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Model Sites: A New Direction towards Cooperation among Extension Agents, Field Experts, Researchers, and Farmers

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ABSTRACT

Participatory approaches have been advocated as ways of increasing knowledge through technology transfer to farmers. Model sites as a participatory approach consist of a Main Unit (MU), owned by the extension local assistant or facilitator, and about 25 subordinate units belonging to the surrounding farmers. These sites disseminate technical knowledge through the MU among the subordinate units. This approach seeks to create synergies among researchers, extension agents, field experts, and farmers to improve the quality and quantity of agricultural products. This investigation, carried out in the production units of Extension Local Assistants (ELA) along with the participation of farmers through the dissemination of knowledge, benefits from the results of a survey through researcher-made checklists. The sample population consisted of 724 farmers in Khuzestan Province, Iran, selected through census method, 34 of whom were extension local assistants and the rest (as large as 690) included ordinary farmers. The results showed that the farmers participating in the sites had gained significantly higher quantity and quality of field crops, horticulture, and vegetables production. Degrees of reduction in water consumption, chemical fertilizers, and pesticides application were observed in MU sites and subordinate units. Moreover, in each site, some new technologies were transferred to subordinate farmers. The sites could be considered as demonstration farms for non-member farmers. This study brings new insights into the impact of synergy between all stakeholders in the form of new agricultural extension approach to improve quantity and quality of field crops, horticulture, and vegetables production, using the capacity of local communities.

Keywords: Extension local assistant, Khuzestan Province, Participatory approach, Technology transfer.

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INTRODUCTION

Agricultural development is one of the basic elements of economic, social, and cultural development in any given country. In Iran, the growth in agricultural productivity relies mainly upon natural resources (33%), alternative technologies (30%) and the quality of work and human resources by 35% (Shakeri and Garshasbi, 2008).

The human resources being an essential component of any extension system is limited in public sector. To advance policies related to agricultural extension including diffusion of improved technologies among farmers, governments should rely on other capacities, mainly local farmer communities. This method works more efficiently, especially where formal methods and mechanisms seem to be inefficient (Kormawa *et al.*, 2004).

The farmer-to-farmer extension method relies on group training of farmers for specific skills. These farmers will subsequently act as farmer trainers. The skills of such farmer trainers need improvement through further training organized by

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extension staff. Subsequently, the farmer trainers are persuaded to train other farmers living in the vicinity (Tanui, 2002). The farmer-to-farmer extension has been operational in Nepal since 2001; and the Sustainable Soil Management Program (SSMP) initiated farmer-to-farmer extension approach in 12 districts ever since. The approach has now drawn attention in the national agricultural extension system. To recognize the grass-root level effectiveness of farmer-to-farmer extension, the national agriculture strategy and the three-year-interim plan have provision of extending technologies through farmer-to-farmer approach (Saravanan, 2008). It is worth mentioning that farmer-to-farmer extension is widely used in dry lands of Kenya. Core groups of farmers are selected and trained in practical skills, then, they are expected to establish farm forests on their own farms so as to act as demonstration and teaching fields to their neighbors. This process contains the steps of farmer selection, farmer training, as well as farm forest establishment (Sinja *et al.*, 2004). Another form of farmer-to-farmer approach is applied in Peru within the framework of Practical Action's work. The farmers, known as the Kamayoq, are selected by their communities, receiving specific training and then returning to their villages for training neighboring farmers. They cooperate with other farmers to find solutions to local agricultural and veterinary problems, generally following a participatory technology development approach. Positive results also include an increase in self-confidence among the Kamayoq and those individuals working with them. This further encourages local experimentation (Hellin and Dixon, 2008).

Group extension method has an advantage over mass media due to better feedback, making it possible to reduce some misunderstandings that may develop between an extension agent and a farmer. There is also greater interaction between farmers themselves. Such an interaction provides an opportunity to exchange previous and practical experiences in order to integrate information from farmers and extension agents (Van Den Ban and Hawkins, 1996).

