Mechanized co-operative irrigation farming in the South-Afram region of the Volta Lake area of Ghana

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SUMMARY

Mechanized irrigation farming was organized by the Volta Lake Research and Development Project at Ampaem, south of the Afram Lake, as a pilot project. The project was sponsored by Ghana Government and the United Nations Development Programme through the Food and Agricultural Organization. Consequently, the Kwahu Tafo Parish of the Catholic Church in the Accra Diocese organized a commercially oriented irrigation crop farming on co-operative basis with the author as a farm manager. The objective in both cases was to introduce irrigation culture as an insurance for moisture availability for all year round farming in drought prone South Afram Region of the Volta Lake area. Results generally showed encouraging economic returns. Nonetheless, problems of socio-economic and mechanical nature were encountered. Suggestions have been made which can promote co-operative commercial irrigation crop farming in the area.

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RÉSUMÉ

Nuamah, G. E. A. *Irrigation mecanisée en co-opératives dans le sud de la région Afram du Lac Volta au Ghana.* Des cultures en irrigation mechanisée en co-opératives ont été organisés par le Volta Lake Research & Development Project à Ampeam au sud de la région Afram comme un project pilote. Le projet a été financé par le gouvernement du Ghana et la Programme de Devéloppement de Nation Unis, via l'Organisation de l'Alimentation et de l'Agriculture. Par conséquent, la paroisse de l'église Catholique dans la ioc èse d' Accra à Kwahu Tafo a organisée des cultures irrigguées commerciales en co-opératives avec l' auteur comme le directeur. Le but dans le deux cas était d'introduire la pratique d' irrigation comme une assurance contre la manque d'eau pour la culture pour toute l' année dans le sud de la région Afram du lac Volta qui est prédisposé à la sècheresse. Genérallement, les résultats montraient des gains economiques importantes. Toutefois, il y avaient des problèmes socio-economiques et mecaniques. Des propositions qui peuvent promouvoir des cultures irrigueés commerciales en co-opéraatives dans ce millieu ont été faites.

Introduction

The creation of the Volta Lake caused ecological problems in the area encompassed by the lake 10 years after its creation. Tall tap-rooted trees started dying out, rainfall amounts and frequency were reducing, resulting in a change in the vegetation. Consequently, farmers could no longer grow their traditional staples to maturity under dry land conditions. As a result, the Volta Lake Research and Development Project, jointly sponsored by the Ghana Government and the United Nations Development Programme and which had the responsibilities, among others to introduce new methods of farming in the lake area decided, to start a pilot medium-scale sprinkler irrigation farm at Ampaem.

The encouraging results from the pilot farm interested the Catholic priest at Kwahu Tafo who also had pastoral responsibility for Ampaem. He started a commercial mechanized co-operative irrigation food farm 5 km west of the UNDP pilot farm.

The author was an agronomist on the senior staff of the Project from 1972 to 1983, and a farm nanager of the co-operative farm from 1985 to 1988.

Materials and methods

The lake was the source of irrigation water and because its water is infested with the bilharzia worm, sprinkler irrigation system was recommended

by the epidemiologist of the Volta lake Research and Development Project. Again, the lake level fluctuates between high tide from August to November and low tide from November the same year to July of the following year; therefore, the irrigation pump had to be mobile so that it would be manipulated to synchronize with the rhythm of the lake level. Hence the FAO supplied Perkins diesel engine trolleyed on two pneumatic tyres and thus mobile, a self-propelled Dolphin irrigator, and all the pipelines. The tractor, implements, and transport facilities were again provided by the FAO. The Dolphin irrigator moved under water pressure along a 400 m iron-chain anchored at the opposite end. It had a rain gun with a 100-m diameter.

The Catholic Co-operative Society used a Perrot Diesel sprinkler system provided by the Catholic Relief Services. It comprised a Deutz diesel water pump, 210-m transport line and an extensive distribution system. There were two settings a day, each lasting 6 h. Area thus covered was 5.4432 ha. There were 6 days of irrigation in a week, thus covering 32.6 ha per week. The farm was sited at Kwahu Amanfrom.

Selection of farmers

In the Volta Lake and Research Project, farmers were randomly selected from four communities in the Ampaem and Kwahu Amanfrom towns on the basis of answers to questionnaires. Thirty-two farmers were thus selected.

In the Catholic Co-operative, farmers were selected on household basis and 110 farmers were involved.

Management

The pilot farm was managed by a committee comprising sectional heads, two representatives of the farmers and a representative of the Ministry of Agriculture. It was headed by the project administrator. The co-operative was managed by a seven member executive committee.

