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THE ROLE OF THE AGRICULTURAL SECTOR IN THE PROTECTION OF THE ENVIRONMENT IN THE MUNICIPALITIES OF (COAST JABEL EL AKHDAR, AL MARJ, AND SOUTH AL MARJ) IN EASTERN LIBYA

Jadalla A.E. Omar
Arts and Science – Elmarj Branch, University of Benghazi-Libya

ABSTRACT
Environmental protection demands practices and technologies which are technically appropriate, economically viable, environmentally non-degrading and socially acceptable. Environmental protection involves management and conservation of the natural resource base and the orientation of the technology and institutional changes in such a manner to ensure the continued fulfilment of human needs for present and future generations. In this search, data were collected through the use of questionnaires to a sample (staff in the agriculture sector) in the study area from January to March 2014. The results were divided into two sections: the major problems and the alternative means in agriculture sector. So, the highest means degree of responses refer to poor infrastructure (Mean = 3.85 ± SD 0.76). Also, the three lowest means refer to the lowest means refer to transfer responsibilities and program planning, management and co-financing to agriculture sector managements in the region (Mean = 3.93 ± SD 0.44). Finally, in terms of setting environmental protection targets, policy-makers are constrained by a lack of information about how to bring about desired outcomes in increased agricultural production, whilst sustaining the resource base.

KEY WORDS: agriculture sector, main problems, alternative means, environmental protection**.**

INTRODUCTION

Eastern Libya (Cyrenaica) rests on a mass of Miocene limestone that tilts up steeply from the Mediterranean Sea and falls inland with a gradual descent to sea level again. This mass is divided into two blocks. The Jebel Akhdar extends parallel to the coast from the Gulf of Sidra to the Gulf of Bomba, and reaches an elevation of 872 meters. There is no continuous coastal plain; the longest strip runs from the recess of the Gulf of Sidra past Benghazi to Tolmeitha. Thereafter, except for deltaic patches at Susa and Derna, the shore is all precipitous. A steep escarpment separates the coastal plain from a relatively level plateau, known as the Marj Plain, which lies at about 300 meters of elevation. Above the Marj plain lies a dissected plateau at about 700 meters, which contains the highest peaks in the range (Gimingham and Walton, 1954). The Jebel Akhdar and its adjacent coast are part of the Mediterranean woodlands and forests ecoregion, and have a Mediterranean climate of hot, dry summers and relatively mild and rainy winters (Mediterranean woodlands and forests, World Wildlife Scientific Report 1, 2011). The lower Jebel Elakabah lies to the south and east of the Jebel Akhdar. The two highlands are separated by a depression. This eastern region, known in ancient times as Marmarica, is much drier than the Jebel Akhdar, and here the Sahara extends to the coast. Historically, salt-collecting and sponge fishing were more important than agriculture in this area. Bomba and Tobruk have good harbours ("Cyrenaica", from Encyclopædia Britannica Eleventh Edition, 1911). South of the coastal highlands of Cyrenaica is a large east-west running depression, extending eastward from the Gulf of Sidra into Egypt. 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 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. Jabel El akhdar area consists of seven agricultural areas (Al Bayda, Shahat, Alhaniyah, Alhamamah,Qusr libiya, Massah and Omar almukhtar) with 510 farms. The principal crops produced include vegetables, fruit, wheat and barley and the principal livestock include sheep and goats, followed by cattle and poultry. In addition, there is a vegetation development project (agriculture ministry, 2011). Al marj area consists of seven agricultural areas (Al marj, Batth, Al bayyadah, Jardas, Al uwayliyah, ad dirsiyah and Barcca) with 580 farms. The principal crops produced include vegetables, fruit, wheat and barley; and the principal livestock include sheep and goats, followed by cattle and poultry. In addition there is a vegetation development project (agriculture ministry, 2011).

METHODOLOGY

The study included three agricultural offices of municipalities namely of, coast of Jabel El akhdar, Al marj, and South Al marj in Eastern Libya. In this search, data were collected through the use of questionnaires to a sample (staff in the agriculture sector) in the study area from January to March 2014. 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. Sixty questionnaires were distributed in the three areas, but only 46staff in the agriculture sector, with fourteen questionnaires not returned. Based on the objectives of the study and nature of the data available, different analytical techniques have been the appropriate descriptive statistics were performed using the statistical package for social sciences SPSS® for Windows, version 16.

