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CONTENTS

ON THE ECONOMIC APPRAISAL OF AGRICULTURAL DEVELOPMENT PROJECTS: THE TANZANIA VILLAGE SETTLEMENT SCHEMES

By

Peter M. Landell-Mills [1]

A. INTRODUCTION

In recent years, as a reaction to the public expenditure programmes of the colonial period, development planning in Africa has been mainly concentrated on macro-economic analysis - on trends, targets, growth-rates - and in very many cases only cursory attention has been paid, at least in the formulative stages, to the details of projects. Even where plans have specified each and every project to be initiated by the public sector, the detailed planning and evaluation of individual projects has mainly been left until after the national plan has been completed. However, before an aid agency will approve a project it will normally require a thorough feasibility study to be prepared. At this stage, when the projects are being more closely scrutinised, it is all too often discovered that to make the projects viable they have to be altered, sometimes radically. This difference between the planned projects and the actual projects implemented leads to a form of quasi-autonomous development increasingly divergent from that originally intended. Even when greatly changed from their original conception projects once included in the plan tend to remain unless the plan is regularly and rigorously revised.

The most serious consequence of failure to make a detailed analysis of individual projects in the formulative stages of the plan is that choices between alternative projects and the establishment of priorities is not based on a thorough knowledge of costs and benefits and, therefore, not placed on a fully rational basis. Another common result is for the plan, instead of being revised, to become increasingly divorced from reality and therefore to be disregarded by those concerned with the implementation of projects.

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[1] The author is now employed in Bechuanaland as Government Economist and is on secondment from the Institute of Economics and Statistics, Oxford, U.K.

The adoption of the techniques of benefit-cost analysis for economic evaluation of development projects in the conditions of an under-developed country needs careful study.(1) In this paper, by way of example, the economic evaluation of the village settlement programme in Tanzania is discussed. It is supposed that each scheme must be analysed so that one scheme may be compared to another, and an order of priority established between different schemes; furthermore the benefits and costs of investment in settlement schemes must be compared with the benefits and costs of investment in alternative projects either in agriculture or in other sectors.

It must be recognised, of course, from the start that the choice between projects is not based simply on economic criteria. For example, the Tanzania Government wishes to introduce its own version of African socialism. It sees settlement schemes as a means towards a social revolution in the rural areas, transforming a subsistence tribal economy into a modern cash economy of small farmers gathered into producer co-operatives. Thus investment in settlement schemes is not merely a means of increasing material wealth, but also a way of modernising rural society. An economic evaluation of the schemes can do no more than show what is the likely return on investment in settlement schemes, for example, in terms of a) value added to the national economy; b) increased income to the farmers; c) increased revenue to the Exchequer. It may also be possible to estimate whether the economic incentives are likely to be sufficient to ensure that the social and political goals will be achieved. It may be that even if settlements required a continuing subsidy the Government may judge that the socio-political benefits warrant it. In such a case the economist should indicate to the political leaders the cost in terms of the monetary benefits forgone which could be derived from alternative investments.

In this paper the scope of village settlement in Tanzania, the policies pursued, and the administration of the programme is described, first because this knowledge is necessary for a proper understanding of the economic analysis which follows.

B. BACKGROUND

On December 10th 1962 President Nyerere announced to the National Assembly in Dar-es-Salaam new plans for a large-scale programme of "villagisation". "Before we can bring the benefits of modern development to the farmers of Tanganyika" he stated, "the very first step is to make it possible for them to start living in village communities".(2) This, it was thought, would achieve two major objectives: firstly, with the people organised in new village settlements it would be feasible to introduce supervised and disciplined modern farming; secondly, Government would then be able to provide much more cheaply essential social services otherwise beyond its means. Unless the scattered subsistence farmers of Tanzania were grouped into villages, the President explained:

> "We shall not be able to use tractors; we shall not be able to provide schools for our children; we shall not be able to build hospitals, or have clean drinking water; it will be quite impossible to start small village industries, and instead we shall have to go on depending on the town for all our requirements and even if we had a plentiful supply of electric power we should never be able to connect it up to each isolated homestead."

Whilest he acknowledged that the new settlements would need considerable financial assistance to be established, the President made it clear that the villages were to be based on sound economic principles. The productive side was to be commercially viable. Also, after the initial stages, the new wealth created should justify the expenditure on social services and, in addition, contribute to national prosperity.

Farming settlements are not new to Tanzania; the Overseas Food Corporation started its first African Tenant Farming Scheme at Nachingwea in 1952, on principles not substantially different from those being used now. Settlers were selected for their farming ability, provided with prepared land, housing, a water supply, and given rations until their own crops had been harvested. The farmers were all wed

credit for seeds and machinery services on the understanding that the debts would be repaid from revenue received from the sale of cash crops. Farmers were tenants who were free to leave or could be evicted for laziness or bad farming practices. However, since the annual turnover of tenants was usually over 50 per cent, no stable settlement was ever created.

When the Tanganyika Agricultural Corporation (TAC) succeeded the Overseas Food Corporation O.F.C.) in 1955, it inherited African Tenant Farming Schemes at Urambo and Kongwa, as well as at Nachingwea, with a total population of some 160 farmers and their families. In the final Report of the O.F.C.(3) the paternalistic philosophy behind their schemes was explained:

> "One of the most stabilising influences in an African community, under the present economic and political pressure being exerted from within and without, is a healthy, prosperous yeoman farmer class, firmly established on the land, appreciative of its fruits, jealous of its inherent wealth and dedicated to maintaining the family unit on it ..... (these schemes were) designed to offer opportunities to such peasants, who were ambitious to better themselves and their children and were willing to work."1/

The Report gloomily noted that the attempt to transform the African peasant from a subsistence cultivator to a yeoman farmer owning his own land of sufficient area to ensure independence and a reasonable standard of living in one step failed ".... as even the most enthusiastic search did not produce any one of even sufficient calibre to be entrusted with a 30 acre farm." The process, the report concluded, would have to be a gradual one; it was thought that it would be perhaps a decade before the sound independent yeoman farmer could emerge. By the time the T.A.C. was wound up in 1964, there was at least one African farmer at Urambo who was earning a four-figure sterling income, and several others who,

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1/ Interestingly enough, almost exactly similar words were used by J.W. Maina, Director of Settlement in Kenya, in a recent address to the East African Staff College in Dar-es-Salaam.

even by the salary standards of the emergent elite of civil servants, were considered very prosperous. This had been achieved by promoting the farmer from being a humble probationer through the small farm stage and eventually allowing him to take possession of a 50 acre tobacco farm side by side with European settlers.

In addition to the O.F.C. settlements the T.A.C. started new tobacco schemes at Kiwere and Luptingatinga, and introduced a novel ranching system at Kongwa.(4) However, for various reasons, the T.A.C. did not succeed in gaining the confidence of the politicians after independence. The President decided to create a new institution, the Rural Settlement Commission, consisting of key Ministers under the chairmanship of the Vice-President, to be responsible for implementing the new settlement programme. The Commission was provided with an executive arm named the Village Settlement Agency (VSA) under the direction of the Commissioner for Village Settlement. The Rural Settlement Commission was made a body corporate in June 1963.

C. THE NEW VILLAGE SETTLEMENT SCHEMES

Outline plans were hurriedly prepared early in 1963 for the establishment of five pilot village settlement schemes. In this work the Agency was advised by an inter-ministerial committee who assisted in the formulation of detailed policy and co-ordinated in the provision of key planning staff. Finance totalling £286,000 was obtained for these pilot schemes from Britain under a Commonwealth Assistance Loan. With World Food Programme assistance and a further £80,000 provided by the Treasury from internal sources, the first schemes were started at Upper Kitete and Rwamkona towards the end of 1963, and during 1964 four more - at Kingorungundwa, Mbale, Mabuku and Kerege. Also during this period an Israel Government Agency, AGRIDEV, has been experimenting with cotton irrigation schemes in the Lake Region at Mbarika, Nyatwali and Kalamera; these, too, were placed under the general supervision of the Commissioner for Village Settlement.

1/ Using a grant totalling £138,880 from the Irish Freedom from Hunger Campaign Committee, under F.A.O. supervision.

In addition to these responsibilities the Rural Settlement Commission decided that no financial assistance was to be provided by Government for any scheme unless plans for it had been approved by the Commission. With numerous schemes being promoted by local initiative and sponsored by Regional Development Committees, the Agency has been inundated with many requests for assistance which it has neither the staff nor the funds to provide. However, a few schemes have been briefly reviewed and three have been granted assistance from OXFAM. Thus, in addition to the main pilot schemes, the Agency has become partly responsible for a number of settlements designated "assisted schemes". In most cases a manager was appointed by the Commission. Nevertheless many regional schemes and local farmers' groups have been started since independence throughout Tanzania without any assistance from Central Government; for example, it is estimated that over 100 such groups exist in the Tanga Region alone. A high proportion have inevitably encountered almost insuperable finacial and organisational problems from the outset.

At the end of 1964 the T.A.C. handed over control of all their settlement schemes to the Village Settlement Agency. It cannot be claimed that any of the schemes were fully successful from the economic point-of-view. This was partly as a result of the large number of bad debts incurred by tenants who either resigned or were dismissed. But Urambo, at least, had shown considerable promise and would undoubtedly succeed if, contrary to expectations, the price of Virginia tobacco could be prevented from falling calamitously as a result of over-production.

For the sake of completion, it is necessary to mention here two major settlement schemes based on irrigation which do not yet come under the Commissioner for Village Settlement, but which may become an Agency responsibility eventually. The Special Fund have a team of experts who are at present undertaking the detailed planning of a 56,000 acre irrigation scheme in the Rangani River Basin; the project will entail the settlement of 20,000 people, and will require a total investment of over £3 million, including the construction of the Nyumba ya Mungu Dam.

The second project is in the Rufiji Basin, an experimental irrigation scheme costing £400,000, being implemented at Mbarali by the Water Development and Irrigation Development Division under the guidance of three F.A.O. experts.

D. THE ADMINISTRATION OF THE VILLAGE SETTLEMENT PROGRAMME

(i) Organisation

The Village Settlement Agency is directed by an expatriate administrative officer with some 25 years experience of Tanganyika. He has under him, as Assistant Commissioner, a Tanzanian with practical experience in the co-operative movement. Their senior staff includes only one agriculturalist (as Chief Planning Officer), two administrative officers, three land planners transfered from the Ministry of Agriculture, an ex-Kenya farmer and an accountant. The Agency is now equivalent to a division of the Ministry of Lands, Settlement and Water Development, the Minister of which is also Chairman of the Rural Settlement Commission.

The pilot schemes are administered directly from the V.S.A. headquarters in Dar-es-Salaam, though the question of establishing regional offices in the future is being discussed. All accounts are maintained at headquarters, the scheme manager simply being required to make monthly returns.

(ii) Settlement Co-operatives

The most significant departure from T.A.C. methods comes in the emphasis placed on co-operatives. New legislation has been passed enabling the schemes to be registered as "village settlement co-operatives" with specially designed rules and by-laws.(7) Unlike simple marketing co-operatives in Tanzania, the Village Settlement Co-operatives are to be run by scheme managers and staff appointed by the Commission.

By giving the Managers extensive powers the Village Settlement Agency is able to maintain detailed control and supervision. Experience has shown here,[1] as in some other countries, that it is essential for the administering authority to maintain a tight control over this type

[1] E.G. at Urambo, which has a co-operative registered under the old system.

co-operative. It is vitally important that proper farming methods are employed, and this will not happen unless a certain degree of coercion is possible. By incorporating the settlers in a form of co-operative and involving them in the process of decision-making, it is hoped that they will more closely identify themselves with the scheme as a whole. As they gradually acquire sufficient experience and understanding they will be able to assume more and more responsibility for its administration permitting the Agency to retire gracefully into the background. However, it is not intended for a very long time, if at all, to relinquish the power to appoint the Manager or his right to veto any decision considered harmful to the scheme taken by the elected co-operative committee.

It may be argued that schemes cannot be run successfully by coercion, and it would be better to design a farming system that the settlers themselves would wish to follow. Whilst there is good evidence that a high degree of compulsion leads to alienation between the farmers and management it must be recognised that the creation of a settlement scheme based on modern farming techniques necessarily involves a massive exercise in adult education, and without discipline the scheme would undoubtedly collapse. Not only are the settlers being required at one stroke to embark on a radically new way of life, but also they are required to co-operate together in a way that would need a disciplined organisation in any context.

When a settler is selected to join a scheme he must also become a member of the co-operative, and in the process signs a form agreeing to be bound by the by-laws. He acquires the right of occupancy of a plot of land of which he can only be deprived if he is expelled from the co-operative for infraction of the by-laws. He must appoint a single successor to inherit his plot when he dies; in these circumstances other relatives who were beneficiaries of the plot before the settler died, are to be compensated by the successor for any loss of benefit.

The by-laws require the settler to work a given number of hours each day as fixed by the Manager in consultation with the elected Co-operative Committee. Failure to comply may lead in the first instance to the Manager hiring labour at the settler's expense to work on his plot, and eventually to the expulsion of the recalcitrant farmer.

