

**THE IMPACT OF ORGANISATIONAL CHARACTERISTICS AND
SUPPORT MECHANISM ON THE SUCCESS OF AGRICULTURAL
EXTENSION MANAGEMENT**

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**THE IMPACT OF ORGANISATIONAL CHARACTERISTICS AND
SUPPORT MECHANISM ON THE SUCCESS OF AGRICULTURAL
EXTENSION MANAGEMENT**

By

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	i
TABLE OF CONTENT.....	ii
LIST OF TABLES.....	xi
LIST OF FIGURES.....	xiii
ABSTRAK.....	xiv
ABSTRACT.....	xvi
CHAPTER 1	INTRODUCTION
1.0 Background of the study.....	1
1.1 Problem statement.....	4
1.2 Research questions.....	8
1.3 Objectives of the study.....	9
1.4 Significance of the study.....	9
1.5 Scope of the study.....	11
1.6 Thesis organization.....	12

2.6.3	Communication mechanism for sustainable agricultural development..	42
2.6.4	Effect of training on skill development of agricultural extension	44
2.6.4.1	Training programs of agricultural extension.....	49
2.6.4.1.1	Pre-service training.....	50
2.6.4.1.2	On-the-job training	50
2.6.4.1.3	In-service training.....	50
2.6.5	Effects of reward system on agricultural extension employees.....	51
2.6.5.1	Tangible rewards	53
2.6.5.2	Intangible rewards.....	53
2.7	The support mechanism for sustainable agricultural development.....	56
2.7.1	The educational organizations and sustainable agricultural development.....	59
2.7.2	The role of farmers organizations in sustainable agricultural development.....	61
2.7.3	Agricultural credit of farmers to achieve sustainable agricultural development	64
2.8	Success of performance.....	68
2.8.1	Decentralization of agricultural extension.....	70
2.8.1.1	Deconcentration	70

2.8.1.2 Devolution.....	71
2.8.1.3 Delegation.....	72
2.8.2 Pluralism of agricultural extension.....	74
2.8.2.1 Participation of educational organizations.....	74
2.8.2.2 Participation of farmers’ organizations	75
2.8.2.3 Partnership of public agricultural extension and private sector...76	
2.9 Alternative approaches to agricultural extension services for sustainable agricultural development.....	79
2.9.1 The farmers’ field schools approach	80
2.9.2 The participatory approach	80
2.9.3 The public– private extension approach	81
2.10 Background of Study	84
2.10.1 Agricultural development projects.....	87
2.10.2 The main agricultural development projects in Libya.....	89
2.10.3 Agricultural extension activities in Libya.....	97
2.10.4 The support mechanism of sustainable agricultural development in Libya.....	98
2.10.4 .1 Educational organizations	98
2.10.4 .2 Farmers organizations.....	99

3.1.4.5 Reliability test.....	128
3.2 Summary.....	131
CHAPTER 4	RESULTS OF THE STUDY
4.0 Introduction	132
4.1 Analysis of ordinal spearman correlation of dependent variables	132
4.2 Demographic characteristics.....	134
4.2.1 Demographic characteristics of farmers.....	134
4.2.2 Demographic characteristics of managers and deputy directors.....	135
4.3 Major constraints of sustainable agricultural development.....	137
4.3.1 Major constraints that hinder farmers in achieving sustainable agricultural development.....	137
4.3.2 Major constraints that hinder the management of agricultural extension in achieving sustainable agricultural development.....	138
4.4 The organisational characteristics for sustainable agricultural development.....	141
4.4.1 Agricultural extension policies for sustainable agricultural development	142
4.4.2 Financial resources of agricultural extension	143
4.4.3 Communication mechanism for sustainable agricultural development.....	144
4.4.4 Effect of training programmes on sustainable agricultural development	145
4.4.5 Effects of reward system on agricultural extension employees.....	146
4.5 The support mechanism for sustainable agricultural development.....	147

4.5.1 The role of educational organisations in sustainable agricultural development.....	147
4.5.2 The role of farmer’s organisations in sustainable agricultural development	149
4.5.3 The role of agricultural credit organisations in achieving sustainable agricultural development.....	150
4.6 Factor analysis of the study.....	151
4.6.1 Factor analysis of organizational characteristics.....	151
4.6.2 Factor analysis of support mechanism.....	154
4.7 The impact of organisational characteristics and support mechanisms on the performance of agricultural extension management.....	155
4.7.1 The impact of organizational characteristics and support mechanism on decentralization.....	157
4.7.2 The impact of organizational characteristics and support mechanism on pluralism.....	162
4.8 Summary.....	167
 CHAPTER 5 FINDINGS AND DISCUSSION	
5.0 Introduction	168
5.1 Achievement of objectives.....	168
5.1.1 Objective 1: To identify major constraints of agricultural extension management.....	168

5.1.2 Objective2: To identify key organizational characteristics of agricultural extension management	172
5.1.3 Objective 3: To identify suitable support mechanism for agricultural extension management.....	177
5.1.4 Objective 4: To study the impact of organizational characteristics and support mechanism on the performance of agricultural extension management.....	181
5.2 Summary	186
CHAPTER 6 CONCLUSION AND RECOMMENDATIONS	
6.0 Introduction	187
6.1 Conclusion.....	187
6.3 Significance of the findings.....	189
6.3 Implications of the study.....	190
6.3.1 Theoretical implications of the study.....	191
6.3.2 Practical implications of the study.....	193
6.4 Limitations of the study.....	194
6.5 Recommendations of for achieving sustainable agricultural development in Libya.....	195
6.6 Suggestions for future studies	197
REFERENCES.....	198

