

## **Determination of training needs for water users associations in Gezira Scheme, Sudan**

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### **ABSTRACT**

The main objective of the study was to determine the training needs for Water Users Associations (WUAs) in order to suggest appropriate training programs. Seven irrigation divisions were selected randomly from 21 irrigation divisions (Wad Elnaw, Wad Elbur, Tabat, Kab Elgidad, Shalaie, Wad Elmansi and Gaboja). A questionnaire was designed to collect the required data by using random sample technique from 395 farmers. The information was collected during the period from April to July 2010. The data were statistically analyzed using the statistical package for social science (SPSS) to calculate frequency, percentages, mean and standard deviation. A Likert scale was used to determine the needed level of training. The study revealed that the previous training courses, training content and duration were neither suitable nor sufficient, because the training courses were concise, short and irrelevant to farmers training needs. In addition, the study revealed that the vast majority of Gezira Scheme farmers preferred practical oriented methods (field demonstrations and field days) to encourage the WUAs to adopt new technology in the irrigation of fields to develop skills, upgrade knowledge and bring positive change among farmers. The study showed that most of farmers were not convinced with the WUAs performance, and that there is a strong need for regular and intensive training programs to raise WUAs capacity regarding management and proper use of irrigation water; rules and regulations; operation and maintenance of irrigation canals; water request and crops water requirement; and water management and water supply contract. All farmers need active participation in water charge, cost recovery and participation in crop choice. This participation must be based on planning of appropriate training programs that consider farmers training needs and to encourage them to voluntary participation in development activities. There is a great need for proper training needs assessment before training activities are carried out.

## INTRODUCTION

Participation is now the buzzword that makes any project successful. Despite huge investments made by successive governments and a host of other organizations in the water resources sector, the unsatisfactory water distribution and inefficient management of the system which contributed to the declining economic and social rate of return was largely attributed to the lack of participation of the users in this sector.

The Federal Parliament adopted the new Gezira Act in July 2005, which gave sweeping new responsibilities to Water Users Associations (WUAs) and private sector while reducing significantly the role of the public sector. The new act guarantees free crops choice, transfers title and long-term lease deeds to farmers, privatizes cost centers and refocuses the Gezira Scheme on agricultural research and technology transfer. The act has major implications on marketing, credit, input supply, water management and maintenance of the irrigation assets. Accordingly, Gezira farmers as individuals or groups should be heavily involved in these activities. Farmers and other involved stakeholders in the Gezira Scheme have been poorly prepared for the radical institutional change and there is skepticism about the managerial and financial capacities of the WUAs to take up their new roles and responsibilities. Therefore, it was suggested that, before the application of the new act, farmers be subjected to intensive training programs covering all aspects of their new duties.

The WUAs is relatively a new concept in irrigation management. Involving farmers through WUA's has proven very successful in a number of smaller irrigation systems. The merits of involving farmers in designing, operating and maintaining irrigation works is expected to increase flow of water reaching downstream areas, greater area cultivated, higher cropping intensity, lower cost of construction and reduction of conflicts. WUAs have been applied in many countries of the world with similar disciplines in concept and implementation. Modern users associations have important financial responsibilities which include repayment of the loan for the execution of the works, operation and maintenance costs, establishment of a reserve fund and administrative costs. These costs are normally recovered from the members of the association by way of taxes and/or fees imposed on the land and/or water (Goldsmith and Hildyard, 1984).

Shortage of irrigation water during the peak summer period, severe inequalities in water distribution throughout the system and deteriorating condition of physical structures (canals, drainage, potable water networks) were found to be factors that contributed to a near absence of water control and the losses of this valuable resource. Therefore, the new Gezira Act (2005) provides the regulatory framework for the establishment of WUAs at the scheme level "water users associations shall be legal entities representing the farmers' self-management system..." (Gezira Act, 2005).

Since the concept is new, there is a strong need for regular and intensive training to upgrade farmers knowledge, attitudes and practices. Van Dorsal (1962) defined training as the process of teaching, informing, or educating people so that they may become qualified to do their job, and perform in positions of greater difficulty and responsibility. Ajayio (1995) stated that training is acquisition of the act of utilizing knowledge and skills.

To be effective and efficient, all training programs must start with needs assessment. Long before any actual training occurs, the training manager must determine the, who, what, when, where, why and

how. The needs assessment is the first step in planning training programs. The assessment begins with a "need" which can be identified in several ways but is generally described as a gap between what is currently in place and what is needed.

