



ALTERNATIVE APPROACHES OF AGRICULTURAL EXTENSION FOR DISSEMINATION OF SUSTAINABLE AGRICULTURAL DEVELOPMENT IN EASTERN LIBYA

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ABSTRACT

Agricultural extension as a source of information plays an important role for the achievement of sustainable agricultural development. The main objectives of the present study of sustainable agricultural development were to determine the impact of alternative approaches on agricultural extension in Eastern Libya. A quantitative research methodology was adopted in this study. Using a questionnaire developed following an extensive literature review, a cross sectional survey was undertaken in the Eastern Libya areas from June to September 2011. A total of 46 managers and deputy directors, were approached for this study. Based on the results analysis, on the variables set, participatory approach, farmers' field schools approach, public– private extension approach, had the most impact upon sustainable agricultural development. Most of respondents were believed that the important of alternative approaches for achieving sustainable agricultural development as follow, Transfer of research results to farmers and agricultural extension staff (87.0 %), Participation in the reform of agricultural markets to stabilize farmers' incomes (80.4 %), Support of micro-credit institutions especially through linkages with commercial banks. (84.8 %). Finally, re-thinking in management components is mandatory and we must strive to find new functions, strategies and objectives for agricultural extension systems toward sustainable agriculture development.

KEYWORDS: Agricultural extension, alternative approaches, sustainable agriculture development, Eastern Libya.

INTRODUCTION

Agricultural extension services are the bedrock of agricultural development; however, the development of the sector cannot be achieved without an efficient and effective extension system. Thus there is a need for a well articulated and comprehensive agricultural extension policy, which depends on decentralisation and pluralism to develop agricultural extension systems (Omar *et al.*, 2011). Worldwide, agricultural extension systems are struggling to prove their importance and relevance to sustainable agricultural development. Achievement of a well-organised extension system for efficient and effective extension delivery in all aspects of sustainable agriculture and rural development would attain food security, poverty reduction, rural empowerment and environment management. In addition, farmers also need to be convinced that achieving such production systems for future generations is crucial. It is necessary to find a way to prioritise different programmes and goals and then allocate resources towards those goals (Omar *et al.*, 2012). Therefore the proposed plan recognises the importance of improving the role of extension in sustainable agricultural development to meet higher production targets and achieve higher incomes for farmers (Jamahiriya, 2006). The public sector extension approach has been historically the dominant extension model throughout the world and it has usually been a key extension of organisations within and reporting to the Ministry of Agriculture. It functions at two levels: the ministry or national level and the implementation level in governorates, districts and villages (Rivera *et al.*, 1997).

Both of these are top-down approaches and the major aim is to transfer the technology to farmers. These top-down approaches create a rigid hierarchy, which discourages the feedback of information to agricultural extension programs. Researchers work independently of farmers and field staff, resulting in a poor understanding of the opportunities and constraints the farmers face (Cho *et al.*, 2004a). Therefore need to alternative approaches currently, there are public extension approaches at various stages of agricultural development and implementation in the world. However, fundamental changes will be needed in many of the bureaucratic and attitudinal foundations embodied in most state-run agricultural extension programs. So instead of trying to modify the “best fit” extension approach for a particular country, the reality is that various approaches are being used in most developing countries. Therefore, agricultural extension approaches are the most important and the primary vehicles with an important role to play in the sustainable agricultural development process and this includes the following (Figure 1):

A. the participatory approach

The participatory approach is a framework for extension staff to participate with farmers in facilitating development planning and activity implementation in a local region. This helps in strengthening farmers' problem-solving abilities from the start. In relation to sustainable agricultural development, the existence of a local management and a decentralised administration is a precondition (Okorley *et al.*, 2009). Achieving a participatory approach entails delegating roles to the local

committees (local leaders, farmers' organisations and agricultural credit organisations) so that they can contribute to the planning and implementation of agricultural extension programs (Rivera *et al.*, 2004). Therefore farmers' organisations (cooperative societies) locally indulge in financial contributions to help members in need with loans, which are repayable at the stipulated time according to the rules and regulations guiding credit system of the agricultural credit organisations (Adejo *et al.*, 2012). Also, studies showed that a participatory approach made extension more effective, led to agricultural growth, and realised high rates of return. This is because extension field staff uses a variety of extension methods for the effective dissemination of agricultural knowledge and skill to the farmers' groups to achieve sustainable agricultural development. It was concluded that agricultural extension programmes related to crop agricultural production were disseminated in a very good manner after decentralisation (Chaudhry *et al.*, 2006). Farm and home visits were perceived as very good for delivering the agricultural extension message to farmers among individual contact methods. Under the decentralised agricultural extension system among the group contact methods farmer-training meetings were perceived as very good (Chaudhry *et al.*, 2006).

