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## **The impact of organizational characteristics on agricultural extension in eastern Libya: toward reorganization for sustainable agricultural development**

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The agricultural extension services can play a crucial role in providing this network of information on sustainable agricultural education. However, the effectiveness of public extension has gradually decreased in recent years. The main objectives of the present study of sustainable agricultural development were to determine the impact of organizational characteristics 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 2010. According to factor analysis, organizational characteristics were categorized into 5 groups consisting of agricultural extension policies, financial resources, communication mechanisms, training programmes and system of rewards and incentive. A total of 46 managers and deputy directors, were approached for this study. Most of respondents were believed that the important of organizational characteristics of agricultural extension for achieving sustainable agricultural development as follow, the multiple and diverse partnership (73.9 %), agreements between the management of agricultural extension and private sector organizations (73.9 %), mutual interest. (76.1 %), providing of in-service training programmes (82.6 %) and medals and certificates (80.4 %). This study concluded that the investigating the relationship between organizational characteristics which have necessary roles in agricultural extension with important contribution of sustainable agricultural development in Eastern Libya. This issue provides a strong indication to agricultural extension management about the importance of the strategic role of organizational characteristics.

**Key words:** Organizational characteristics, agricultural extension, sustainable agricultural development, eastern Libya.

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## **Introduction**

The agricultural development projects aims at improving the living condition of farmers in rural areas. This is attained by increasing the agricultural areas available to them, land development and by improving the productivity of crops through introduction of improved dry land farming practices, planting of fruit trees, providing support to the agricultural extension service, development of the rural water resources, providing support to the animal husbandry program, improvement of utilization of feed and support to the rural development program in the project area. The study focused on the eastern part of Libya that relies on rain-fed and irrigated crops, and livestock; there were all together 2938 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). Moving from Tubruq to Benghazi (East to West), across the 'Green Mountains', there is a visible gradient of increasing rainfall, water availability and agricultural activities. Particularly, the plateau between Al Bayda and Al Marj (approx. 100 km by 20-30 km) is covered with large barley fields and wind break tree lines. From Al Marj to Benghazi (coastal plain) the landscape is drier with barley fields and grazing areas. While From Benghazi to Ajdabiya is drier area with grazing areas and Palm Farms in Jalu and Awjlah (FAO, 2011).

## **Materials and methods**

The quantitative method was used. The survey divided into six areas namely of Tubruq, Derna, Al Bayda, Al Marj, Benghazi and Ajdabiya in Eastern Libya. Data collected through the use of questionnaires on a sample of population involved in agriculture in the study area. Data collected through the use of questionnaires on a sample of population involved in agriculture in the study area. A total of 46 of managers and deputy directors (Agricultural Extension Management) are involved. The questionnaire consisted of several categories of questions. Part I: Demographic information such as age, gender, level of education, present position in the organization, work experience. Part II: Organizational characteristics (extension policies, financial resources, communication mechanisms, training programmes and reward system). 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 2010. To assess the content

validity of the questionnaire, the preliminary version, consisting of 12 items for managers and deputy directors, was reviewed by five academicians and ten PhD students in Universiti Sains Malaysia. These professionals were asked to provide their overall opinion of the questionnaire and to list the questions in the order of their relevance and importance. The more relevant and important questions were thus highlighted. To assess the face validity of the questionnaire, fifteen participants were solicited, who were asked for their views on the significance, worth, and simplicity of each question; they were also asked to identify any questions which, in their view, should be removed so as to make the questionnaire simpler. In addition to this, the participants were also invited to make further comments on whether the questions were easily comprehensible or not. Most of them suggested simplifying the questions. The reliability test was applied to all the variables comprising all domains. The reliability of the tool was estimated on the basis of Cronbach's Alpha ( $\alpha = 0.73$ ). Each section of the questionnaire included a set of statements for which responses were requested. These were questions which required a “yes” or “no” response. To indicate the level of agreement a 5-point Likert scale was used, where 1 = *strongly agreed*, 2 = *agreed*, 3 = *neutral*, 4 = *disagreed*, 5 = *strongly disagreed*.

