The Approach of Aweil Rice Scheme Production

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ABSTRACT

Concerning the approach of Aweil Rice Scheme Production, there were several factors that had been mentioned for the failure of Aweil Rice Development Project (ARDP). Aweil Rice Development Project since its inception had a lot of hurdles such as remoteness of the area, lack of transport, no enough agricultural machinery, lack of adequate and skilled personnel, lack of fertilizers, and the wars of 1955-1972 and 1983-2005; combined together has made the Project not to fulfill the objectives it was established.

The planned area to be cultivated was not fully utilized only a small acreage and this has made the produce to be small. The number of employees was small as well as the machinery to cultivate the envisaged area of 22,000 feddans. The yield was small as there were no enough implements of agricultural machinery and proper agricultural practices.

The objective of the study is first, to find out whether production of rice was going on well or there were some challenges; and to examine the variation in the quantity of yield of the production level in Aweil Rice Scheme. In this study, survey design was used by collecting data using questionnaire, interviews and observation. The study population was only on assessed population of the South Sudan members working in Aweil Rice Scheme and the implied population was (240), the sample size was (120) respondents. The instruments for the research were the questionnaire, interview schedules and observation. The result of the findings were that: a larger quantity of production in Aweil Rice Scheme can provide national need; surplus for export and expected productivity and the reasons for choosing rice as the only crop to be produced instead of diversifying the production of various crops was due to suitability of land, and plenty of water and many others. Therefore, if the government of South Sudan and their partners focus much on Aweil Rice Scheme Production, then there will be availability of much food and hunger could be below Zero in South Sudan.

Keywords:

- Agriculture
- Cultivation
- Employment
- Food consumption.
- Production ability.
- Technological elements.

INTRODUCTION

South Sudan is a predominantly agricultural economy with 78 percent of all households owning or using agricultural land. Wide variation exists between states with 58 percent of households in Western Bahr El Ghazal State engaging in agriculture compared to 88 percent in Eastern Equatoria State. Agriculture exists even in ‘urban’ areas with 29 percent of households engaging in agriculture compared to 86 percent in rural areas. Agriculture remains the predominant sector of the economy in terms of livelihoods and employment (National

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Bureau of Statistics [NBS], 2009)." "South Sudan has a vast agricultural potential which has remained largely under exploited because the intensity of crop production is limited by the traditional practice of cultivation by hand using a limited range of implements. Government sponsored farms and few farms operated by private entrepreneurs are where intensity of crop production is found. Any realistic development for South Sudan must be based on the development of agriculture because it is the mainstay of the majority of the people. The National Baseline Statistics (2009) showed that crop farming has the highest percentage among the main sources of livelihood among households in the rural areas in South Sudan.

Agriculture is one of the leading sources for sustenance of livelihood and the country's economy. South Sudan economy is a dual economy. As defined by Thirlwall (1978), "a dual economy is one characterized by a difference in social customs between the subsistence and exchange sectors of an economy, a gap in the level of technology between rural subsistence sector, and possibly a gap in the level of per capita income between regions of a country if the money economy and industrial development are geographically concentrated." Agriculture in South Sudan should have been given priority to be developed as a primary source for sustenance of livelihood and promotion of the economy in South Sudan. Generally, a variety of crops are grown including rice in South Sudan, mainly at Aweil.

On the objectives, the study is to examine the production ability for food consumption in the area, to measure the production level in Aweil Rice Scheme and then strategize the quantity of yield of the produce for the nation's consumption. The proposition of the study is that: Low price of imported rice caused the upheavals in marketing of the produce of the Aweil Rice Development Project. Low price of the imported rice has an impact on the marketing of the rice produced by the Project. Thus, the independent variable is "low price of imported rice" and the dependent variable is "the decline of the rice price of the Project."

LITERATURE REVIEW

Introduction

Aweil Rice Development Project is an agricultural scheme involved in production of rice. Tools of production management also known as operations management are being practiced by the Project Management. Functions of production management have been in practice at Aweil Rice Development Project and have been bringing together men, money, machines, materials, methods and markets in order to produce rice which is intended to satisfy the wants of the people of South Sudan. It is imperative that theoretical framework of production or operations management is reviewed in this Article.

Concept of Production Function

Production function also known as operations function is concerned with design and control systems responsible for the productive use of raw materials, human resources, equipment and facilities in the development of a product or service. The words production and operations are used synonymously (Telsang, 2007).

Production is a creation of utility. The production function creates utility by providing form, time and place utilities for the produced goods.

Production management means planning, organizing, directing and controlling of production activities. It deals with converting raw materials into finished goods or products. It brings together the 6M's i.e. men, money, machines, materials, methods and markets to satisfy the wants of the people. Production management also deals with decision-making regarding the quality, quantity, cost, etc., of production. It applies management principles to production.

Production management is a part of business management. It is also called production function. Production management is slowly being replaced by operations management.

The main objective of production management is to produce goods and services of the right quality, right quantity, at the right time and at minimum cost. It also tries to improve the efficiency. An efficient organization

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can face competition effectively. Production management ensures full or optimum utilization of available production capacity.

Operations management may be defined as a process, which combines and transforms various resources used in the production operations subsystem of the organization into value added products or services in a controlled manner as per the policies of the organizations. Thus, production function or operations function is a part of an organization, which is concerned, with the transformation of a range of inputs into required outputs having a requisite quality level.