B. The farmers' field schools approach

Field schools are a method of learning, technology development, and dissemination based on adult-learning principles such as experiential learning. One of the hopes of the extension approach is that the field schools will serve as a platform for improved exchanges and more constructive relationships between farmers, extension agents, researchers, and other organisations (Witt *et al.*, 2008). Therefore, training courses are provided for employees and farmers focusing on sustainable agricultural development through field schools (classroom training and on-farm and field visits), in coordination with

education organisations, farmers' organisations and agricultural credit organisations (Barrick *et al.*, 2009).

C. The public– private extension approach

The basic characteristic of this approach is that the production system is vertically integrated from the input supply to the technology adoption and marketing of the produce. This enables the agricultural firms to promote their products and match their supplies with real demands for farm inputs; and to organise a joint task force to prepare and publish specially tailored principles of agricultural extension material for display and distribution by the private advisory firms as leaflets and posters, and research results to cooperate in funding and organising a well founded system (Al-rimawi *et al.*, 2002). There is no way the private sector organisations can effectively provide extension services without the assistance of the public sector and also from agricultural development organisations, because they already have well-trained personnel and infrastructure in place (Davis *et al.*, 2003).

Area of Study

The study focused on the eastern part of Libya, which relies on rain-fed and irrigated crops and livestock. Altogether there are 1350 farms which are grouped into six major agricultural regions: Tubruq, Derna, Al Bayda, Al Marj, Benghazi and Ajdabiya. Most of the arable land and pastureland of Libya is in the eastern parts of the coastal belt. Grains are grown and some livestock is grazed to a lesser extent in the southeast area. Cultivation is sporadic and dependent on rainfall (Laytimi, 2002). Several small and medium-sized stone fruit tree plantations are present. Principal crops produced include vegetables, fruits, wheat, barley and dates while principal livestock include sheep and goat flocks which are relatively large. Many camels, cows and poultry farms are also observed. Agriculture infrastructure, machinery and agricultural extension service centres are present across the eastern area (FAO,2011).

