technical competencies at many stages of farming activity such as planting, harvesting, plant crop protection and using agricultural machinery. The study showed that 75-82% of young farmers should be taught about all previously mentioned aspects of farming.

More recently Karbasioun & Mulder [32-33] underlined the vital role of rural development in realizing AD and disclosed that farmers in the province of Esfahan in Iran had difficulties in coping with the negative changes and problems they experienced. Although governmental agricultural extension services (AES) helped them to some extent, nonetheless, they had to overcome the changes by relying on their own initiative, relatives and friends. Other studies of Karbasioun et al. [34-40] also support this fact. Iranian policy makers have endeavoured to address these difficulties by implementing several sets of national five year agricultural plans. It should be said that these problems originate from a wide variety of sources as well as physical and humanistic issues. Few studies have been carried out on this topic and only a minority have had a long-range perspective with the aim of anticipating the priorities for the future of AD. In this study research this issue and also the AD problems that will be crucial in the next 3-5 years are addressed. Furthermore, the study aims at examining the shortcomings and strengths of previous national plans for AD. The extent to which the Ministry of Agriculture (MAJ) has been able to and could be able to, address these problems in the future is explored too.

## MATERIALS AND METHODS

In this study the general purpose is to investigate the perceptions of agricultural experts of the evolution of AD and its problems from the last decade up to the present-day in Iran. To achieve this general purpose, the specific research questions are formulated as follows:

- C What AD changes have been perceived by the expert, in Iran over the last decade? Are they regarded as positive or negative and to what extent?
- C What have been the most important AD problems in Iran over the last decade? Which ones will remain important for the next five years? What is the priority of considering these problems in the next five years?
- C To what extent has the MAJ addressed AD problems so far and is MAJ able to solve the problems on its own.
- C What are the relationships between experts' personal traits and the AD changes and problems?

Interviews along with survey questionnaires were used for data collection. To pilot test the survey questionnaire, fifteen interviews were carried out with selected agricultural experts and managers in the Agricultural-Jihad organization of the province of Esfahan.

This selected small group of experts were comparable with the major target group. Each interview took about one hour in which enough time was given to the interviewees to explain whatever they felt was most important to discuss. The selected experts were excluded from the main study at the end. A semi-structured questionnaire was used for interviews.

The interview process lasted two weeks in total from 15<sup>th</sup> until 30<sup>th</sup> of March 2005. At this stage, the validity of the questionnaire was tested and some questions were changed, added or deleted where necessary. Thereafter, the questionnaire was distributed among three of the teaching staff of Wageningen University and also a translated version of the questionnaire was posted to 22 experts, managers and instructors in the MAJ and the Ministry of higher education of Iran. All professors and 12 experts replied and gave their general or detailed remarks on the questionnaire. This process helped to assure the reliability of the questionnaire. At the end, the translated questionnaire in Farsi (Iranian language) was revised by taking the views of 17 Iranian agricultural PhD students and experts who were studying in Wageningen University into account. In the next phase, 130 agricultural experts who were skilled and sufficiently knowledgeable in the field of Agricultural extension and development in Iran were selected out of the whole population (212 persons) of agricultural experts in the agricultural-Jihad organization of the province of Esfahan. Therefore, the research covered nearly 60% of all respondents.

The selection method was accomplished to ensure that experts are truly informed and experienced. To do so, a pre-inquiry was carried out and those experts who had at least five years of work experience, or had research or publications about agricultural extension and related fields, were picked out of all available respondents (130 individuals).

The questionnaire, including open and closed questions, was prepared and used for data collection. In designing the closed questions, a 5-point Likert-type scale was applied. Then the questionnaires were sent to the target group addresses in different townships of the province of Esfahan. A total of 83 questionnaires were returned and a total of 70 (-54% of 130 selected experts) completed questionnaires were used in the study. Then, the data were analyzed using SPSS software.

A quantitative method of data analysis was applied. Descriptive statistical analyses were used to determine AD changes and problems. Furthermore, non-parametric statistical methods such as Pierson and Kendal tau Rank Correlation Coefficients and Cruskal Wallis tests were

used. Where allowed, F-tests were also carried out to explore the possible significant differences between personal characteristics of respondents and their views about the abovementioned variables.