Farmer-to-farmer extension programs date back at least to the 1950s, when the approach was used by the International Institute of Rural Reconstruction in the Philippines (Selener *et al.*, 1997). Such programs are currently quite common in different countries. For example, in Malawi where a survey of 37 extension services indicated that individuals had used some form of farmer-to-farmer extension by 78 percent (Masangano and Mthinda, 2012). The Malawi Ministry of Agriculture single-handedly works with over 12,000 lead farmers. Unexpectedly, as pervasive as these programs are, little has been done to describe them, assess their effectiveness or distill lessons on successful implementation. Despite the fact that there are numerous case studies as to farmer-to-farmer extension programs operating in particular places (e.g., Hellin and Dixon, 2008; Amudavi *et al.*, 2009; Lukuyu *et al.*, 2012), the only document available comparing approaches used by various organizations is that of Selener *et al.* (1997), which draws on examples from Latin America.

Any effective extension model should have the capability of increasing production and productivity (Rivera and Carry, 1998), and be readily available and accessible (Chambers, 1990). Most of the past extension services models in Iran lacked both of these vital requirements and thus proved ineffective. This is due to the lack of sufficient extension staff, unprofitability of providing services, and the complex farming systems (where farmers operate) as well as farmers' inability to pay for the services (Kormawa *et al.*, 2001). Therefore, the main objective of the Model Sites approach is to compensate such major weaknesses (Ssemakula and Mutimba, 2011; Shahpasand, 2017).

In Iran, some renowned people in local community assist extension agents, working as local assistants, facilitators or key farmers. These people support other farmers in case any potential technical issues or problems occur. They act as the Main Unit (MU) in each model site. Other farmers with common activities with the MU are selected as Subordinate Units (SUs). Each site consists of a MU with 20 SU's. The units belonging to ELA are known as MU and the other units under the title of SU (Shahpasand and Ghaffari, 2012). Meanwhile, the technical aspect of each site is supported by researchers, field experts, and extension agents. Recommendations, run on the MU, are implemented by SU in the production units. This approach helps to increase the coefficient coverage of extension activities by approximately twenty-fold.

Local assistants with considerable experiences and technical skills in agriculture, having positive interaction with extension agents and other agricultural producers, may participate in transferring the research findings and technical knowledge. Accordingly, this will help to manage SU's, each of which will further act as a separate MU. The useful outcomes of such a plan are as follows:

1- The efficacy and synergy of different actions is increased through making model sites and accumulation of all activities and services in these sites.

2- Successful designing program under farmers' condition with their participation will spread the model sites

3- All of applicable and suitable recommendations not applied so far will be transferred in certain time periods to most of the beneficiaries (Shahpasand, 2017).

In order to achieve targets and operational coordination among the extension agents, the presence of executive experts and researchers is absolutely necessary. The extension agents and the two other actors should combine their facilities and abilities to cooperate based on pre-planned activities.

Extension and training methods applied at each model site are shown in table 1.

The farmer-to-farmer approach utilizes such ways as field days, demonstrations, exchange visits, training of farmers, mass media, group methods, farmer workshops and extension pamphlets (Franzel *et al.*, 2014). These methods are also used in the model sites.

The following steps are necessary to create a model site:

- Creating working teams including extension agents, researchers, executive experts and farmers, and determining the job description of each and every agent
- Determining the subject and designing operational program
- Determining the best location for the main sites and selecting a qualified extension local assistant for each site
- Choosing the SU around the MU
- Forming the technical supervision group
- Implementing the technical recommendations by working team
- Supervising and monitoring
- Documenting the implementation process and results
- Evaluating the plan effectiveness (Shahpasand, 2012).

The desirable extension strategy

In this plan, dominant approach is based on the activity and cooperation of subgroups, combination and suitable applying of available resources, transfer of science, technical recommendations and findings, technologies and consistent experiments with the aim of the collaborative activities being result-oriented and efficient in a

Table 1. List of activities per site**.**

Row	Activities	Number
1	Extension meeting	20
2	Field monitoring and supervision	3
3	Distribution of technical guidelines	5
4	Distribution of extension publications	140
5	Extension visits	70
6	Staff training	10
7	Workshops for nongovernment companies	10
8	Educational courses for member farmers of the sites	120
9	Research-extension project	1
10	Work done by the private sector	1

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framework of collaborative approach via cooperating with private sectors.

Collaboration of beneficiaries in assessment, planning, implementation and evaluation of plans represents the use of participatory approaches and methods. In this plan, assisting farmers especially unites beneficiaries with average function to be formed with the help of model unites beneficiaries ELA through cooperative methods such as Farmer Field School (FFS) and Participatory Technology Development (PTD).