The settler must sell all produce grown by him through the settlement co-operative. Sales revenue is to be paid direct to the Village Settlement Agency who will deduct various levies, debts and advances before distributing the remaining proceeds as a dividend to the farmers. Thus strict control of the repayment of loans is assured. Successful co-operatives will be encouraged to accumulate scheme savings to be spent on improving communal amenities.

(iii) Local Administration

As far as possible the village settlement will be integrated into the local administration. The village will be represented on the local District Council and District Development Committee. The farmers should pay local rates, cesses and taxes and in return, the Local Authority are to be responsible for the provision and running of schools, dispensaries and water supplies, especially in the commonest case where those who are not members of the scheme use such facilities of the scheme. Local Authorities will receive from the Central Government only those grants and subsidies for social services normally provided. In the case of the poorer Districts, unable to raise the money for their contribution, the Village Settlement Agency may decide to provide additional assistance. It is considered an essential prerequisite of any settlement scheme that it be equipped with a primary school, a dispensary and a clean water supply.

(iv) Selection of Settlers

The pilot schemes are each planned to accommodate 250 selected settlers and their families. The farmers are not required to bring to the scheme any capital except a nominal membership fee. The intention is to choose individuals with the following characteristics:-(5)

(i) farming experience;
(ii) a feeling for farming as a profession;
(iii) receptivity to new ideas and methods;
(iv) a capacity for sustained hard work;
(v) a wife and children;
(vi) previous contact with the monetary economy;

(vii) willingness to live in a community;

(viii) 25 to 40 years of age

In practice it has not yet proved possible to apply very thorough tests in the selection of settlers. It was hoped that unsuitable candidates would be weeded out in the pre-cooperative stage, though this is bound to be rather disruptive and should be avoided as far as possible. Once the idea of Village Settlements has been sufficiently popularised and large numbers of farmers apply to join, it would be an advantage to require the settlers to contribute a small initial sum of capital, as has been done in the case of the more successful medium and low density schemes in Kenya. This would provide concrete evidence of a settler's earnestness and genuine interest, and is probably a better guide than a short interview or a dozen written recommendations. The settler would then have a real stake in the success of the scheme.[1/]

(v) Capital Loans

In the initial plans of the pilot schemes each settler was to be provided with a frame for a permanent house, including corrugated iron roof,[2/] free food until the first harvest and sufficient land and agricultural equipment to enable him to earn eventually, after repayment of loans, a net family income of over £150 per annum. As far as possible individual plots would be allocated, but in some cases the land would have to be farmed communally, where the modern agricultural techniques to be used did not allow the land to be sub-divided.[3/] In the initial stages communal farming was practised on a number of schemes, with very poor results and the Agency is determined to avoid this wherever feasible.

1/ This system was used successfully by T.A.C. at Urambo to identify worthwhile candidates.

2/ This policy is being gradually abandoned in favour of much cheaper temporary houses constructed with local materials which can be improved by the farmers from their earnings.

3/ E.G. wheat cultivation at Upper Kitete.

A total investment (including social facilities) of between £600 and £800 per family is envisaged. The Treasury has agreed to subsidise the full cost of initial surveys, the construction of access roads, and head office expenses. The cost of social services should be met either by the local authority or the Central Government. The water supply is to be 25 per cent subsidised. In principle it is not intended to provide the settlers with subsidies not normally available to the population in general. The remainder of the capital cost is to be treated as a loan bearing an interest of 5 per cent per annum to be repaid within 25 years of the date on which the first repayable expenditure was incurred. The scheme will be allowed a moratorium on loan repayments until full production is attained. The loan will be administered by the co-operative on behalf of the individual settlers under the supervision of the Manager appointed by the Village Settlement Agency.

E. FIVE-YEAR PLAN

Very great emphasis was laid on this "transformation" approach in the Five-Year Plan. The share in the agricultural sector of this type of expenditure was to be twice that in the proceeding plan. Over sixty new settlements were to be created, necessitating an expenditure of £7.7 million on dry farming and £5.8 million on irrigation and involving 15,000 families. This amounts to 13.5 per cent of the total Central Government development budget, but with a direct effect on less than 1% of the population.

The importance the Government attaches to the new policy was stressed by President Nyerere in his address to Parliament on the 12th May 1964:(6)

> "New Settlement Schemes will be established all over the country, as fast as the shortage of capital allows, for they are expensive things ..... We expect by 1980 to have about one million people living and working under these conditions ..... The effect of this settlement will be far reaching, for planned settlement does not only mean farms. It also means roads, commerce, and some local industries, as well as schools for the children, and health centres to help people enjoy the life they are creating .... I hope that nothing I have ever said on these new settlement schemes leads people to believe that the settlers are

> going to have everything they want from the beginning. They will not. They will be pioneers, and that is always hard. But they will be working out the future of our country."

To tackle this programme massive assistance both in the form of finance and skilled manpower will be needed from overseas. It is a sad fact of international life that the types and quality of experts required to plan and implement large scale settlement projects are very scarce. So far the Government has failed to recruit even the minimum headquarters staff needed to plan its original five pilot schemes. If this were simply to mean that projects could not go forward it would be unfortunate enough. However, the desire for progress and the tremendous urge, released by Independence, to press ahead with development means that delays in the implementation of new projects cannot and will not be tolerated by the political leaders. Equally the schemes cannot and will not be properly planned until adequate qualified staff has been recruited. The dangers of inadequate planning have been spelled out thoroughly in the literature on land settlement and agricultural development.(8) They are already apparent from the modest experience so far gained by the Village Settlement Agency.

F. THE ECONOMIC EVALUATION OF VILLAGE SETTLEMENT SCHEMES

(a) General considerations

The methods for evaluating development projects in under-developed countries must take into account the special characteristics of the economy of each country. The first essential question must be: what are the critical bottlenecks and constraints? Furthermore, it is essential to adapt the techniques of benefit-cost analysis to each country. In the following paragraphs it is not intended to plough through all the tortuous and controversial arguments which surround the subject of benefit-cost analysis. A recent survey of benefit-cost analysis, including a detailed bibliography, has been made by Prest & Turvey(9) to which the reader is referred. In this article the discussion will be limited to the problems of the practical application of benefit-cost analysis for the economic evaluation of village settlement schemes in Tanzania.

The critical constraint on the implementation of development projects in Tanzania is without doubt manpower. The large number of unfilled posts, the rate of turnover of expatriate specialists and advisers, and the rate of promotion of relatively inexperienced and poorly qualified local officers are all evidence of this fact. Finance for public expenditure, although not a serious bottleneck at the moment, is likely to become the critical constraint as soon as the manpower problem is solved by the training of local technicians and administrators, which is now proceeding apace. It is true that once Tanzania has established its own currency and central bank, there will be some scope for deficit financing. But this source of finance will be strictly circumscribed by balance of payments consideration especially so since the Tanzania economy is a classical case of the under-developed territory geared to the export of primary products and the importation of industrial goods from the developed countries.

Government development projects in Tanzania are financed partly by overseas loans and partly by internal revenue surplus to the recurrent budget. In general, donor countries are extremely reluctant to meet any of the local costs of a project, preferring these to be regarded as Tanzania's contribution. Hopefully, it has been estimated that 75% of the cost of the Five-Year Plan will come from external sources and 25% from internal sources. If we assume that part of the local contribution will be raised by deficit financing investment in settlement schemes will displace expenditure from the private purse equipment to less than 25% of the cost of the projects. If we make the assumption that out of the £20 million annual development budget, only £5 million must be raised internally, of which possibly one half may be safely borrowed from the Central Bank, then only 12½% of the cost of a project will have to come from the private purse. In so far as overseas aid is tied specifically to a single project and cannot be switched to alternative projects, the cost of the project from a national viewpoint is largely determined by the terms of the loan. On the other hand where overseas aid is offered as programme loans, the problem of priorities immediately arises and any investment has an opportunity cost which must be taken into consideration. The latter situation is the case as far as investment in village settlement schemes is concerned.

(b) Benefit-cost analysis

Before any village settlement scheme is started a detailed feasibility study, including a benefit-cost analysis, should be carried out on the proposed scheme plan, so that (a) the optimum organisation of the scheme can be determined, and (b) priorities can be established between both competing settlement schemes and on projects either in agriculture or in other sections. Once started, schemes must be reviewed from time to time to check on their progress. However, no settlement scheme in Tanganyika has been in operation sufficiently long for an economic evaluation to be based on its achievements to date. The most that can be hoped is that the results of the first one or two years will give some indication of the validity of the basic assumptions used for the projections in the original scheme plans.

It is insufficient simply to carry out a benefit-cost analysis of a scheme for the nation as a whole, since consideration must also be given to the distribution of the costs and benefits between the settlers, the rest of the population and the Government.

Firstly, the present discounted value of the scheme must be positive, or in other words the benefit-cost ratio must be greater than one. If this is not so, the scheme will be of doubtful economic benefit to the country. Secondly, the annual budgetary implications of a scheme must be examined to discover whether or not it is likely to become a long term burden to the Exchequer, given that the possibilities for deficit financing will be strictly limited by the balance of payments constraint. Although a project may have a benefit-cost ratio in excess of one, it may not be possible for the Exchequer to claim sufficient of the benefits to meet the cost of the scheme to the Exchequer. If the net return to the Exchequer in terms of increased tax revenue (both direct and derived), loan repayments, etc., is less than the cost of servicing the overseas loan over the long term the project should not be undertaken without careful justification.

Thirdly, if a scheme is to succeed it must ensure the farmers an increased income sufficient to reward them for their increased effort and to compensate them for the disruption in their lives which inevitably

occurs. If the rewards are too low the farmers will leave and the schemes will collapse. Equally, the staff needed to manage the scheme must be adequately paid, to ensure that technicians of the right calibre are recruited..

Thus the analysis must be carried out from several view-points. The present value of the benefits and costs of a scheme to the nation as a whole, which may be arrived at by the summation over a given period of the flow of all identifiable net benefits (i.e., new outputs less inputs), including additional induced, and stemming, secondary incomes generated by the activities of the scheme where they result from a real increase in production, the net benefits being appropriately discounted.

This exercise involves the usual theoretical problems of benefit-cost calculations. What discount rate is appropriate? What importance should be attached to externalities? What multiplier effect should be assumed? These questions were discussed by the I.B.R.D. Mission Report on Tanganyika,(10) and a number of recommendations were made, which have been adopted subsequently in feasibility reports on specific projects submitted to overseas donors on the basis of which aid decisions have been made. For this important reason careful consideration needs to be given to these recommendations.

(i) The rate of interest:

It was the opinion of the I.B.R.D. Mission that it would be necessary for the Government to seek 'hard loans' to expand expenditure on development. Thus the marginal cost of capital was assumed at that time to be 6% with repayment over 20 years; this provided a suitable standard by which projects could be compared. The Tanzania Treasury has stated that loans provided to farmers on settlement schemes should be charged at 5% interest and be repaid within 25 years; this has been calculated to be the average cost of capital to Government. However, it would be more appropriate to take an interest figure of 7%, which is the return currently being offered on long-term Government stock.

It is important at this juncture not to confuse the cost of investment finance with the discount rate. Interest paid to overseas lenders should certainly be charged as a cost, but the rate at which in theory the flow of net benefits should be discounted is something different. The traditional reasoning here is that, since individuals prefer present consumption to future consumption, lenders must be compensated for waiting. Unfortunately it is very difficult to determine an individual's pure time discount rate and the appropriate social time discount cannot be determined empirically. It can be suggested that a simple way out might be to assume that the individual's time preference discount rate is equal to the opportunity private rate of return, that is, the interest that could be earned if the individual invested his marginal unit of income, instead of consuming it, in the optimum riskless way. Alternatively it might be suggested that the social time preference discount rate can be assumed to be equal to the social opportunity cost of capital, that is the marginal rate of return on public investment. In Tanzania the rate of return on private capital is over 15% on most investments and includes a sizeable risk premium. However the Government is offering only 7% on long term bonds to which private investors are subscribing, if only in small numbers. Provided we interpret the net benefits of public investment to include secondary incomes and externalities the rate of return should not fall below the marginal rate of Government borrowing.

The choice of a suitable social time preference discount rate has been the subject of much debate. But although the theoretical analysis has been sophisticated,(11) the result in terms of a practical recommendation has been distinctly inconclusive. It seems that the discount rate cannot be derived on the basis of existing market rates; it must therefore be administratively determined. An administrative decision by an elected Government, it is claimed, satisfied the requirements of democracy. However it is unreasonable to expect a political leader in an underdeveloped country to announce ex cathedra an appropriate discount rate; he will certainly expect his economic advisers to give him guidance. The practical solution in the case of Tanzania proposed in this paper is for a rate of 7% to be used, which is the actual rate of return received on Government long-term bonds, and seems a reasonable estimate of both the marginal private rate of return on riskless investment and the marginal social rate of return on public investment.