APPENDIXES	213
1. APPENDIX 1: List of publications.....	213
2. APPENDIX 2: Questionnaire of pilot survey for management of agricultural extension.....	216
3. APPENDIX 3: Questionnaire of pilot survey for farmers.....	229
4. APPENDIX 4: Final questionnaire for management of agricultural Extension.....	231
5. APPENDIX 5: Final questionnaire for farmers.....	245
6. APPENDIX 6: Questionnaire of pilot survey for management of agricultural extension	248
7. APPENDIX 7: Questionnaire of pilot survey for farmers.....	256
8. APPENDIX 8: Final questionnaire for management of agricultural extension.....	258
9. APPENDIX 9: Final questionnaire for farmers.....	266
10. APPENDIX 10: Factor analysis.....	268
11. APPENDIX 11: Analysis of multiple regression.....	275

LIST OF TABLES

Table 2.1: The major constraints of sustainable agricultural development.....	28
Table 2.2: The organizational characteristics in the agricultural extension sector....	55
Table 2.3: The main support mechanism to the agricultural extension sector.....	68
Table 2.4: The performance success to the agricultural extension.....	79
Table 2.5: The main public investment activities in the agricultural sector	97
Table 3.1: The changes of pilot study.....	119
Table 3.2: The reliability test.....	130
Table 4.1: Analysis of ordinal spearman correlation of dependent variables.....	134
Table 4.2: Demographic characteristics of the farmers.....	135
Table 4.3: The demographic characteristics of managers and deputy directors.....	136
Table 4. 4: Major constraints of farmers.....	138
Table 4. 5: Major constraints of management of agricultural extension.....	141
Table4.6: Agricultural extension policies.....	143
Table4. 7: Financial resources of agricultural extension.....	144
Table4. 8: Communication mechanism of agricultural extension.....	145
Table 4. 9: Training programmes of agricultural extension.....	146
Table 4. 10: Reward system of agricultural extension.....	147
Table 4. 11: The role of educational organizations in sustainable agricultural development.....	148

Table 4. 12: The role of farmers organizations in sustainable agricultural development.....	149
Table 4. 13: The role of agricultural credit organizations in achieving sustainable agricultural development.....	150
Table 4.14: Results of KMO and Bartlett's Test	152
Table 4.15: Results of Factor analysis for organizational characteristics	153
Table 4.16: Results of KMO and Bartlett's Test.....	154
Table 4.17: Results of Factor analysis for support mechanism.....	155
Table 4. 18: Model summary of regression analysis for (IVs) and (DV ₁).....	159
Table 4.19: ANOVA of regression analysis.....	159
Table 4.20: Coefficients of regression analysis.....	161
Table 4. 21: Model summary of regression analysis for (IVs) and (DV ₂).....	164
Table 4.22: ANOVA of regression analysis.....	164
Table 4.23: Coefficients of regression analysis.....	166

LIST OF FIGURES

Figure 2.1: Elements that contribute in the dissemination of sustainable agricultural.....	20
Figure 2.2: The framework support mechanism of agricultural extension.....	58
Figure 2.3: Alternative extension approaches that contribute in the dissemination of sustainable agricultural development	83
Figure 2.4: Map of Libya in Africa	84
Figure 2.5: Map of eastern part of Libya.....	102
Figure 2.6: Map of study area in eastern part of Libya which includes six regions namely: Tubruq, Derna, Al bayda, Al marj, Benghazi and Ajdabiya..	104
Figure 2.7: The Research Framework.....	107
Figure 3.1.1: Flow Chart of Methodology.....	112
Figure 4.1: The framework of independent variables and dependent variables.....	156
Figure 4.2: The framework of independent variables and dependent variables (decentralization).....	158
Figure 4.3: The framework of independent variables and dependent variables (pluralism).....	163

IMPAK CIRI-CIRI ORGANISASI DAN MEKANISME SOKONGAN DI ATAS KEJAYAAN PENGURUSAN LANJUTAN PERTANIAN

ABSTRAK

Sistem pengembangan pertanian di dunia sedang berjuang untuk membuktikan kepentingan mereka dan relevan yang berkaitan dengan pembangunan pertanian yang mampan. Oleh itu, peranan pengembangan pertanian adalah penting untuk menyokong pembangunan pertanian mampan, yang bergerak daripada pengeluaran kepada set yang lebih luas objektif kemampanan dan alam sekitar. Tujuan kajian ini adalah untuk menyediakan satu rangka kerja organisasi untuk mereka bentuk perkhidmatan pengembangan pertanian yang berkesan untuk menyokong pembangunan pertanian lestari. Ia juga bertujuan untuk mengenal pasti kekangan utama, ciri-ciri organisasi dan mekanisme yang sesuai untuk menyokong pembangunan pertanian lestari menggunakan reka bentuk deskriptif-korelasi. Kajian ini bertujuan untuk mengkaji persepsi di kalangan petani, pengurus dan timbalan pengarah dari bahagian Timur Libya telah dipilih dari bandar-bandar utama kawasan pertanian (Tubruq, Derna, Al Bayda, Al Marj, Benghazi dan Ajdabiya). Data telah dikumpul melalui penggunaan soal selidik pada sampel penduduk yang terlibat dalam sektor pertanian di kawasan kajian. Sebanyak tiga ratus lima puluh (350) soal selidik telah diedarkan kepada petani di mana 300 memberikan respon. Juga, lima puluh (50) soal selidik telah diedarkan di wilayah timur Libya di mana 25 pengurus dan 21 Timbalan Pengarah bertindak balas. Kajian mendapati kaitan yang positif antara ciri-ciri organisasi, mekanisme sokongan dan prestasi pengembangan pertanian. Walau bagaimanapun, analisis regresi berganda mendapati ciri-ciri organisasi menjadi peramal tertinggi pembolehubah, diikuti oleh mekanisme sokongan. Juga, terdapat kekangan utama dalam pemindahan program pembangunan

mampan pertanian kepada petani, yang menghalang penggunaan pembangunan pertanian mampan. Kajian ini mendedahkan bahawa sistem lanjutan Libya perlu memberi perhatian lebih kepada mekanisme sokongan yang diperlukan dan ciri-ciri organisasi pengurusan pengembangan pertanian untuk mencapai pembangunan pertanian yang mampan.