Cooperation of the beneficiaries with researchers, extension agents, executive experts and progressive farmers should be completely evident in all stages and activities of production unit. Some of the characteristics of this plan include bridging the current gap between research, extension, execution and beneficiaries from their operational units as evaluation of modern technologies, correcting technical recommendations in a way consistent with recourses and the socio-economic situation of farmers, and considering overall situation of operational units through providing technical recommendations. Eventually, applying the collection of technical and empirical findings in these model sites is desired.

The appropriate extension approach in these sites is based on modeling through integrated management of extension methods to be explained subsequently in explanation of functional programs (Figure1).

The basic approach is empowering local communities within themselves (extension local assistant), and increasing coverage coefficient of agricultural extension activities.

MATERIALS AND METHODS

This study was conducted through a survey method. The data were collected via researcher-made checklists in 2014. In fact, the present investigation adopted a comparative survey design to collect perceptual data on the effectiveness of the model sites in Iran, as practiced by other countries, known as farmer-to-farmer extension approach. Comparisons were made between levels of production, consumption of water, chemical fertilizers and

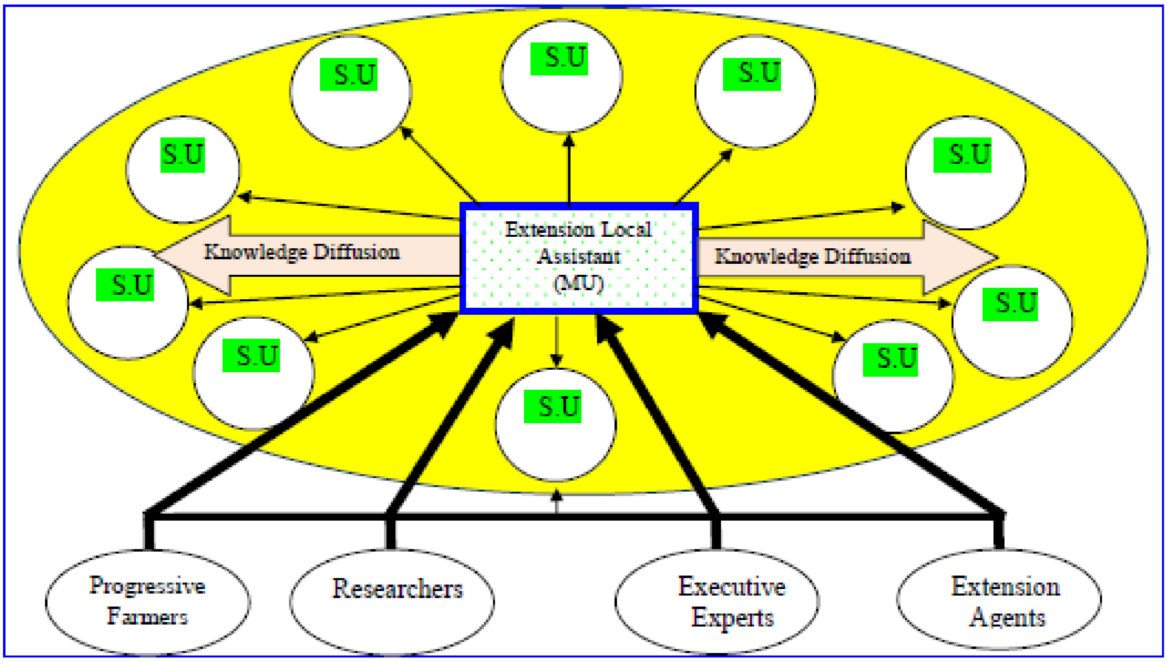

Figure 1. Scheme of the model site.

pesticides before and after applying the model sites by the ELA and the follower farmers SU. Furthermore, comparisons were made based on the participation of researchers and extension agents as well as executive experts.

The collected information was classified as follows:

a) Characterization of the MU and SU in the model sites, including farmers' age, education, farm size, and experience in agriculture.

b) The average farm size of the MU and SU including agronomy, vegetables and horticulture sites.

c) The average yield of crops, vegetables, and horticulture production in SU before and after establishing model sites.

d) The average number of farmers visiting agronomy, vegetables, and horticulture sites.

e) The methods and recommendation in the sites.

f) The average water, chemical fertilizers, and pesticides consumption in the sites.