The final questionnaire consisted of several categories of questions. The topics of the questionnaire were the following (number of questions for each topic is mentioned between brackets):

- C Background information of experts (such as age, gender, level of education, present position in the organization, work experience, level of expertise and experience (12);
- C Experts' level of expertise and experience in different AD related fields (10);
- C The rate of frequent and interactive contact with farmers (1);
- C The extent to which different aspects of agriculture (selected from the latest National AD Plan) have improved or unimproved during the last decade (28);
- C AD problems in Iran at the present time and in the next five years (105).

## RESULTS AND DISCUSSION

First of all, the results of the study about respondents' characteristics are presented below.

**Experts' Demographic Profile:** Descriptive analysis of the data showed that about 50% of experts were educated to masters degree level; the vast majority of them were male (94%) and 45% were between 41 and 50 years of age. Nearly half of the experts in this study had more than 20 years of work experience. Additionally, the minority of them (22.7%) had high rank managerial positions and 44% were technical specialists without any managerial position.

The subject-specialties of respondents were distributed among 22 different majors. Of respondents, 13.6% had a degree in agronomy and 12.2% were animal husbandry specialists, 9.1% were extension professionals, 9.1% sociologists and 6.1% had a general management degree. These specialities altogether covered half of the sample and the remaining respondents had 17 other different specialities. About 40% of experts were the employees of extension and rural services departments and around 30% of them were employees of the directorate office.

Table 1: Distribution of experts' knowledge in different scientific AD related areas (Number of respondents: 70)

Subject	$r^1$	$M^2$	$SD$
Rural training	1	3.4	1.09
Agricultural extension and education	1	3.4	0.88
Agriculture work	2	3.3	1.00
Administrative management in agriculture	3	3.2	0.99
Rural sociology	3	3.2	0.93
Agricultural development	4	3.0	0.74
Agricultural innovations	4	3.0	0.79
Agricultural research	4	3.0	0.96
Agricultural policy making	5	2.7	0.95
Agricultural economy	6	2.6	0.77

Note: <sup>1</sup>Rank <sup>2</sup>Mean: 0= nothing; 1= very little; 2= little; 3= moderate; 4= much; 5= very much

The remaining numbers of respondents (30%) were distributed among nine other organizations where agricultural research centres (9%) and universities (7.5%) were the most popular group. With respect to experts' townships in the province of Esfahan, 65.5% of experts were the employees of Esfahan Township (the centre of the province of Esfahan) and others were employees of 12 different townships across the province.

Self-assessment questions were asked to the respondents to uncover the experts' perceptions of their level of knowledge of ten different AD related disciplines (Table 1). The mean scores of experts for these knowledge domains were between 2.6 (sd= 0.77) and 3.4 (sd= 1.09) where the majority got scores equal to or higher than 3.0 (=moderate).

The scale used ranges from 1 (=very little) to 5 (=very much). Therefore, all experts perceived themselves to be moderately or considerably knowledgeable in different AD related disciplines. They particularly assumed themselves to be knowledgeable in rural training, agricultural extension and education and agriculture work (3.4 = M = 3.3; 1.09 = sd = .88).

In reference to the frequency of respondents' contact with farmers, 63.2% of experts in total claimed that they have often or always direct contact with farmers and 26.5 % mentioned that they occasionally have contact with farmers. Only 8.8% stated that they have rare or no contact with farmers.

**General Perceptions of Experts about the Research Questions:** To have an overview of the experts' perceptions about AD changes, problems, their importance at present and in the future, the extent of addressing problems by the MAJ and finally the solvability of the problems by the MAJ alone, all

Table 2: Experts' overall perceptions with respect to key variables (Number of respondents= 70)

Subject	Q <sup>1</sup>	" <sup>2</sup>	Nu <sup>3</sup>	M	SD
1. Experts' AD knowledge	10	0.87	3	3.36	0.68
2. Overall AD evolution	28	0.81	3	3.39	0.32
3. Importance of AD problems right now	21	0.85	2	2.70	0.59
4. Importance of AD problems in the next five years	21	0.86	2	2.85	0.58
5. The extent to which MAJ has addressed AD problems so far	21	0.85	2	1.81	0.54
6. Priority of addressing AD problems by MAJ during the next five years	21	0.93	2	2.83	0.64
7. Possibility of solving AD problems by MAJ alone	21	0.88	.5	0.35	0.23