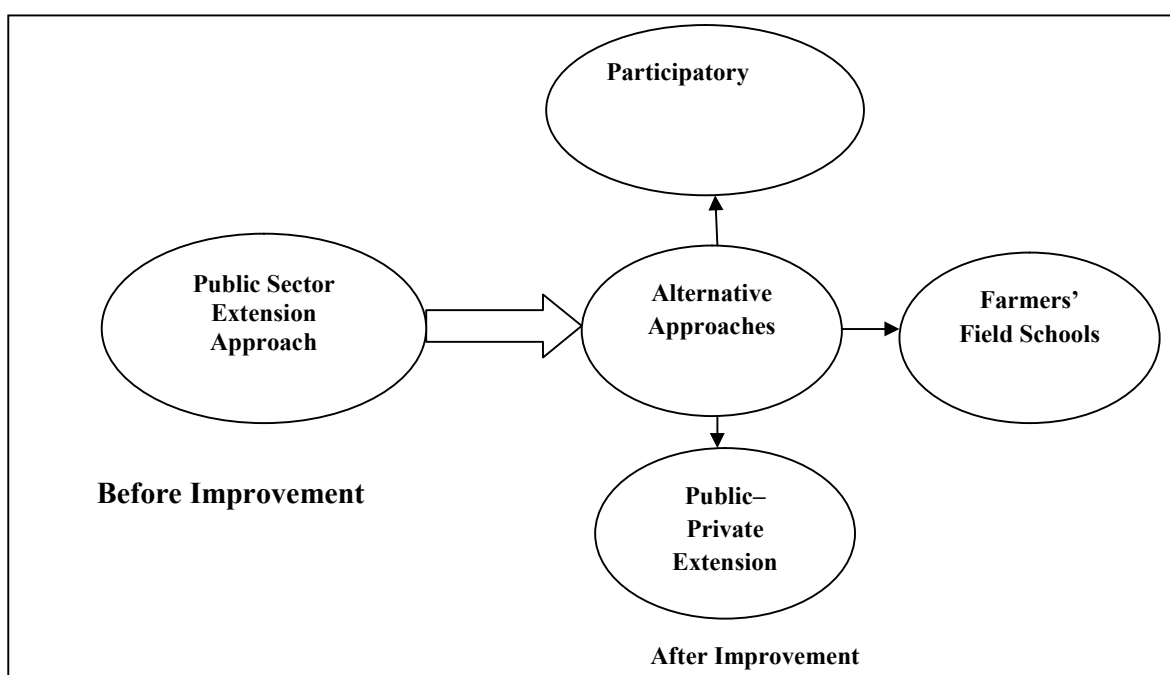


FIGURE 1: Alternative extension approaches that contribute in the dissemination of sustainable agricultural development

METHODS

The survey was divided into six areas, namely Tubruq, Derna, Al Bayda, Al Marj, Benghazi and Ajdabiya in eastern Libya. Data were collected through the use of questionnaires on a sample of agricultural extension managers in the study area. A total of 46 managers and deputy directors were involved. The questionnaire consisted of several categories of questions. To indicate the level of agreement, a five-point Likert scale was used, where 1 = *strongly agree*, 2 = *agree*, 3 = *neutral*, 4 = *disagree*, and 5 = *strongly disagree*. Both non-parametric statistical tests and the appropriate descriptive statistics were performed using the statistical package for social sciences (SPSS®) for Windows, version 16, from June to September 2011.

RESULTS

The main purpose of this study is to explore new approaches in order to achieve sustainable agricultural development, as follows:

1. The Role of participatory approach in Achieving Sustainable Agricultural Development

Active participation of the different organizations is an essential factor for sustainable agricultural development. Table (1) presents the differences in specialists' opinions about the performance of extension activities after Rely on

Participatory approach. While considered of 65.2% ($n=30$), that performance is high with transfer of responsibilities and programme planning, management and co-financing to agriculture sector management in the region. Also, 67.4% ($n = 31$) believed that performance was high with Delegate the local committees (local leaders, farmers' organizations and agricultural credit organizations) for the dissemination of sustainable agricultural development programmes and for the collection of taxes and financial charges from the farmers due to the extension services and loans , while 87% ($n = 40$) of members of the study agreed on establishing regular networks to facilitate the exchange of knowledge between farmers under the supervision of farmers' organisations. In addition, 84.8% ($n = 39$) agreed with support of micro-credit institutions especially through linkages with commercial banks that would enhance credit delivery to farmers. As can be seen from Table (1), the highest mean refers to the use of Transfer responsibilities and program planning, management and co-financing to agriculture sector managements in the region (Mean = 4.07, SD =0.698) and the lowest mean refers to establishing regular networks to facilitate the exchange of knowledge between farmers under the supervision of farmers' organizations (Mean = 4.00, SD=0.365).

TABLE 1: The Role of participatory approach in Achieving Sustainable Agricultural Development

Item in Question	SD n (%)	DS n (%)	N n (%)	A n(%)	SA n (%)	mean	SD
1	00(00%)	2(4.3%)	4(8.7%)	30(65.2 %)	10(21.7%)	4.07	0.698
2	00(00%)	2(4.3%)	5(10.9%)	31(67.4%)	8(17.4%)	4.04	0.683
3	00(00%)	00(00%)	3(6.5%)	40(87%)	3(6.5%)	4.00	0.365
4	00(00%)	00(00%)	3(6.5%)	39(84.8%)	4(8.7%)	4.02	0.394

Note: SD strongly disagree; DS disagree; N neutral; A agree; and SA strongly agree

Question 1: How can Participatory approach of perform an important role in the development of sustainable agricultural development?