Activities in production management or operations management include organizing work, selecting processes, arranging layouts, locating facilities, designing jobs, measuring performance, controlling quality, scheduling work, managing inventory and planning production. Operations management is an area of business that is concerned with the production of goods and services, and involves the responsibility of ensuring that business operations are efficient and effective. It is also the management of resources and the distribution of goods and services to customers.

The field of operations management has been gaining increased recognition over the last two decades. One major reason for this is public awareness of the success of Japanese manufacturers and the perception that the quality of many Japanese products is superior to that of American manufacturers. As a result, many businesses have come to realize that the operations function is just as important to their firm as finance and marketing. In concert with this, firms now realize that in order to effectively compete in a global market they must have an operations strategy to support the mission of the firm and its overall corporate strategy.

Another reason for greater awareness of operations management is the increased application of operations management concepts and techniques to service operations. Finally, operations management concepts are being applied to other functional areas such as marketing and human resources. The term marketing/operations interface is often used.

No longer is operations management considered subservient to marketing and finance; rather, it is a legitimate functional area within most organizations. Also, operations management can no longer focus on isolated tasks and processes but must be one of the architects of the firm's overall business model.

With regards to the operations of Aweil Rice Development Project there is a Production Department headed by a Production Manager and comprises five units, having responsibilities of (The Democratic Republic of the Sudan, Ministry for National Planning, 1979):

1. Land Development and Water Management Unit: This unit is responsible for the planning, design and construction of the irrigation and drainage systems, and for the establishment of methods for the operations and maintenance of these facilities; land development; and also charged with operation and maintenance of the water management facilities.

2. Technical Service Unit: The unit has a vital function of being in charge of the maintenance of all project machines and equipment; and also responsible for the construction works and the maintenance of bridges.

3. Milling Unit: The unit is responsible for the operation of the rice mill.

4. Extension Unit: The extension unit is responsible for settlement, training, guidance and supervision of tenants; and in the future will be charged with the responsibility for the growing of seed rice by the tenants.

5. Production Farm Unit: The production farm unit is responsible for planting, maintenance and harvesting of the developed land not yet farmed by tenants. Furthermore, the production farm unit manages the seed production farm and will therefore, as long as no other arrangements have been made, grow seed rice. The production department is responsible for the proper preparation of the farm land occupied by tenants.

The units of Aweil Rice Development Project are as shown in figure 1 below of the Management Organogramme.

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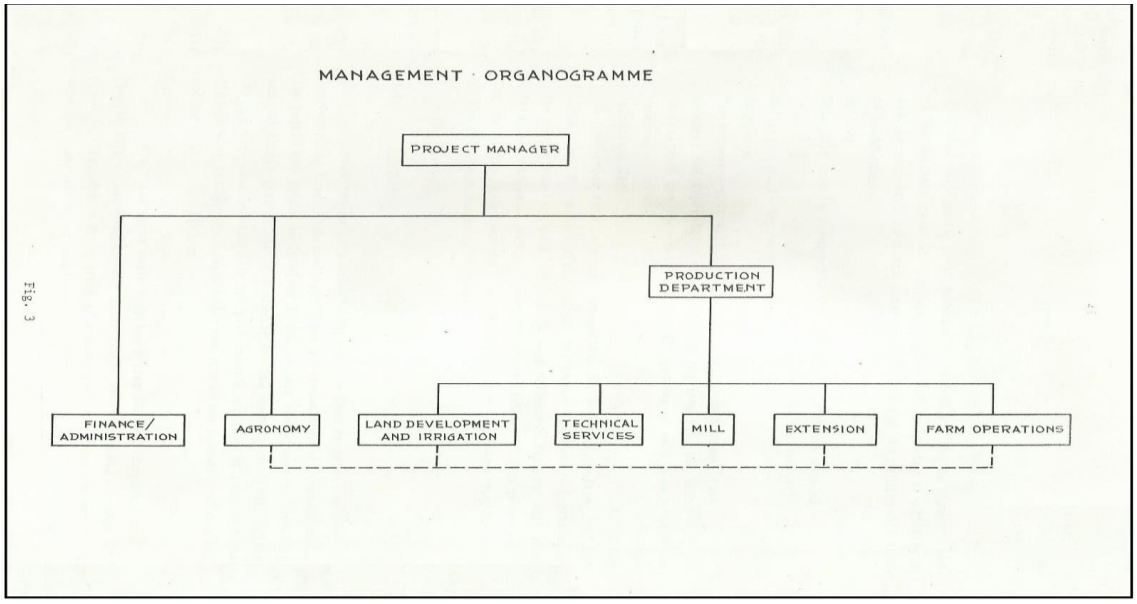
Figure 1: Management Organogramme of Aweil Rice Development Project.



Source: Democratic Republic of the Sudan, Ministry for National Planning. Final Report, Aweil Project Study (Phase 2), November 1979. P. 13.

Production System

Production system or function of an organization is that part which produces the organization's products. Production is the basic activity of all organizations and all other activities revolve around production activity. The output of production is the creation of goods or services, which satisfy the needs of the customer (Telsang, 2007).

In some organizations the product is a physical or tangible good, while in others it is a service. A production system comprises both the technological elements (machines and tools) and organizational behaviour (division of labour and information flow). An individual production system is usually analyzed in the literature referring to a single business, therefore it's usually improper to include in a given production system the operations necessary to process goods that are obtained by purchasing or the operations carried out by the customer on the sold products, the reason being simply that since businesses need to design their own production systems this then becomes the focus of analysis, modeling and decision making (also called "configuring" a production system).

