

The Effect of Field Days, Farmers Field Schools and contact with other farmers adoptions on, Roselle (*Hibiscus sabdariffa*.L) production in North Kordofan State, Sudan

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Abstract: The current study was conducted during 2010/2011 cropping season; the objective of the study was to assess the impact of some extension group contact methods such as (extension meetings, field and home visits, field's demonstrations and farmer field schools (F.F.Ss) on farmers adoption of Roselle "*Hibiscus sabdariffa*, L." Production technical package such as (Use of improved varieties, use of hand peeling tools or "Gargara" as well as adoption of other recommended cultural practices such as (seed rate, sowing date, plant spaces, cultivation and harvesting date" by the farmers in North Kordofan State (N.K.S). The study also aimed at identifying the association between farmers' socio-economic characteristics such as (Age, gender, family size, education level, farm size, farmer experience ... etc) and their impact on adoption of Roselle technical package, multi-stage stratified random simple sample procedure was used for selection of 130 farmers out of the total population 1420 Roselle growers, the selected sample were distributed in 13 villages and in three localities namely Arrehed (4 villages), Um Rowaba (5 villages) and Sheikan (4 villages). Primary data were collected through a questionnaire, data were analyzed by descriptive statistics and Chi-square test at a level of significance (0.05) used to detect the association between variables. The results showed that, there was significant association between farmers attending field days and their adoption for technical packages, at chi-square values of 21.712 and 13.574 and at level of significant of 0.01 and 0.035 respectively, the association between farmers' attending F.F.Ss and their adoption for some hibiscus production technical packages showed the adoption for using improved variety (Bertra) were significant for chi-square value 26.227 and at level of significance of 0.010, and showed the adoption of using (Betera) were dependent on farmers' attending F.F. Ss, the associations between farmers' contact with other farmers adoption for hibiscus production practices was highly significant.

Keywords: Adoption, Hibiscus, Association, North Kordofan.

I. INTRODUCTION

It is not known where or when the first extension activities took place. It is known however, that Chinese officials

were creating agricultural policies, documenting practical knowledge, and disseminating advice to farmer at least 2000 years ago. The birth of the modern extension service has been attributed to events that took place in Ireland in the middle of the 19th century: between 1851-1845 Irish potato crop was destroyed by fungal disease and a severe famine occurred. The British Government arranged for "practical instructors" to travel to rural areas and teach small farmers how to cultivate the crops. Swanson (1984) stated that: the use of the term "Extension" originated in England in 1866 with the system of "University Extension" which was taken up first by Cambridge and Oxford universities and later by other educational institutions in England and other countries. Swanson (1984), stated that: Agricultural extension, as public sector institution has an obligation to serve the needs of all agricultural producers, either directly or indirectly. There are multiple client groups in rural communities who have different needs; these groups include not only large and small farmers, but also women and young farmers. Therefore, if the objectives of "growth with equity" which was adopted by the world conference on Agrarian Reform and rural Development (WCARRD) in 1979, is to be achieved then the technological and related needs of these different client groups must be identified and solved. Within the rural areas, what are the common and /or competing interests between large and small farmers, male and female farmers, and established and young farmers, must be considered before the implications of deferent technological alternatives. Rolling (1983), calls those larger, more progressive farmers as high access farmers; they have somewhat better education, greatest access to land, capital credit, and inputs, they generally are more tied closely to information net work. In the Third World, and in Sudan particularly most of those operating in agriculture are low access farmers, they generally operating at or near the substance level, with very limited access to resources

particularly land and capital, and with minimal capacity to handle risk. Thus, they must be the major area of concern for a country and its development objectives. Formulating a strategy for designing and implementing an extension programme aimed at technology transfer and utilization, require to develop realistic extension strategy that will result in broad-based technology utilization, in doing so, extension objectives must be specified, client categories need to be identified, and appropriate extension methods must be selected. Swanson 1984 stated that these methods were particularly useful in making large number of people aware of new ideas, and practices, or alerting them to Sudan emergencies, while the amount of detailed information that can be transmitted by mass media is limited. Kelsey & Hearn (1963), defined " Agricultural Extension" as a system of out-of-school education for rural people (adult, youth, ...etc), to help them through educational procedures to improve farming methods, techniques, as it's an integrated work held by the government, agricultural colleges and the farmers, with task to serve farmers need and to develop them. Van den Ban & Hawkins (1979) regarded extension as purposive communication designed to assist people in solving their problems. H. Maunder (1973), define, " Agricultural Extension" as a service or system which assists farm people , through educational procedures in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living and lifting social and educational standard of rural life.