## **Results**

### ***The organizational characteristics for sustainable agricultural development***

The importance of organizational characteristics highlighted by this study focus on five areas: policies, financial sustainability, communication, training programmes, and reward systems, as follows:

### ***Agricultural extension policies for sustainable agricultural development***

Agricultural extension policies play important roles in sustainable agricultural development. There should be promotion of participation of the low level staff in the management of agricultural extension in usual decisions and provision of an independent budget for operating expenses 80.4 % ( $n = 37$ ) agreed with the perceived roles. Also 73.9 % ( $n = 34$ ) agreed there should be multiple and diverse partnership between the management of agricultural extension and other organizations in planning and implementing programmes of agricultural extension to achieving of sustainable agricultural development. Of respondents, 76.1 % ( $n = 35$ ) agreed one of the most important solutions is providing a clear legal framework for the implementation of decentralization and pluralism in programmes of agricultural extension Table

1. As can be seen from this Table 1, the highest mean refers to the multiple and diverse partnership between the management of agricultural extension and other organizations in planning and implementing programmes of agricultural extension in order to achieve sustainable agricultural development (Mean = 3.96, SD = 0.515) and the lowest mean refers to The promotion and the participation of the low level staff in the management of agricultural extension in the usual decisions and providing an independent budget for operating expenses (Mean = 3.93, SD = 0.442).

**Table 1.** Agricultural extension policies

Item in questionnaire	Responses					Mean	SD
	SD (%)	DS (%)	N n (%)	A n (%)	SA n (%)		
1	0	1(2.2%)	5(10.9%)	35(76.1%)	5(10.9%)	3.96	0.556
2	0	00(00%)	7(15.2%)	34(73.9 %)	5(10.9%)	3.96	0.515
3	0	00(00%)	6(13%)	37(80.4%)	3(6.5%)	3.93	0.442

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

**Question 1:** What are the best agricultural extension policies that contributed to the achievement of sustainable agricultural development?

Providing a clear legal framework for the implementation of decentralization and pluralism in programmes of agricultural extension.

The multiple and diverse partnership between the management of agricultural extension and other organizations in planning and implementing programmes of agricultural extension in order to achieve sustainable agricultural development.

The promotion and the participation of the low level staff in the management of agricultural extension in the usual decisions and providing an independent budget for operating expenses.

### ***Financial resources of agricultural extension***

The management of 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 also revealed that only 71.7 % (n=33) of the respondents agreed and see a better option is to adopt the shifting of fiscal responsibility to districts and sub counties, while 76.1 % (n = 35) agreed with the collection of fees from farmers for agricultural extension services. The results further revealed that 73.9 % (n = 34) of the respondents agreed with the idea of

initiating contracts and agreements between the management of agricultural extension and private sector organizations to increase financial resources Table 2. As can be seen from this Table, the highest mean refers to initiating contracts and agreements between the management of agricultural extension and private sector organizations to increase financial resources. (Mean = 3.93, SD = 0.574) and the lowest mean refers to Collection of fees from farmers for agricultural extension services (Mean = 3.89, SD = 0.605).

**Table 2.** Financial resources of agricultural extension

Item in questionnaire	Responses					Mean	SD
	SD (%)	DS (%)	N n (%)	A n (%)	SA n (%)		
1	0	2(4.3%)	5(10.9%)	35(76.1%)	4(8.7%)	3.89	0.605
2	0	1(2.2%)	10(21.7%)	33(71.7%)	2(4.3%)	3.78	0.554
3	0	1(2.2%)	6(13%)	34(73.9%)	5(10.9%)	3.93	0.574

Note: SD: strongly disagree, DS: disagree, N: neutral, A: agree, SA: strongly agree

**Question 2:** What are the best means to contribute in providing the financial resources for the management of agricultural extension?

Collection of fees from farmers for agricultural extension services.

Shifting fiscal responsibility to districts and sub counties.

Initiating contracts and agreements between the management of agricultural extension and private sector organizations to increase financial resources.