The population of the present study included 724 farmers in Khuzestan Province in Iran, selected through census. Meanwhile, geographical coverage consisted of all districts and towns. The sampling frame can be summarized in two parts. The MU was selected based on the conditions stipulated in the instructions of model sites (34 people) and the SU on the basis of the type of product and the farmers' interest (690 people), benefiting from the model sites.

Checklists were used to measure the effectiveness of this approach, the farm size, the type of product, the average yield of the agricultural products in the previous year and the test year, number of visitors, reduction of water consumption, reduction of fertilizer utilization, and reduction in the use of pesticides.

RESULTS

The findings of this study suggest that 79.4% of the respondents were young, 20% were relatively young, and 0.6% were middle-aged and above. In term of education, as shown in Table 2, 60% of the respondents had no high-school diploma, 28.4% with diploma, and the rest, 11.6%, were university-educated. Approximately 60% of the respondents had less than 20 years of experience and 39.4% had over 20 years of experience in agriculture with the average of 21 years.

This study proved that a multiplier effect was created when MU passed on the knowledge and skills to SU in the community, as indicated in Table 3. The main and SU's were selected based on specific requirements of the sites guidebook.

Table 3 shows the characteristic of the studied model sites. Clearly, model sites are mainly categorized into 3 different disciplines of agronomy, vegetables, and horticulture located in different cities of Khuzestan Province, and the main cultivated crop. In the column of models sites, the number of MU and SU for each city along with area size in next column is specified.

Each site enjoys 20 S.U on average and a MU that increase the coverage and effectiveness of the extensional activities. The average area of MU in agronomy, vegetables and horticulture sites were 9.6, 4.8 and 5.1 hectares, respectively and the average of SU were 182, 53.8 and 81 hectares, respectively.

However, the average area of SU was significantly different in various sites based on the type of product and region, suggesting that the same products in different regions are different subordinate unit area.

Table 4 along with discipline, city, and crop of the sites shows the number of new techniques applied, performance before and after running the sites, and farmer visitors. The results showed that the highest frequency belonged to wheat production sites and, in all sites, a significant increase in mean yield was observed. Average number of farmers visiting the agronomy, vegetables, and horticulture sites were 52, 65 and 88, respectively. Despite the diversity of numbers and titles, average number of applied new techniques in all

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Table 2. Personal characteristic of the respondents.

Variable	Group	Frequency	Percent	Explanation
Age (years)	Young (Less than 30 years)	574	79.4	Maximum: 67 Minimum: 22 Average: 28.8
	Relatively young (30-50 years)	145	20	
	Old (Above 50 years)	5	0.6	
	Total	724	100	
Education level	Under diploma	434	60	Mode: Under high school diploma
	Diploma	206	28.4	
	Academic Degree	94	11.6	
	Total	724	100	
Years of experience in agriculture	Less than 10 years	220	30.3	Maximum: 52 Minimum: 3 Average: 21
	10 to 20 years	214	29.5	
	20 to 30 years	155	21.4	
	Above 30 years	135	18.7	
	Total	724	100	

Table 3. The characteristic of studied Model Sites.[a]

Row	Discipline	City	Crop	No of models sites		Area size (ha)	
				MU	SU	MU	SU
1	Agronomy	Abdolie	Wheat	1	20	10	250
2		Karoon West	Wheat	1	20	15	240
3		Kut	Canola	1	20	6	64
4		Jahangiri	Rainfed wheat	1	20	10	500
5		Molasani	Wheat	1	20	10	280
6		Allahoakbar	Wheat	1	20	4	188
7		Safhe	Triticale	1	20	12	120
8		Horriahi	Wheat	1	20	20	210
9		Gabir	Rice	1	20	5	125
10		Zidon	Corn	1	20	6	80
11		Chanane	Alfalfa	1	20	14	218
12		Sorkhe	Wheat	1	20	10	230
13		Shamsabad	Wheat	1	20	9	154
14		Dashtlali	Canola	1	20	12	130
15		Jayzan	Wheat	1	20	15	120
16		Raghive	Wheat	1	20	4	75
17		Hoseinabd	Wheat	1	20	6	182
18		Mianab	Wheat	1	20	10	215
19		Halaijan	Rainfed wheat	1	20	5	76
		Mean of discipline		1	20	9.6	182
1	Vegetables	Soltanabad	Vegetables	1	20	3	55
2		Janatmakan	Tomato	1	20	10	30
3		Asiab	Watermelon	1	20	5	75
4		Shavor	Tomato	1	20	12	40
5		Hamidie	Vegetables	1	20	4	50
6		Raghive	Vegetables	1	20	2	54
7		Hoseinabd	Tomato	1	20	2	50
8		Mianab	Tomato	1	20	4	62
9		Marbache	Tomato	1	20	2	68
		Mean of discipline		1	20	4.8	53.8
1	Horticulture	Lur	Apple	1	18	17	270
2		Midavood	Pomegranate	1	24	2	88
3		Bahmanshir	Date Palm	1	20	2	40
4		Abushanak	Date Palm	1	20	3	50
5		Ghalekhaje	Grapes	1	10	3	15
6		Buzi	Date Palm	1	20	5	60
7		Shamsabad	Citrus	1	20	4	44
		Mean of discipline		1	18.8	5.1	81