H. Axinn, George (1985) defined agricultural extension as a non-formal education system whose cliental are rural people, and whose content is primarily agriculture (including crops, live stock production, marketing as well as fisheries, foresting and rural development). Gabriel (1991), added to say: " Extension" is always a complex process rather than static activity mostly extension include a problem solving perspective, a process of non-formal education directed towards people in rural areas, offering advice and information to help them overcome their problems. This aim to increase, production improve their standard of living and efficiency of the farming farm. Extension may also try to alter farmers' attitude towards their difficulties through discussion and decision-making on overcoming problems.

Hibiscus production in the world and Sudan:

According to Herbal Gram-organization 2007: *Hibiscus* is a flowering plant that is native to warm and tropical climates, native to part of North Africa and south East Asia. It is a shrubby tropical plant that produces light yellow flourish with reddish-purple centers; after the petals drops from the flower. Its remaining deep-red calyces (the cup like structures formed by the sepals) grown into seed containing pods that look like flower buds. Most of the *hibiscus*

economic value, particularly as ingredient in herbal teas comes from red calyces, although the leaves, seeds, and flowers are also used, in local forms of traditional medicine. *Hibiscus* is now widely cultivated for its flowers, fruits and calyces in the tropical and sub-tropical regions of almost every continent.

According to consultative Meeting Report, October 21th, 2010, Sudanese chambers of industries Association, Khartoum, Sudan: the main importer of *hibiscus* are Germany (more than 80% of total export) followed by Mexico. Belgium, Egypt, Spain, France, UK, Hong Kong, Italy, Japan, Lebanon, Netherland, Poland, Russia, Saudi Arabia and Syria. *Hibiscus* (H. Sabdariffa L) locally known as Karkadeh. It is a minor cash crop in arid- areas of Sudan, although it is a cash crop, with great potential for small scale farmers in Sudan. Ali, Idris and Griffith (2010) added: *Hibiscus* is one of the main high potential exports of the rain-fed traditional agricultural sectors in Sudan, grown by poor marginalizing farmers, most of whom are women, into remote and challenging areas of Sudan. *Hibiscus* is an important cash crop for Sudan, with approximately 2240,000 farmers in the traditional rain-fed areas (North Kordofan and North Darfur states) "cultivate the crop."

Market research indicated that international demand for *hibiscus* was shown to be favored by European buyers due to its product characteristics (such as acidity and color). It was also generally recognized that growing conditions in Sudan meant that virtually no chemicals needed to be used for pest or disease control. This was considered to be strong selling point, especially when compared with up and coming competitors such as China and Thailand. The total volume of production for *Hibiscus* in the year 2008 was estimated at 18 thousand tones (a good average compares to the past 10 years). The total volume for export usually about half of the production, the rest consumed country inside. Igami Abdelatif (2010), described *hibiscus* as one of the most important crop for the poor, due to its resistance to draughts and pests as well as its lab our intensive nature. He saw the main challenges in creating and enabling environment for the farmers via training services empowering farmers to produce in larger scale, to increase productivity, opening marketing and trade opportunities as well as supporting export. North Kordofan State is among the poorest states in Sudan, where people live predominantly in rural areas, and depend mainly on the natural resources to sustain livelihoods. In these areas crops farming and livestock rising were the main sources of income for the majority of population. The main cash crops were groundnuts, sesame, and hibiscus. Although, it was considered as one of the main producing areas, but the adopted traditional production systems have limited the contribution of those crops to the improvement of community livelihoods. According to consultative Meeting

Report October 21th, 2010, farmers who are growing *hibiscus* were facing many problems, including; use of local varieties, resulting in low productivity in most of the cash crops, particularly *hibiscus* (It was estimated that the current productivity of *hibiscus* per area unit was only 19% of the optimum productivity). Traditional methods of agricultural practices and inefficient operations leading to high production cost. Also the methods of harvesting and post harvesting were negatively affecting the quality of to product. Farmers having little awareness of exporters needed the potential for adding value by improving harvesting methods or simple technologies for achieving this. Ali, Initially 13 villages out of the total 23 villages in the study area were covered to represent the three localities (Sheikan, Arrehed, and Um Rowaba) as the main targeted area for growing *hibiscus* crop.

II. RESEARCH METHODOLOGY

Multi-stage stratified random sample was used in selection of villages and farmers, the number of villages and the number of farmers were selected to represent each locality was proportional to the total number of village and number of farmers in the locality.

Questionnaire field survey was used to collect data from three localities or rural communities of 13 villages and the total sample size was 130 respondents. Descriptive statistical was use for analyzing the data.

Data analysis techniques

Data were analyzed via descriptive statistics and Chi-square was used to test the association between the variables.