RESULTS

Major problems of the agricultural sector

The results in table 1 show that the agriculture sector could play a key role in fostering environmental protection programmes; the outcome of respondents, indicating the major problems of agricultural development, as well as an absence of legislative policy for the coordination of work between the agriculture sector and other organizations, agreed with the statement of views of respondents (63% n = 29). The majority (78.3%, *n* = 36) of the respondents also agreed that there was a limited budget allocated to agriculture sector. Furthermore, 71.7% (n = 33) agreed there is a poor infrastructure, 63% (*n* = 29) strongly agreed that there were lack of training programmes for staff on environmental protection. Adoption of technology requires the existence of appropriate financial recourses which are usually unavailable for agriculture sector where (63%, *n* = 29) of the respondents strongly agreed with this statement. Of the respondents, 58.7 % (*n* = 27) strongly agreed that there was a high cost for supporting environmental protection programmes. As shown in table 1, the three highest means degree of responses refer to poor infrastructure (Mean = 3.85 ± SD 0.76), the absence of legislative policy for the coordination of work between the agriculture sector and other organisations (Mean = 3, 83 ±SD 0.85) and limited budget allocated to agriculture sector (Mean = 3.80 ± SD 0.78). The three lowest means refer to the three lowest means refer to the adoption of technology requires the existence of appropriate financial recourses which are usually unavailable to agriculture sector (Mean = 3.54 ± SD 0.98), the high cost for supporting environmental protection programmes (Mean = 3.65 ± SD 0.92) and lack of training programmes for staff on environmental protection (Mean = 3.67 ± SD 0.94).

TABLE 1: Major problems of the agricultural sector

Degrees of responses	SD n (%) (1)	DS n (%) (2)	N n (%) (3)	A n(%) (4)	SA n (%) (5)	Mean	SD
Item in section							
1	1(2.2%)	3(6.5%)	6(13%)	29(63%)	7(15.2%)	3.83	0.85
2	2(4.3%)	1(2.2%)	4(8.7%)	36(78.3%)	3(6.5%)	3.80	0.78
3	1(2.2%)	2(4.3%)	5(10.9%)	33(71.7%)	5(10.9%)	3.85	0.76
4	2(4.3%)	4(8.7%)	6(13%)	29(63%)	5(10.9%)	3.67	0.94
5	3(6.5%)	4(8.7%)	7(15.2 %)	29(63 %)	3(6.5%)	3.54	0.98
6	2(4.3%)	3(6.5%)	9(19.6%)	27(58.7 %)	5(10.9%)	3.65	0.92

Note: (1) SD strongly disagree; (2) DS disagree; (3) N neutral; (4) A agree; and (5) SA strongly agree.

1. The absence of legislative policy for the coordination of work between the agriculture sector and other organizations.
2. Limited budget allocated to agriculture sector.
3. Poor infrastructure.
4. Lack of training programmes for staff on environmental protection.
5. The adoption of technology requires the existence of appropriate financial recourses which are usually unavailable to agriculture sector
6. The high cost for supporting environmental protection programmes.

Alternative means in agriculture sector for achieving environmental protection programmes

The table 2 shows the results and some views from the respondents of this study on the agricultural sector and the important roles which it played in environmental protection. There should be promotion of transfer responsibilities and program planning, management and co-financing to agriculture sector managements in the region of which 80.4% (*n* = 37) of the respondents agreed with the perceived roles. Also 76.1% (n=35) of respondents agreed that one of the most important solutions is providing a clear legal framework for the implementation of decentralisation and pluralism in the agricultural sector. Respondents (82.6%, n=38) agreed with providing in-service training to staff on environmental protection also, suggest that (87.0 %, n = 40) of the respondents agreed that the use of direct funding for national priority programmes, including the introduction of new technologies and developing production, will help the success of environmental protection programmes, while 82.6% (n = 38) agreed on the improvement of research and the publishing of articles which document research findings on environmental protection. In contrast (89.1%, n = 41) of participants agreed with the idea of regular meetings between farmers on the environmental protection programmes and also, that the farmers' participation in these meetings will help the reform the agricultural markets to stabilise farmers' incomes. As shown in table 2, the three highest means degree of responses refer to the conduction of research and publication of articles documenting research findings in environmental protection (Mean = 4.09 ± SD 0.41), the use of direct funding for national priority programmes, including the introduction of new technologies and developing production (Mean = 4.04 ±SD 0.36) and regular meetings with farmers on environmental protection

programmes (Mean = 4.02 ± SD 0.33). The three lowest means refer to The three lowest means refer to transfer responsibilities and program planning, management and co-financing to agriculture sector managements in the region (Mean =3.93 ± SD 0.44), the providing a clear legal framework for the implementation of decentralization and pluralism in the agricultural sector (Mean= 3.96 ± SD 0.56) and the providing of in-service training programmes to staff on environmental protection (Mean=3.98± SD 0,49).