It is important that the discount rate is not under-estimated or the pattern of investment may become distorted in favour of slow-maturing projects. The discount rate which Henderson[12] has recently proposed as applicable to the evaluation of public investment projects in the United Kingdom is 5%, which is 2% lower than that now proposed for Tanzania. There are good reasons for believing that the average private time preference discount would be relatively higher in Tanzania than in the more developed countries. Firstly, the majority of the people are extremely poor and therefore necessarily have extremely limited time horizons. Secondly, the life expectation is shorter and the time discount rate would allow for this. Thirdly, the marginal rate of return on private investment is relatively high.

(ii) Secondary incomes:

The implementation of a settlement scheme will not only result in immediate incomes for the farmers and staff, but also generate new or secondary incomes (a) through the expenditure incurred in the operation of the scheme, and through the farmers and staff spending their incomes (the multiplier effect) induced secondary incomes; (b) through increased trade for both the suppliers of inputs and the transporters and processors of the output - "stemming" secondary incomes. The justification for including either the induced or the stemming secondary incomes in benefit-cost calculations has been questioned.[9] The argument runs as follows: the benefit derived from the scheme is the value of the output and this is best measured by the market price where this is possible. This argument is clearly not accepted in the IBRD Mission Report and, I think, rightly not. Comparison must be made in the case of each project between two alternative situations: a) without the project, and b) with the project. It cannot be denied that without the project there would not be the additional income in the hands of settlers and employees and the additional incomes that are generated when these new incomes are spent would not otherwise have arisen. This argument does, however, assume the existence of some spare capacity - a not unreasonable assumption in the case of Tanzania. One other note of warning must be sounded; if the project is so large in

relation to the economy as to alter price levels, an equilibrium approach will have to be adopted involving extremely difficult calculations.

The operation of this 'multiplier effect' may be partially, or even totally, cancelled if the crops produced are to be sold internally, thereby displacing less efficient production elsewhere within the country. In this case the increase in incomes from the settlement scheme will be counterbalanced by the loss of incomes elsewhere. There will only be a sizeable positive multiplier effect if, firstly, the crops produced are either exported (e.g. cotton, sisal, etc.) or are import substitutes (e.g. wheat) and, secondly, domestic supply has the capacity to respond to the increased consumer demand, which might otherwise be removed from circulation through inflation or the purchase of imports.

This analysis is to some extent at variance with the exposition given in the I.B.R.D. Mission Report, where a multiplier of 1.2 was recommended for irrigation schemes. It appears that it was assumed in the Report that part of the output was exported and the remainder displaced existing supply; an average figure of 1.2 was therefore chosen. This procedure is far from satisfactory; the size of the secondary effect may vary considerably between schemes and if a sound choice is to be made, we must try to estimate the secondary effects as accurately as possible. As far as settlement schemes are concerned, the main cash crops are usually either exports or import substitutes and a higher multiplier would be appropriate. Since the multiplier depends largely on the proportion of the added expenditure made on imports, the most satisfactory procedure would be to derive a specific multiplier for each category of consumer, and hence for each scheme, from an analysis of the [illegible] from the operation of the scheme. This may be done by reclassifying all expenditure as follows:-

(a) Wages and farmers dividends;

(b) Salaries;

(c) Scheme purchases of imports;

(d) Scheme purchases of local products

(For both (c) and (d) above the import costs and other commissions incurred in bringing the materials to the scheme should be included: roughly estimated at 15%);

(e) Government receipts;

(f) Scheme savings;

(g) Secondary incomes stemming from the transport, processing and marketing of the crops.

As will be seen below this breakdown is also useful in calculations of net tax revenue generated by the scheme.

To obtain the total increase in incomes generated by the scheme, we apply the appropriate multiplier to each category of consumer, after deducting from each the opportunity cost incomes. Clearly the multiplier for imports will be zero, while that for categories (d), (e) and (f) will be approximately equal to the multiplier calculated for the nation as a whole. This was estimated by the I.B.R.D. Mission report to be about 2.5. The method used to arrive at this figure was, to quote:

> "The size of the multiplier in Tanganyika is indicated by the following consideration. Central Government revenues have increased over recent years by about 40% of the increase in export earnings, while the average incidence of tax on incomes is about 17%. These and other indications are consistent with a Keynesian multiplier for the territory of the order of 2.5."

Presumably the reasoning behind this is that an increase in exports results in a net increase in incomes and that there is definite proportional relationship between the two. More recent figures inserted in the same equation also indicate a multiplier of about 2.5. This calculation is not very satisfactory since it omits the effect of increasing the fiduciary issue, which will have a multiplier effect similar to an increase in foreign exchange reserves. An alternative estimate taking this consideration into account produces a figure for the multiplier around 2.

Another approach would be to attempt to trace through the actual expenditures. The increased incomes accruing from a new settlement scheme are removed from circulation in one of the following ways:

1. imports;
2. saving, including hoarding;
3. rise in prices.

Now both the average and marginal propensities to import from outside Tanzania appear to be about 25% for the nation as a whole.(13) The figure for agricultural incomes is not known, but inspection of the

consumption pattern of the rural villages surveyed by the Central Statistical Bureau indicates it is unlikely to be much higher than that. However, the marginal propensity in this special case is certainly higher - possibly 30 to 35%. This means that if the multiplier is 2.5, then another 5 to 10% of income must be lost at each round of spending through saving and inflation. When faced with such uncertainty the only practical step is to take what seems to be a reasonable figure given the available evidence; therefore a multiplier of 2 is suggested for the country as a whole, 1.5 for salaries and secondary incomes, and 2.5 for wages and farmers' dividends. It is disconcerting that this crucial part of the analysis must be so inexact; it is essential that further research be undertaken in this field.

There is one further unknown income figure - the "stemming" secondary income arising from the transport and marketing of the crops and the supply of inputs. The figure proposed by the I.B.R.D. Mission report was 20% of the gross sales revenue, which seems a reasonable estimate. Backward as well as forward linkage effects should be included, and the additional profits made by local suppliers of imports, which would not otherwise be made, added in.

The complete benefit-cost analysis can be set out in two columns; the one giving the input flow and the other the output flow. For each year all the expenditure incurred whether on capital or current account and including maintenance and depreciation changes are to be included on the input side. On the output side, new income from all sources - primary, secondary and multiplier - should be credited. The net benefit stream is the difference between the two columns; it is subject to an annual discount rate of 7% and summed over the chosen time period. Finally, the discounted end value of the scheme assets is credited to the total.(17) The time period proposed for settlement schemes is 25 years, the period of the loan repayment; the discounted value of the net benefits after 25 years is negligible.

It would be possible to distinguish between different types of income flow and use shadow prices to rate them according to their value to the economy. For example, incomes accruing directly or indirectly

to Government might be considered more 'valuable' (by some chosen factor) than incomes spent on consumer items by the farmers. Any decision of this nature must, of course, be taken at the political level. It is not proposed to use shadow prices in the present case. However, the Exchequer implications of each project are discussed below.

(c) Financial Analysis

The Government is borrowing finance both internally and from overseas to finance settlement schemes. The average cost of this finance is calculated to be 5% with repayments stretching over 25 years. This is approximately equivalent to an annual service charge of 7% of the total capital invested. The settlers are required to repay all expenditures except Head Office expenses, initial surveys, and access roads, which are 100% subsidised by Central Government; water supplies which are 25% subsidised; and the cost of the school and dispensary, which are to be met partly by the local authorities and partly by Central Government. As a rough approximation, about 30% of the total expenditure on settlement schemes is not to be charged to settlers for repayment.

The activities of the schemes will generate Government revenue in the form of increased tax revenue. If the additional annual revenue clearly exceeds 30% of the loan service charge, then there is a chance that a scheme will not become a long term burden to the Exchequer. It should be stressed that this is the lower limit, especially as it is Government policy that settlement schemes should be economically viable. If the net return to the Exchequer, that is, the loan repayment by the settlers plus new tax revenue, does not exceed 7% of the total cost of a project, then the net cost to the country of the project must be carefully compared with the indirect benefits to determine whether this cost can be justified.

In order to calculate the tax revenue to be derived from the expenditures made by the scheme and from the secondary and multiplier incomes, some assumptions about the incidence of taxation is needed.

The I.B.R.D. Mission Report suggested the following percentages:

Wages and farmers' dividends 12%

Salaries and secondary incomes ..... 20% based on the fact that the general incidence of Central Government taxation was 17%. Since the date of the Report the general incidence of Central Government taxation on monetary income has risen to over 20%.(15) In the case of wages and farmers' incomes the main source of revenue is derived from indirect taxes levied on the estimated 30% import content of expenditure; thus even today a 12% figure seems reasonable. On the other hand, revenue arising from salaries and secondary incomes should be put higher, e.g. 25%, since the increases in taxation have born more heavily on this gooup. Thus, to give an example, the breakdown of a scheme's annual expenditure can be traced as shown in Table 3.

TABLE 3: ESTIMATE OF INCOME AND TAX REVENUE

	1 Direct expenditure	2 Government revenue derived from	3 Induced secondary income	4 Government revenue derived from (3)
(a) wages & farmers' dividends	10,000	960[1]	12,000[1]	2,400
(b) salaries	3,000	250[2]	500	100
(c) imports	4,000	500	-	-
(d) local products	7,000	1,400	7,000	1,400
(e) to Government[3]	5,000	5,000	-	-
(f) scheme savings	1,000	200	1,000	200
(g) secondary "stemming" income	6,000	1,500	3,000	600

The calculation is made as follows: column (2) is the tax derived from the increase in expenditure in each category, and assumes that the tax yields per unit of income are as given above. Column (3) is the additional incomes generated through the operation of the multiplier,

1/ Calculated on a net increased income of only £8,000 on the assumption that their previous or opportunity cost incomes amounted to £2,000.

2/ Net increased income of only £1,000.

3/ Loan repayment by settlers.

and column (4) is the tax derived from these additional incomes. From Table 3 it can be calculated that the total increase in income is £51,500 assuming that the opportunity income of the farmers was £2,000 and of the employees also £2,000. The increased tax revenue amounts to £9,510 (say £9,000 net of collection costs) and the loan repayment made by the scheme on behalf of the settlers was £5,000.

If the capital invested was £100,000, the scheme is definitely financially viable from the point of view of the Exchequer, since the net annual return to Government is over £13,000 while the cost of servicing the loan is only £7,000. In this case the scheme is contributing over £7,000 to general Government revenue. Unfortunately the actual schemes so far embarked upon appear unlikely to be as productive as this hypothetical example.

(d) Farmers' Incomes

The farmers must be assured of a noticeable improved income from the start, if they are to remain on the scheme, especially when they are required to work much harder than before. This income must be calculated net of loan repayments and other levies. In view of the low incomes involved and the great degree of uncertainty, the farmer's time horizon is necessarily limited - and wisely so. A debt repayment spanning 25 years bearing 5 per cent interest is not easily understood, and the servicing of the loan will appear to him very much like an annual rent for land and other capital assets. He has a poor chance, if he is, say, 30 years old, of enjoying the higher income which will eventually accrue once the loan has been repaid. Furthermore since a settlement scheme will require from its members a marked increase in labour input, the farmer will wish to be compensated for his loss of leisure by a corresponding increase in cash income.

To this must be added the well-known fact that the risks involved in any agricultural project, not only vulnerable to wide oscillations in market prices, usually with a depressing downward long term trend, but also subject to the vagaries of nature - bad harvests, droughts, floods, pests, diseases, etc. - with yields all too often falling below

estimates. Since a few pounds of produce per acre extra often makes the difference between a zero income and a handsome profit, the temptation to be too optimistic in the forecasting of yields is all too great. This can best be illustrated with the example of wheat cultivation at the Upper Kitete Scheme. The local peasant farmers using no fertilisers and poor methods obtain yields between 3 and 5 bags per acre. The Agricultural Department has shown that using sound methods and correct fertilisers a yield of 10 - 12 bags is possible when the rainfall is adequate; if the rains fail, the fertiliser is almost useless and yields will drop to 4 - 5 bags per acre. The scheme-plan estimates an average yield of 8 bags per acre, but in the first year only 4½ bags were obtained (because fertiliser was not used) and last year only 5 bags (because the rains failed). The following figures demonstrate how critically the viability depends on the yields:

Total recurrent costs of the scheme	22,365
Gross scheme revenue (assuming 5 bags per acre)	18,700
" " " " 6 " " "	21,400
" " " " 7 " " "	24,300
" " " " 8 " " "	26,900
" " " " 9 " " "	29,900
" " " " 10 " " "	32,700

In truth it is simply not yet known whether the scheme will achieve an average yield of 8 bags per acre. When it is better known, say in 5 years time, the scheme will be thoroughly established with a sum of about £100,000 irrevocably invested. If it happens that the average yield is only 7 bags per acre, instead of 8, the annual gross scheme margin will be only £2,000 instead of £4,500, i.e. an income per family of £20 instead of £45, which is certainly insufficient to keep the farmers interested. Lastly, it must be remembered that even when the average yield is 8 bags per acre, there will often be years when it falls to only 5 bags per acre, and an operating loss of £3,665 would be sustained. In such cases the Government is inevitably called upon to subsidise incomes unless the scheme has built up its own reserve funds.