III. RESULTS AND DISCUSSION

Table (1) chi- square test for the association between farmers' attending of field days and their adoption for some recommended *hibiscus* production practices revealed that there were significant association between farmers attending of field days and their adoption for some technical packages such as using hand peeling tools for harvesting at recommended date, these could be at chi-square values of 21.712 and 13.574 and at level of significance of 0.01 and 0.035 respectively. Which showed that these practices were dependent on farmers' attending field days also adoption of the two important varieties *Abu shankel* and *Abu Nagama* were significant at chi- square values of 34.68 and 21.806. At the levels of significant of 0.000 and 0.010 respectively. The results showed the adoption of these improved varieties were dependent on farmers' attending of field days, other practice such as plant spaces, seed rate, sowing date and cultivation were insignificant for the chi-square values 7.650, 4.194, 2.678 and 3.528 respectively and at level of insignificants of 0.285, 0.650, 0.740, and 0.650 respectively, which showed the adoption of these production technical packages were not dependent on farmers' attending of field days.

Table (1) Chi- Square Tests for the Association Between Farmers' Attending Field Days and Adoption some *Hibiscus* Production Practices:

<i>Adoption of production practice</i>	<i>Sign</i>	<i>df</i>	<i>Chi-square value</i>	<i>Indicative</i>
using hand peeling tool	0.01	9	21.712	Sign
recommended plant spaces	0.265	6	7.650	Non Sign
recommended seed rate	0.650	6	4.194	Sign
recommended sowing rate	0.740	6	3.528	Non sign
recommended cultivation	0.840	6	2.678	Non sign
Harvesting date	0.035	6	13.574	Non sign
Adoption of improved varieties	-	-	-	-
1.Abu shankel	0.000	9	34.568	Sign***
2.Betera	0.161	9	13.031	Non sign
3. Abu Nagama	0.010	9	21.806	Sign**

Table (2) chi-square tests for the association between farmers' attending F.F.Ss and their adoption for some *hibiscus* production technical packages showed the adoption for using improved variety (*Bertra*) were significant for chi-square value 26.227 and at level of significance of 0.010, and showed the adoption of using (*Betera*) were dependent on farmers' attending F.F. Ss, while the adoption for the other two varieties *Abu shankel* and *Abu Nagama* were found to be insignificant for chi-square values 13.419 and 9.789 and at level of

significant of 0.333 and 0.935 respectively. The adoption of these two varieties was independent on farmers' attending of F.F. Ss.

Table (2) Chi- Square Tests for the Association Between Farmers' Attending F.F. Ss and Adoption of Hibiscus Production Technical Packages:

Adoption of technical package	Sign	df	Chi-square value	Indicative
using of hand peeling tool	0.359	12	21.712	Non Sign
Adoption of improved varieties:				Non Sign
(i) Abu shankel	0.330	12	13.419	Non Sign
(ii)	0.010	12	26.227	Sign
(iii)	0.635	8	9.789	Non sign
Plant spaces	0.311	8	9.379	Non sign
Seed rate	0.333	8	9.117	Non sign
cultivation	0.995	8	1.335	Non Sign
Sowing date	0.147	8	12.094	Non sign
Harvesting date	0.743	8	5.134	Non Sign

Table (3) showed that chi – square tests for the associations between farmers' contact with the other farmers and their adoption for some *hibiscus* production practices was found to be highly significant for the adoption of some practices such as (using hand peeling, using improved varieties *Abu Shankal* & *Abu Najma* and adoption of recommended cultivation date for chi – square value of 38.272, 41.171, 35.802 & 61.265 respectively. While it was insignificant for the adoption of other practices such as adoption of some recommended practices such as plant spaces, seed rate, soil date at level of a significant of the 0.178, 0.304 and 0.080 respectively.

Table (3) Chi – square test for the test of association between farmers' contact with other farmers and their adoption for some recommended hibiscus production technical packages:

Adoption of technical package	Chi – square	df	Sign	Indicative
Using of hand peeling tools	38.272	12	0.000	Sign ☆☆☆
Improved variety Abu Shankal	41.171	12	0.000	Sign ☆☆☆
Betera	18.456	12	0.103	non Sign
Abu Najma	35.802	12	0.000	Sign ☆☆☆
Adoption recommended technical packages:				
Plant space	9.479	8	0.304	Non sign
Sowing date	14.978	8	0.080	Non sign
Cultivation date	61.256	8	0.000	Sign ☆☆☆
Harvesting date	15.767	8	0.046	Sign

IV. CONCLUSION AND RECOMMENDATIONS

There were significant association between farmers attending of field days and their adoption for some technical packages such as using hand peeling tools for harvesting at recommended date.

Contact with the other farmers and their adoption for some hibiscus production practices that it was found to be highly significant for the adoption of some practices such as

(using hand peeling, using improved varieties *Abu Shankal* & *Abu Najma*.

Recommendations:

1. Farmers attending and participating in extension activities; field demonstration, F.F.Ss field visits, and contact with the other farmers enable access to necessary information concerning improve *hibiscus* production.

2. Need for local extension agent would help farmers to raise innovations adoption.

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