Note: <sup>1</sup>number of questions; <sup>2</sup>Cronbach's alpha; <sup>3</sup>Neutral value in the 5-point scale (for the first six rows of the table) and 2-point scale (for the last row of the table) used for the questionnaire

Table 3: Distribution of experts' views about AD changes in Iran during the last decade (Number of respondents: 70)

AD changes				
A. Most developed issues (highest scoring variables)	R <sup>1</sup>	V <sup>2</sup>	M <sup>3</sup>	SD
1. Establishment of intensive farming and greenhouses	1	+	4.1	0.70
2. Application of new irrigation methods	1	+	4.1	0.43
3. Insurance funds allocated to agricultural products	2	+	4.0	0.82
4. Stabilising the prices of agricultural products by the Ministry of Agriculture	3	+	3.8	0.72
5. Access of farmers to mechanisation technology	3	+	3.8	0.58
6. The provision of training programs (to farmers and employees)	3	+	3.8	0.72
7. Long-term loans allocated to small farmers	3	+	3.8	0.77
B. Least developed issues (lowest scoring variables)	R <sup>1</sup>	V <sup>2</sup>	M <sup>3</sup>	SD
1. Transparency of supportive policies in agriculture and natural resources	9	+	3.2	0.96
2. Active participation and cooperation of villagers in agricultural policy making	9	+	3.2	0.80
3. Balance between livestock number and rangelands	9	+	3.2	1.0
4. Sustainability in agriculture and natural resources	10	0	3.0	0.89
5. Stabilising the price of agricultural inputs by the Ministry of Agriculture	11	-	2.8	1.28
6. Preventing the settlement of the industries or residential sites in agricultural areas	12	-	2.6	1.20

Note: <sup>1</sup>Rank; <sup>2</sup>Value: (+) = positive ; (0) = neutral & (-) = negative <sup>3</sup>Mean: 1= Very decreased; 2= Slightly decreased; 3= No difference; 4= Slightly increased; 5= Very increased

sub-questions in each category (10 questions for AD related knowledge of experts, 28 questions for AD changes and 21 questions for AD problems) were summed up and one key variable was calculated for each category as is shown in table 2. To assure the reliability of each category, Cronbach's alpha coefficient for all clusters was separately calculated which was higher than .81 in all cases (column 3 of table 2). Based on the first row of table 2, respondents perceived themselves to be moderately knowledgeable in AD related fields (M= 3.36, sd=.68). The scale used for this category ranged from 1 (=very little) to 5 (=very much). Additionally, according to the second row of the table, it could be assumed that, on average for all AD changes, there is room for improvement (M= 3.39, sd=.32).

The 5-point scale for AD changes (1= Very decreased; 2= Decreased; 3= No difference; 4= Slightly increased; 5= Very increased) was considered. It means that in the view of respondents the evolution of AD during the last decade has not been convincing and needs to be accelerated. Additionally, both current and future AD problems in the scale used (0= not important;

1= a little important; 2= moderately important; 3= very important; 4= very much important) were assumed as moderately to very important (M= 2.70, sd=.59; M= 2.85, sd=.58). To examine the extent to which the MAJ has addressed those problems, a 5-point scale (0= nothing; 1= a little; 2= moderately; 3= very; 4= very much) was applied. As it is seen, the perceived MAJ priorities (M= 2.83, sd= 0.84) are considerably higher than what the MAJ has already done in the past according to experts (M= 1.81, sd= 0.54). Finally, using a 2-point scale (0= No; 1= Yes), experts declared that the majority of them believe that the problems cannot be resolved by the MAJ alone (M= 0.35, sd= 0.23).

The following sections address research questions one to five.

**Research Question One: AD Changes:** With respect to the first research question, respondents perceived AD changes, in most cases, as positive but not convincing. The seven most developed issues according to the experts are listed in part A of Table 3. Establishment of intensive farming and greenhouses, application of new