### *Communication mechanisms for sustainable agricultural development*

Agricultural extension assumed that a decentralized structure would reduce the hierarchy in communication as well as promote organizations' collaboration at levels of sustainable agricultural development. Table 3, shows that the highest percentage 82.6 % ( $n = 38$ ) of respondents who agreed with joint meetings between the management of agricultural extension and other organizations, and 76.1 % ( $n = 35$ ) agree with encouragement on exchange of staff between agricultural extension management and other organizations. Furthermore, 80 % ( $n = 37$ ) agreed with specialized technical committees composed of the management of agricultural extension, education organizations, agricultural credit organizations and farmers' organizations. In addition to the proportion of 76.1 % ( $n = 35$ ) who agreed with mutual interest, 78.3 % ( $n = 36$ ) also agreed with the use of personal relationships. As can be seen from Table 3, the highest mean refers to

specialized technical committees composed of the management of agricultural extension, education organizations, agricultural credit organizations and farmers' organizations (Mean = 4.02, SD = 0.447) and the lowest mean refers to the use of personal relationships (Mean = 3.91, SD = 0.626).

**Table 3.** Communication mechanisms of agricultural extension

Item in questionnaire	Responses					Mean	SD
	SD (%)	DS (%)	N n (%)	A n (%)	SA n (%)		
1	0	00(00%)	4(8.7%)	38(82.6%)	4(8.7%)	4.00	0.422
2	0	00(00%)	7(15.2%)	35(76.1%)	4(8.7%)	3.93	0.490
3	0	00(00%)	4(8.7%)	37(80.4%)	5(10.9%)	4.02	0.447
4	0	1(2.2%)	6(13%)	35(76.1%)	4(8.7%)	3.91	0.551
5	1(2.2%)	00(00%)	5(10.9%)	36(78.3%)	4(8.7%)	3.91	0.626

Note: SD: strongly disagree, DS: disagree, N: neutral, A: agree, SA: strongly agree

**Question 3:** What are the best mechanisms of communication between the management of agricultural extension and other organizations for achieving success in programmes of sustainable agricultural extension?

Joint meetings between the management of agricultural extension and other organizations.

Exchange of staff between agricultural extension management and other organizations.

Specialized technical committees composed of the management of agricultural extension, education organizations, agricultural credit organizations and farmers' organizations.

### ***Mutual interest***

#### ***The use of personal relationships***

#### ***Effect of training programmes on sustainable agricultural development***

The most important training needs of multi-functional extension workers were in the areas of sustainable agricultural development; Table 4, shows the knowledge test results for the participants about the best training programmes, 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, while the number of managers and deputy directors (82.6 %,  $n = 38$ ) agreed with providing in-service training to staff on sustainable agricultural development. Also, 71.7 %

( $n = 33$ ) agreed with monthly meetings as a way to provide staff with information about agricultural policies. As can be seen from Table 4, the highest mean refers to preparing and training newly graduated agricultural employees and rehabilitating them scientifically and professionally for sustainable agricultural development (Mean = 4.00, SD = 0.516) and the lowest mean refers to monthly meetings as a way to provide staff with information about agricultural policies (Mean = 3.93, SD = 0.533).

**Table 4.** Training programmes of agricultural extension

Item in questionnaire	Responses					Mean	SD
	SD (%)	DS (%)	N n (%)	A n (%)	SA n (%)		
1	0	1(2.2%)	3(6.5%)	37(80.1%)	5(10.9%)	4.00	0.516
2	0	1(2.2%)	3(6.5%)	38(82.6%)	4(8.7%)	3.98	0.494
3	0	00(00%)	8(17.4%)	33(71.7%)	5(10.9%)	3.93	0.533

Note: SD: strongly disagree, DS: disagree, N: neutral, A: agree, SA: strongly agree

**Question 4:** What are the best training programmes that contributed to the achievement of sustainable agricultural development?

Preparing and training newly graduated agricultural employees and rehabilitating them scientifically and professionally for sustainable agricultural development.