The extension services in an irrigation and agricultural sector needs multidimensional approach to bring in desirable changes in order to increase the awareness of farmers and define the role of participation in water resources management, it becomes imperative to provide the water users with intensive training programs in order to promote their skills in the operation, and management of irrigation systems. This is in addition of teaching them important relevant subjects to enable them make a good living. Therefore, there is a need to assess their training needs before planning training programs.

Each training program includes several short courses covering the most important topics relevant to the subject. This is in addition to on-job training in the field of installation, operation, and maintenance of the irrigation systems. An important strategy to improve and save water systems is to: (1) improve operation practices to provide more reliable, predictable and equitable water deliveries to users (2) sustain a preventive maintenance program (3) provide technical and social assistance to beneficiaries for enhancing tertiary subsystem management and (4) improve irrigation water management on farms.

This study is therefore undertaken to assess the training needs of WUAs in Gezira Scheme to suggest appropriate training programs and priorities as a guide spot for preparation of WUAs training modules under the Gezira Act (2005) in terms of water operation and maintenance, management and administration of WUAs, legal documents and farmers' participation.

## MATERIALS AND METHODS

### Population and sample

This study was conducted in Gezira Scheme during the period from April to July 2010; seven irrigation divisions were selected randomly from (21) irrigation divisions (Wad Elnaw, Wad Elbur, Tabat, Kab Elgidad, Shalaie, Wad Elmansi and Gaboja). The random sampling technique was used. Accordingly, a sample of 395 farmers was randomly selected from 50555 farmers in the selected irrigation divisions according to size of farmers in each irrigation division.

The formula used (Israael, 1992)

$$n = \frac{N}{1 + N(e)^2} = \frac{50555}{1 + 50555(.05)^2} = 395$$

Where:-

N = Total population (50555)

n = Sample size

e = Standard error = 0.05

A questionnaire consisting of 28 questions was developed and a personal interview technique was used to implement the questionnaire. The survey for collecting the data was carried out during April-July 2010. The collected data were statistically analyzed and interpreted by using the statistical package for social sciences (SPSS).

- 1) Descriptive analysis (tables, frequencies, percentage, mean and standard deviation) were used to assess the training needs area. "
- 2) Comparison method was used to find out the gap.

3) A Likert scale was used for assessing WUAs training needs.

The mean and standard deviation were computed based on mean value obtained.

The needed level of training was calculated by subtracting the mean value from 3 i.e., maximum scale value. Above 2= very high,  $1.5 < 2$ = high,  $1.25 < 1.5$ = medium,

$1.0 < 1.25$ = low,  $0.5 < 1.0$ = very low and less than 0.5 not considered.

Maximum value – mean= needed level of training or desired situation - current situation= Training need

The difference between “desired status of learners” and “current status of learners” equals a training need (Popham, 1993).

## RESULTS AND DISCUSSION

### Farmer’s sources of information, sufficiency and relevance of previous training and training needs of water users associations

#### Source of information

Data in Table 1 showed that the ranking of the sources from which the farmers received their agricultural information were considered as follows: WUAs ranks first followed by the field supervisor, the television, the radio, the field demonstration, the neighborhood, the farmers union, the press, the leaflet and the least is the information received from the Agricultural Extension Department. This may indicate the weakness of agricultural extension in its current situation, due to the fact that the Scheme has been evacuated from extension field staff. Therefore, farmers rely on the experience of water users associations to obtain solutions for their problems. This may lead to ineffective ways of farming, unless comprehensive training programs that consider WUAs training needs is designed and implemented.

Table 1. Distribution of farmers according to sources of information.

Sources of information	Frequency	%
Waters Users Associations	314	78.9
Field Supervisor	274	68.7
Television	194	48.6
Radio	188	47.1
Field demonstration	162	40.6
Neighborhood	135	33.8
Farmers Union	120	30.1
Press	111	27.8
Leaflet	102	25.6
Agric- extension department	87	21.8

Source: field survey 2010

#### Sufficiency, quality, and relevance of previous training

Data in Table 2 showed that 48% of the farmers had never attended training programs before. In addition, 95.2% and 69.9% of them affirmed that training content and training courses duration respectively were not sufficient and did not respond to their needs. Lack of training quality and quantity is probably one of the main causes of low productivity, which requires designing comprehensive training programs based on training objectives and which should indicate the subjects’ matter that has to be taught to respond to the farmer’s needs. Moreover, the training content should clearly outline the balance between upgrading knowledge and developing skills. Overall, the training content should be relevant to farmers needs. Table 2 also showed that the majority of farmers (68.1%) affirmed that they did not benefit from the training courses attended before. About 95.1%, 82.5% and 74.8% of farmers

attributed the main causes of not benefiting was due to irrelevance of training contents to their training needs, training duration is concise and short and the irregularity of the training programs, respectively. This again necessitates designing continuous comprehensive training programs that consider training quality and quantity according to farmers needs.