THE IMPACT OF ORGANISATIONAL CHARACTERISTICS AND SUPPORT MECHANISM ON THE SUCCESS OF AGRICULTURAL EXTENSION MANAGEMENT

ABSTRACT

Agricultural extension systems in the world are struggling to prove their importance and relevance related to sustainable agricultural development. Thus, the role of agricultural extension is important to support sustainable agricultural development, which is moving from production to a wider set of sustainability and environmental objectives. The purpose of this study is to provide an organizational framework for designing an effective agricultural extension service to support sustainable agricultural development. It also aims to identify major constraints, organizational characteristics and appropriate mechanisms to support sustainable agricultural development using a descriptive-correlative design. This study aims to investigate perceptions among farmers, managers and deputy directors from Eastern part of Libya were selected from major cities of agricultural regions (Tubruq, Derna, Al Bayda, Al Marj, Benghazi and Ajdabiya). A quantitative data analysis approach was used to analyze the data. Data were collected through the use of questionnaires on a sample of the population involved in agriculture in the study area. A total of three hundred and fifty (350) questionnaires were distributed to farmers where 300 responded. Also, fifty (50) questionnaires were distributed in the eastern region of Libya where 25 managers and 21 deputy directors responded. The study found a positive association between organizational characteristics, support mechanisms and the performance of agricultural extension. However, multiple regression analysis found organizational characteristics to be the highest predictor of variables, followed by support mechanisms. Also, there are major constraints in the transfer of sustainable agricultural development programmes to farmers, which hamper the

adoption of sustainable agricultural development. This study revealed that Libya's extension system should pay more attention to the necessary support mechanisms and organizational characteristics of agricultural extension management to accomplish sustainable agricultural development.

CHAPTER ONE

INTRODUCTION

1.0 Background of the study

Sustainable agricultural development is one that produces abundant food without depleting the earth's resources or polluting its environment. It is an agricultural concept that follows the principles of nature to develop systems for raising crops and livestock that are, nature like and self- sustaining (Ahmadvand et al., 2007).

Sustainable agricultural development is also the agriculture of social values, one whose success is indistinguishable from vibrant rural communities, rich lives for families on the farms, and wholesome food for everyone (Kalantari et al., 2008). Sustainable agricultural development as a set of commonly accepted practice or a model farm economy is still in its infancy and tied to broader issues of the globe (Allahyari, 2009a).

In recent years, sustainable farmers and researchers around the world have responded to the extractive industrial model with ecology-based approaches, basically called the natural, organic, low-input, alternative, regenerative, holistic, biodynamic, and biological farming systems (Ahmadvand et al., 2007). All of them, representing thousands of farms, have contributed to our understanding of what sustainable systems are, and each of them shares a vision of "farming with nature", an agroecology that promotes biodiversity, recycles plant nutrients, protects soil from erosion, conserves and protects water, uses minimum tillage, and integrates crop and livestock enterprises on the farm. But no matter how elegant the system or how accomplished the farmer, no agriculture is sustainable if it's not also profitable, able to provide a healthy family income and a good quality of life (Earles et al., 2005).

Sustainable practices lend themselves to smaller, family-scale farms. These farms, in turn, tend to find their best niches in local markets, within local food systems, often selling directly to consumers. As alternatives to industrial agriculture evolve, so must their markets and the farmers who serve them. Creating and serving new markets remains one of the key challenges for sustainable agriculture (Earles et al., 2005).

As alternatives to industrial agriculture evolved, so must their markets and the farmers who serve them. Creating and serving new markets remains one of the key challenges for sustainable agricultural development.

Sustainable agricultural development demands practice and technologies, which are technically appropriate, economically viable, environmentally non-degradable and socially acceptable; but the challenges to agricultural development is to maintain sustainable and progressive production increases and at the same time, to protect production resources and prevent their degradation (Chaudhry et al., 2006).

Nevertheless, considering dependency on pesticide and insecticide imports, a growing population limited arable land, increasingly destruction of natural resources, soil erosion and degradation, water pollution and decreasing ground water tables, bio-system degradation, air pollution, excessive use of chemical inputs loss of considering the progress of these problems and with emphasis on water and soil which are basic resources for agricultural activities; importance must be given to the conservation and sustainability of these resources.

That sustainable agriculture is more than a shift in farming practice; rather, it must be focused on raising consciousness, knowledge and related information, skills, technologies, and attitudes will also play key role in the sustainable agriculture (Allahyari, 2009a). For example, for farmers that practice sustainable agricultural

development to be successful in managing their farmlands, there must be a continuous network of information, new technologies, and innovations that are available to them (Chizari et al., 1999).