It will be said with much justification that it would be better not to start schemes until field trials had clearly established the likely yields to be obtained from large-scale farming. To obtain a reliable series of figures some 5 - 7 years must elapse, which in the present political circumstances is definitely too long to wait. Even this period may well be too short to give a high degree of certainty since the weather seems to vary in Tanzania not only from year to year but also from decade to decade; for example in the 1950's in central Tanganyika seven drought years were recorded, but so far this decade there have already been three successful harvests out of five. These kinds of variations would make all the difference between an average yield of 8 bags and 6 bags per acre at Upper Kitete - the difference between success and failure.

One of the principal objectives of village settlement is to raise farm incomes. To evaluate a scheme it is thus essential to know what the family incomes are before resettlement occurs. The impact of a scheme both on the settlers and on national production will depend on the change in income that results from the implementation of the scheme.

Here it is possible to discover a dichotomy facing the Village Settlement Agency in its recruitment policy. Both the President of Tanzania and the authors of the Tanzania Five-Year Plan have emphasised the proposal to transfer farmers from areas of land-hunger and over-population to new areas; these people are considered to be suffering from disguised unemployment with a theoretical "opportunity-cost income" of almost zero. The resettlement of unemployed from the towns may be placed in the same category, although, since all too often they are also unemployable as farmers, the results may be very different. Alternatively, the original policy of 'villagisation' may be adhered to, namely that within an area the scattered subsistence farmers are grouped into newly built settlements on the same land and taught modern farming techniques. This latter policy is fraught with costly pitfalls. Firstly, it is not possible to select farmers without expelling some long-established but unsuitable residents who will naturally demand compensation and create social and political unrest. In these circum-

stances scheme discipline is under[illegible] and the project endangered. Secondly, the farmers' new income must be higher than in the case of the alternative policy in order that the increase in incomes is sufficiently above the previous average to meet the new overheads and permit the repayment of capital loans, as well as provide adequate reward for the increased effort. In other words, their opportunity cost income is appreciably higher than in the case of resettlement where farmers with a marginal income are deliberately selected.

In the Five-year Plan it is announced that by 1980 half a million people are to be resettled in the Kilombero and Pangani/Wami River Basins.(6) It would currently seem that this is more promising than the idea of 'villagisation', but the transfer of such large numbers to new areas will prove a formidable task. The experience gained from resettlement in other countries neither confirms nor denies the possibility.[1/] A particular attraction of the proposal is that by moving a farmer bodily to a new area far from his traditional home, he more readily makes a complete break with traditional practices, and moves decisively into the modern monetary sector both in terms of production and consumption.

Statistical information on rural incomes in Tanzania is to date very scant. The Central Statistical Bureau has carried out household surveys over a period of a single year into two rural areas - Bagamoyo and Morogoro.(14) The results are given in summary form in Table 1.

TABLE 1: INCOME PER ANNUM PER FAMILY[2/]

	Morogoro mountain villages	Morogoro plain villages	Bagamoyo coast villages	Bagamoyo inland villages
Persons per household	3.9	5.1	4.4	5.3
Adult equivalents[3/] household, shs	2.9	3.9	3.3	4.1

1/ It has been moderately successful in Uganda at Kigimba where 242 farmers of Kenyan and Sudanese origin have been settled. The Kabuku Sisal scheme in Tanga Region of Tanzania has also made a promising start.

2/ In West African shillings = $0.14

3/

Adult male	14--50	= 1.0	Child under	= 14	=	0.6
Adult female		0.75	Males over	50	=	0.85

	Morogoro mountain villages	Morogoro plain villages	Bagamoyo coast villages	Bagamoyo inland villages
Av. cash income per household, shs	140/-	360/-	340/-	280/-
% of total households with cash incomes below 100/-	62	15	-	6
% of total households with cash incomes between 100/- & 199/-	11	14	12	42
% of total households with cash incomes between 200/- & 399/-	23	42	38	35
% of total households with cash incomes between 400/- & 799/-	2	22	50	17
% of total households with cash incomes 800/- or above	2	7	-	-
Av. value of subsistence consumption	1,273/-	1,632/-	797/-	841/-

The survey covered 125 households in eleven villages in the Morogoro area and 36 households in four villages in Bagamoyo. These figures must be treated with caution; the 1961 harvest was poor, while 1962 was a good year. The survey was deliberately carried out away from famine areas. It is evident from these figures that there are large numbers of peasant families with cash incomes below 100/- per year resulting from a number of factors, such as poor communications and markets, shortage of fertile land and bad farming practices, especially in the mountainous areas. If it were possible to transfer the better farmers in the lowest income groups to a planned settlement scheme a substantial increase in income might be achieved.

There have been two other studies of farm incomes which provide some further evidence.(15) Collinson carried out farm management surveys in 1961, 1962, and 1963 in the Lake Region. His results are summarised in Table 2.

TABLE 2: ANNUAL FAMILY INCOME IN THE LAKE REGION

	Bukumbi 1961	Usmco 1962	Maswa 1963
Average family size	9	8	10
Labour available (in man equivalents) ...	3.11	3.18	3.74
Labour used as % of labour available	33%	34%	34%
Total gross value of production (shs) ...	2,035	2,045	2,160
Net farm incomes (shs)	1,660	1,719	1,881
Estimated value of home consumption (shs)	567	(600)	(600)
Net family cash income (shs)	1,093	1,119	1,200

These incomes are probably higher that the average, since the sample was selected from a list of members of a co-operative society, who are likely to be the more prosperous individuals of a village.

A study by Mr. R.S. Beck in 1961 of a 100 Chagga farms in the Machame Central Area based on coffee and bananas estimated the net annual cash income per family as 763/- with an average family of 7.5 persons; in addition, home consumption was estimated at 700/-.

It may be concluded from such statistical indications that if a settlement scheme recruits its farmers from an area of over-population and land hunger,[1/] the opportunity cost income may be assumed to be subsistence plus about 100/-. If, however, the scheme merely consists in regrouping scattered peasant farmers the opportunity cost will be much higher. In the absence of a detailed survey in the area chosen for a scheme, which is very costly, a rough estimate may be computed from observation. For example, in the Nyatwali area of Lake Victoria where an irrigation cotton scheme is to be started, the family size appears to be about 7. An average family grows between 2 and 3 acres of cotton, with yields between 400 and 500 lbs. per acre, giving a total annual production of about 1,125 lbs. Cash income is also obtained from the sale of cattle; the average family herd is about 6 head, and the producti-

1/ E.g. Rungwe District, Kilimanjaro District, the Usumbaras or the Uluguru Mountains.

vity of cattle in this area is estimated at 20/- per head, of which, perhaps, a half is sold and half consumed. The average cash income per family may thus be roughly computed to be about 500/- to 600/- and the income to be received through membership of the settlement scheme must rise substantially above this figure if it is to interest the farmers. This type of calculation is certainly rudimentary, but in most cases nothing better can be done, without the cost and the delays of a detailed survey.

G. VILLAGE SETTLEMENT AND ECONOMIC DEVELOPMENT

Two purposes can be served by the benefit-cost analysis and financial evaluation of settlement schemes: firstly, it assists in an appraisal of the viability of the schemes, given specific assumptions, and indicates given certain explicit probability assumptions whether or not there will be a net gain (a) to the settlers, (b) to the national income, and (c) to the Exchequer; secondly, it provides a standard by which different schemes may be compared with each other and with alternative development projects.

If scheme plans are fully evaluated before the scheme is started - as they certainly should be, but rarely are - it would be possible to rate them in order of merit, and implement the more promising schemes first. These evaluations would also enable the economists in the Ministry of Development Planning to reassess the allocation of resources made to the Village Settlement Programme.

Although the scheme plans so far prepared are sketchy and incomplete, there is enough evidence to indicate that this benefit-cost ratio is low - in fact, so low as to bring into question the justification of allocating to settlements a 13% share in the Five-year Development Budget, especially when it is remembered how risky the investment is, and how intensive the schemes are in the use of skilled manpower, the country's scarcest resource. This skilled manpower is simply not present in the quantity and quality necessary for the proper planning and implementation of the present programme. Unless the programme is curtailed, at least until an adequate staff has been recruited, not only are the economic objectives unlikely to be achieved

but the social objectives will also be jeopardised to the degree that the farmers become disillusioned with modernisation, and an awareness of the failure will spread widely among the rural community.

Emphasis has been placed on Village Settlement by the Five-Year Plan for two main reasons - one economic and the other social. The economic argument is that the country will only develop if new wealth can be created in the agricultural sector. If we accept this - and I think it is valid, though careful comparisions must be made with projects in the industrial sector - we must seriously study whether this can be best brought about by concentrating on transformation agriculture (i.e. settlement schemes) or on the improvement of existing farming, for example, through the discriminate use of the extension service and by better marketing arrangements. Little is known of the productivity of investment in extension, but there is reason to suppose that it can be high - possibly much higher than that in settlement schemes, although it may not be accompanied by the kinds of social benefits anticipated from new settlements.

To give just one example, it has been tentatively estimated that the diversion of extension workers to the block farming system in the Lake Region in 1964/65 resulted in a loss of cotton production (through late planting which should have been prevented had the extension staff devoted their time to their normal duties) valued at over £250,000. The block farms resulted in a loss, which may be partly ascribed to initial difficulties. But even the most optimistic projections for block farming on the given acreage would not show a profit of more than £50,000, which still suggests in this case that investment in extension would have been many times more productive. Not much confidence should be placed in these figures, but the obvious deduction remains: economic research must urgently be undertaken to evaluate the productivity of agricultural extension work.

Because modern farming is associated in most peoples minds with the use of tractors, transformation agriculture is usually taken to mean mechanized farming. The assumption is that the bottleneck lies in hoe cultivation. For example, an O.F.C. report(2) states:

"The main limiting factor an ambitious African farmer is up against when he wishes to improve the lot of his family on the land is the hoe. It limits physically the amount of land that can be prepared, the quality of the work and psychologically it weakens the endeavour of all but the strong in character to persevere ..... In the investigations being surveyed, the African family is encouraged to play a much more important and active role in increasing agricultural productivity ..... To attain this goal an endeavour has been made to marry European initiative and drive, modern marketing methods, agricultural knowledge and farm mechanisation to African peasant family, so enabling the African family to farm efficiently a much larger area of land than it attempted or was physically able to attempt in the past."

Since the use of tractors requires capital coupled to organisation and skill, an obvious way to mechanize is through the establishment of settlement schemes. The assumption that labour for cultivation - rather than methods, seeds or fertilizers - is the bottleneck and that mechanization is the answer is by no means always true, and has led in several cases to over-mechanization on settlement schemes.(16) A major limiting factor, for example, in cotton cultivation is the labour available for picking, and deep ploughing is the only operation which needs to be mechanized. With tobacco cultivation the labour bottleneck is again picking and curing and tractors are not essential for cultivation. In many areas the average cost of farm labour hired by Tanzanian African farmers is no more than 80/- per month including payment in kind. Ploughing and harrowing will cost 80/- per acre, and the same work can be done thoroughly (though it usually isn't) by hand in 20 man days if labour is available. When the work is done by tractor at least 50/- goes into imports, while the 60/- paid to labour remain within the country, provide employment, and generate secondary incomes. The provision of large numbers of tractors for agricultural development has become a political shibboleth in Africa, and the advocacy of ox-cultivation tends to be regarded in some places as a neo-colonial plot to hold back African development. The point is that these and other alternatives have not yet been properly investigated by agricultural economists in the Tanzanian context.

The social argument in favour of village settlements is that by grouping the farmers together in a new scheme they will be transformed rapidly from traditional peasant subsistence cultivators into modern farmers, a development which will be accompanied by the adoption of a modern attitude towards all aspects of life. It is, however, debatable to what extent such shock tactics are either successful or wise; it could be maintained that a gradual but steady improvement of life in the rural communities by raising cash incomes through agricultural extension work and changing social habits and attitudes by community development work, although less dramatic, is a much sounder policy.

It was stressed above that the major constraint on development is the shortage of high level manpower. This is particularly true of agriculture where the scarcity of experienced agricultural officers is acute. Settlement schemes tend to aggravate this problem. Each schemes of 250 farmers is to be managed by a skilled agriculturalist. Unfortunately only a fraction of the managers' time is devoted to agricultural instruction, the remainder being dissipated on logistic and administrative chores. The same man if employed as an agricultural extension officer typically can devote a higher proportion of his time to technical work, and provide advice and guidance for very many more farmers.

In so far that foreign exchange is likely very soon to become a major bottleneck, it is essential that settlement schemes should concentrate on the production of either exports or import substitutes, rather than produce local foodstuffs. In doing so the secondary incomes will be maximised and there will be no counter-balancing factor which would arise if the more inefficient producers of local foodstuffs were displaced.

There is one field in which transformation may be highly successful. There are in Tanzania several large and fertile river valleys which cannot at present be cultivated because of annual flooding. It will be possible, at great expense, to introduce intensive irrigated cultivation through flood control. These projects should be cautiously encouraged, with proper attention being paid to planning, experimentation and detailed pre-investment studies.