Table 4: Distribution of experts' views about AD problems

AD problems				
A. Most important AD problems at present	n <sup>1</sup>	r <sup>2</sup>	M <sup>3</sup>	SD
1.Lack of power of the MAJ to control various mediators and dealers in the agriculture sector	68	1	3.1	1.12
2.Inadequacy of financial support for farmers by the MAJ	68	2	2.9	0.91
3.Failing to achieve international contacts and active participation of the MAJ in the agricultural global market	67	2	2.9	1.21
4.Untrustworthiness of the agricultural sector for private individuals and companies to invest in it	67	3	2.8	1.05
5.Influence of political issues on decision making for agriculture	66	3	2.8	1.15
B. Most important AD problems in the next five years	n <sup>1</sup>	r <sup>2</sup>	M <sup>3</sup>	SD
1.Inadequacy of funds allocated to agricultural projects by the government	66	1	3.3	0.90
2.Lack of power of the MAJ to control various mediators and dealers in the agriculture sector	65	2	3.2	0.95
3.Failing in international contacts and active participation of the MAJ in agricultural global market	67	3	3.1	1.09
4.Influence of political issues on decision making for agriculture	65	4	3.0	1.03
5.Shortage of competent employees in the MAJ	69	5	2.9	0.96
C. AD problems with greatest priority to be addressed in the next five years by the MAJ	n <sup>1</sup>	r <sup>2</sup>	M <sup>3</sup>	SD
1.Implementation of five year national agricultural plans	66	1	3.1	0.92
2.Controlling various mediators and dealers in the agriculture sector	66	1	3.1	1.05
3.International contacts and active participation of the MAJ in the agricultural global market	66	2	3.0	1.07
4.Allocating sufficient funds to agricultural projects	66	2	3.0	1.04
5.Encouraging private individuals and companies to invest in the agricultural sector	67	2	3.0	1.05

Note: <sup>1</sup>Number of respondents; <sup>2</sup>Rank; <sup>3</sup>Mean: 0= not important, 1= little important, 2= moderately important, 3= very important, 4= very much important

irrigation methods. This also confirms the research done by Pigram [41]. Likewise, the insurance funds allocated to agricultural products were mentioned as the three most developed aspects (4.1 = M = 4.0; 0.82 = sd =0.43) on the 5-point scale (1= Very decreased ; 2= Slightly decreased; 3= No difference; 4= Slightly increased; 5= Very increased).

Items 1, 2 and 5 indicate that the agricultural sector has improved the application of new technologies (such as greenhouse and intensive farming, new irrigation methods and mechanisation technology). Items 3, 4 and 7 illustrate a moderate improvement in the MAJ's financial support for farmers (Insurance fund, stabilising the prices of agricultural products and long-term loans). According to part B of table 3, experts perceived that AD has deteriorated in preventing the settlement of the industries or residential sites in agricultural areas and also in stabilising the price of agricultural inputs (M= 2.6, sd=1.20; M= 2.8, sd= 1.28).

No changes were perceived in sustainability in agriculture and natural resources (M= 3.0, sd= 0.89) and very little increase was mentioned in the balance between livestock numbers and rangelands, active participation and cooperation of villagers in agricultural policy making and transparency of supportive policies in agriculture and natural resources, respectively (M= 3.2, 0.96 = sd =0.8). Overall, the items 3, 4 and 6 mentioned in part B of Table 3 pinpoint the lack of sustainability in the farming

system of Iran, as perceived by respondents. Likewise, items 1, 2 and 5 of part B, stress the shortage of supporting policies, usage of participatory approaches and failure of the MAJ in stabilizing the prices of agricultural inputs (3.2 = M = 2.8; 1.28 = sd =0.8).

**Research Question Two: AD Problems:** To address research question two, respondents were asked to rate 21 items based on their current importance, future importance and also the potential priority allocated to them by the MAJ in the next five years. The results are displayed in parts (A, B and C) of table 4. The scale used ranges from 0 to 4 (0= not important; 1= Important; 2= moderately important; 3= very important; 4= Extremely important).

In part A of this table, the failure of the MAJ to control beneficiary mediators and dealers (being the sole beneficiaries of farmers' products) in the agricultural sector was assigned as the first crucial problem at present (M= 3.1, sd= 1.12). Lack of sufficient financial support by the MAJ was perceived as the second important problem (M=2.9, sd= 0.91) by respondents.

The three other crucial problems were failure of the MAJ to attain international contacts in the global market (M= 2.9, sd= 1.21), untrustworthiness of the agricultural sector for investors (M= 2.8, sd= 1.05) and unfair influence of political issues on decision making in the agriculture sector (M= 2.8, sd= 1.15).