The extension services can play a crucial role in providing this network of information on sustainable agricultural education. Thus, the role of extension is very important to support sustainable agriculture which is moving from production to a wider set of sustainability and environmental objectives may need to change their extension approach. An enterprise focuses on the whole farm and its natural and human resources is more likely to contribute to sustainable livelihood and production systems than one which concentrates on a single commodity or which deals with crops (Sallam, 1994). Extension not merely occupies a bridge position but facilitates to improve the efficiency and effectiveness of both the farmer and the research, to facilitate transfer of agricultural technologies among the farmers (Rivera et al., 1997).

The sustainable agricultural development practice demands cooperation among researchers, extension agents and farmers. The development and implementation of sustainable agricultural practice require active involvement, creativity, innovativeness and learning abilities of the farmers and the extension workers (Cho et al., 2004a). The participation of farmers could be ensured through the creation of village-level farmer advisory groups, district farmer advisory committees, and governorate farmer advisory councils. These groups would improve agricultural and rural program relevance and outcomes, and empower farmers toward greater involvement and responsibility for managing agricultural development support services (Rivera et al., 1997).

1.1 Problem statement

The agricultural extension system is one of the primary vehicles for diffusing technologies and therefore has an important role to play in the development process by shifting the development paradigm of experiences in agricultural extension and development. However, the effectiveness of public extension has gradually decreased in recent year (Umali, 1997 and Kidd et al., 2000). Considering unsustainable agriculture conditions and organizational recession and inability of current extension organization to achieve sustainability; it seems that extension systems require a new organizational structure to achieve sustainability objectives. By reason there are difficulties, barriers, misunderstandings and weaknesses in the transfer of new technology and information to farmers. Lacking the suitable extension organizational characteristics has been a barrier for transfer of appropriate new technology to farmers (Allahyari, 2009a). Due to its characteristics that disregard active participation, its highly centralized structure, its top-down of policies extension management based on the same approach, the existing research and extension system is somewhat alienated to the farmers (Kizilaslan et al., 2007).

There has been a growing realization that public sector extension approach have not been sufficiently effective in promoting adoption of sustainable agricultural practices as well as there is a lack of proper extension programs for the needs of farmer (Allahyari,2009b). A top-down approach is not very successful because it creates a rigid hierarchy, which discourages the feedback of information. Researchers work independently from farmers and extension workers, resulting in a poor understanding among farmers and the opportunities and constraints they face (Sallam, 1994). Due to the weak communication and coordination and the dense bureaucratic procedures amongst the agricultural extension institutions, research institutions and amongst the

farmers themselves, the areas of research are determined in a manner that is detached from the producers, which in turn imposes considerable difficulties in the production and definition of appropriate technologies and on the implementation of such technologies by the farmers (Kizilaslan et al., 2007). There are public extension approaches at various stages of agricultural development and implementation throughout the world. However, fundamental changes will be needed in many of the bureaucratic and attitudinal foundations embodied in most state-run agricultural extension programs.

The major obstacle to sustainable agricultural development is insufficient knowledge of farmers with regard to environmental hazards; the poor performance of farmers is attributed to their lack of use of sustainable agricultural practices and their lack of awareness about these sustainable agricultural practices. The absence of farmers' participation in implementation and maintaining of rural development projects and lack of a coherent strategy for sustainable rural development, and absence of participation of local organizations (agricultural associations and the agricultural bank and its branches) in planning and implementation process of rural development projects. Lack of such co-ordination and co-operation among institutions and organizations involved in rural development is a serious problem affecting sustainable rural development (Kalantari et al., 2008). It is argued that public sector agricultural extension is characterized by poorly motivated staff, and lack of well trained staff, inadequate operational funds, lack of relevant technology, top down planning, centralized management and a general absence of accountability (Kizilaslan et al., 2007).

The coastal zone is the most important agricultural area in Libya which located nearly 70 per cent of agricultural activities followed by the mountains and the oases (Jamahiriya, 2006a). 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 Tobruk 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, North and west of Libya are drier areas (FAO, 2011).

Although planned activities coincide well with objectives of sustainable agricultural development, Libya needs to focus more closely on preparing the agricultural sector to integrate into the global economy concentrating on extension, and agricultural research. Although these planning institutions may seem to be able to perform their functions in theory, in practice they lack the resources and are unable to set clear objectives, policies and tools to ensure efficient planning, as well as institutional instability and rapid administrative changes have made it difficult to plan or follow up on plans (Jamahiriya, 2006a).

The Ministry of Agriculture and Livestock and Resource Marine is the central sector which contains many managements, such as management of protection and the inspection of agriculture, management of planning, management of agricultural development, management of animal resources, management of affairs, administrative and finance and management of agricultural extension. The role of

these managements are to follow all agricultural projects and provide the agricultural medium-term credit, long-term credit and short term loans for financing seasonal needs to farmers and to public projects through the agricultural bank (Jamahiriya, 2006a).

Several stone fruit tree plantations of small and medium size are present; and Principal crops produced include vegetables, fruits, wheat, barley and dates while principal livestock include Sheep and goat flocks which are relatively large (approx. 50 – 70 heads). Many camels, cows and poultry farms are also observed. Agriculture infrastructure, machinery and agricultural extension service centers are present across the eastern area. (FAO, 2011).

The agricultural extension has many roles; it plays an important role in primary vehicles for diffusing technologies and in the development process (Umali, 1997 and Kidd et al., 2000). The roles of agricultural extension in Libya, like those in many other countries, are unsatisfactory and require a new organizational structure to achieve sustainability (Shalooof et al., 1990 and Toness, 2001). By shifting the development paradigm, experiences in agricultural extension and development have indicated that traditional approaches will need to be transformed in order to move toward sustainability (Toness, 2001).