H. SUMMARY

In this paper the following main arguments of general interest to development economists have been advanced:

(1) Recently development planning in Africa has been concentrated too much on macro-economic planning and too little attention has been paid to the evaluation and comparison of individual projects, both within a sector and between sectors.

(2) The techniques of benefit-cost analysis need to be carefully adapted to the specific situation in which they are to be applied.

(3) Secondary effects, both induced and stemming, should not be excluded from the benefit-cost calculation if there is spare capacity within the economy. The multiplier effects are often of considerable importance and need to be carefully identified and computed.

(4) Benefit-cost calculations depend on the group whose interest is being considered - whether it is simply those directly concerned (e.g., the settlers) or the Government, or a region, or the Nation as a whole. It is usually necessary to consider how all the different groups involved are affected by the one project.

(5) The non-economic benefits arising from a scheme should be carefully listed, evaluated and then compared to their cost.

NOTES

1. For an example of the use of benefit-cost analysis to evaluate projects in under-developed countries, see either E.K. Hawkins: Roads and Road Transport in an Underdeveloped Country - A Case-study of Uganda 1962, or B.H. Farmer: A Divided Nation, 1963. Also see R.W.M. Johnson: "The Northern Province Development Scheme in Northern Rhodesia" in Agricultural Economics Bulletin for Africa. E.C.A., April 1964.

2. See Tanganyika Parliamentary Debate, National Assembly Report, 1st Session, 10th December 1962, to 16th February, 1963, page 7

3. See Overseas Food Corporation's Reports & Accounts for 1954-55. (Her Majesty's Stationery Office, London).

4. For a brief review of T.A.C. Settlement Schemes see "Planning Land Settlement Schemes" by G.A. Bridger in the Agricultural Economics Bulletin for Africa (Sept. 1962) published by E.C.A. Other East African Schemes are also reviewed.

5. Tanganyika Information Services: Memorandum on Rural Settlement in Tanganyika: Government Printer, Dar-es-Salaam 1963 page 4

6. Tanganyika Five-Year Plan for Economic and Social Development. (page X and page 21) Government Printer, Dar-es-Salaam.

7. Land Tenure (Village Settlement Act). 1964

8. See for example D.M. Etherington: "Land Resettlement in Kenya: Policy and Practice" East African Economics Review June 1963. Also a series of articles in Kenya Weekly News by Leslie Brown, beginning July 16th 1965.

9. A valuable survey of benefit-cost analysis by Prest & Turvey is published in the Economic Journal, December 1965.

10. The Economic Development of Tanganyika: Report of a Mission sent by the International Bank for Reconstruction and Development. See Appendix VII.

11. See M.S. Feldstein's article in the Economic Journal, June 1964.

12. P.D. Henderson: Notes on Public Investment Criteria in the United Kingdom; Bulletin of the Oxford University Institute of Economics and Statistics, February 1965.

13. See Budget Survey, 1965/66. Dar-es-Salaam, 1965

14. Central Statistical Bureau: Village Economic Surveys, 1961/62. Dar-es-Salaam, May 1963.

15. Mimeographed Reports in the Ministry of Agriculture. See also Hans Reuthenberg, Agricultural Development in Tanganyika, 1964 p. 23 and 26. This book contains a useful bibliography.

16. R.F. Lord: Mechanised Farming at Natchingwea, H.M. Stationary Office, 1963.

17. The calculation may be made as follows:

let $c_1, c_2, \ldots c_n$ = series of prospective costs in years 1, 2, ...n

$b_1, b_2, \ldots b_n$ = series of prospective benefits in years 1, 2,....n

Sn = end value of scheme after n years

i = appropriate rate of discount for annual compounding

then, if BCR = benefit-cost ratio and PV = present value,

$$BCR = \frac{b_1+b_2(1+i)^{-1}+ b_3(1+i)^{-2}.....(b_m+Sn)(1+i)^{1-n}}{c_1+c_2(1+i)^{-1}+ c_3(1+i)^{-2}.....Cn\ (1+i)^{1-n}}$$

$$PV = (b_1-c_1) + (b_2-c_2)(b_2-c_2)(1+i)^{-1}+ (b_3-c_3)(1+i)^{-2}..... (b_n+Sn-c_n)(1+i)^{1-n}$$

PROBLEMS OF INCOME STABILIZATION IN DEVELOPING COUNTRIES: A CASE STUDY OF THE GEZIRA SCHEME *

by

Ali Ahmed Suliman and D.J. Shaw**

INTRODUCTION

Erratic year-to-year fluctuations in the prices of and incomes from primary products in underdeveloped economies can have important economic disadvantages at the national and local levels, as well as creating social and political disturbances.[1] Not only can an entire economy be affected (see Appendix 1), but at the producer level, such fluctuations can lead to frustrations and the adoption of short-term production plans, hamper savings and investment, and thus hinder economic growth.

This essay is a case study of one facet of this problem. It examines the problems of money income fluctuations in the Gezira Scheme in the Sudan, and the policies devised to-date to try to create greater stability. It is stressed at the outset that we are mainly concerned here with income rather than price stabilization, and with money as opposed to real incomes at the local or regional rather than the national level. Although price fluctuations can help to create income instability, greater price stability need not necessarily, ipso facto, lead to income stabilization in situations in which yields continue to fluctuate yearly, and in certain cases, might even induce or enhance it.[2] Price stabilization may reduce income fluctuations

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** Ali Ahmed Suliman is Lecturer in Public Finance and D.J. Shaw Senior Lecturer in Rural Economy in the University of Khartoum, Sudan.

when yield and price tend to move together, but when they move in the opposite directions attempts to stabilize price may destabilize income. As we are concerned with money income, attempts to control real income fluctuations entail considerations which go beyond the scope of this paper.

Stabilization is a much abused concept.[3] We shall use it to mean the reduction of short-term fluctuations around the long-run trend. This involves narrowing the range of changes in the variables concerned, and not necessarily fixing them at any given level, with as little effect as possible on the rate of adaptation of supply to long period changes in demand. This in turn involves maintaining contact with the trend of prices or incomes, although dampening fluctuations in incomes rather than prices, might give a more accurate forcasting of the flow of producers' incomes for a short period ahead. Political and administrative, as well as economic factors must be taken into consideration, as well as a careful balancing of incentives against the costs of stabilization measures. Baldly stated the attempt is to achieve the stabilization of money incomes through setting aside some of the surplus of good years for redistribution to the producer in years of either low prices and/or low crop yields thereby reducing uncertainty and its effects on producer behaviour.

The Gezira Scheme[4]

This case study is in many respects an extreme example. The Gezira Scheme is centrally placed in the Sudanese economy. Cotton provides some 65 per cent of the total value of domestic exports, some 17 per cent of the Gross Domestic Product, and approximately 20 per cent of the money incomes generated in the Sudan. Fluctuations in cotton receipts, which are influenced by yield levels, grades and price, have a significant impact on Sudan's balance of payments position (see Appendix I).

The Gezira Scheme is the most important producer of extra-long (Egyptian) cotton in the Sudan. It supplies some 70 per cent of cotton revenue, and over the past five years, its share of cotton proceeds to Government has averaged some 10 per cent of total Government revenue. Apart from direct income accruing to Government, the interest on the capital lent to the scheme, dividends, contribution to agricultural research, freight charges, and import and export duties, all make a substantial contribution to Government revenues indirectly, as do the generating effect of money incomes to cultivator and hired worker.

The scheme, which has a capital of some £S.20 million, is operated as a joint undertaking between the Government, which provides the land and irrigation facilities, the Sudan Gezira Board, which is responsible for the management of the scheme, the marketing of the cotton crop and the promotion of social development amongst the farming population, and the tenant farmers who supply the labour for producing and harvesting cotton according to the Board's instruction.[5/] There are over 75,000 tenant farmers working in the scheme which now covers over two million acres. They are assisted by some 350,000 casual labourers during the cotton harvest.

Although the scheme also produces dura (Sorghum vulgare), loubia (Dolichos lablab), groundnuts, wheat and vegetables, the joint undertaking only relates to cotton at present. In return for the various functions performed by each party, cotton proceeds are divided amongst them, after deduction of certain production costs which they meet jointly, 40 per cent going to Government, 10 per cent to the Board, and 46 per cent to the tenant farmers. Two per cent is allocated to a social development fund, and the remaining 2 per cent to Local Government Councils in the scheme area. The tenants' share contains up to 2 per cent which can be placed in an equalization fund, known as the Tenant Reserve Fund, which attempts to reduce money income fluctuations.

TABLE 1

Annual Area, Yield, Price and Revenue Fluctuations for Gezira Cotton

Season	Cotton Area ('000 feddans)	Average Annual Yields (kpf)[a]	Average Annual Price (£S.)[b]	Government Share (£S.millions)	Board Share (£S.millions)	Tenants' Share (£S.millions)	Total Proceeds (£S.millions)
1950/51	207.4	6.78	32.8	17.5	8.8	17.5	43.8
1951/52	221.0	3.14	27.4	6.0	3.0	6.0	15.0
1952/53	234.7	4.72	13.2	4.7	2.3	4.7	11.8
1953/54	235.0	4.69	14.2	6.4	3.2	6.4	16.1
1954/55	234.8	4.28	14.9	5.2	2.6	5.2	13.0
1955/56	239.0	4.86	17.1	7.4	3.7	7.4	18.5
1956/57[e]	245.4	6.76	17.4	8.6	2.1	9.0	20.5
1957/58	245.4	1.51	13.3	0.4	0.1	0.5	1.0
1958/59	310.6	4.71	10.4	6.0	1.4	6.2	14.2
1959/60	385.9	4.18[c]	14.4	9.2	2.2	9.7	22.0
1960/61	430.7	2.73	13.6	4.0	0.9	4.2	9.4
1961/62	467.6	6.64	12.4	8.7	2.1	9.0	20.7
1962/63	484.3	4.30	11.7	7.2	1.7	7.6	17.3
Average 1951/63	303.2	4.56	16.3	7.0	2.7	7.3	17.2
Average 1952/63[d]	311.2	4.38	15.0	6.2	2.1	6.4	15.0

a/ Kantars of seed-cotton per feddan.
1 kantar of seed-cotton is equivalent to 312 lbs.
1 feddan is equivalent to 1.038 acres or .42 hectare.

b/ £Egyptian (to 1956/7) and £Sudanese per kantar (100 lbs.) of lint cotton f.o.b. Port Sudan.

c/ From 1959/60 to 1962/63 yields exclude new extension.

d/ 12 year average (1952/63) to show effect of 1950/51 season.

e/ Revision of sharing arrangement with effect from July 1, 1956. Before that date sharing was Government and tenants 40% and Board 20%. After that date, sharing became Government 42%, tenants 44% and Board 10%

(Source: Sudan Gezira Board, Annual Reports and Statements of Account, Barakat: Sudan Gezira Board, (1950-1963)).

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Income Instability in the Gezira Scheme

Despite extensive research and high-cost management[6/], average seed cotton yields per feddan have fluctuated considerably in the recent past between over 2,100 lbs. in 1951 and 470 lbs. in 1958. Average grades have also been erratic and prices for ginned Gezira cotton have been unstable (see Table I). These fluctuations have been the result of such factors as weather conditions during the production period, pests and diseases, and general world market conditions for Sudan cotton, and have produced wide fluctuations in money income to the three parties. This has been particularly burdensome as the general level of income has been low.

The cotton producer is placed in a peculiar position. Faced with these frequent, and often wide, fluctuations in revenue from cotton, he is unable to reallocate his resources freely to other enterprises. He is compelled, under the terms of contract with the Sudan Gezira Board, to cultivate a given area under cotton and must provide a minimum level of labour inputs. If the field staff of the Board considers that the standard of cultivation on any cotton operation is inadequate, or if a tenant does not perform his cotton operations on time, the officer may call in hired labour to meet the deficiency and charge the cost of this labour to the tenant's account. Other capital inputs are applied for him by the Sudan Gezira Board and charged to the tenant's or to the joint account. At harvest time a cultivator must supply the cotton to the Board which markets it on behalf of the three parties. In return, the producer receives not only 46 per cent of cotton proceeds, but also the full returns from the other crops he grows, which at present, are charged neither a land rent nor water rate. It can be argued that the advantage of growing his staple food in the scheme, using an assured supply of irrigation water, and the revenue from the crops other than cotton, have acted as a retaining force on the tenant population during years of low revenue from cotton.

Cotton revenue to Government and Board are, nevertheless, significantly higher per irrigated feddan, than revenue from any other single crop in the scheme. This does not appear to hold true for the tenant farmer. The crop sharing system of the scheme, which relates to one crop only, and a high propensity to hire labour amongst the tenant community,[7] reduces considerably the revenue to the cultivator from cotton making the crop less attractive than groundnuts and wheat, and creating a differential incentive effect to grow the various crops.