TABLE 2: Alternative means in agriculture sector

Degrees of responses	SDn (%) (1)	DSn (%) (2)	N n (%) (3)	A n(%) (4)	SA n (%) (5)	Mean	SD
Item in section							
1	00(00%)	00(00%)	6(13%)	37(80.4%)	3(6.5%)	3.93	0.44
2	00(00%)	1(2.2%)	5(10.9%)	35(76.1%)	5(10.9%)	3.96	0.56
3	00(00%)	1(2.2%)	3(6.5%)	38(82.6%)	4(8.7%)	3.98	0.49
4	00(00%)	00(00%)	2(4.3%)	40(87%)	4(8.7%)	4.04	0.36
5	00(00%)	00(00%)	2(4.3%)	38(82.6%)	6(13%)	4.09	0.41
6	00(00%)	00(00%)	2(4.3%)	41(89.1%)	3(6.5%)	4.02	0.33

Note: (1) SD strongly disagree; (2) DS disagree; (3) N neutral; (4) A agree; and (5) SA strongly agree.

1. Transfer responsibilities and program planning, management and co-financing to agriculture sector managements in the region.
2. Providing a clear legal framework for the implementation of decentralization and pluralism in the agricultural sector.
3. Providing of in-service training programmes to staff on environmental protection.
4. The use of direct funding for national priority programmes, including the introduction of new technologies and developing production.
5. The conduction of research and publication of articles documenting research findings in environmental protection.
6. Regular meetings with farmers on environmental protection programmes.

DISCUSSION

This results is consistent with the previous studies that indicate there is a need for educational programmes and training courses for staff on environmental protection as staff lack the skill and knowledge concerning improved environmental protection practices (Owona, 2010). In addition the adoption of technology requires the existence of appropriate financial resources, which are usually unavailable to agriculture sector (FAO, 2002). As well as that the economic factors, such as the high cost of environmental protection services, and agriculture sector' lack of access to financial resources were identified as other barriers to the effectiveness of environmental protection (Allahyari, 2009a and Rasouliazar *et al*., 2011). So there are major problems on agriculture sector that hinder the development of environmental protection programmes, such as the poor agricultural infrastructure (Kalantari *et al*., 2008) along with other major problems such as the absence of legislative policy for the coordination of work between the agriculture sector and other organizations. Also, insufficient budget allocated to agriculture sector services (Kizilaslan *et al*., 2007 and FAO, 2002). These results agree with the previous studies of that the external factors such as the type of decentralization, pluralism, political will to decentralize, the presence of a clear legal framework of responsibilities, roles and coordination mechanism, and the existence of established organizations that are willing to support the process have an important influence on the performance of a district level agriculture sector (Okorley *et al*., 2009a). Also, the quality of staff training (supervisors, the subject matter specialists) improves the staff members' confidence, reflection, stimulation of new ideas and performance, in addition, that the devolution can take place by transferring the responsibilities of co-financing to agricultural sector managements in the region (Okorley *et al*., 2009b). As well as, financial support is important and necessary to agriculture sector in this scope; direct financing will be used in the future for the realization of priority national programs, including the introduction of new techniques and the development of production (Trendafilov *et al*., 1995). In addition to conducting research, articles documenting research findings on environmental protection should be published (Snapp *et al*., 2003). Also, there should be regular meetings with farmers on environmental protection programmes (Vatta, 2008).

CONCLUSION

The study confirmed that achieving environmental protection in the agriculture sector requires restructuring new expertise and skills and creating a new set of operational procedures. These procedures must be less hierarchical and more flexible in order to be able to respond to the emerging needs of environment at the local level and to improve cooperation among agriculture sector with other organizations. Finally, in terms of setting environmental protection targets, policy-makers are constrained by a lack of information about how to bring about desired outcomes in increased agricultural production, whilst sustaining the resource base. There is uncertainty about how to set environmental protection targets, assess the short- and long-term costs, and how to go about reaching these targets.

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