Table 5: Distribution of experts' views about the extent to which the MAJ has addressed AD problems and their solvability by the MAJ

Addressing AD problems by the MAJ				
A. AD problems moderately addressed by MAJ				
	n <sup>1</sup>	r <sup>2</sup>	M <sup>3</sup>	SD
1. Designing appropriate five year AD plan by the policy makers	66	1	2.1	0.97
2. Implementation of training programs to enhance the competency of employees	64	1	2.0	0.91
3. Preparation of new learning and communication technology for employees	67	1	2.0	1.11
4. Providing financial support for farmers by the MAJ	64	2	1.9	1.00
5. Implementation of training programs for farmers and other careers involved in the agricultural sector	64	3	1.8	0.89
B. AD problems addressed to the least extent by the MAJ				
	n <sup>1</sup>	r <sup>2</sup>	M <sup>3</sup>	SD
1. Considering low level of farmers' education to be improved	61	8	1.2	1.06
2. Controlling various mediators and dealers in the agriculture sector	65	8	1.2	1.13
3. Increasing employees' motivation and accountability in the MAJ	65	6	1.5	1.10
4. Reducing the Influence of political issues on decision making for agriculture	57	5	1.6	1.22
5. Performing competency assessment of employees	65	5	1.6	0.98
C. AD problems that are most likely solvable by the MAJ alone				
	n <sup>1</sup>	r <sup>2</sup>	m <sup>3</sup>	SD
1. Competency assessment of employees	65	1	0.8	0.40
2. Competency assessment of farmers	61	2	0.7	0.43
3. Access of employees to new learning and communication technology	63	2	0.7	0.44
4. Training programs to enhance the competency of employees	64	2	0.7	0.46
5. Training programs for those involved in agriculture	61	3	0.6	0.48
D. AD problems that are hardly solvable by the MAJ alone				
	n <sup>1</sup>	r <sup>2</sup>	m <sup>3</sup>	SD
1. Lack of power of MAJ to control and manage various mediators in the agriculture sector	61	7	0.1	0.32
2. Preparation of appropriate five year AD plan by the policy makers	65	7	0.1	0.35
3. Mistrust of the agricultural sector by private individuals and companies for investment	63	7	0.1	0.35
4. Funds allocated to agricultural plans by the government	65	7	0.1	0.36
5. Influence of political issues on decision making for agriculture	64	6	0.2	0.38

Note: <sup>1</sup>Number of respondents; <sup>2</sup>Rank; <sup>3</sup>Mean=Mean for addressing the problems: 0=nothing, 1=a little, 2=moderately, 3=very, 4=very much; <sup>3</sup>m=Mean for solvability of the problem by MAJ alone: 0= No & 1= Yes

The most dominant problems in the next five years (part B) were mainly the same as the current problems (items 2, 3 & 4). There are also new concerns discernable for the future such as inadequacy of funds allocated to agricultural projects by the government (M= 3.3, sd= 0.90), which was assigned as the first priority and the shortage of competent employees in the MAJ (M= 2.9, sd=0.96) as the fifth priority.

Finally, in part C of Table 4, the priority of addressing problems is listed. Experts deemed the first priority as the implementation of five year AD plans by the MAJ (M= 3.1, sd= 0.92). Then they once again highlighted the necessity of controlling dealers in the agricultural sector (M= 3.1, sd= 1.05), expanding the international contacts of MAJ (M= 3.0, sd= 1.07), allocating sufficient funds to agricultural projects (M= 3.0, sd= 1.04) and encouraging investors to invest in the agricultural sector (M= 3.0, sd=1.05).

**Research Question 3: the Extent to Which Maj Addresses AD Problems:** On a 5-point scale (0= nothing; 1= a little; 2= moderately; 3= very; 4= very much) experts perceived that the MAJ has, on average, addressed AD

problems between 1.2 and 2 (a little to moderate extent). As shown in part A of Table 5, they cited that five year national agricultural plans are moderately well designed (M= 2.1, sd= 0.97). In the second place, implementing training programs and providing new learning and communication technology for employees were assumed to be moderately addressed (M= 2.0, sd=0.91 & 1.11).

In part B of Table 5, it can be seen that in the experts' opinions the MAJ has attempted, to a very little extent, to improve the low level of farmers' education and has not been adequately able to control various beneficiaries in the agriculture sector (M= 1.2, sd= 1.06; M= 1.2, sd= 1.13). In addition, the MAJ has not paid sufficient attention to employees' motivations, undue political impacts on agricultural sector and employees' competency assessment (items 3, 2 & 1 of part B, 1.6 = M = 1.5; 1.22 = sd = 0.98).