[a] MU: Main Unit; SU: Subordinate Units.

Table 4. Number of applied new techniques, yield, and farmer visitors in model sites.

Row	Discipline	City	Crop	Applied new techniques	Yield (kg ha^{-1}) Before	After	Farmer visitors
1	Agronomy	Abdolie	Wheat	4	2800	3600	65
2		Karoon West	Wheat	3	3200	3500	50
3		Kut	Canola	2	700	1000	43
4		Jahangiri	Rainfed wheat	2	1500	1680	40
5		Molasani	Wheat	3	3000	3450	60
6		Allahoakbar	Wheat	3	3100	3750	50
7		Safhe	Triticale	2	2000	2220	40
8		Horriahi	Wheat	4	4500	5700	120
9		Gabir	Rice	4	5500	6000	20
10		Zidon	Corn	3	6700	7500	20
11		Chanane	Alfalfa	2	12000	14500	46
12		Sorkhe	Wheat	3	3500	4300	50
13		Shamsabad	Wheat	3	3800	4150	45
14		Dashtlali	Canola	3	1200	1600	64
15		Jayzan	Wheat	3	2800	3450	56
16		Raghive	Wheat	2	3000	3400	70
17		Hoseinabd	Wheat	3	2500	3100	60
18		Mianab	Wheat	2	4000	4600	44
19		Halaijan	Rainfed wheat	3	2600	3100	50
Mean of discipline				3	3600	4242	52
1	Vegetables	Soltanabad	Vegetables	3	30000	36300	62
2		Janatmakan	Tomato	2	25000	31000	65
3		Asiab	Watermelon	4	26000	35000	63
4		Shavor	Tomato	3	35000	41000	60
5		Hamidie	Vegetables	2	22000	25000	53
6		Raghive	Vegetables	3	34000	39000	84
7		Hoseinabd	Tomato	4	22000	26000	65
8		Mianab	Tomato	3	30000	37000	63
9		Marbache	Tomato	4	25000	32000	73
Mean of discipline				3	27667	33589	65
1	Horticulture	Lur	Apple	3	28000	35000	90
2		Midavood	Pomegranate	3	10000	12000	96
3		Bahmanshir	Palm date	4	8200	10800	120
4		Abushanak	Palm date	4	7700	9100	125
5		Ghalekhaje	Grapes	2	27000	33500	45
6		Buzi	Palm date	4	4200	5000	80
7		Shamsabad	Citrus	3	15000	18500	60
Mean of discipline				3	14300	17700	88

sites was 3. In addition, the number of visiting farmers from each site shows that extension activities can increase the number of visiting farmers. It should also be pointed out that sites can be utilized as demonstration farms for other farmers, and that the results of the application of the findings can be seen in the field. This is in line with earlier studies. For example, Simpson and Owens (2002), in their study conducted in Ghana and Mali, found that the farmer-to-farmer extension approach encourages communication between farmers at several levels, thereby creating a multiplier effect. Also, Suranga *et al.* (2011) showed that other farmers in the community were willing to get agricultural advice form the leader farmers.