The Tenant Reserve Fund (TRF)

Various policies have been devised in an attempt to dampen the fluctuations in money incomes from cotton. These have included marketing policies, such as bulk sale agreements and reserve prices which have not achieved any marked degree of income stabilization.[8]

We shall concentrate our analysis on attempts at money income stabilization at the producer level, and in particular on a device known as the Tenant Reserve Fund. The TRF was started in 1935 with three main objectives:[9]

(a) to repay the private companies, which ran the scheme before its nationalization in 1950, bad debts accumulated in the depression years of the 1930's, and to provide security for future loans to the cultivators;

(b) to act as an equalization fund when, in any season, yields and prices resulted in the producer's share of the proceeds of the cotton crop being unduly low;

(c) to finance projects deemed to be for the benefit of the scheme as a whole. It was, in the main, built up by levies on the tenant farmers' share of cotton receipts. In addition, Government and the private companies contributed LE.46,632 plus the accumulated interest.[10]

The TRF was launched firstly as security measure for loans paid out to the producers for cultivation operations by the cotton companies, and only secondly, as an equalization fund. The establishment of a fund to cover bad debts was a sound measure so far as the companies were concerned, particularly as cotton prices reached their nadir in 1937. Yet this reduced the effectiveness of the TRF as an income stabilization measure.

The history of the TRF is useful in providing lessons on the political, social and psychological, as well as the economic, problems which surround the successful establishment of this type of equalization measure.[11/] The cultivators were not informed that a fund had been created in their name. It may be argued that it would have been difficult to convince the tenant population of the value of such a measure, particularly in such bad times as the 1930's, and when income stabilization was not the only, or even the prime, objective of the policy. The outcome was that when the cultivators discovered that, what was to them, a large sum of money was being accumulated unknown to them in their name, they went on strike on the eve of cotton sowing in 1946.

The lessons to be drawn from these events are numerous. They show the importance of establishing such a fund with the full knowledge and understanding of the cultivator, but also the difficulty of doing so amongst cultivators just emerging as commercial producers or who have little or no stake in the land. Furthermore, they reveal the necessity of devising a system of control and disbursement of such a fund which will include the cultivator, giving him a sense of responsibility, and, at the same time, educating him in the usefulness of such a scheme. It could also establish a platform for healthy management/labour relations.

For paternalistic reasons, the cotton companies did not inform the cultivators of the existence of the TRF with the result that once discovered it provided a factor for keeping management and cultivator apart rather than bringing them together. It also created a psychological attitude amongst the farming community against the TRF which has yet to be removed.

Another problem is concerned with the timing of the establishment of equalization measures. Either they should be set up at the commencement of an enterprise or during a period of good years. We shall see later that the TRF in the Gezira Scheme has never been built up to a level which would enable it to work as an equalizer. Again, the legacy of 1946 might to some extent be held accountable for this. The outcome of the strike was that LE.400,000 or over 30 per cent of the TRF was paid out of the fund at one time. This only resulted in local inflation, but drew the fund down to a level from which it was difficult to raise it.

With the nationalization of the scheme in 1950 and the establishment of an independent board to replace the private companies, the TRF was vested in this board of management as trustees. The fund was given a ceiling of LE.3 million,[12] which at that time was equivalont to LE.20 per feddan of cotton or approximately LE.125 per tenant farmer. This ceiling was later revised, with effect from July 1, 1956, and set at LS.25 per feddan under cotton.[13] With 510,000 feddans under cotton in the Gezira Scheme at present, this would amount to a total of £S.12.75 million. If the TRF falls short of this amount, then up to 2 per cent of the tenants' share of cotton receipts may be fed into the fund. Interest earned on TRF capital is credited to a "special account" to a ceiling of £S.15 per feddan of cotton, after which interest would be accredited to the TRF. The Board, after consulting the tenant farmers, may make payments out of the special account to individuals whose cotton revenue" ... owing to circumstances other than gross negligence on his part appears to the Board to be inadequate having regard to his means of subsistence and to the earnings of other comparable tenants[14]" (see Appendix 2).

TABLE 2

The Operation of the Tenant Reserve Fund

Year	No. of Tenants	Tenants' Share of cotton proceeds	Amount of TRF	Payment into TRF	Payment out of TRF	Average Share of cotton proceeds per Tenant (Col.3/Col.2)	Payments per Tenant from TRF	TRF Related to Total Payment (4 as % of 3)	Three-year moving average of (Col.3)	Average payt. to tenant from TRF as % of average payt. to tenant (Col.8 to 7)
	('000)	(£S.Million)	(£S.million)	(£S.million)	(£S.million)	(£S.)	(£S.)	(%)	(£S.million)	(%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1950/51	24.8	17.8[c]	3.0	2.1[a]	nil	716.9[b]	nil	17	9.9	nil
1951/52	26.9	6.6[c]	3.0[f]	nil	nil	246.6	nil	45	10.3	nil
1952/53	29.2	5.1[c]	3.1[f]	nil	nil	176.0	nil	61	9.9	nil
1953/54	29.4	6.4	2.8	0.6[g]	0.9	218.6	31.8	44	6.1	14
1954/55	29.7	5.2	2.9	0.4[g]	0.4	174.9	11.8	56	5.6	7
1955/56	30.5	7.4[c]	3.0	0.7[g]	0.7	241.0	23.0	40	6.3	9
1956/57	30.0	8.7[d]	3.4	0.5[g]	nil	289.0	nil	39	7.0	nil
1957/58	31.8	0.9[e]	3.0	0.1[g]	0.5	28.8	15.4	327	5.7	53
1958/59	43.1	6.0	1.2	0.3[g]	2.0	138.2	45.6	21	5.2	33
1959/60	55.6	9.2	1.2	0.4[g]	0.5	166.1	8.8	13	5.4	5
1960/61	63.0	4.0	1.4	0.2	nil	62.8	nil	34	6.4	nil
1951/62	66.6	7.0	1.0	0.5	0.9	104.5	12.9	14	6.7	12
1962/63	73.8	7.2	1.5	0.5	nil	98.2	nil	21	7.2	nil
Total	534.5	91.5	30.6	6.4	5.8	2661.6	149.3			
Average 13 yrs. (1951/63)	41.0	7.0	2.4	0.5	0.4	204.7	11.5			
Average 12 yrs.[h] (1952/63)	42.5	6.2	2.3	0.4	0.4	162.1	11.4			

a/ Transfer from the Board's net revenue account.

b/ LE.785 with surplus from Board's account.

c/ Includes surplus which is above the TRF ceiling paid from Board's share.

d/ Includes underpayments from previous season

e/ Actual share is £S.443,177, therefore, LS.474,604 due to be collected from tenants.

f/ Includes payment of interest and unclaimed balances.

g/ Includes unclaimed balances and interest, but since 1956 paid to special account.

h/ See effect of 1950/51 season.

(Source: Calculations from Sudan Gezira Board, Annual Reports and Statements of Account (Barakat: Sudan Gezira Board, (1950/1963)).

Deficiencies of the TRF

Between 1935, when the TRF was introduced, and 1946, when it reached its highest prenationalization total, the fund was built up slowly from £S.0.428 to LE.6.434 per feddan of cotton. Only four transfers were made from the TRF over this period, the only large one, apart from the 1946 payout referred to earlier, being in 1948, when LE.309.519 was distributed. Payments into and out of the TRF between 1950/51 season and the 1962/63 season are given in Table 2 and are related to the tenants' share of cotton proceeds. Average cotton proceeds per tenant and average payments from the TRF per tenant have also been calculated.

Tenant cotton proceeds have fluctuated considerably over the period from 1950/51, which was the most successful season the Gezira Scheme had experienced so far, from the point of view of cotton production. Cotton yields, grades and, as a result of the Korean war, prices reached their highest level, and average payments from cotton revenue to the tenant farmers attained the record of £S.717. Over the next 12 years, average cotton proceeds per tenant were to be higher than £S.200 in four seasons, and less than £S.100 in three, with the lowest average payment of £S.28 in the 1957/58 season. Average cotton proceeds per tenant were £S.205 for the period 1951/63, and allowing for the extraordinary 1950/5 season, £S.162 over the period 1952/63 (see Col.7, Table 2). Tenant labour costs should be deducted from these figures to obtain the net revenue from cotton to the cultivator.

Although it is recognized that an income stabilization fund is necessary in a farming system within which one crop is dominant, the yields and prices of which fluctuate erratically from year to year, the present system operated as the TRF is deficient in a number of ways.

(i) The fund's capital is too low to act as an equalizer. This was recognized in 1951. The ceiling of £E.3 million was fixed in 1950 on the basis of previous years of experience and, therefore, the opportunity to build up an adequate fund out of the exceptional 1950/51 season

was lost. Another aspect of an equalization fund, namely as a controller of local inflation, was also forfeited, with the result that the high returns to the cultivator created high prices for labour and consumer goods which have remained in subsequent years of low-returns from cotton production.

The higher reserve funds held from the sale of cotton in Uganda and cocoa in Ghana,[15] were obtained through a fixed buying price, a medium not open to the Gezira Scheme where the tenant farmer is a partner in the actual sales price of cotton. In Uganda the reserve did not fall below 93 per cent of producers' income in any year between 1949 and 1960, whereas in the Sudan, it has been as low as 13 per cent, and apart from the abnormally low year of 1957/58, has not been more than 61 per cent (see Col.9, Table 2).

While the Gezira system can give the producer a greater sense of getting current market value, the actual ceiling fixed by the Gezira Scheme Ordinance in 1950 was far lower than in the stabilization reserves of other countries with similar monoculture economies, and very low compared with the market value of cotton at that time.[16]

(ii) Payments into and out of the TRF have been inconsistent both with the level of total cotton proceeds paid to the cultivators and the amount in the TRF for any one year. Payments into the TRF (Col.5, Table2) have continued in years of low as well as high cotton revenues (Col.3, Table 2), and payment out of the TRF (Col.6, Table 2) have had little relation to the level of tenants' cotton proceeds. Payment out of the TRF has taken place as a result of bargaining between the Board and the tenants representative body, and is distributed on a per feddan of cotton basis.

(iii) Payments into and out of the TRF are done collectively through a levy of up to 2 per cent on the tenants' share of cotton receipts and through an issue based on the number of feddans worked under cotton by each tenant. Therefore, the good producer is subsidising the inefficient cultivator. In the early stages of the Gezira Scheme's development, the collective treatment of the tenant farming population was considered necessary for its efficient working. It is doubtful whether such a case can be made after the scheme has been operating for forty years. Moreover, hardship cases amongst the cultivators are provided for through the special account. (Appendix 2).

(iv) As no time period has been laid down, the accumulated TRF has been disbursed to beneficiaries who have entered the scheme lately. This can be seen in Table 2 (Col.1) which shows that the tenants of the scheme more than doubled over the ten year period 1950/51 to 1959/60. There has been a large and rapid increase in the number of tenant farmers in the scheme particularly since 1958/59, when the first phase of a large addition to the scheme, known as the Managil Extension,[17/] was brought into cultivation. This extension has added some 800,000 feddans to the scheme, and provided employment for over 42,000 tenant farmers, more than doubling both the area under cotton in the scheme and the number of tenants. A separate TRF was not set up for the Managil Extension with the result that tenants who contributed to the TRF over a number of years, and who helped to build it up to its present level, share the fund with tenants who entered the scheme only last season. This has decreased the effectiveness of the TRF as an efficient stabilizer of income still further.

(v) There is no clearly defined concept of stabilization embodied in Gezira legislation, and how the TRF might help to attain it in the Scheme. Therefore, the value of the TRF as an incentive to producers has not been utilized. It is doubtful whether tenants understand the function of the TRF, and, together with the historical legacy of 1946, this has created a situation in which the fund has rended to become a spoiling ground for bargaining between cultivators and management, rather than as a meeting place for reconciling differences and arriving at a common policy.

The Board attempted to increase the ceiling of the fund above the LE.3 million set in 1950. LE.630,317 was paid out of the Fund in the 1951/52 season because it had reached its statutory maximum. The exceptional 1950/51 season may be held to account for the discord between tenants and Board. The average gross money income from cotton paid out to the tenants at the end of that season was over $2\frac{1}{2}$ times as great as has been received for any year subsequently. This not only led to local inflation, but the payments received by the cultivators in that year became to be regarded by them as the norm to be received each year. When payments were considerably lower in the following years, there was pressure from the tenant community to build up their cotton incomes to the 1950/51 level with disbursements from the TRF. It was this pressure which showed the inadequacy of the fund as defined in the 1950 Ordinance. On the other hand, it can be argued that to have maintained money incomes from cotton at the exceptional level attained in 1950/51 through withdrawals from a very large TRF would have been, with hindsight, to have lost touch completely with the general trend both of yields and prices. This points to some of the central

problems of designing an income stabilization fund. Such funds must be related to a specific time period, and be of a size which will take into account the cost of running such a fund, the efficiency of the fund as stabilizer, and the effect on output achieved through such a measure. At the same time such funds should be related to the price envisaged under stabilization and the open market level. There is a tendency to argue for larger stabilization funds in situations of frequent and often large fluctuations in incomes, without sufficient consideration of the cost, efficiency and incentive effects of such funds. And it is by no means certain that higher incomes and output will be realized in an economy sheltered under a large stabilization fund in the long run, particularly as there is the possibility of impeding the adaptation of supply to long-period changes in demand.