### Training as a kind of learning

The results in Table 2 showed that the majority of farmers (81.8%) affirmed that the training as a learning process was very important. In addition, the majority of respondents (86.3%) preferred practical oriented methods (field demonstration and field days) as training methods that can help in acquisition of new skills. Therefore, comprehensive training programs must be organized in operations, maintenance and irrigation water management related to their needs taking into consideration the practical oriented methods.

Table 2. Distribution of farmers according to sufficiency, quality and relevance of previous training.

Farmers training	Frequency	%
Farmers training attended:		
Not attended	166	42.0
Attended	229	58.0
Training courses duration:		
Not suitable	160	69.9
To some extent	67	29.3
Suitable	2	0.9
Training courses contents:		
Not sufficient	218	95.2
To some extent	9	3.9
Sufficient	2	0.9
Extent of benefit:		
Benefit less	156	68.1
Small degree of benefit	62	27.1
Benefit to some extent	6	2.6
Medium degree of benefit	4	1.7
Great benefit	1	0.4
Reasons of non-benefit:		
Training duration concise and short	189	82.5
Training contents irrelevant to my training needs	268	95.1
Irregularity of the training programs	171	74.8
Training as a kind of learning:		
Important	72	18.2
Very important	323	81.8
Training methods:		
Field demonstration	228	57.7
Field day	113	28.6
Symposium	54	13.7

Source: field survey 2010

### Training of Water Users Associations

Table 3 showed that most of the farmers (93.9% and 87.8%) affirmed that WUAs were not trained well on rules and regulations, on optimum use of irrigation water and on the process of management, operations and maintenance of irrigation canals. WUAs were given a range of responsibilities to which they were not prepared. This has resulted in a lot of haphazard practices which are now witnessed in the field of Gezira Scheme.

Table 3. Distribution of farmers according to their opinion on whether the WUAs have been well trained on optimum use of irrigation water, management, operation and maintenance and on rules and regulations.

Training of WUAs	Frequency	%
Training of WUAs on optimum use of irrigation water:		
Not agree	371	93.9
To some extent	21	5.3
Agree	3	0.8
Training of WUAs on management, operation and maintenance :		
Not agree	347	87.8
To some extent	42	10.6
Agree	6	1.5
Training of WUAs on rules and regulations:		
Not agree	371	93.9
To some extent	21	5.3
Agree	3	0.8

Source: field survey 2010

### Farmers' perception towards water management

Data in Table 4 showed that the majority of farmers (84%) did not agree that WUAs had become aware of water requests and crop water requirement,. Also 74.9% and 62.3% of the farmers did not agree that WUAs had fairly participated in water distribution among farmers at the field canal and on management of irrigation water and water supply contract, respectively. Table 4 also showed that 64.6% of respondents did not agree that the water users associations had become aware of water charges and cost recovery. Moreover, 32.7% of respondents indicated that WUAs failed to participate on seasonal agricultural plan and crops choice.

### WUAs needed level of training and ranking

The information in Table 5 showed that the needed level of training for WUAs was "very high" in all subjects areas. Also, the data in Table 5 showed that the farmers rank optimum use of irrigation water and rules and regulations at the top, followed by operation and maintenance, water request and crops water requirement, participation of WUAs on distribution of water and finally participation of WUAs on management and water supply contracts and on water charge and cost recovery. Therefore, the study points out that most of the farmers are in need of training in almost all of the fields of water management and its different aspects. This indicates that the training should deal with all mentioned needs according to the results stated.

Table 4. Performance of WUAs towards water request and crops water requirements, fairly participated water distribution, participation in water management and water supply contract, water charge cost return and participation in crops choice.