In part C and D of Table 5 the focus was on the rate of problem resolution by the MAJ alone. A broad average from 0.1 to 0.8 on a 2-point scale (0= No; 1= Yes) was obtained. 0.1 (0.8) means that 10% (80%) of respondents were in agreement with the claim that the problem is solvable by the MAJ. From the table it is perceivable that

all five items that received the highest rate of solvability in part C are HRD-related problems (internally solvable) and are directly under the control of MAJ. In other words, themes such as competency assessment of employees and farmers' access to new information technology and arrangement of training programs for employees and farmers are all components of HRD programs. Oppositely, in part D of the table, the least solvable problems were dedicated to mainly external problems which are related to overarching governmental decision making policies such as controlling beneficiary dealers ( $M= 0.1$ ,  $sd= 0.32$ ), preparation of five year AD plans ( $M= 0.1$ ,  $sd= 0.35$ ), mistrust of the agricultural sector ( $M= 0.1$ ,  $sd= 0.35$ ), funds allocated to the MAJ ( $M= 0.1$ ,  $sd= 0.36$ ) and political issues ( $M= 0.2$ ,  $sd= 0.38$ ).

**Research Question 4: Relationships Between Respondents' Personal Traits and AD Changes and Problems:** To see whether there is any relationship between personal characteristics of experts and their opinion about AD changes and problems, Pierson and Kendal tau correlation, Kruscal Wallis and F-tests were used. The results are displayed in three different parts as follows:

**Inter-Relationships of Expert's Traits:** older experts had lower educational degrees ( $r_p= -.267^*$ ,  $sig. = 0.042$ ,  $N= 58$ ) and had more contact with other farmers ( $r_p=.304^*$ ,  $sig. = 0.024$ ,  $N= 56$ ). Experts with more work experience, had lower educational degrees ( $r_p= -.277^*$ ,  $sig. = 0.032$ ,  $N= 60$ ) but they had more contact with farmers ( $r_p=.287^*$ ,  $sig. = 0.029$ ,  $N= 58$ ). Furthermore, respondents who had more contact with farmers perceived themselves to be more knowledgeable in AD related fields ( $r_p=.305^{**}$ ,  $sig. = 0.002$ ,  $N= 67$ ) and they had higher organizational positions ( $r_p=.334^{**}$ ,  $sig. = 0.002$ ,  $N= 64$ ).

**Relationships Between Experts' Traits and the Clustered AD Issues (mentioned in Table 5):** A significant difference was explored between experts with different work experience and their perceptions about changes that have happened in AD up to the present ( $F= 1.847^*$ ,  $sig. = 0.050$ ,  $df= 20$ ). Likewise, experts who had more frequent contact with other farmers were more optimistic about AD changes ( $r_p=.239^*$ ,  $sig. = 0.011$ ,  $N= 68$ ) and the role of the MAJ in addressing AD problems during the last decade ( $r_p=.218^*$ ,  $sig. = 0.021$ ,  $N= 68$ ). They also gave higher priority to addressing AD problems in the future ( $r_p=0.250^*$ ,  $sig. = 0.040$ ,  $N= 68$ ).

**Relationship Between Experts' Traits and Some Important AD Changes:** work experience and educational level were the two personal characteristics of experts that were found to have significant correlations with some AD changes.

**Work Experience:** positive significant relationships were found between experts' work experience on the one side and the following variables on the other side:

The influence of political trends on decision making in the agricultural sector ( $r_p=.503^{**}$ ,  $sig. = 0.000$ ,  $N= 49$ ); the priority of considering farmers' age levels ( $r_p=.327^*$ ,  $sig. = 0.018$ ,  $N= 52$ ). More experienced experts were finally more certain about the MAJ failure to stabilise the prices of agricultural inputs in comparison to their less experienced counterparts ( $r_p=.274^*$ ,  $sig. = 0.036$ ,  $N= 59$ ).