Production and Production Management

Production is defined as the step-by-step conversion of one form of material in to another form through chemical or mechanical process to create or enhance the utility of the product to the user. Thus, economists define production as an activity by which form utility is created and enhanced. Edwood Buffa defines production as a process by which goods and services are created (Telsang, 2007).

Production management is a process of planning, organizing, directing and controlling the activities of the production function. Edwood Buffa defines production management as the one that "deals with the decision-making related to production so that the resulting goods and services are produced according to specifications, in the amounts and by the schedule demanded and at a minimum cost (Telsang, 2007).

Objectives of Production Management

Production is an organized activity and each organized activity has its objectives, which helps to evaluate its performance against the set objectives. The objective of production management is stated as: 'To produce goods or services of right quality and quantity at the predetermined time and predetermined cost' (Telsang, 2007).

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Thus, the objectives of production management are reflected in: right quality, right quantity, predetermined time, and predetermined cost (ASPF, 2012).

1. **Right Quality**: The quality of the product is established based upon the customers' needs. Customers' needs are translated into product specifications by the design or engineering department. The manufacturing department then translates these specifications into measurable objectives. Thus, the cost-quality trade off decides the final quality of the product. Thus, a proper balance must be obtained such that the product quality offered to the customer should be within the pre-established manufacturing cost (ASPF, 2012).

2. **Right Quantity**: The manufacturing organization should produce the products at the right number. If the products are produced in quantity excess of demand the capital will block up in the form of inventory and if it is produced in quantity short of demand, there will be shortages of products. Thus, a decision is to be taken regarding how much to produce (ASPF, 2012).

3. **Manufacturing Schedule**: Timelines of delivery or schedule is one of the important parameters to judge the effectiveness of production department. There are many reasons like non-availability of materials at right time, absenteeism, machine breakdown etc., which affect the timely completion of the products. Thus, the manufacturing department should organize its activities in such a way that the products will be manufactured as per schedule (ASPF, 2012).

To achieve the above objectives, the manufacturing/production department has to make the optimum utilization of various inputs like men, materials and machines. Consequently, to have a better utilization of resources, the production department has to achieve the other objectives, which are lower in the hierarchy. These objectives are called intermediate objectives and are going to optimize the utilization of resources (ASPF, 2012).

4. **Manufacturing Costs**: Manufacturing costs are established before the product is actually manufactured. The manufacturing department has to manufacture the products at the pre-established cost. In any case, any variations between the actual costs and the standard or pre-established costs should be kept at a minimum.

The Flood Region

Awiel Rice Scheme falls within the ecological zone of the Flood Region. According to Barbour (1961), Flood Region includes the rest of Upper Nile, the eastern and north-eastern parts of Bahr el Ghazal, and parts of north-eastern Equatoria. Rainfall here is heavy and it is between 750-1,000mm. The Flood Region is shown in the Map of the South Sudan Ecological Zones which is in page 8 of this Article.

Tothill (1948) noted that: The Flood Region falls into four main areas that are: Permanent swamps along the Nile which are perennially flooded; The flood plain, or *toich*, inundated from the rivers for 4-6 months each year; Intermediate land, largely flooded by poor drainage of rainfall; and Higher areas, within or beyond the flood plain which escape river flooding and have permeable soils, thus avoiding flooding by rainfall.

The main areas of cultivation are found on the ridges which are not subject to flooding. Climatically, the Flood Region falls largely into dry monsoon zone, with 3-4 humid months, and 4-7 dry months. The rains usually begin in late May and end in early October. However, annual rainfall varies considerably throughout the region and, 'as often as not, although the rainfall may be up to average, incidence of fall is spasmodic, distribution poor, and in consequence crops fail badly. Soils are highly variable within the region both in terms of texture and fertility, but clays predominate and these can be very difficult to work, tending to contract and crack when dry and to swell and become impermeable when wet.

In regards to the cropping calendar in the Flood Region, the Ministry of Finance and Economic Planning (1983) asserted that the number of crops and crop varieties is much more restricted than in other areas. Sorghum and maize are the crops grown most extensively, the two main varieties of maize having been introduced since the Addis Ababa Accord. Lesser crops include sesame, groundnuts, beans (*Phaseolus* spp.), and tobacco. Both the maize and the sorghum varieties, grown widely are resistant to water-logging.

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Systems of Agricultural Production in South Sudan

The large area of South Sudan, the wide variation in physiography and climate, and the wide variety of peoples have given rise to equally wide variations in the systems of agricultural production found within its boundaries. Underlying this diversity, however, four major factors have affected all farming systems in South Sudan, and they are (Republic of South Sudan. Ministry of Agriculture, Forestry, Cooperatives and Rural Development, 2012):