Reports and previous studies on agricultural extension in Libya have indicated that a considerable gaps exists between the Ministry of Agriculture and agricultural extension management. This gap is related to the centralization of management in the Ministry of agriculture, which has led to many problems for agricultural extension management, such as lack of funds represented as a limited budget and inadequate operational funds (Shalloof and Khafaji, 1990). Also, the absence of legislative policy and intensive bureaucratic procedures exist in relations between the

management of agricultural extension and other organizations (Jamahiriya, 2006b). These gaps remain a big challenge for the extension systems even today and they represent a severe problem in the majority of the developing countries, where the number of farmers has become very large and more varied geographically. This study intends to fill up these gaps, trying to determine the most appropriate methods of decentralization and pluralism, by measuring the organizational characteristics and the suitable support mechanisms among the Ministry of Agriculture, Agricultural Extension Management and Various Organizations in Libya. The main results anticipated from this study will be more helpful in designing the agricultural extension programs, which will ultimately provide better results for performance of Agricultural Extension Management, for Libya generally and in Eastern Libya especially.

1.2 Research questions

The primary purpose of this study is to focus on agricultural extension management as one of the primary vehicles for diffusing technologies, because the success of sustainable agriculture depends on motivations, skills, knowledge and action taken by farmers' projects, The answers to the following questions are sought to illustrate this interest:

1. What are the major constraints of agricultural extension management?
2. What are the key organizational characteristics of agricultural extension management?
3. What is the suitable support mechanism for agricultural extension management?

4. What are the impact of organizational characteristics and support mechanism on the performance of agricultural extension management?

1.3 Objectives of the study

The following objectives have been identified in the effort to achieve the purpose of this study:-

1. To identify major constraints of agricultural extension management.
2. To identify key organizational characteristics of agricultural extension management.
3. To identify suitable support mechanism for agricultural extension management.
4. To study the impact of organizational characteristics and support mechanism on the performance of agricultural extension management.

1.4 Significance of the study

There is a dearth of research for exploring the agricultural extension in Libya (Shalloof and Khafaji, 1990) and this study is a modest attempt to contribute to the dissemination of sustainable agricultural development in Eastern Libya. In many parts of the world, agricultural extension has played a significant role in the increase of agricultural production. In addition, it is widely believed that agricultural extension can make an important contribution to the training of large numbers of farmers, especially in developing countries (Shalloof and Khafaji, 1990). Furthermore, with the introduction of decentralization and pluralism, it is possible to

overcome the major constraints of agricultural extension management to achievement sustainable agricultural development (Shalloof and Khafaji, 1990).

This study aims to identify the organizational characteristics of agricultural extension management and the functions that it performs. The mechanisms used are directly influenced by its goals and must be evaluated in terms of their contribution to the achievement of agricultural extension programs; in addition, it seeks to identify major constraints that have an impact on sustainable agricultural development. The study attempts to achieve two main outcomes through alternative approaches in relation to agricultural extension:

1. Accrediting decentralisation, ensuring a more efficient and equitable allocation of government resources, promoting accountability to stakeholders, building local capacity, and responding more effectively to local needs to promote sustainable agricultural development. Making use of this pluralistic environment by taking a coordinating role so that the resources it and other organizations put into agricultural extension are used more efficiently for sustainable agricultural development in the district.

In accordance with the transformation of the public sector extension approach, the rest of the world may turn to alternative approaches. Alternative approaches are a rather recent phenomenon and typical of either industrialised forms of agriculture or most sectors of agricultural products. This study is an attempt to contribute in implementing a participatory approach, farmers' field schools approach and public-private extension approach aiming to alleviate problems of agricultural extension in agricultural districts on the basis of a simultaneous improvement in the utilisation of natural resources and of human potential in Eastern Libya.

1.5 Scope of the study

Realization of the objectives of sustainable agricultural development requires systematic planning and careful implementation. To this effect, application of knowledge, skill, tools and techniques in the farms environment, were meet these objectives. It is important to indicate all the other alternatives considered with justification in favour of the specific programs proposed for consideration. These organizational characteristics and the support mechanism should provide for diversified technical and managerial competency and facilitate decentralized decision-making. In agriculture, knowledge and decision-making capacity determine how production factors – soil, water and capitals are utilized.

Agricultural extension is central in formulating and disseminating knowledge and in teaching farmers to be competent decision makers. Therefore, agricultural extension plays an important role in most programs of sustainable agricultural development. Demands put on agricultural extension in the immediate future needs increase in organizational characteristics. In this context, support mechanism a vital role. Besides the role of organizational characteristics and the support mechanism in the improvement of performance in agricultural extension management, there are lacunae which need to be removed, including: lack of linking up of training to varied resources for the farmers, lack of insight into the social and economic aspects of farming systems, lack of relevancy to the job entrusted and training which is basically crop-oriented rather than farming-system-oriented and many of the old concepts no longer hold well in modern management practices. It would be meaningful to understand how scientific methods can be applied effectively and efficiently in the agricultural extension management to accomplish the desired objectives.

1.6 Thesis Organization

This thesis has six chapters, including an introduction, review of literature, methodology, result finding & discussion, conclusion, implication and recommendations. Chapter One discusses introduction in sustainable agricultural development and activities of agricultural extension and discusses also objectives. Significance of study consists of a review of organizational characteristics of agricultural extension management and suitable extension mechanism and key characteristics of agriculture extension management are the limitations of the study.