**Educational Level:** negative significant relationships were discovered between the educational level of experts and their perception about active participation of the MAJ in the international agricultural market ( $Kt= -0.252^*$ ,  $sig. = 0.023$ ,  $N= 64$ ) and also the success of the MAJ to stabilize the price of agricultural inputs ( $Kt= -0.244^*$ ,  $sig. = 0.021$ ,  $N= 67$ ). Experts with higher education levels put more emphasis on the necessity of increasing the level of farmers' education ( $Kt= 0.231^*$ ,  $sig. = 0.036$ ,  $N= 63$ ).

## CONCLUSION

A great number of respondents (about 60%) cited that they had continuous contact with farmers. This percentage is far more than what Lotfi [42] stated in his research report. The reason could probably be the selective sampling method used in the current study. Experts asserted the idea that most of the AD changes during the last decade have been relatively positive but at a very slight speed. They believed that this speed could be significantly improved in the future. Moreover, experts assigned all AD problems to be more or less prominent. It alludes to the fact that the agricultural sector is indeed suffering from various malfunctions and deficits.

However, experts stressed the lack of adequate funding and the lack of the power of the MAJ to control beneficiary dealers, unfair political influence on MAJ activities, lack of MAJ international contacts and distrust of agricultural business for private investors. All these uncover the big concern of respondents regarding mentioned crucial issues. Likewise, It should be said that merging two previous ministries responsible for



agriculture into one unique ministry (MAJ) in 2001 also created new challenges and problems and might be one of the reasons for the indicated deficits in the MAJ. This is in agreement with Rivera and Gustafson [43] when they contend in their book “Worldwide institutional evolution and forces for change” that new organizational problems worldwide are emerging as new changes are occurring.

In the experts’ view, the MAJ has failed to address AD problems as it is hoped. It could be interpreted from the findings that generally speaking the MAJ has put its efforts in technology-driven and not human resource development (HRD) strategies. Therefore, respondents feel it is necessary that the MAJ focus more on farmers’ demanded AD problems. In more details, they unanimously believed that the MAJ has not satisfactorily addressed sustainability in agriculture and maintenance of agricultural lands. Nevertheless, in their view the MAJ has moderately succeeded in three dimensions of AD, which are: designing accurate national developmental plans, providing new learning technology for employees and increasing the extent of allocated funds to agricultural projects and farmers. Experts felt that the majority of problems have extrinsic nature and are not simply solvable by the MAJ alone; instead, in their view, the problems need to be addressed by many involved organizations, institutions and companies if they are to be solved. However, they think that HRD-related problems are most likely solvable by the MAJ alone.

The results of inferential statistical analyses revealed that generally more experienced and educated experts were more susceptible to AD issues and problems. They stressed the necessity of farmer competency development, motivation enhancement and sensitivity to farmers’ age and education level. Additionally, they were more worried about the active participation of the MAJ on the international market, its power of stabilizing the price of agricultural inputs and the effects of political trends on it. However experts who made more contact with farmers were rather optimistic about AD evolution and the role of the MAJ in addressing AD problems. One surprising finding is that experts with higher organizational positions claimed that they have more contact with farmers; while the opposite declaration was expected due to lack of their time to make regular contact with farmers. Further research may investigate and clarify such correlations and underpinning reasons.

As already said, respondents believed that the major focus of MAJ has been on technology delivery to specific and mostly rich, farmers. Due to this fact, smallholders,

who are the majority of farmers in the agro-food sector, were less supported in various aspects. So, AD approaches need to be re-arranged by taking the roles of smallholder farmers and entrepreneurs into account. Moreover, a noticeable link between them and other correspondent private or governmental sectors in agrobusiness should be developed. Therefore, the bottom-up policies in AD and sustainable farming supported by different organizations involved in AD are encouraged. Specifically, the MAJ needs to develop new solid regulations to support sustainability in agriculture and protect the agricultural lands. Employee motivation, international contacts of the MAJ; particularly with NGOs, trustworthiness of the agricultural sector, adequate fund allocation to AD programs and managing the political impacts are the important issues for MAJ to address in the future.

Similarly, the government is advised to dedicate sufficient funding to the MAJ to be used in AD national programs and support the MAJ to control beneficiary dealers by ordaining overarching rules and national regulations. In addition, since, a great number of AD problems are interlocked with many other Ministries and organizations, the government should call other Ministries to implement determined policies in order to solve the problems by close cooperation with all related organizations and sectors. Finally, it is proposed that the same research be performed with a larger respondent population on a national level; if so, the findings of the research in different provinces can be compared with each other and consequently the results will be applicable for the whole country.

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