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The average yield increase in agronomy, vegetables, and horticulture sites were 642, 5,922, and 3,400 kg ha^{-1}, respectively. Accordingly, the findings of this research are consistent with other studies carried out worldwide (Mofakkarul-Islam *et al.*, 2011; Lukuyu *et al.*, 2012; Benjamin 2013; Suranga *et al.*, 2011; Carlberg *et al.*, 2014; Baloch and Thapa, 2016),

As shown in Table 5, researchers, extension agents, executive experts and farmers work together in line with knowledge-based agriculture. Regrettably, participation of agricultural researchers in sites was very low. In 27 out of 35 sites, no researcher reportedly participated.

This finding indicates that further actions should be taken in order to motivate researchers' participation. The participation of extension agents and executive experts in the sites seems to be acceptable in all studied model sites where executive experts and extension agents participated.

Another key finding was that although participation of private sector experts is critical in every agriculture extension activities specifically model sites, no recorded private sector expert participated in the sites. Thus, it seems that some strategies should be designed to involve them actively in the process of performing this approach.

As shown in Table 6, farmers received

Table 5. Participants in model sites.

Row	Discipline	City	Crop	Number of participants			
				Researchers	Executive experts	Extension agents	Farmers
1	Agronomy	Abdolie	Wheat	0	3	2	20
2		Karoon West	Wheat	1	2	2	15
3		Kut	Canola	0	2	1	20
4		Jahangiri	Rainfed wheat	0	1	1	20
5		Molasani	Wheat	0	2	1	20
6		Allahoakbar	Wheat	0	2	1	20
7		Safhe	Triticale	2	1	3	20
8		Horriahi	Wheat	2	3	2	20
9		Gabir	Rice	1	3	2	20
10		Zidon	Corn	0	2	2	20
11		Chanane	Alfalfa	0	2	2	20
12		Sorkhe	Wheat	0	2	2	20
13		Shamsabad	Wheat	0	2	2	20
14		Dashtlali	Canola	0	2	2	20
15		Jayzan	Wheat	0	2	2	20
16		Raghive	Wheat	0	2	2	20
17		Hoseinabd	Wheat	0	2	2	20
18		Mianab	Wheat	0	2	2	20
19		Halaijan	Rainfed wheat	0	2	2	20
1	Vegetables	Soltanabad	Vegetables	0	2	1	20
2		Janatmakan	Tomato	0	2	2	20
3		Asiab	Watermelon	0	2	1	20
4		Shavor	Tomato	0	2	2	20
5		Hamidie	Vegetables	0	3	2	20
6		Raghive	Vegetables	0	2	2	20
7		Hoseinabd	Tomato	0	2	1	20
8		Mianab	Tomato	0	2	2	20
9		Marbache	Tomato	0	2	2	20
1	Horticulture	Lur	Apple	1	3	2	18
2		Midavood	Pomegranate	0	3	2	24
3		Bahmanshir	Palm date	1	2	3	20
4		Abushanak	Palm date	1	2	3	20
5		Ghalekhaje	Grapes	0	2	2	10
6		Buzi	Palm date	0	2	2	20
7		Shamsabad	Citrus	2	2	2	20

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recommendations developed by researchers and executive experts on the basis of experience or research findings. Recommendations were presented based on product type and season, farmers' understanding and education, leading to offering different advice to farmers.

All methods were tried to apply in each site, yet, sad to say, it failed to function properly due to environmental and farmers' conditions.

Table 6 also shows that apart from increase in product yields, the sites reduced consumption of water, fertilizers, and pesticides. The average of water consumption decreased in agronomy, vegetables, and horticulture sites by 20, 30, and 25%, respectively. The research also confirms the role of extensional activities in the adoption of technologies to increase water productivity (Namara, *et al.,* 2007; Mangisoni, 2008: Zhou *et al.,* 2008; Afrakhteh *et al.,* 2015).

In order to produce a healthy product, the average reduction in fertilizer consumption in agronomy, vegetables and horticulture sites were 20, 30 and 35%, respectively. The findings of some previous studies also confirm this point (Shahpasand, 2015; Abdoulaye and Sanders, 2005; Ajewole, 2010; Okoedo-Okojie and Aphunu, 2011; Freeman and Omiti, 2003; Yu *et al.,* 2009). Meanwhile, it must be noted that the average reduction in consumption of pesticides in agronomy, vegetables, and horticulture sites were 20, 35 and 40%, respectively. This is confirmed by other researches (Asiabaka 2002; Praneetvatakul and Waibel, 2006; Zuger 2004; Mancini *et al.,* 2006).