1. A harsh natural environment.

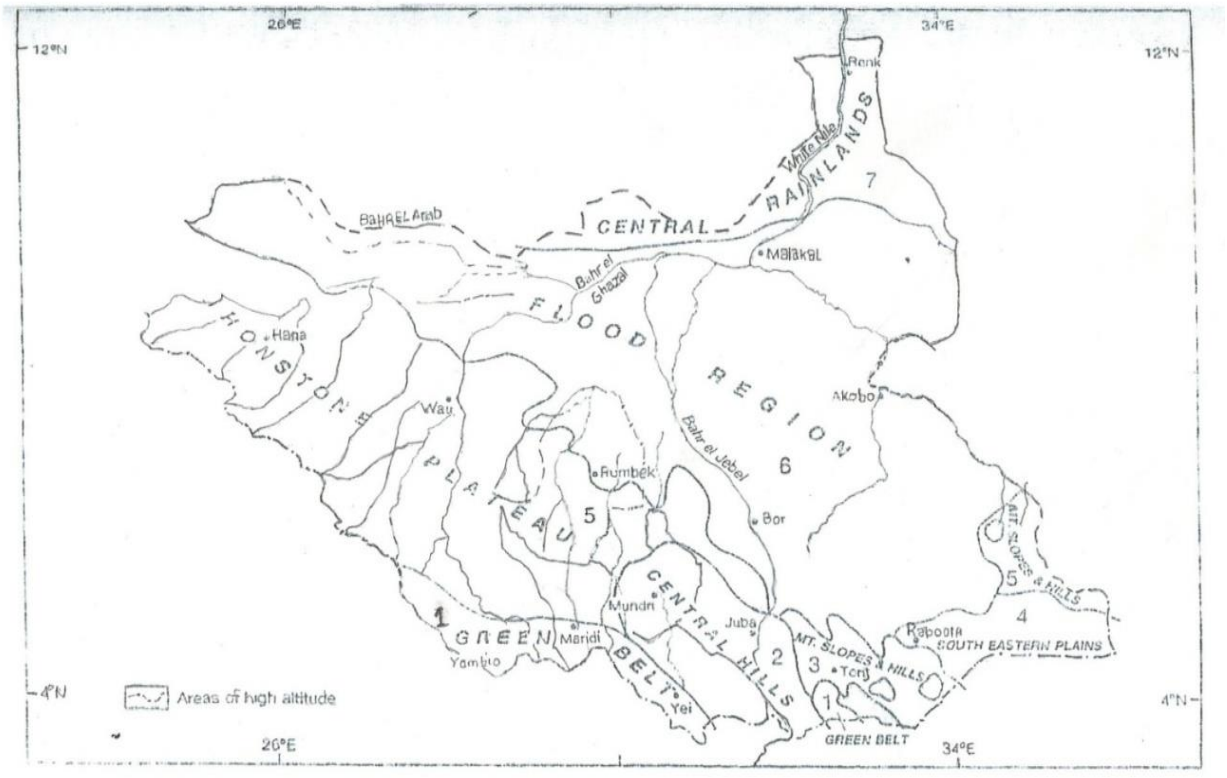
2. A sparse population-the result of years of exposure to raiding and destruction by slavers, Turco-Egyptians, the Dervishes and, more recently, by both sides in and on-going civil war. There are few sizeable urban centres to provide local markets for agricultural surpluses.

3. Poor communications-natural disadvantages have been exacerbated by poor maintenance of the communications network or even by deliberate destruction during the periods of civil war. The fine natural corridor of the Nile has been barely exploited. This has hampered the export of agricultural products and made the importation of farm inputs difficult and costly.

4. A very low level of technological development-years of raiding, fighting, and destruction have given rise to physical and mental demoralization among indigenous South Sudanese. Farmers have been forced to flee their farms to find refuge in the bush, or even across international borders. Even during the relatively stable progressive period of Anglo-Egyptian rule, the development programme in the South was low-key, emphasizing disease control, famine control, and soil conservation, sometimes to the detriment of long-term development.

The Southern Development Investigation Team (SDIT) in its report in 1955 divided South Sudan into seven major ecological areas (Ruthenberg, 1980), as reflected in the map of the South Sudan Ecological Zones as hereunder:

Map of South Sudan Ecological Zones



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These ecological areas are:

1. The Green Belt.
2. The Central Hills.
3. The Mountain Slopes and Hills.
4. The South Eastern Plains.
5. The Iron Stone Plateau.
6. Flood Region or Sudd; and
7. Central Rain Lands.

Most of South Sudan land comprises the Green Belt, the Central Hills, the Mountain Slopes and Hills and the South-Eastern Plains. Stretching east of the Nile-Congo Watershed which (the border with the Central African Republic) lies the iron Stone Plateau which merges in turn into the vast Flood Region or Sudd, drained by the Bahr el Ghazal and Bahr el Jebel. The most northerly zone was identified as the Central Rain lands.

The low level of technological development in the area makes farming methods particularly sensitive to local variations in land form, soils, hydrology, and rainfall. The low population levels also mean that the majority of cultivated land is still farmed under some form of shifting cultivation, with more restricted areas, i.e. those close to towns, those with particularly fertile soils and good water supplies, or those subject to heavy refugee immigration, falling into the fallow system category (Schlippe, 1956), or even that of permanent cultivation.

METHODOLOGY

In the Methodology, the research was exploratory. The method used was descriptive with case study design together with analytical, applied, quantitative, qualitative, evaluative, and comparative tools. Deductive and inductive methods of the research were also used. Library research and field research were the two types of research methods widely used together with their subsequent techniques. Interviews and discussions were carried out and respondents were served with a questionnaire. The study population was only on assessed population of the South Sudan members working in Aweil Race Scheme and the implied population was (240), and the sample size was (120) respondents.

The sources of the data included primary data source of which the information was collected straight from the field by means of the questionnaire, interviews, and observation. Secondary data source was accessed from the text books, journals, websites (internet) reports, articles, newspapers and related studies.

The research instruments used in this study were such as answering questions in the questionnaire, interview schedules and observation. Interviews were physically conducted by the researcher. In the interview there were questions asked orally and only structured interviews were used. And the interviews were conducted with every group member under the scope of the study. On the observation the researcher used it during interview to understand the behaviors patterns in their physical and social context in Aweil Rice Scheme.