Under the Gezira Scheme Act of 1960, the TRF was raised to a ceiling of £S.25 per feddan of cotton, or a total of £S.12.75 million, over four times the previous ceiling. In 1962/63 the TRF stood at £S.1.5 million. The tenants' share of gross profits from cotton was also raised from 40 to 44 per cent, subsequently raised by another 2 per cent, but the tenants now have to build up the TRF themselves, by releases of up to 2 per cent of the share of gross profits from cotton, as long as the TRF is short of its ceiling. With the present discrepancy between the ceiling and the actual capital level of the fund, and noting the trends of both cotton yields and prices, it will take a considerable time to build up the fund to its ceiling. This also implies that syphoning off of part of the tenants' share of cotton proceeds will take place irrespective of the level of tenant incomes in any year.

Under the 1950 Ordinance, the Board paid the residue of its 20 per cent of gross cotton proceeds into the fund, after covering its own expenses and building up its reserves to LE.3 million, which at that time was equivalent to LE.3.5 per feddan under cotton. Such payments were highly indeterminate, and when the fund was at its ceiling of LE.3 million , Board surplus was credited to the tenants' collective account for direct payment to the cultivators. The 1960 Act raised the ceiling of the fund appreciably, removed the spillover of surpluses from the Board to the fund, and allowed for the future expansion of the fund by relating its ceiling to the number of feddans under cotton. However, whereas it might be argued that 2 per cent of the tenants' share of cotton proceeds is too low in good years (2 per cent of the tenants' share of cotton proceeds in 1951 would contribute only LE.362,000 to the TRF), it might be particularly onerous in bad seasons.

Suggestions for Improvement

The aim of a stabilization policy should be directed towards dampening year-to-year fluctuations. This is particularly desirable amongst small scale cultivators dependent on the production of a narrow range of crops, where large fluctuations in crop yields and prices have considerable effects on real incomes. We have seen from this case study of the Gezira Scheme that such a policy is difficult to design and perhaps even more difficult to implement. There are the problems of maintaining contact with long-term trends especially when, as in the case of the cotton market, there are general changes in the underlying factors of supply and demand. This is more difficult than maintaining incomes at a particular level. There is also the danger of creating an inflexible or insensitive economic environment which might hamper expansion or change in production. Moreover, the costs of operating an equalization fund might reduce any benefits accruing from it considerably.

In the Gezira Scheme the fact that the tenants take their income as a percentage of gross cotton revenue has some stability effect, though this is very small.[18/] Improvements in the effectiveness of the TRF might be achieved through increasing the size of the fund, bearing in mind the balancing of costs and incentives that this involves. A TRF of the size of one year's income of the tenants may achieve this compromise, between its effectiveness as a stabilizer, and a reduction of the costs involved. There is also the necessity to make a clear-cut basis on which payment out of the TRF is allocated rather than the arbitrary procedure adopted at present. Furthermore, a more flexible arrangement should be devised for payment into the TRF, instead of the current practice of allocation to the fund of a small, fixed percentage of tenant cotton revenue irrespective of the level of that income.

We suggest that a practical, readily understood and unambiguous stabilization scheme might be set up based on a simple statistical formula, such as moving average, covering a clearly defined time period which is long enough to give security to the producer, but not so long as to lose contact with trends in yields and prices. A clause should be inserted in the stabilization policy that revision of the payment both into and out of the fund might be made following upon freak movements in yields and prices. Product prices might be based on the moving average of net proceeds per unit of output. In Table 2 (Col.10), a three-year moving average of the tenants' share of cotton proceeds has been calculated which reduces fluctuation markedly and which, with the operation of a TRF, would achieve a reasonable degree of income stability.

It is also suggested that the TRF be operated on an individual, rather than a collective, basis as is the case at present. It is appreciated that a collective operation of the fund had certain points in its favour at the commencement of the scheme. All cultivators were inexperienced, and spreading the risks and benefits over the tenant community might have helped in developing a spirit of <u>esprit d'accord</u>. However, as time has progressed, the inefficient producer has been

supported by the more efficient cultivator through the collective operation of the fund. A strong argument in favour of operating the fund on a collective basis is that it reduces the costs involved considerably. This does not apply in the Gezira Scheme where individual tenant accounts are already kept. Therefore, the marginal cost of applying the stabilization fund directly to the actual incomes earned by individual tenants would be small. This would have the benefits of not penalizing the good producer to the advantage of the bad, reducing unrest and bargaining between management and tenants, relating the payments made into the fund with those drawn out of the fund by each cultivator separately, increasing incentive to produce well, and stimulating savings.

Now that the Gezira Scheme is being modified under a programme of intensifying and diversifying production, alternative schemes for stabilizing tenants' incomes can also be introduced. Until 1959, irrigation water shortage placed a severe limitation on the intensity and range of production within the scheme. The Nile Waters Agreement of 1959, which considerably increased Sudan's share of the streamflows of that river, has now lifted this restriction and allowed a greater range of crops to be produced in the Scheme. The area under wheat and groundnuts is being considerably increased, as well as vegetable and fodder crops.[19/] Wheat and groundnuts could be brought within the scope of the TRF, thereby not only increasing its size but also making it much more flexible. The diversification of production in the scheme will also contribute to a greater stabilizing effect on tenant incomes.

It must be stressed however that although improved stabilization measures can be important as part of a general policy for increasing production and incomes by reducing uncertainty, they are not sufficient, by themselves, to sustain adequate level of production and money incomes, and in certain circumstances, may be inimical to development. Extension services are necessary to see to it that good husbandry is practised. Adequate credit facilities should be provided at reasonable cost and marketing arrangements should be designed so that the producer receives a fair price for his commodities. Ultimately, much will depend on

creating a class of progressive farmers with a stake in the land, stimulated to save and invest for increased production. This would do much to support, and at the same time reduce the need for, a stabilization fund.

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9/ Sudan Plantation Syndicate, Statement on the Tenants Reserve Fund, December 1950 (Barakat: Gezira Board Archives Centre, typewritten).

10/ The highest total reached by the TRF before 1950 was LE.1.3 million in 1946, equivalent to LE.6.7 per feddan of cotton or LE.5 per tenant farmer. One Egyptian pound was calculated at £.1.0.6d. Sterling at that time.

11/ A. Gaitskell, ibid., pp. 164-70.

12/ Gezira Scheme Ordinance, ibid.

13/ The Gezira Scheme Act, ibid.

14/ The Gezira Scheme Act, ibid.

15/ See, Polly Hill, "Fluctuations in Incomes of Primary Producers", Econ.J., Vol. LXII, 1953; P. Addy, "Fluctuations in Incomes of Primary Producers: A Comment", Econ.J., Vol. LXIII, 1953; also, J.C. Wells, "Price Stabilization of Nigeria's Export Crops", The Nigerian J. of Econ. and Soc. Studies, Vol. IV, No. 1, March 1962, and, FAO, "Problems of Agricultural Support and Stabilization in Asia and the Far East", Monthly Bulletin of Agr.Econ. & Stats., Vol. VII, Nos. 7/8, pp.3-4.

16/ Sudan Gezira Board, First Annual Report 1950-1951, p.9.

17/ D.J. Shaw, The Managil South-Western Extension: An Extension to the Gezira Scheme (Wageningen: International Institute of Land Reclamation and Improvement, Bulletin No.9, 1965), 37 p.

18/ Although the whole system of sharing of costs and income have some stabilizing effects, it also involves undesirable disincentives. See D.S. Thornton and D.J. Shaw, "A Note on the Reconciliation of the Partners' Interests" in Interim Report of the Working Party on the Development of Agriculture in the Main Gezira Area (Khartoum: mimeographed, April, 1965), Appendix 3.

19/ D.J. Shaw, "Recent Developments in the Gezira Scheme", FAO Land Reform, Land Settlement and Co-operation, Dec.1964, pp. 8-22.

APPENDIX I

SUDAN'S BALANCE OF TRADE AND THE POSITION OF COTTON: 1956 - 1964

(£S. Millions)

Year	Imports	Exports[a]			Invisibles[b]	Surplus or Deficit[c]
		Total	Cotton	Others		
1956	48.2	71.8	45.8	26.0	-6.3	17.3
1957	69.7	51.7	24.1	27.6	-3.6	-21.6
1958	54.0	44.9	23.5	21.4	-3.7	-12.8
1959	49.2	68.2	42.3	25.9	-5.0	-14.0
1960	61.9	64.0	34.0	30.0	-4.6	- 2.5
1961	77.8	61.3	28.7	32.6	-6.1	-22.6
1962	86.7	79.7	42.5	37.2	-14.0	-21.0
1963	97.9	85.5	43.7	41.7	-13.9	-26.3
1964	87.9	70.0	32.0	38.2	-14.2	-31.9

Source: Bank of Sudan, Report for the Year ending 31 December 1964 (Khartoum: Government Printing Press, March, 1965), pp. 64-5.

a/ Split into cotton and others estimated by reference to Trade Account.

b/ Payments and receipts.

c/ On current account.

APPENDIX 2

GEZIRA TENANTS' RESERVE FUND SPECIAL ACCOUNT

(£S. Thousands)

Year	Payments In	Total Fund
1956/57	44.4	44.4
1957/58	53.1	97.5
1958/59	23.3	120.8
1959/60	14.3	135.1
1960/61	24.9	160.0
1961/62	21.1	181.1
1962/63	20.7	202.0
1963/64	33.0	235.0

(Source: Sudan Gezira Board, Annual Statement of Accounts (1957 -1964) (Barakat: Sudan Gezira Board).

MARKET PROSPECTS FOR POULTRY INDUSTRIES IN AFRICAN COUNTRIES

J.C. Abbott[1/]

Important problems for African poultry development are:- 1. Is the commercial poultry industry in Africa destined to remain a high cost operation supplying mainly foreign residents, and higher income Africans who have adopted European diets? 2. At what retail prices for eggs and poultry meat could increasing proportions of the population afford to eat them regularly? 3. How can those who can already afford to eat some eggs and poultry meat, but do not, be induced to purchase them regularly?

EGGS

Present levels of egg output in most African countries reflect a response to limited markets. The sectors where consumption rates approach those of Western Europe, for example, are those where European residents predominate. Annual per capita consumption of Europeans in Rhodesia, for example, averages 219 eggs (Rhodesia 1964) as against overall averges of 1 to 2 kg. or 20 to 40 eggs of 50 g in Madagascar, Sierra Leone and the U.A.R. (See Table 1). Reductions in the number of European residents have intensified marketing problems in Algeria, Morocco, Kenya and Senegal.

Some African countries, in addition to South Africa, were until recently regular exporters of eggs. (See Table 2). In face of increasing competition from international exporters because of reduced traditional outlets, they have found it increasingly difficult to maintain such export.

1/ Marketing Branch, Food and Agriculture Organization, Rome.

Only to a small extent have these movements been replaced by new intra-African trade such as the Nigerian exports to Ghana in 1961, or trial sales from Dahomey to Niger by air in 1964.

Market prospects for growth of a specialized domestic poultry industry are much brighter in the countries which have been, until recently, or still are, on an importing basis. These include most of the savannah and coastal countries of Western and Central Africa. (See Table 2).

Import restrictions and duties have been effective in assuring that domestic industry has the whole of the local market in former importing countries such as Dahomey, Nigeria, Sierra Leone and Tanzania. However, it could result in that market remaining very small. Protection of a high cost industry with eggs retailing at 80 cents[1/] per dozen or more, means correspondingly less incentive for marketing approaches designed to go beyond foreign residents and high income Africans who have adopted European diets.

Household consumption surveys providing specific data on egg purchasing reveal income elasticity with respect to demand generally at 1.3 in Moslem North Africa. Available income/egg consumption data, south of the Sahara, though less conclusively, still suggest that expenditure on eggs can be expected to increase rapidly with income; for example:

Ibadan, Nigeria	Income group weekly family expenditure	Low	Medium	High
1964	on eggs (cents)	21	76	98

1/ All prices have been converted into US dollars at official exchange rates.

On the basis of population increase, the effect of oil revenues on popular income and continuation of current retail prices, Taylor (1964) estimates 1970 egg consumption in Libya at 9,500 tons, or five times the current amount. Overall FAO estimates point to indices of market demand for eggs in Africa by 1975 (base 1958 = 100) as high as North Africa 250, West and Central Africa 390, East and South Africa 270, all Africa 330.

There is much evidence of a clear inverse correlation between the price of eggs and the quantity consumed. At up to 29 cents per dozen, Africans are large and regular buyers in Rhodesia (Southern Rhodesia, 1964). In Kenya, they come onto the market for pullet eggs at 18 cents per dozen. (Winmill, 1965). Guinea fowl eggs are sought in Ibadan when they are available, principally because they are cheaper than chicken eggs. (Gopalan and Falobi, 1965). Sales by an egg marketing cooperative in Dahomey during a special promotion week, with retail prices reduced from 7 to 5 cents each, rose to 16,000 from a normal of 6,000. In Zambia, the seasonal drop in egg prices leads to a sharp increase in egg purchases by the African sector. (Zambia, 1964).