- 1- Transfer responsibilities and program planning, management and co-financing to agriculture sector managements in the region.
- 2- Delegate the local committees (local leaders, farmers' organizations and agricultural credit organizations) for the dissemination of sustainable agricultural development programmes and for the collection of taxes and financial charges from the farmers due to the extension services and loans.
- 3-Establishing regular networks to facilitate the exchange of knowledge between farmers under the supervision of farmers' organizations.
- 4- Support of micro-credit institutions especially through linkages with commercial banks that would enhance credit delivery to farmers.

2. The Role of Field schools approach in Achieving Sustainable Agricultural Development

Agricultural extension could play a key role in fostering sustainability through its Educational programmes but there has been a growing realisation that traditional agricultural extension approaches have not been sufficiently effective in promoting the adoption of

sustainable agricultural development. It is clear from the results in Table (2) that the proportion of 87% ($n=40$) of the members of the study agreed on the importance of developing and modifying curricula that use appropriate communication strategies, methods and media to reach farmers and share information with them, as 80.4% ($n = 37$) agreed when they were asked about preparing and training newly graduated agricultural employees and rehabilitating them scientifically and professionally for sustainable agricultural development, Additionally, 63% ($n = 29$) believed that performance is high with the provision of training courses for employees and farmers focusing on sustainable agricultural development through field schools (classroom training and on-farm and field visits), by coordination with educational organizations (universities and research centers), As can be seen from Table (2), the highest mean refers to the use of providing training courses for employees and farmers focusing on sustainable agricultural development through field schools (classroom training and on-farm and field visits), by coordination with educational organizations (universities and research centers) (Mean = 4.07, SD =0.712) and the lowest mean refers to Develop and modify curricula that use appropriate communication strategies, methods, and media to reach farmers and share information with them (Mean = 4.00, SD=0.362).

TABLE 2: The Role of Field schools approach in Achieving Sustainable Agricultural Development

Item in Question	SD n (%)	DS n (%)	N n (%)	A n(%)	SA n (%)	mean	SD
1	00(00%)	00(00%)	2(4.3%)	40(87%)	4(8.7%)	4.00	0.362
2	00(00%)	1(2.2%)	3(6.5%)	37(80.4%)	5(10.9%)	4.04	0.516
3	00(00%)	2(4.3%)	4(8.7%)	29(63%)	11(23.9%)	4.07	0.712

Note: SD strongly disagree; DS disagree; N neutral; A agree; and SA strongly agree

Question 2: How can Field schools approach of perform an important role in the development of sustainable agricultural development?

- 1- Develop and modify curricula that use appropriate communication strategies, methods, and media to reach farmers and share information with them.
- 2- Preparing and training newly graduated agricultural employees and rehabilitating them scientifically and professionally for sustainable agricultural development.
- 3- Providing training courses for employees and farmers focusing on sustainable agricultural development through field schools (classroom training and on-farm and field visits), by coordination with educational organizations (universities and research centers).

3. The Role of public– private extension approach in Achieving Sustainable Agricultural Development

The agricultural extension is concerned with alternative means of financing agricultural extension and the ways in which different financial mechanisms may influence the

type of extension services offered to farmers. The results table (3) also revealed that only 76.1% ($n = 35$) agreed with the collection of fees from farmers for agricultural extension services. Also, 80% ($n = 37$) agreed on participation in the reform of agricultural markets to stabilise farmers' incomes. while 65.2% ($n = 30$) thought that performance is high with contracting the private sector to provide agricultural equipment in the provision of extension services, as well as in re-employment of retrenched field staff and deployment of more better-trained and adequately remunerated staff (table 3). As can be seen from this table (3), the highest mean refers to Contracting the private sector to provide agricultural equipment in the provision of extension services, as well as in re-employment of retrenched field staff and deployment of more better-trained and adequately remunerated staff (mean = 4.04, SD = 0.699), and the lowest mean refers to Participation in the reform of agricultural markets to stabilise farmers' incomes (mean = 3.89, SD = 0.515).