RESULTS

Actual Produce Over the Years of Production

Records of the rice produced during the years of the functioning of Aweil Rice Development Project (ARDP) were hardly to be found. However, from 1961 to 1971 the records available were that of the paddy rice milled which were the production records of the annual capacity of the mill.

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However, production levels records found at Aweil Rice Development Project for various years are as shown in the tables 1, 2, 3, 4, 5, 6, 7, 8, and 9 in the next pages.

Table 1: Aweil Rice Production Performance for the years 1956-1979.

Year	Area (inhac.)	Yield (in ton.)	Av. Yield (ton/hac)
1956-57	226	160	0.707
1957-58	256	458	1.789
1958-59	168	320	1.904
1959-60	308	580	1.883
1960-61	289	545	1.885
1961-62	403	768	1.905
1962-63	361	548	1.518
1963-64	588	671	1.141
1964-65	2100	1008	0.480
1965-66	1344	1060	0.788
1966-67	420	329	0.783
1967-68	1441	1209	0.839
1968-69	1358	930	0.684
1969-70	3362	2595	0.771
1970-71	4466	1335	0.298
1971-72	2223	1960	0.431
1972-73	2328	682	0.292
1973-74	256	224	0.875
1974-75	680	115	0.169
1975-76	565	171	0.300
1976-77	762	147	0.193
1977-78	687	215	0.313
1978-79	344	1135	3.300
1979-80	354	1480	4.180

Source: Food and Agriculture Organization of the United Nations. Land Development Project (Aweil Rice Scheme), Sudan/73/001, Final Report, November 1979. P. 25.

The figures in table 1 above show that there is variation in the area cultivated and the yield respectively. This is due to the fact that, when farming machineries are in good condition to cultivate more additional area, the yield

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increases. Another factor is that the year that there are adequate supplies of fuel and fertilizers the area cultivated increases as well as the yield.

Table 2: Aweil Rice Scheme Production Levels of 1980-1981.

1980/1981	Actual	Estimate	Actual	Estimate
Paddy for milling (t)	1729	1845	1699	2150
Rice Grade I (t)	716	-	590	-
Recovery (%)	41.4	-	34.7	-
Rice Grade II (t)	376	-	463	-
Recovery (%)	21.7	-	27.3	-
Total rice production (t)	1092	1070	1053	1250
Average recovery (%)	63	58	62	58

Source: Democratic Republic of the Sudan, Ministry of Finance and Economic Planning. Aweil Rice Development Project, First Phase (EDF), Final Report, December 1982. P. viii.

Table 3: The paddy yields (kg/ha) of Aweil Rice Scheme from 1980/81-1981/82

Area	**1980/81**	**1981/82**
Total arable land	2550	2286
Central farm and seed multiplication	2343	1626
Seed multiplication	3537	2517
Tenants' plots	2926	3018

Source: Democratic Republic of the Sudan, Ministry of Finance and Economic Planning. Aweil Rice Development Project. First Phase (EDF), Final Report, December 1982. P. 29.

Table 4: The yields realized per variety (in kg/ha) by Aweil Rice Scheme from 1980/81-1981/82:

Variety	**1980/81**	**1981/82**
C20	2093	1389
RPW 6-7	-	2298
CR 189-4	-	1600
BR 4	-	2250
B 1990 B-mr-28-5-2-1	-	3608
Bhavani	2540	2489

Source: Democratic Republic of the Sudan, Ministry of Finance and Economic Planning. Aweil Rice Development Project, First Phase (EDF), Final Report, December 1982. P. 31.

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Table 5: Below Shows Planned Planting and Production targets versus actual results 1980/81-1981/82 of Aweil Rice Scheme:

	1980/81			**1981/82**		
	Planned	**Actual**	**Actual (% of planned)**	**Planned**	**Actual**	**Actual (% of planned)**
Area Planted (ha)	700	756	108	700	874	125
Number of tenants	250	276	110	550	416	76
Paddy production (t):						
Tenants	687	805	117	1788	1251	70
Farm	1238	1165	94	487	747	153
Total	1925	1970	102	2275	1998	88
Paddy production (kg/ha)						
Tenants	2750	2915	106	3250	3140	97
Farm	2750	2427	88	3250	1631	50
Average	2750	2600	95	3250	2286	70
Average income tenant (£)	-	252.47		-	253.57	

Source: Democratic Republic of the Sudan, Ministry of Finance and Economic Planning. Aweil Rice Development Project. First Phase (EDF), Final Report, December 1982. P. vi.

Table 6: Below shows tons of Crop Yield in basin 9 for the year 1979 per ha (Fully water controlled area)

Variety	**Area (inHac.)**	**Total Yield (in Ton.)**	**Av. Yield (ton./Hac.)**
IR-20	31.5	149.79	4.76
Bhavani	229.5	965.26	4.21
RPW-6-17	45.0	189.50	4.22
Suvale	22.0	77.73	3.53
C-20	12.0	38.40	3.20
Experimental Farm	14.0	60.00	4.28
Total	**354.0**	**1480.61**	**4.2 (Average)**

Source: Food and Agriculture Organization of the United Nations. Land Development Project (Aweil Rice Scheme), Sudan/73/001, Final Report, November 1979. P. 37.

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Table 7: Below shows tons of paddy rice production of Aweil Rice Scheme from 1961-1971.