WUAs performance	Frequency	%
Water request and crops water requirements:		
Not agree	332	84.0
To some extent	54	13.7
Agree	9	2.3
Fairly participated in water distribution:		
Not agree	296	74.9
Agree to some extent	99	25.1
Participation in water management and water supply contract:		
Not agree	246	62.3
To some extent	149	37.7
Water charge cost return:		
Not agree	255	64.6
To some extent	128	32.4
Agree	12	3.0
Participation in crops choice:		
Not agree	129	32.7
To some extent	233	59.0
Agree	33	8.4

Source: field survey 2010

Table 5. WUAs needed level of training and ranking.

Training subject areas	Possesses knowledge		Needed level of training*	Rank order
	Mean	Std		
Optimum use of irrigation water	0.07	0.28	2.93	1
Rules and regulations	0.07	0.28	2.93	2
Operation and maintenance	0.14	0.39	2.86	3
Water requests and crops water requirement	0.18	0.44	2.82	4
Participation of WUAs in distribution of water	0.25	0.43	2.75	5
Participation of WUAs in water management and water supply contract	0.38	0.49	2.62	6
Water charges and cost recovery:	0.38	0.55	2.62	7

Above 2= very high, 1.5<2= high, 1.25< 1.5= medium, 1.0< 1.25= low, 0.5<1.0= very low and less than 0.5 not considered.

\*The needed level of training is obtained by subtracting the mean value from 3, the maximum scale value.

## **CONCLUSIONS AND IMPLICATIONS**

The study pointed out that most of the WUAs of Gezira Scheme are in great need for comprehensive training programs relevant to their needs on many subjects concerning water management. Highly demanded areas for training were found to be the optimum use of irrigation water, rules and regulations, operation and maintenance, water request and crops water requirements, participation of WUAs on distribution of water, participation of WUAs on water management and water supply contracts and training on water charges and costs recovery. Operation and maintenance as well as managing irrigation water systems need active participation of all farmers. This participation might be based on planning appropriate training programs that consider farmers training needs, to encourage them to voluntary participation in water management and related activities. WUAs being one of the main sources of information for farmers, unless they are well trained, will diffuse wrong information and ill-chosen recommendations among farmers.

Farmers participation in successful practical oriented training programs may not only help mobilize resources for improvements but makes farmers play significant roles in managing water at farm levels thus saving water and increasing productivity.

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## تحديد احتياجات التدريب لروابط مستخدمي المياه بمشروع الجزيرة، السودان

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### الخلاصة

هدفت الدراسة لتحديد احتياجات التدريب لروابط مستخدمي المياه بمشروع الجزيرة لاعداد برنامج تدريبي لرفع قدرات الروابط. تم اختيار (7) سبعة اقسام ري عشوائيا من جملة 21 قسم ري بالمشروع (ودالنو، ودالبر، طابت، كاب الجداد، شلعي، ودالمنسي وقسم ري قبوكة). تم تصميم استبيان لجمع المعلومات المطلوبة باستخدام تقنية العينة العشوائية بحجم عينة لهذه الدراسة 395 مزارع. تم جمع البيانات الاولية بواسطة الاستبيان في الفترة من ابريل - يوليو 2010. وتم تحليلها باستخدام برنامج الحزم الاحصائية للعلوم الاجتماعية (SPSS) لحساب التكرارات، النسب المئوية، المتوسط والانحراف المعياري كما تم استخدام a Likert scale لتحديد مستوى الحاجة التدريبية. كشفت الدراسة ان الدورات التدريبية السابقة غير مناسبة و غير كافية من حيث المحتوى والفترة الزمنية وان معظم مزارعي مشروع الجزيرة يرغبون في طريقة التدريب العملي الموجه (الحقول الايضاحية وايام الحقل) لتشجيع روابط مستخدمي المياه لتبني التقانات الحديثة في مجال مياه الري لزيادة المعارف وتنمية المهارات لاحداث تحول ايجابي وسط المزارعين. وضحت الدراسة ان معظم المزارعين غير مقتنعين باداء روابط مستخدمي المياه وان الحاجة لكبيرة وملحة لتنظيم دورات تدريبية مكثفة ومنتظمة لرفع قدرات روابط مستخدمي المياه فيما يتعلق بادارة وترشيد استخدام مياه الري، الصيانة والتشغيل لقتوات الري، المشاركة في عقد الامداد المائي، استرداد كلفة خدمات الادارة ورسوم مياه الري، اللوائح والقوانين واختيار المحاصيل. واخيرا وضحت الدراسة ان هنالك حاجة ماسة لتحديد الاحتياجات التدريبية بدقة قبل المضي قدما في الانشطة التدريبية.