TABLE 3: The Role of public– private extension approach in Achieving Sustainable Agricultural Development

Item in Question	SD n (%)	DS n (%)	N n (%)	A n(%)	SA n (%)	mean	SD
1	00(00%)	2(4.3%)	5(10.9%)	35(76.1%)	4(8.7%)	4.00	0.605
2	00(00%)	1(2.2%)	2(4.3%)	37(80.4%)	6(13%)	3.89	0.515
3	00(00%)	2(4.3%)	5(10.9%)	30(65.2%)	9(19.6%)	4.04	0.699

Note: SD strongly disagree; DS disagree; N neutral; A agree; and SA strongly agree

Question 3: How can public– private extension approach of perform an important role in the development of sustainable agricultural development?

1. Collection of fees from farmers for agricultural extension services.
2. Participation in the reform of agricultural markets to stabilise farmers' incomes.
3. Contracting the private sector to provide agricultural equipment in the provision of extension services, as well as in re-employment of retrenched field staff and deployment of more better-trained and adequately remunerated staff.

DISCUSSION

Agricultural extension is crucial for sustainable development in the agricultural sector of eastern Libya, so there is a need to legislate for agricultural extension policy to ensure it is well organized and financially stable so that it will be effective and will have a sustained impact. Thus a clear legal framework should be provided. Also, agricultural universities and research institutes also have an active role to play in development activities by

providing training courses for employees and farmers focusing on sustainable agricultural development through field schools (classroom training and on-farm and field visits)(Davis *et al.*, 2010). With regard to training programmes in Eastern Libya, in the process of developing the agricultural sector, conducting training and offering agricultural extension programmes that meet local standards are crucial for sustainable agricultural development, for example to prepare and train newly graduated agricultural employees and to rehabilitate them scientifically and professionally for sustainable agricultural development(Cho *et al.*, 2004b).Therefore curricula that use appropriate communication strategies, methods, and media must be developed and modified to reach farmers and share information with them (Lopez *et al.*, 2002). So, other intervention measures include providing effective information dissemination to farmers, improvement in technology delivery mechanisms and increasing outreach such as making technology component farmer specific. Others are decentralization of agricultural technology delivery institutions, enhancing farmer's managerial ability especially through farmers'

organizations and reforming agricultural markets to stabilize income of farmers. In addition, regular networks should be established to facilitate the exchange of knowledge between farmers under the supervision of farmers' organizations (Van *et al.*, 2000). Also providing adequate and stable funding for agricultural extension in eastern Libya through the establishment of farmers' cooperatives for the collection of fees from farmers for agricultural extension services is one of the most important of the major strategies for sustainable agricultural development. In addition, micro-credit institutions should be supported, especially through linkage with commercial banks that would enhance credit delivery to farmers (Chukwuone, 2006). Therefore devolution can take place by transferring the responsibilities of co-financing to agricultural sector in the region. Also, the collection of taxes and financial charges from the farmers due to the extension services and loans can be delegated to local committees (local leaders, farmers' organizations, and agricultural credit organizations) (Ozor, 2009). In addition, the private sector can be contracted to provide agricultural equipment in the provision of extension services, as well as in the re-employment of retrenched field staff and deployment of more well-trained and adequately remunerated staff (Bardon *et al.*, 2009).

CONCLUSION

the findings also indicated the adoption of this organisational model in agricultural development programmes usually requires adaptations to be made in order to meet the needs of agricultural extension approaches (participatory approach, farmer field schools' approach and public– private extension approach), but its relevance is closely related to the importance attached to participative sustainable agricultural development. In order to achieve these linkages there is the need to restructure new expertise and skills and a new set of operational procedures; which are less hierarchical and more flexible, to respond to the emerging needs of farmers at the local level; and to improve the cooperation among the management of agricultural extension and other organisations. Although different organisations' involvement is essentially arranged with and through agricultural extension, direct mutual communication mechanisms between the various organisations operating in Eastern Libya should be encouraged. Also Personnel in both the agricultural extension management and at the support organisations should collaborate to plan and implement sustainable agricultural development programmes. This is because the advisory planning committees should have representatives from agricultural extension management and support organisations. In addition, some facilitating measures include the establishment of a revolving credit mechanism as part of the extension programmes. Also, giving tax support to farmers' organisations (cooperatives) especially through linkage with agricultural credit organisations would enhance credit delivery to farmers. Training for the staff of farmers' organizations on agricultural extension programmes is also required. In addition, the formation of integrated groups between researchers, field staff and farmers for training in the field schools is proposed.

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