Cropping plan

In the pilot project each farmer was alloted 0.40 ha farm. Inputs were provided on a package deal basis from a revolving fund provided by Ghana Government. The planned rotation was maize, Feb/Mar, and tomatoes, Oct/Nov. The project took off in May 1977 with maize variety Lapesta as the first crop. It was followed in November with tomatoes variety Roma VF ex Holland. The seed rate was 22 kg/ha for maize at a spacing of 60cm × 60 cm. The rate for tomatoes was 250 g/ha at the same spacing as that for maize.

Fertilizer was applied at 250 kg/ha NPK as a basal dressing after germination and top-dressed with 150 kg sulphate of ammonia, 6-8 weeks after planting.

Farmers in the co-operative society were allocated a 0.01-ha plot each. They planted only tomatoes in the dry-season.

Results and discussion

Tables 1 and 2 show production with corresponding cash returns from the two farmers'.

The maize variety Laposta did not have favour with the local taste so it had to be sold elsewhere. The Department consequently conveyed everything to Akosombo, sold them and returned the farmers' balance after deducting marketing expenses. Marketing of tomatoes was relatively easier through the existing marketing committees. As time went on, marketing of maize improved and the product was sold locally. For tomatoes, the Accra market women had counterparts in Togo who came to Accra to buy from them. Hence, marketing of tomatoes from the farm was affected whenever borders were closed.

The marketing arrangements for tomatoes of the co-operative was similar to that of the Volta Lake Research Project. Marketing of tomatoes in the 1987/88 season was particularly difficult. The rainfall in 1987 prolonged far into the dry season; therefore, marginal lands for tomato production in terms of moisture had sufficient moisture for production. Consequently, there was a glut for tomatoes in the whole country. Fruits rotted on the plant because there were no buyers. About 60 per cent of the fruits were so allowed to rot.

TABLE 1

Production and Cash Returns of the Pilot Project Compiled from Documents Cited as References

Year	Maize		Tomatoes	
	Production (t)	cash (¢)	Production (t)	Cash (¢)
1977/78	62.47	37,479.00	56.89	194,465.00
1978/79	69.62	69,626.24	51.60	139,070.00
1979/80	49.9*0	69,874.00	60.50	39,630.00
1980/81	61.90	63,000.00	66.05	396,080.00

TABLE 2

Production and Cash Returns from the C0-operative Farm Compiled from Documents Cited as references

	Tomatoes only	
Year	Production (t)	Cash (¢)
1985/86	48.77	204,400.00
1986/87	54.61	1,782,032.00
1987/88	30.00	373,300.00

Yield of maize rose from 62.47 tonnes in 1977 to 69.62 tonnes in 1978 when the farmers had had some experience with the irrigation system. There was a drop to 50 tonnes in 1979 when the Dolphin irrigator developed mobility problem. However, yield of tomatoes rose from 51.6 tonnes in 1979 to 60.5 tonnes in 1980 because the Dolphin had the speed control valves replaced.

Cash returns to farmers dropped from ¢194,465.00 in 1978 to ¢139,070.00 for almost the same quantity of produce because the Togo border was closed; hence Togoleese market women could not come to Accra. However, in 1980/81 when there was political stability in both countries, farmers enjoyed stable high prices because the Togoleese women resumed trade with their Ghanaian counterparts.

The Catholic Co-operative produced 48.77 tonnes of tomatoes in the 1985 season with cash returns of ¢204,400.00. Production rose from 48.77 to 54.61 tonnes, a difference of only 5.84 tonnes but cash returns multiplied nearly nine times at ¢1,782,032.00. The reason was that few people could plant that year so there was an inflationary price. In 1987/88, there was a glut and farmers did not harvest because the market was simply not there.

Some of the problems were similar while others were peculiar, depending on who was the project holder. The common problem were lack of feeling of ownership of the facilities by the farmers, culminating in the careless attitude towards the safety of the facilities. Another was lack of communal spirit which made line changing very difficult, and the tendency of some farmers to conceal part of the harvest. In the FAO project, because it had governmental presence and the officers were paid by Government, the farmers were respectful. However, in the co-operative, farmers owned the organization and they paid the staff. They had little respect for the staff. There were mechanical problems involving the irrigation set. The Dolphin was self irrigation propelling under water presure and controlled by speed control valves in the machine. They wore out very fast and the irrigation lost complete mobility. In the Co-operative, essential parts like risers and sprinklers were stolen, thus reducing the command of the system.

Conclusion

At least, the basic technical problem of dependency on rainfall as the only source of moisture for farming had been debunked. The adoption of irrigation culture was encouraging. Recommendations are as follows:

(1) Irrigation sets obtained by the farmers should be of such a nature and type that essential parts are available in the system.
(2) Extensive market surveys and intelligence should be conducted for the very perishable crops before they are grown on large scale.
(3) When such co-operatives are organized by religious bodies, key personnel for the organization should be employed and paid by them for some reasonable time to help the co-operatives build a broad financial base be-

fore weaning thsem off assistance and support.

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