CONCLUSIONS

In many countries, the limitation of human resource is an important factor reducing the coverage coefficient of extensional activities. In this case, extension managers should attempt to use local community capacities. For any extension model to be effective, it is imperative to improve production and productivity. At the same time, it should readily be available and accessible. Past models of extension services lacked both of these vital requirements and thus proved ineffective. The model site is an extension approach aiming to address these weaknesses.

The present study revealed that a) the major players in the model sites were Extension Local Assistants (ELA) as: (a) MU; (b) The MU had similar socio-economic characteristics in terms of age, education, size of farms and years of experience in agriculture; (c) MU had community roles such as local and technical leadership that enhances social communication networks; (d) Increased understanding and uptake of research findings and technical knowledge; (e) Decreased consumption of water, chemical fertilizer, and pesticides; and (f) Increased food production. Results also showed that each site contained 20 SU and one MU, increasing the coverage of the extensional activities. The average area of MU agronomy, vegetables, and horticulture were 9.6, 4.8 and 5.1 ha, respectively, while the average areas of SU's were 182, 53.8 and 81 ha, respectively.

The highest frequency belonged to wheat production sites, and a significant increase in the mean yield was observed in all the sites. The average yield increase of agronomy, vegetables, and horticulture sites were 642, 5,922 and 3,400 kg ha^{-1} and the average numbers of individuals who visited the agronomy, vegetables, and horticulture sites were 52, 65 and 88. Despite the diversity of numbers and titles, the average number of applied innovations in all sites was 3. Collaboration of researchers, extension agents, executive experts and farmers was in line with knowledge-based agriculture. Regrettably, researchers' participation in sites was unexpectedly weak.

The aforementioned recommendations have been developed by researchers and executive experts on the basis of experience or research findings. The methods were based on instruction provided on the site.

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Table 6. Specific results in model sites.

Row	Discipline	City	Crop	Topic recommendations	Methods used	Consumption: Water	Consumption: Pesticide and fertilizer
1	Agronomy	Abdolie	Wheat	Using Bio fertilizers- conservation tillage -recommended density - using varieties resistant to salinity - observe the planting date - direct planting - suitable density -organic sulfur fertilizer - using new crop seeds- irrigation drip – Rain - crop rotation- irrigation management - nutrition management - chemical weed control management - non-chemical pest and diseases management	Extension meeting, field monitoring and supervision, Distribution technical guidelines and extension publications, extension visits, staff training, Workshops for nongovernment companies, educational courses for sites' member farmers, research-extension project	20% reduction	20% reduction in the consumption of chemical fertilizers - 20% reduction in pesticide use
2		Karoon West	Wheat				
3		Kut	Canola				
4		Jahangiri	Rainfed wheat				
5		Molasani	Wheat				
6		Allahoakbar	Wheat				
7		Safhe	Triticale				
8		Horriahi	Wheat				
9		Gabir	Rice				
10		Zidon	Corn				
11		Chanane	Alfalfa				
12		Sorkhe	Wheat				
13		Shamsabad	Wheat				
14		Dashtlali	Canola				
15		Jayzan	Wheat				
16		Raghive	Wheat				
17		Hoseinabd	Wheat				
18		Mianab	Wheat				
19		Halaijan	Rainfed wheat				
1	Vegetables	Soltanabad	Vegetables	Pheromone traps - traps light - organic fertilizer - biological control - The use of beneficial insect - Mechanized cultivation- irrigation management- Nutrition management - chemical weed control management - non-chemical pest and diseases management		30% reduction	30% reduction in the consumption of chemical fertilizers - 35% reduction in pesticide use
2		Janatmakan	Tomato				
3		Asiab	Watermelon				
4		Shavor	Tomato				
5		Hamidie	Vegetables				
6		Raghive	Vegetables				
7		Hoseinabd	Tomato				
8		Mianab	Tomato				
9		Marbache	Tomato				
1	Horticulture	Lur	Apple	Irrigation management- nutrition management - biological control- organic fertilizer - drip irrigation - chemical weed control management - non-chemical pest and diseases management		25% reduction	35% reduction in the consumption of chemical fertilizers - 40% reduction in pesticide use
2		Midavood	Pomegranate				
3		Bahmanshir	Palm date				
4		Abushanak	Palm date				
5		Ghalekhaje	Grapes				
6		Buzi	Palm date				
7		Shamsabad	Citrus				

The model sites approach caused reduction in the consumption of water and fertilizers as well as pesticides. The average reductions in water consumption in agronomy, vegetables, and horticulture sites were 20, 30, and 25%, respectively, suggesting increase in water use efficiency. The decrease in average consumption of chemical fertilizers in agronomy, vegetables and horticulture sites were 20, 30, and 35% and the average consumption of pesticides decreased by 20, 35, and 40%.