Year	Tons of Paddy Rice
1961	165
1962	642
1963	138
1964	159
1965	1,146
1966	1,232
1967	51
1968	2,150
1969	686
1970	1,637
1971	925

Source: Consultancy Report to the Project Manager, FAO/UNDP Land Development Project DP916 SUD 73/001 on the rice processing plants at Aweil Rice Scheme-Sudan by Rudolf Runte, Consultant Rice Milling, Aweil, October 1974. P. 4.

In table 7 above, the quantities of paddy rice produced vary from year to year. This results from the amount of inputs injected into the production processes. For example, adequate machinery, quantity of fuel supplied, application of fertilizers, and proper weeding, harvesting and threshing in time. All these factors account for increase and decline of the yield.

Table 8: Below shows rice production of Aweil Rice Scheme from 1975 to 1985.

Year	Tons of Paddy Rice
1975	84,000
1976	98,000
1977	252,000
1978	2,566,830
1979	37,000
1980	38,702
1981	390,050
1982	39,200
1983	39,100

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1984	38,200
1985	39,111

Source: Aweil Rice Development Project Stores Ledger Book for the years 1975-1985.

The figures of production in table 8 above vary because:

1. The rehabilitation and reorganization of ARDP was gradually implemented by UNDP/FAO from 1977-1979. For example, in 1977, a pilot area of 550ha was cultivated and then got increased to 720ha in 1978. EEC funding continued the expansion of the area of the Project under cultivation to 756ha in 1980 and to 874ha in 1981. The gradual increase of the area cultivated from year to year can explain the increase in yield. That means when the area cultivated increases, the yield increases provided all the required inputs are availed but if not all availed it could account for the decrease of the yield even though the area cultivated is increased.

2. The years from 1977-1978, the implementation of the rehabilitation and reorganization of the Project by UNDP/FAO was at its peak, this is because more inputs were injected to boost production which subsequently resulted to the increase of the yield.

3. UNDP/FAO was phasing out in 1979, the last year for their support to the Project. Therefore, the resources were at minimal and the yield had to decline.

4. The period of financing for the Project by UNDP/FAO elapsed in 1979, and EEC provided more money for the continuation of the Project from 1980 which was a transitional period and so the yield remained almost the same as that of the previous year. The year of 1981, was a year of stability and the yield increased. War broke out in 1983 and this affected the operations of the Project and the yield declined and eventually the Project closed down in 1986.

Table 9: Below shows rice production of Aweil Rice Scheme from 2001 to 2015

Year	**Tons of Paddy Rice**
2001	119,420
2002	-
2003	12,530
2004	1,330
2005	84, 420
2006	-
2007	-
2008	275,800
2009	296,170
2010	313,891
2011	32,388
2012	590,380

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2013	498,315
2014	484,750
2015	371,000

Source: Stores Ledger Book for the year 2001-2015.

As can be observed in table 9 above, there are years of low and high yields. The years 2001-2004, were the years that the war was still on and the Government was responsible for financing the Project, but the funds availed were not adequate to run the Project and bring good results, and subsequently, the yields varied from year to year. The year 2005 was the year that the Comprehensive Peace Agreement was signed and the war stopped. The Government might have provided good amount of money for the Project and subsequently the yield increased.

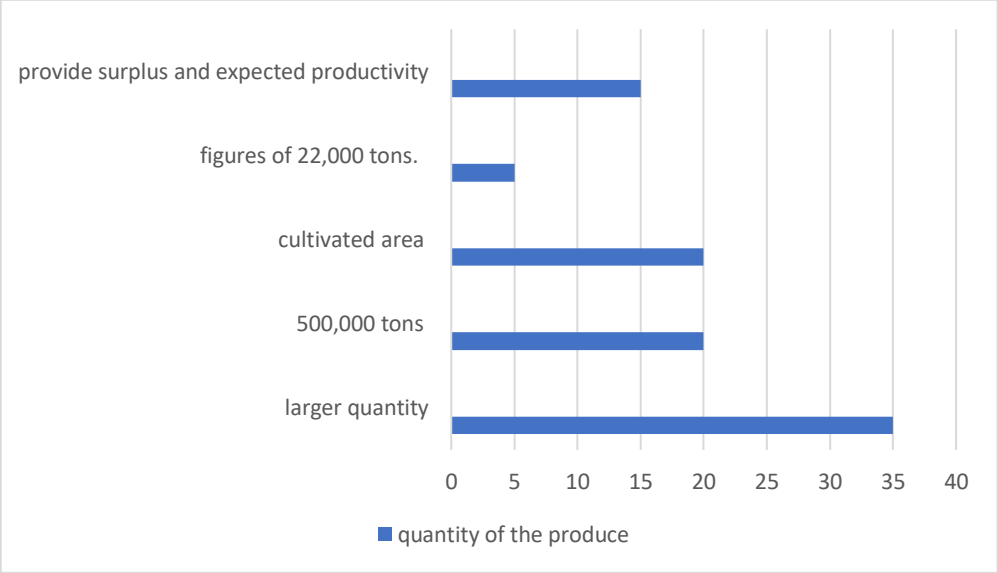
EU provided funds in 2007 for the rehabilitation of ARDP, and German Development Cooperation (GIZ) was mandated to rehabilitate the Project from 2008-2012. New agricultural machineries were procured together with milling machine and other agricultural inputs which resulted to the increase of the yield from 2008-2010 and 2012. The decline of the yield in 2011 is unexplainable but the yield rose in 2012 to an extent that it became more than double than the produce of 2008.