Chapter Two explains literature review that related it by organizational characteristics of agricultural extension management. While Chapter Three focuses on explaining research methods used in study. Chapter Four is analysis of results after data collection and conclusion. Chapter Five discusses of results and the extent of the relation in dissemination of sustainable agricultural development in Eastern Libya. While, Chapter Six showed of conclusion and recommendations. Last section of Thesis is the reference, which shows where information was sourced in order to make the thesis is a genuine write-up and not fabricated.

CHAPTER TWO

AGRICULTURAL EXTENSION'S ROLE IN SUSTAINABLE AGRICULTURAL DEVELOPMENT

2.0 Introduction

Sustainable system of agriculture is to ensure that resources are used efficiently, renewable resources are replaced, and essential non-renewable resources are conserved. There is balance of inputs and outputs by minimizing resource costs and relying more on inputs derived from the farm. This therefore depends not just on the motivations, skills, and knowledge of individual farmers, but on actions taken by organizations (Asadi et al., 2008). The benefits include increased efficiency, improved quality, client-orientation, job satisfaction for staff, and expanded marketing opportunities for farmers (Qamar, 2005).

The goal of agricultural extension is to satisfy knowledge, skills and needs of all types of farmers in order to help them in running their farms efficiently and to become good citizens to improve their quality of life (Farrington, 1995). It also helps in reforming management of agricultural and rural development, for creating effective regulatory agencies for agriculture. Effective regulatory agencies create an enabling investment climate for the private sector and farmer organizations, giving priority to agriculture agendas and local government institutions (Farrington, 1995).

2.1 Definition of Terms

Sustainable Agriculture / Farming

Sustainable approach is tested and is able to manage resources to successfully meet changing human needs while maintaining and improving the environment and natural resources and preserve its integrity (Alibaygi et al., 2008).

"The concept of sustainable development at the community level. A community defined in terms of sustainable development means, the pursuit of modes of economic development that not just "environmentally friendly" but which also offer the community long-term economic stability, diversity and prosperity" (Kalantari et al., 2008). Sustainable, can be defined as what can be kept up or prolonged over a long time period. Sustainable agriculture is defined as successful management of the resources of agriculture to satisfy changing human needs, to conserve the environment, and increase biological resources (Allahyari, 2009a).

Green agriculture

It is an imperative and now becoming a sustainable agricultural standard for food production that is eco-friendly. Alternate bio-fuels, wind and solar energy harvesting has been on the increase. These and more ideas are now being implemented for making the magnitude of these benefits to depend on the magnitude of changes to agricultural practice. Environmental benefits include improved water quality, healthier fish, increased carbon sequestration, and decreased greenhouse gas emissions. While economic benefits include social capital formation, greater farm profitability, and avoided costs. Policy transitions that emphasize functions of agriculture in addition to food production are crucial for creating change (Allahyari, 2009a).

Sustainable agricultural development

Agricultural development is setting realistic goals for development within the sustainable use of resources, ambitious goals like achieving self-sufficiency in all major food commodities (Saysel et al., 2002).

Agricultural extension

Agricultural extension defined as the process of non-formal educational system which is an integral part of professional and local leaders to serve the farmer, his family and society, through the desirable behavioral changes in their knowledge, attitudes and skills, to help them help themselves to solve their problems (Worth, 2002).

The agricultural extension system is one of the primary vehicles for diffusing technologies, and therefore clearly has an important role to play in the development process. By shifting development paradigm, experiences in agricultural extension and development have indicated that traditional approaches will need to transform in order to move towards sustainability (Allahyari, 2009a). Agricultural extension is the function of providing need- and demand-based knowledge in agronomic techniques and skills to rural communities in a systematic, participatory manner, with the objective of improving their production. Extension is essential to inculcate positive behavioral changes among farmers (Hoque et al., 2008).

2.2 Agricultural extension

The role of extension is changing from one of motivating people toward the adoption of improved practices to one of solving problems. Practices must be adopted in order for the required problems to be solved, but problems are not always what they appear to be on the surface. A careful and probing analysis of the situation is often one of

solving problems. Practices must be adopted for the problems required; this is necessary to reveal the causes, which must be attacked and removed for the problem to be solved. The crucial point from agricultural extension is that the farmer receiver views certain techniques of communication as being more worthwhile than others and the more worthwhile techniques provide the opportunity for the farmer to become more of a participant in the process of change (Hoque et al., 2008).

Training methods help trainees to internalize particular strategies and patterns of learning which they will use in their professional practice. Extension workers who are expected to encourage farmers to adapt technologies to their own farm and local environment should be encouraged to learn about sustainable technologies through direct observation and experimentation (Swanson et al., 1997). If sustainable agricultural development requires extension workers to engage farmers in dialogue, respect farmers' knowledge and recognize the social and economic dimensions of technology, their own training should incorporate methods which embody these principles of extension resources which are as follows:

1. Dissemination of extension activities in the field of crop and animal production (Guney et al., 1999).
2. Increase in yield through the application of modern agricultural techniques (Guney et al., 1999).
3. To improve the quality of agricultural products (Guney et al., 1999).
4. Helping farmers to solve the technical problems at the farm level (Edeoghon et al., 2008).
5. The transfer of modern technologies and training of farmers to use it (Edeoghon et al., 2008).

6. Questionnaire responses of farmers to new technologies and the transfer reactions of these agricultural research centers to develop scientific methods (Edeoghon et al., 2008).
7. Conduct economic studies of farm production systems and agricultural projects and evaluate the impact of various social factors, political, economic and financial capacity to take agricultural work (Edeoghon et al., 2008).