Providing of in-service training programmes to staff on sustainable agricultural development.

Monthly meetings as a way to provide staff with information about agricultural policies.

#### ***Effects of reward system on agricultural extension employees***

Systems of rewards and incentives are fundamental to developing capacities and to translating developed capacities into better performance for agricultural extension programmes. Table 5, shows the effect of a system of rewards and incentives on field staff, where 73.9 % ( $n = 34$ ) agree on modifying the bonuses and salaries system on the basis of individual accomplishments rewards and not on the basis of working years. Thirty-four (73.9 %) agreed with additional financial support dedicated for travelling to professional social conferences, and 80.4 % ( $n = 37$ ) agreed with medals and certificates of appreciation for employees for outstanding employees' performance in sustainable agricultural development programmes. As can be seen from Table 5, the highest mean refers to medals and certificates of appreciation to employees for outstanding employees' performance in

sustainable agricultural development programmes (Mean = 3.98, SD = 0.447) and the lowest mean refers to modifying the bonuses and salaries system on the basis of individual accomplishments rewards and not on the basis of the working years (Mean = 3.85, SD = 0.556).

**Table 5.** Reward system of agricultural extension

Item in questionnaire	Responses					Mean	SD
	SD (%)	DS (%)	N n (%)	A n (%)	SA n (%)		
1	0	1(2.2%)	8(17.4%)	34(73.9%)	3(6.5%)	3.85	0.556
2	0	00(00%)	7(15.2%)	34(73.9 %)	5(10.9%)	3.96	0.515
3	0	00(00%)	5(10.9%)	37(80.4%)	4(8.7%)	3.98	0.447

Note: SD: strongly disagree, DS: disagree, N: neutral, A agree, SA: strongly agree

**Question 5:** What are the best means to be employed by rewards and incentives system that will encourage field staff to ensure the success of sustainable agricultural development programs?

Modifying the bonuses and salaries system on the basis of individual accomplishments rewards and not on the basis of the working years. Additional financial support dedicated for travelling to professional social conferences.

Medals and certificates of appreciation to employees for outstanding employees' performance in sustainable agricultural development programmes.

## Discussion

Agricultural extension policy is a part of national development policy in general and of agricultural and rural development policy in particular. Hence, the problems of establishing or maintaining an effective agricultural extension service can be traced back to the lack of a realistic policy or an unstable policy framework for charting of the extension system. That external factors such as the type of decentralization, pluralism, political will to decentralize, pluralism, the presence of a clear legal framework of responsibilities, roles and coordination mechanisms, and the existence of established organizations that are willing to support the process have an important influence on the performance of a district level agricultural extension organization (Okorley *et al.*, 2009). Prior to decentralization, the management of the case organization was top-down - the district extension director received and followed instructions from the senior management of the agricultural extension with



limited involvement of subordinate staff. The staff is involved in the development of the case organization's annual extension plan and each staff member is responsible in consultation with his supervisor, for the development of his own annual work plan and training program. Two field staff representatives are also included in a management team comprising the director and assistant, the supervisors and a support staff representative (Omar *et al.*, 2011). A system of innovation consists of major social actors or organizations that affect the revealing acknowledgment, generation and diffusion of technical and institutional knowledge. Agricultural innovation system comprised of organizations that jointly or individually deal with issues relating to agriculture (Chapman and Tripp, 2003). It represents multiplicity of organizations, research institutes, universities, colleges of agriculture, government extension and rural development agencies, private input dealers, agro processors, consultancy firms, farmers and farmers' organization (Chapman and Tripp, 2003). Public budgets for extension activities in many countries were drastically cut and scope of extension work was reduced or modified (Kizilaslan and Kizilaslan, 2007). This may be a result of previous decisions that had the effect of protecting staff salaries and staff size at the expense of allocations for operating costs. Agricultural extension can receive and expand funds of Agricultural extension programs, enter into contracts and agreements and maintain revolving accounts that can be used to collect fees and thereby recovering operating costs (Sulaiman and van den Ban, 2003). The fees collected could be a potential source of funds for Agricultural extension to meet its declining operational funding (Sulaiman and van den Ban, 2003). Fee-for-service Agricultural extension is provided for by Agricultural extension management (or another sector) and paid for by the farmers. Small groups of farmers usually contract the services. This arrangement allows farmers to "vote" on programs and program scale by paying for them (Davis, 2008). In addition to providing feedback, fee-for-service also can provide additional sources of revenue to public extension, and private extension recognizes that public money can be used to fund private activities, and that public services may benefit from private (cost-recovery) revenues (Chapman and Tripp, 2003). Subsidiary refers to the operational authority and responsibilities that are devolved to the lowest possible level of authority, consistent with organizational competencies and the efficient use of funds. Resources including funds, would be assigned to the grassroots level based on specific responsibilities, interested in and willing to shift the authority for providing extension services to farmers' associations, and moving towards shifting fiscal responsibility to districts and sub-counties while transferring the rights to farmer associations to contract-out to private entities for extension services (Rivera *et al.*, 2001).