The GIZ term of rehabilitation of the Project elapsed in 2012, and subsequently, handed the Project to the Government. The Government continued to fund the Project and maintained the momentum of production to more than that of 2010.

However, according to the Acting Manager of Aweil Rice Development Project, Mr. Deng Deng Jor, “for the year 2015/2016, the production yield was 1,600 sacks of 60kgs of paddy rice not milled, which is the lowest yield in the history of the Project because rains were poor and no floods during the year. Rice was dried up in the Scheme and this caused lack of seeds and as a result, they have to procure seeds from the market to compensate for the loss.”

Planned Quantity of the Produce

Figure No. 2: Planned quantity of the produce



Primary source

In regards to the planned quantity of the produce: 35% of the respondents mentioned that it was larger quantity, 20% stated that it was 500,000 tons, 20% stated that it depends on the area cultivated, 05% mentioned figures of

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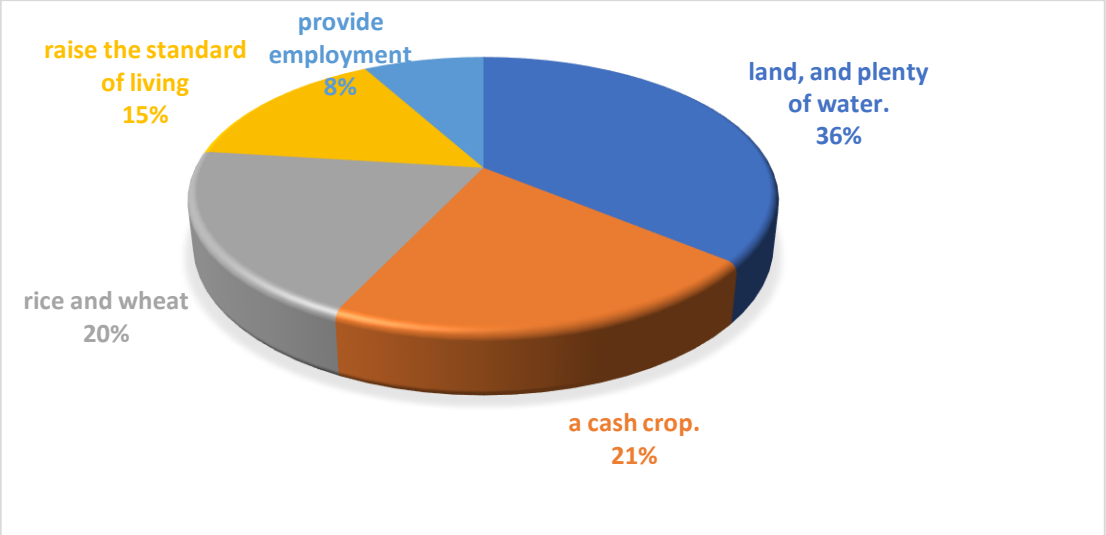
22,000 tons, 19,250MT, 10,000 tons, 3 tons of paddy rice per ha, and small production. Other 15% came up with irrelevant answers such as: to provide national need, surplus for export and expected productivity. The result of the research was that there was a larger quantity of production in Aweil Rice scheme.

Choosing rice as the only crop

Figure No. 3: Reasons for choosing rice as a crop for ARDP

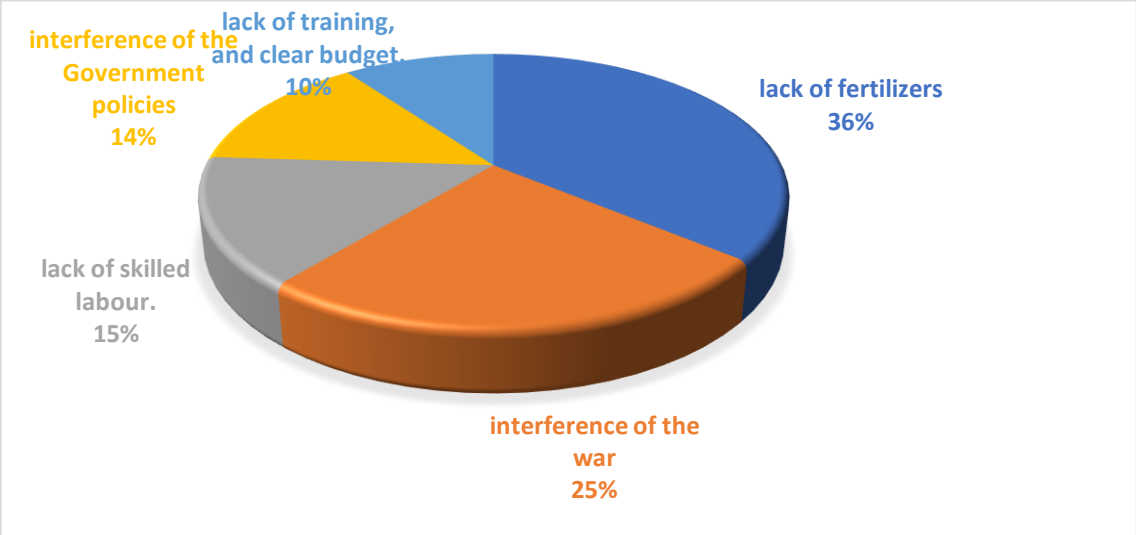


Primary source

The reasons for choosing rice as the only crop to be produced instead of diversifying the production of various crops, according to 36% of the respondents it was due to suitability of land, and plenty of water. 21% mentioned improvement of national nutrition and economy, and that it is a cash crop. 20% stated that rice and wheat are kings of cereals. 15% mentioned that rice is a crop of high yield, and to raise the standard of living. 8% mentioned that rice is a crop of high demand, it was to provide employment, because of the limitations of funds, and it was recommended by the Investigation Team. Most of the respondents agreed that the reasons for choosing rice as the only crop to be produced instead of diversifying the production of various crops was due to suitability of land, and plenty of water.