2.2.1 Public sector extension approach

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 and Boland, 2004a). Some of the tasks assigned by the central administration of the agricultural extension as follows: (field visits, home and office, extension lectures, days of field\field extension), extension bulletins, communication via radio and television, agricultural films and documentaries and agricultural exhibitions (Cho and Boland, 2004a).

2.3 Agricultural extension management

Agricultural extension management is a skill that requires constant planning and development which are concerned with the optimum attainment of extension programmes and objectives with and through other organizations. Agricultural

extension management is characterized by many strategies, wide spans of control, democracy, and autonomy. Their management practices cannot be reduced to one standard set of operating guidelines that will work for all organizations continually (Waldron, 1994b). Agricultural extension management is also in close communication mechanism with all the specialist sections of the department of agriculture, other departments and services of the ministry of agriculture and natural resources and especially with the agricultural research institute, the veterinary services department, the water development department and the land consolidation department. The cooperation existing between the department of agriculture (including the extension service) and the agricultural research institute operates on a systematic basis and covers all the aspects of agriculture (agricultural problems, research programme, development projects, promotion of improved agricultural methods or new varieties, etc (Neocleous, 1995).

2.4 Sustainable agricultural development

Sustainable agricultural development is defined as successful management of the resources of agriculture to satisfy changing human needs, to conserve the environment, and increase biological resources (Karami et al., 2008), as a practice that meets current and long-term needs for food, fiber, and other related needs of society while maximizing net benefits through conservation of resources to maintain other ecosystem services and functions, and long-term human development (Allahyari, 2009a). The specific objectives of sustainable agricultural development are to enhance food security; to increase productivity and competitiveness of the sector; to deepen linkages with other sectors; to create new sources of growth for the sector; and to conserve and utilize natural resources in a sustainable basis (Yabi et al., 2009). Also there must be a continuous network of agricultural information, new

technologies, and innovations that are available to them. The agricultural extension service can play a crucial role in providing this network of information on sustainable agricultural development (Allahyari, 2009a).

An agricultural extension services system is composed of a large number of varying elements, but there are some commonly known services which are essential to sustainable agricultural development, in spite of their various organizational schemes and arrangements. These services are based on previous studies on sustainable agricultural development (Weitz, 1971, World Bank 1990, Umali 1994). Figure 2.1, designed by authors Omar and colleagues, summarizes the important elements that contribute in the dissemination of sustainable agricultural development, including: agricultural research, agricultural extension, agricultural education and farmer's training centers, agricultural credit, a marketing system for purchasing inputs and selling agricultural produce and transport facilities (Omar et al., 2012a).

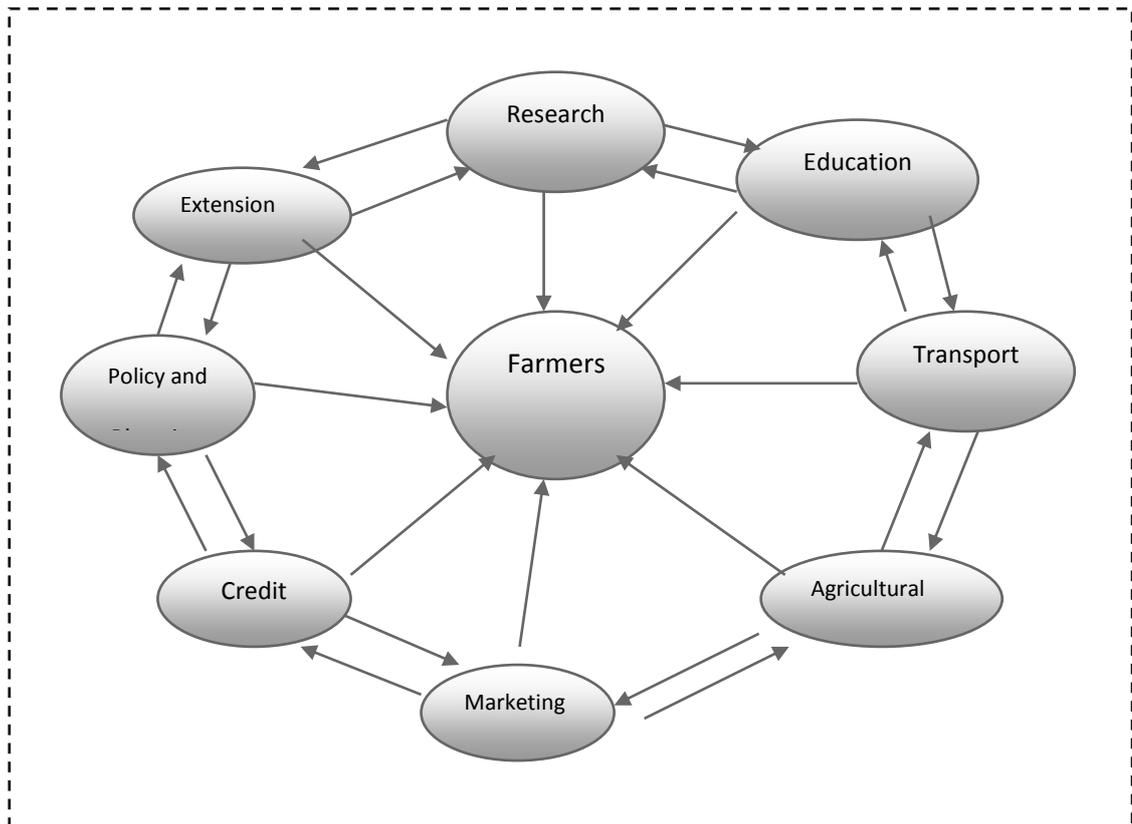


Figure 2.1:- Elements that contribute in the dissemination of sustainable agricultural development (Omar et al., 2012a).