Non-economic consumption factors It is not clear how far traditional taboos on the eating of eggs continue to restrict domestic demand in Africa. Eggs are eaten very little by Limba men of northern Sierra Leone and are forbidden for women and children. (Finnegan, 1965). Such taboos also prevail among many Galla, Somali and other non-Semitic groups in Ethiopia, among Kikuyu, Buganda, Chagga and other East African tribes, and along the Congo. (Simoons, 1961). However, they appear to be losing market significance as men leave the villages for work, military service, etc. (FAO, 1964 c). Only in extreme cases are they completely separate from price.

Promotion campaigns Since lack of appreciation of and familiarity with eggs is often a major sales obstacle in Africa, promotion has an important role. An intensive program is being operated by home economics and agricultural extension staff in Western Nigeria, including visits to homes and institutions, demonstrations, radio talks and eye-catching posters. This initiative has still to be followed in many African countries.

Market costs. Table 3 shows that the marketing margins on eggs taken in most of the African countries are smaller than in the USA, for example. However, the American consumer rarely receives a bad egg. In contrast, a housewife, purchasing from a retailer in Kano market a few years ago, had to test 100 eggs in water before finding a dozen she regarded as satisfactory - and the eggs rejected were put back on the pile to be offered to other potential customers.

The most obvious way to reduce quality deterioration and keep down marketing costs is direct sale from producer to consumer. This is common in Africa wherever the producer is within reach of enough consumers to move his whole output in this way. It becomes progressively more difficult as the number and scale of producers increases. A production pattern of large numbers of producers who combine egg production with other agricultural activities, as under the Eastern Nigeria settlement program, for example, calls almost inevitably for a specialized egg collection and marketing service.

While independent traders have organized successfully a large-scale movement of guinea fowl eggs from Northern Nigeria to the cities of the south, for example, the preference of many governments is for marketing cooperatives. They are being encouraged officially in Ghana, Nigeria, Rhodesia, Kenya and Dahomey, for example; thus the cost of grading staff and equipment for the Mid-West Nigeria egg marketing cooperative is met

by the government. Success generally waits upon the availability of staff with an adequate appreciation of what must be done to ensure business success and maintain quality through to the consumer. A tendency for producers to sell through cooperatives varying quantities of eggs surplus to their normal direct outlets, has sometimes led to somewhat unwieldy storage and export proposals.

Governments are also organizing marketing directly. Nearly three million eggs were handled during the year 1963/64 under the egg marketing programme of the Ministry of Agriculture of Western Nigeria.

Need for storage Seasonal shifts in the volume of output of eggs are not pronounced in most African countries. Estimated monthly production of eggs in the Western Region of Nigeria 1964/65, for example, varied only between 2.2 and 2.6 million, with February the low month, and July the highest. (Gopalan and Falobi, 1965). This limits the need for storage to current handlings pending distribution, and short-term accumulation to meet seasonal demand peaks, such as feasts and religious holidays. However, unless eggs are collected or delivered promptly from the farm, and distribution is carefully organized, as under the system whereby kiosk sellers in Ibadan return unsold eggs to cold stores each night, consumers may still face bad eggs. When the income available for expenditure on eggs is very limited, risk of poor quality may well be the factor that would divert them to a more reliable product. (Van Rensburg, 1954). A strong feature of the marketing system in Freetown has been that eggs in retail shops were rarely more than three to four days from the farm. (Gocht, 1963).

Sales advantages of small eggs The Rhodesian Poultry Inquiry Committee (1964) reported that "the demand of African consumers for eggs was restricted at present wage levels largely to pullet and small eggs". This and other evidence noted earlier, poses a question whether total consumption of eggs by low income groups in Africa, could be raised substantially by the adoption of breeds producing small eggs, with the same efficiency as the best imported stock.

MEAT POULTRY

Specialized production of poultry for meat is still very limited in Africa. Traditionally, consumption is confined to feasts and poultry offered on the market reflects occasional sales to obtain cash. (See Table 4). The import and export data in Table 5, provide a rough indication of the countries where there is evident scope for developing supplies from domestic sources under present conditions.

Demand Reliable household consumption survey information is even sparser for chicken meat than for eggs. A 1958-59 household survey in the UAR showed coefficients of demand for poultry meat with respect to income of 1.85 in urban areas, and 2.54 in rural districts. Slaughter according to Moslem ritual is easy to arrange and an increase in effective demand in Libya, for example, comparable to that for eggs, can be expected with appropriate marketing organization and promotion.

South of the Sahara the demand position is more obscure, with some tribal groups rejecting chickens for human consumption. Also to be considered are consumer preferences for leaner, darker meat than that of fast-grown broilers, and some objection to meat offered under refrigeration, as reported in Sierra Leone (Gocht, 1963) Western Nigeria (Gopalan and Falobi, 1965), Kenya (Spinks, 1965). The rapid absorption of frozen broilers in the UAR suggests, however, that these factors would not constitute a very serious obstacle, provided the price was attractive relative to those of competing foods such as beef and fish.

There are many parts of savannah and upland Africa where beef prices are so low, that the possibility of competing on price is small. (See Table 6). In the tse-tse infested coastal regions, where beef must be brought in over long distances, fish is usually the cheapest animal protein. Thus, at present prices, chicken meat must depend for its market mainly on prestige appeal and its contribution to a varied diet; there may be some tse-tse areas also lacking easy access to fish, where it could also compete with other animal proteins on price.

As between alternative types of meat poultry, the eviscerated broiler from specialized farms has difficulty in competing on cost with village chickens, produced and distributed under a system which requires little capital outlay on feed, equipment or marketing. Gocht (1963) finds little scope for cost reduction in a system in Sierra Leone, which offers the chicken live to the urban consumer at only 15 per cent more than is paid to the farmer. The consumer of these chickens appreciates the opportunity to examine the bird while still alive, and has no objections to killing and dressing it at home. The critical issue is whether an expanded market can be developed for poultry offered in this way, in the face of competition from other meat and fish presented ready to cook.

Gocht's investigations in Sierra Leone suggest that the absence of an effective wholesale processing enterprise able to absorb considerable quantities of meat poultry, is a major deterrent to investment in broiler producing farms, which, because of larger scale operation, more specialized management, and disease control services, etc., should eventually be able to produce at lower cost.

Government services to poultry marketing. In Western Nigeria, the Government has provided physical marketing facilities, and extension agents actively assist producers in sales. Provision of such facilities by a central authority is often the most effective way of demonstrating what is needed and how it can be made to work. The advantages, however, of efficient management of a plant by the person or persons who will sell the poultry, as compared with a municipality, for example, are great. Provision of credits, technical and market information, and other assistance to trading enterprises and cooperatives to establish such plants, may be the most economical and effective course of public action.

The operation of an efficient broiler marketing channel calls for skilled management and specific technical qualifications. A successful cooperative operation, for example, cannot be established by providing buildings and credit. With this kind of aid must go systematic programmes

to select suitable men for training, and ensure that they follow appropriate courses and acquire the necessary experience before responsibility is thrust upon them.

SUMMARY

In a significant number of African countries, growing poultry industries seem to have reached the limit of their markets at present price levels, particularly for eggs. Yet, generally it can be said that poultry products are still consumed regularly only by foreign residents and high income Africans who have adopted European diets. Consumption surveys reveal income elasticity with respect to demand for eggs generally about 1.3 in Moslem North Africa. Sharp reduction of retail prices during an egg sales campaign week in Dahomey resulted in a more than corresponding increase in consumer purchases. Traditional taboos are a factor in determining the dimensions of the market for eggs, but have not been analysed quantitatively.

Government support is usually forthcoming; however, protection against import competition could lead to maintenance of a low volume, high cost industry. Efforts to familiarize families with egg consumption through production and distribution programmes at schools etc., offer prospects of expanding the market in the long run. Specialized marketing arrangments closely integrated with production are needed to reduce costs, and risks of poor quality which deter potential consumers. Access to laying strains which produce larger numbers of smaller sized eggs with lower feed and other environmental requirements than those used at present, might help greatly to expand the total market by permitting the sale of good eggs at lower unit cost.

Rapid absorption of available supplies of frozen broilers in the UAR indicates the potential market for meat poultry where other meat is scarce. Lack of nearby sources of beef and lamb, because of tsetse fly infestation, is a favourable condition for broiler marketing in the West African coastal cities, though fish is often the lowest-priced

animal protein. Organization of an effective broiler production and marketing system will require considerable entrepreneurial capacity calling for systematic training of personnel.

TABLE 1

Production and Consumption: Estimates for some African Countries

	Production (tons)	Consumption per caput (kgs)
UAR (1960-62)	34,100	1.1
Libya (1964)	1,625	1.3
Morocco (1964)	25,200	2.1
Sierra Leone (1962)	4,200	2.0
Madagascar (1959)	8,000	1.5
Mauritius (1960-62)	1,100	1.7

Sources: UAR, Madagascar and Mauritius - FAO (1963); Libya - Taylor (1965); Morocco - Kheireldin (1964); Sierra Leone - Gocht (1962).

TABLE 2

Shell egg imports and exports: African countries

(Annual averages 1961-63)

	Imports	Exports
	(tons)	
UAR	-	181
Libya	19	3
Algeria	7,511	-
Morocco	-	1,190
Chad	15	-
Niger	4	-
Senegal a/	333	41
Liberia b/	32	-
Ivory Coast b/	37	-
Ghana	24	-
Togo	4	-
Dahomey c/	5	-
Cameroon	16	-
Gabon	18	-
Central African Republic	13	-
Congo (Brazzaville)	42	-
Congo (Leopoldville)	155	-
Ethiopia b/	34	410
Kenya	-	258
Uganda	-	9
Tanzania b/	11	-
Mozambique c/	14	-
Angola c/	12	-
Madagascar	4	1
Mauritius	31	-
Réunion	28	-

a/ Average 1962-63; b/ Average 1961-62; c/ 1961.

Sources: FAO (1964b); for Angola and Mozambique - Southern Rhodesia (1964), for Niger - Kheireldin (1964).

TABLE 3

Producer and consumer price relationships for eggs

	Producer price	Retail price	Producer price as % of retail price	Marketing Procedure
	(cents per dozen)		%	
Freetown	77	91	84	Ungraded eggs delivered by producer to retailer in cartons.
Bobo Dioulasso	98	123	80	
Ibadan	56	63	89	Large eggs sold in cartons through government collecting centres and kiosks retailing on commission.
Akure	36	49	78	Mixed lots distributed to retailers on credit under W. Nigeria Government marketing programme.
Nairobi	38	51	68	Purchased from farmers by African wholesalers and retailed in public markets.
Malawi	28	42	67	
Tananarive	44	49	90	Producer delivers to retail stall in city market.
USA	31	56	55	Averages for 10 cities; large eggs.

Sources: FAO marketing advisers 1963-65 and U.S. Dept. of Agriculture (1963).

TABLE 4

Production and consumption of poultry meat:
Some African countries

(Annual average 1960-62, carcass weight)

	Production (tons)	Consumption per caput (kgs)
UAR	61,000	2.3
Morocco	45,000	2.1
Sierra Leone	1,870	0.9
Madagascar	9,000	1.7

Sources: UAR and Madagascar - FAO (1963), Morocco - FAO (1964a), Sierra Leone - Gocht (1963).

TABLE 5

Poultry meat imports and exports: African countries

(Annual average 1960-63, carcass weight)

	Imports	Exports
	(tons)	
UAR	831	1
Libya [a]	38	-
Algeria [a]	5,944	18
Morocco	-	19
Chad	7	-
Senegal [b]	33	-
Liberia [b]	104	-
Ivory Coast [b]	64	-
Ghana [c]	582	-
Togo	6	-
Dahomey [b]	3	-
Cameroon [b]	63	-
Gabon	48	-
Central African Republic	18	-
Congo (Brazza.)	79	-
Congo (Leo.)	808	-
Ethiopia [b]	-	11
Kenya	4	33
Uganda	8	-
Tanzania	28	-
Malawi, Zambia, S. Rhodesia	26	28
Mozambique [d]	10	-
Madagascar	4	11
Mauritius	75	-
Réunion	39	-

Sources: FAO (1964b); for Mozambique - Southern Rhodesia (1964).

a/ 1960-61; b/ 1960-62; c/ 1961-63; d/ 1961.

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TABLE 6

Retail prices of eggs, meat chicken, beef and fish in public markets

	Eggs	Meat chicken (eviscerated)	Beef	Fish
		($ per kg)		
Libya	1.05	2.32	1.23	.92
Algeria	1.33	1.92	2.52	1.17
Niamey	1.98	2.00	.82	.41
Accra	2.20	2.48	2.34	.61
Lomé	1.49	1.57	.83	
Cotonou	1.34	1.66	1.23	.29
Ibadan	1.11	.85	.79	.31
Addis Ababa	.50	.80	.40	.64
Nairobi	.87	.74	.57	.55
Mauritius	.96	1.15	1.05	.76
Tananarive	1.04	1.30	.55	.06
Leopoldville	3.50	5.20	3.30	.93

Sources: Reports by FAO marketing and poultry advisers, 1962-65.