Communication is the most vital ingredient of an organization. In fact, an organization cannot be conceived of without communication. Agricultural extension linkage involves the use of subject-matter specialists, technical committees, joint study meetings, and staff exchanges between research and extension organizations. In addition, informal linkage mechanisms based on friendship and mutual interest include the promotion of joint social activities and the use of existing personal ties (Agbamu, 2000).

The training of extension personnel contributes directly to the development of human resources within extension organizations, and clearly that a high priority should be given to planning, developing, and implementing in-service training programs for agricultural extension agents regarding sustainability issues. This training is provided for new graduates from the agricultural University and the agricultural Institutes, because it plays an important role in providing other technical advisory and support services (Cho and Boland, 2004). The duties and responsibilities of the extension staff and the ideology of agricultural extension activities were emphasized; the curriculum is based mainly upon the theoretical education (Cho and Boland, 2004). In service, training programs play a critical role in reinforcing staff capability, as well as renewing their skills. The organizations and institutes, which are responsible for in-service training both for agricultural extension experts, must consider the training needed by them (Movahedi and Fathi, 2012). In addition to the monthly meetings serve as an avenue to provide the staff with information about policies and other relevant issues of interest to them (Okorley *et al.*, 2009).

An important aspect of human resource management which needs special attention in extension organizations is the development of a reward system which will attract, retain, and motivate extension personnel, as well as provide training and promotion. Most of the extension services are run by government agencies and operate under rules and regulations of public administration. Such as additional financial support for travel to professional conferences, meetings, or workshops, support in the form of start-up money for program development, new technologies or equipment for individual agents, one-time monetary rewards for outstanding program development such as increased stipends, or scholarships and further education (Schmiesing *et al.*, 2003), also Certificate of recognition and praise at an award-giving ceremony (Schmiesing *et al.*, 2003). as well as They should develop an administrative system to ensure accurate staff records are maintained and the promotion of staff is sought promptly when it is due. Also to concentrate on rewarding individual achievements and accomplishments rather than developing a system that rewards all extension staff equally, regardless of their accomplishments (Schmiesing *et al.*, 2003). In

addition modifying the system of rewards and salary were not to be based on longevity of employment. Rather they should be based on impact of programs and for positive risk-taking, new partnership development, program growth, scholarly and creative works, and stakeholder feedback (Schmiesing *et al.*, 2003).

## Conclusion

This study revealed that Libya's extension system does not pay enough attention to necessary organizational characteristics of agricultural extension management to accomplish sustainable agricultural development and these attributes do not lead to a favourable situation. These conditions necessitate the reorganization of extension management to accomplish sustainable agricultural development. The findings of the study show that to accomplish sustainable agricultural development we must pay attention to five groups of organizational characteristics: (1) Agricultural extension policies, (2) financial resources, (3) Communication mechanisms, (4) Training programmes, and (5) Systems of rewards and incentives for the multiple and diverse partnership between the management of agricultural extension and other organizations in planning and implementing programmes of agricultural extension.

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