Therefore, the following recommendations are noteworthy: (a) In selection of Extension Local Assistants (ELA) as the MU, social closeness should be considered as a criterion for identifying the appropriate individuals; (b) Farmers with more social roles in the community should be considered as ELA since they have a better chance of interacting with the other farmers; (c) Communities should be involved in the selection of ELA to ensure their accountability; (d) To prevent social exclusion, ELA should be appropriately trained to handle farmers of different social status.

Considering the low cost of setting up a site, approximately $ 2,000, the model site seems to be quite economical. Therefore, it is recommended that developing countries apply this approach for disseminating technical knowledge and research findings to rural areas.

This approach creates a new social identity for the ELA working in MU in rural communities. In this social structure, model site can be pursued for different objectives based on the local and regional conditions. In addition, the efficiency of extension activities will increase significantly.

Subsequently, a favorite SU can be converted to MU to create another site. In these new sites, the subordinate units should be chosen from surrounding farmers who had visited the site in previous years.

After several years, all farmers can be covered adopting this approach. This helps them to acquire the technical knowledge and research findings and, accordingly, improve their living conditions. Members of the site can establish a production association, enabling them to commonly purchase their inputs, sell their products and earn more profit. Even with the group production, they can gain favorable positions in local and regional markets. Although not all the steps of creating a model site were executed in the application of this research, the results were acceptable. It is expected to achieve better results via taking all envisaged measures.

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سایت الگویی: رویکردی نوین در همکاری بین کارکنان ترویج، کارشناسان اجرایی، محققان و کشاورزان

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چکیده

رویکردهای مشارکتی روشی برای افزایش دانش کشاورزان از طریق انتقال تکنولوژی است. سایت‌های الگویی به عنوان یک رهیافت مشارکتی متشکل از یک واحد اصلی(مددکار ترویج یا تسهیلگر روستایی) و حدود ۲۵ واحد تابعی متعلق به کشاورزان اطراف هستند، که انتشار دانش فنی از طریق واحد اصلی در بین واحدهای تابعی صورت می‌گیرد. این رهیافت سعی در ایجاد هم‌افزایی میان محققان، کارشناسان ترویج، کارشناسان اجرایی و کشاورزان به منظور بهبود وضعیت تولید کشاورزان را دارد. مطالعه حاضر با هدف بررسی تاثیر برنامه‌های سایت‌های الگویی، بر کیفیت و کمیت محصولات

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زراعی، باغی و سبزیجات در استان خوزستان انجام شده است. تحقیق حاضر به روش پژوهش میدانی و از طریق چک‌لیست‌های محقق-ساخته انجام شده است. جمعیت نمونه شامل ۷۲۴ کشاورز از استان خوزستان بودند که به روش سرشماری انتخاب شدند، ۳۴ نفر از آنها مددکار ترویجی و ۶۹۰ نفر دیگر شامل کشاورزان واحدهای تابعی بودند. نتایج نشان داد که تولیدات کشاورزان شرکت کننده در این سایت‌ها، از نظر کمیت و کیفیت نسبت به سایر کشاورزان شرایط بهتری داشتند، همچنین در زمینه میزان کاهش مصرف آب، کودهای شیمیایی و استفاده از آفت‌کش‌ها عملکرد سایت‌ها قابل توجه بود .علاوه بر این، در هر سایت، برخی از فناوری‌های جدید به کشاورزان واحدهای تابعی منتقل شدند. از طرفی این سایت‌ها می‌توانند به عنوان مزارع نمایشی برای سایر کشاورزان مورد استفاده قرار گیرد. این مطالعه می‌تواند موید یک بینش جدید در مورد تاثیر هم‌افزایی بین همه ذینفعان در قالب یک رهیافت نو در توسعه کشاورزی برای افزایش کمیت و کیفیت محصولات و استفاده از ظرفیت جوامع محلی باشد.