The Production Quantity and Quality

Figure No. 4: Reasons for achieving envisaged quantity of production



Primary source

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The reasons given for not achieving the envisaged production in terms of quantity and quality are: according to 36% of the respondents was due to lack of fertilizers. 25% mentioned that it was due to the interference of the war, and 15% stated that it was due to inadequate cultivation machinery and lack of skilled labour. 14% stated that it was due to interference of the Government policies, 10% stated lack of training, and no clear budget.

DISCUSSION

Actual produce over the years of production

Records of the rice produced during the years of the functioning of Aweil Rice Development Project (ARDP) were hardly to be found. However, from 1961 to 1971 the records available were that of the paddy rice milled which were the production records of the annual capacity of the mill. There is variation in the area cultivated and the yield respectively. This is due to the fact that, when farming machineries are in good condition to cultivate more additional area, the yield increases. Another factor is that the year that there are adequate supplies of fuel and fertilizers the area cultivated increases as well as the yield. The quantities of paddy rice produced vary from year to year. This results from the amount of inputs injected into the production processes. For example, adequate machinery, quantity of fuel supplied, application of fertilizers, and proper weeding, harvesting and threshing in time. All these factors account for increase and decline of the yield.

The figures of production vary because:

1. The rehabilitation and reorganization of ARDP was gradually implemented by UNDP/FAO from 1977-1979.

2. The gradual increase of the area cultivated from year to year can explain the increase in yield; more inputs were injected to boost production which subsequently resulted to the increase of the yield.

3. Phasing out of UNDP/FAO in 1979, resulted to minimal support and the yield had to decline.

4. The year of 1981, was a year of stability and the yield increased.

5. The break out of the war in 1983 affected the operations of the Project and the yield declined and eventually the Project closed down in 1986.

6. The provision of good amount of money by the Government for the Project subsequently increased the yield.

7. EU provided funds in 2007, and German Development Cooperation (GIZ) rehabilitated the Project from 2008-2012 and new agricultural machineries were procured together with milling machine and other agricultural inputs which resulted to the increase of the yield from 2008-2010 and 2012.

8. Production yield for the year 2015/2016, was 1,600 sacks of 60kgs of paddy rice not milled, which is the lowest yield in the history of the Project because rains were poor and no floods during the year.

Planned Quantity of the Produce

In regards to the planned quantity of the production of rice, the result was that there was a larger quantity of production in Aweil Rice scheme which can provide food for national need, and surplus for export.

And this could be the approach the management team in Awiel Rice Scheme have to take seriously to fulfil the need of South Sudanese who are in need of food, and on the other way it will provide job opportunity for the youth in South Sudan.

Conferring to ASPF (2012), the manufacturing organization should produce the products at the right number. If the products are produced in quantity excess of demand the capital will block up in the form of inventory and if it is produced in quantity short of demand, there will be shortages of products.

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Thus, a decision is to be taken regarding how much to produce as ASPF noted. Therefore, ARDP has to produce some more quantities of rice and other products for export to get hard currency for the nation.

Choosing rice as the only crop for Aweil Rice Scheme

According to the respondents, the reasons for choosing rice as the only crop to be produced by Aweil Rice Scheme instead of diversifying the production of various crops were as follows:

1. Was due to suitability of land;
2. Availability of plenty of water;
3. Improvement of the national nutrition and economy;
4. It is a cash crop;
5. Rice and wheat are kings of cereals;
6. Rice is a crop of high yield;
7. To raise the standard of living;
8. Preferred by the community;
9. Rice is a crop of high demand;
10. To provide employment; and
11. Because it was recommended by the Investigation Team.

CONCLUSION

Aweil Rice Development Project since its inception had a lot of hurdles such as remoteness of the area, lack of transport, no enough agricultural machinery, lack of adequate and skilled personnel, lack of fertilizers, and the wars of 1955-1972 and 1983-2005; combined together has made the Project not to fulfill the objectives it was established.

The planned area to be cultivated was not fully utilized only a small acreage and this has made the produce to be small. The number of employees was small as well as machinery to cultivate the envisaged area of 22,000 feddans. The yield was small as there were no enough implements of agricultural machinery and proper agricultural practices.

There was a larger quantity of production in Aweil Rice scheme which can provide food for national need, and surplus for export. ARDP has to produce some more quantities of rice and other products for export to get hard currency for the nation.

There were various reasons for choosing rice as the only crop to be produced by Aweil Rice Scheme instead of diversifying the production of various crops. The reasons included among others: suitability of land; availability of plenty of water; improvement of the national nutrition and economy; a cash crop; raise the standard of living; and to provide employment.

Although Aweil Rice Development Project is a national Scheme, there is no enough support it is getting from the National Ministry of Agriculture, Forestry, Cooperatives and Rural Development. Presently, there are no enough qualified staffs, agricultural machinery, and fertilizers are not being supplied.

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