2.5 Major constraints of sustainable agricultural development

2.5.1 Major constraints faced by the farmers

There is a need for educational programmes and training courses for farmers on sustainable agricultural development as farmers lack the skill and knowledge concerning improved agricultural practices. This has resulted in deficiencies in some of the technical and managerial skills of farmers because they were unable to access production information routinely (Owona et al., 2010).

Economical factors such as the high cost of consultancy services and farmers' lack of access to financial resources were identified as other barriers to the effectiveness of sustainable agricultural development (Rasouliazar et al., 2011), where the adoption of technology requires the existence of appropriate financial resources which are usually unavailable to farmers (FAO, 2002). This implies that proven agricultural technologies, which are needed to ensure higher productivity and food security, are not accessible to all farmers scattered in agricultural areas (Tanko et al., 2013).

Financial resources, as one of the main factors of production, are necessary to purchase farm inputs and to undertake the development work necessary to enhance the competitiveness of farms. The degree of access to this resource will undoubtedly influence farming decisions. While capital is not easily available from farmers' resources, credit is an alternative (Ganpat et al., 2000).

Credit is available at agricultural banks only at high interest rates and individuals and it is very limited use in agricultural areas. This situation is even worse for small farmers who cannot provide the credit guarantees required by creditors (Betru et al., 1996). Also, unavailable procedures for payment of agricultural credit loans are still very difficult and need to be streamlined (FAO, 2002).

In addition, market failures also result from the limited capacity of farms to pay for services and the imperfections prevailing in output, input and credit markets. Market imperfections severely limit the ability of farmers to access new technologies, equipment and inputs (Rivera et al., 2004a). For example, because of a lack of appropriate storage methods and facilities, farmers are compelled to sell their produce immediately after harvest, although prices are generally low at that time (Egbadzor, et al., 2013).

There has been a growing realisation that public sector extension approaches have not been sufficiently effective in promoting the adoption of sustainable agricultural practices. This is due, in part, to the failure of farmers to react to the advice and the programmes of agricultural extension, owing to some failure that accompanied earlier implemented methods or programmes (Allahyari, 2009a).

2.5.2 Major constraints faced by the management

Agricultural extension could play a key role in fostering sustainable agricultural development programmes through its training programmes, but there has been a growing realisation that public sector extension approaches have not been sufficiently effective in promoting the adoption of sustainable agricultural practices (Allahyari, 2009a).

The major obstacle to sustainable agricultural development is the absence of legislative policy for the coordination of work between the management of agricultural extension and other organisations. The poor performance of agricultural extension is attributed to their lack of use of sustainable agricultural policy and their lack of awareness about these sustainable agricultural practices. Furthermore, adding to the dense bureaucratic procedures in the relations between the extension and other

organisations is the problem of insufficient communication with other organisations (Kizilaslan et al., 2007).

The agricultural extension system is one of the primary vehicles for diffusing technologies. However, the effectiveness of public extension has gradually decreased in recent years and it is unsurprising, considering the absence of participation of local organizations (farmers' organizations, educational organizations and agricultural credit organizations) in the planning and implementation process of sustainable agricultural development programmes (Kalantari et al., 2008).

The public sector extension approach is an often crucial element in this strategy, which targets the entire farmers in a given area; however, the top-down model creates a rigid hierarchy, which discourages the feedback of information (Kizilaslan et al., 2007).

Sector agricultural extension is characterised by poorly motivated staff, a preponderance of non-extension duties and a limited budget allocated to agricultural extension services (Kizilaslan et al., 2007). As well, the number of field staff working in the agricultural extension management is not enough when compared to a large number of farmers. This is because of the very low salary and the lack of incentives for field staff (Cho and Boland, 2004a), as well as poor infrastructure (Kalantari et al., 2008) and the high cost of buying and maintaining hardware and software (FAO, 2002).

Extension organisations face several challenges in applying including the fundamental lack of appropriate training in the roles and responsibilities of agricultural extension officers on sustainable agricultural development (Azizah, 2011). In addition, there are weaknesses in the present agricultural extension system

such as the very weak linkage and low coordination between research and extension wings (Hoque and Usami., 2007).

According to previous studies on the management of agricultural extension in Libya, there is mismanagement in the public sector and this represents a chronic problem in the Libyan agricultural sector. Prior to 2011, many reports and previous studies mentioned that there were no effective checks and balances on executive power, which will represent the main major constraints on the management of agricultural extension in Libya, including, first, according to the study of (Outlook, African Economic, 2012), the decisions making on agricultural extension was done secretly by government and special interest groups which held sway. Therefore, the role of agricultural extension in Libya is unsatisfactory and requires a new organizational structure to achieve sustainability.

These present constraints on the management of agricultural extension in Libya are in line with some previous studies: the first study, conducted by (Azizah, 2011), concluded that the Indonesian extension organisations face several challenges in applying, including the fundamental lack of appropriate training in the roles and responsibilities of agricultural extension officers on sustainable agricultural development. In addition, a second study was conducted by (Hoque and Usami., 2007) in Bangladesh, which reported that there are weaknesses in the agricultural extension system, such as the very weak linkage and low coordination between research and extension wings.

Secondly, the findings from a previous study of (Outlook, African Economic, 2012) reported that the main challenges lie in the absence of appropriate policy instruments and weak institutional capacity in Libyan agricultural extension to address key issues and implement effective policies and strategies; this is because of the frequent