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A REVIEW OF LAND SETTLEMENT IN JAMAICA

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The Jamaican experience in Land Settlement is reviewed keeping in mind as far as possible the Central theme of the Conference, namely "Land Reform and Financing Agricultural Development, with particular reference to the Commonwealth Caribbean."

The term 'land settlement' as applied in Jamaica, and possibly elsewhere in the Commonwealth Caribbean is often used to connote land reform. Clearly this is incorrect since land reform embraces a much wider area than does land settlement. Within recent times there has developed a greater awareness of the distinction between these two terms, even if the distinction has not been precisely made in practice. Unless otherwise stated in this paper, land settlement will be regarded as involving a system whereby Government or any other agency subdivides land which it either owns or subsequently purchases for settlement of farmers either on a freehold or on a leasehold basis.

Within the limits of available data, statistical, financial and economic information will be provided. Reference will also be made to new approaches to land settlement in Jamaica which may have some significance for application elsewhere in the region.

This paper will provide a historical review of land settlement in Jamaica since 1949.

Land Settlement in Jamaica, 1949-1963

During this period attempts were made to improve the social amenities provided on land settlements. However, insofar as increasing output was concerned constraints were set on the level of income which could be derived from farms under the scheme, particularly due to the grades of land which had been purchased originally for land settlement. (See also comments made by IBRD Mission)¹ These properties included land which had become idle and had become ruinant, sub-marginal land which had been effectively squatted on for a long period of time. Provision was made for improvement in roads and water supply, and for guidance in operating the farms. The Lands Department itself increased its staff by providing Settlement Officers.

Consideration was given to improving the land settlement programme by procuring, in the first instance, land which had a good potential for agriculture. Some consideration was given to the use of production and income targets as the basis for determining the size of allotments. The IBRD Mission to Jamaica in 1952, in its Report² 'Economic Development of Jamaica', made a number of observations relating to land settlement. Essentially, the Mission reiterated much that had been discussed locally before, but added that nearly all land on settlements required rehabilitation. It pointed out that many deficiencies of the scheme were due to political pressures which impeded the efficient operation of land settlement.

By 1958 a total of 176 properties had been acquired by Government for land settlement and 10,126 freehold titles had been issued.³ A critical review of a scheme such as this would involve detailed surveys and analyses which cannot be accommodated within the time limit provided for preparation of this paper. Johnson⁴ in 1960 observed that many remedial measures suggested by Barnes et al (particularly the members

¹ *Economic Development of Jamaica*. IBRD, 1952.

² *Ibid.*, 1952.

³ *Ibid.*, 1952.

⁴ Johnson, I.E. "Alternatives in Agricultural Land Tenure: Jamaica, W.I." Ph.D. Thesis, Cornell University, 1961.

of the Agricultural Policy Committee) had been ignored for too long and that in many cases the time and money required for rehabilitation would be considerable. He suggested that the adoption of these improved measures would be of considerable benefit in the future development of land settlement.

In retrospect, an expanded land settlement scheme, freehold oriented, had developed prematurely, particularly since 1938. Little effective planning was possible under the early conditions which existed and which had led to the rapid expansion of the scheme, and questions naturally arise concerning the extent to which the objectives of pursuing the strategies adopted for settlement have been met. The first evaluation carried out by Redwood in 1949, 20 years after the start of what was originally conceived as an experimental scheme, indicated that the objectives of the land settlement scheme as operated up to 1949 had not been met.

The emphasis so far had been mainly on freehold tenure. Other alternatives based on leasehold form of tenure were tried, largely on an experimental basis. These projects were started about the year 1939 and largely coincided with food production programmes associated with World War II. An analysis of these projects shows up the disenchantment with leasehold tenure regardless of any real advantages and economic benefits which derive from such a form of tenure. It is abundantly clear that the freehold system of tenure is almost the only form which has proved acceptable to the farming population over the years. At the same time the freehold system as already pointed out has not been successful in meeting the objectives specified. It is therefore relevant to examine certain projects based on leasehold tenure. These are:-

- (a) The Land Lease Scheme; and,
- (b) The Cooperative Leasehold Farm Project(s).

Land Lease Scheme

Under this scheme which started in 1939, the owners of many large properties leased land to government for subletting for agricultural purposes, (largely to assist the war-time food production efforts) on the understanding that the land would be returned to the owner suitably improved on the expiration of the lease. Government made certain improvements before leasing the land to small-scale farmers. The lease lasted for a period of 5 years. This short lease period made it impossible to accommodate the erection of buildings (including houses) or the establishment of permanent crops. In its report in 1952 the IBRD Mission doubted that under these conditions a sound basis could be provided for permanent land improvement. This analysis did not go far enough as little if any consideration was given to reasons for initiating such a scheme. In particular, the question of the practicability of pursuing such a scheme after correcting the stated objectives was not considered. The scheme was short-lived, however, and was discontinued during the early 1950's. It appears that the main factor which militated against its continuation was the disenchantment of potential settlers with the leasehold system. An overwhelming attachment existed then as now to rights of ownership rather than to those of usufruct. (N.B. Some persons acquiring agricultural land were not interested in farming.) Some of the properties used in this scheme were subsequently acquired for land settlement on a freehold basis.

Cooperative Farming Under a Leasehold Tenure Basis

This project which eventually developed into an experiment of using an entire property cooperatively under a leasehold system, for agricultural purposes did not in fact begin with this aim in view. The experiment was tried out on 2 properties, namely Lucky Hill and Grove Farm. The first was at Lucky Hill and the salient issues connected with this scheme are outlined.

The group of farmers formed themselves into a Pioneer Club, and sought Government's assistance in purchasing the Lucky Hill property covering 873 acres of land, with the ultimate aim of providing allotments to the members of the group on a freehold basis of tenure. The land-use for the property was as follows:

	(acres)
Arable land	90
Permanent orchard crops	69
Guinea grass pasture	232
Permanent grazing land	180
Afforestation	32
Other (buildings, ponds, etc.)	270
Total	873

The Lucky Hill Scheme as such was divided into a number of phases. *The first Lucky Hill Scheme* - Initially the group approached the war-time Food Production Board requesting that the property be acquired as a labour-relief food production centre, with a view to subsequent subdivision as a land settlement. The Board negotiated a 5-year lease with option to purchase. The membership of the group was insufficient for working the property and for subsequent settlement. Four other groups of small cultivators from nearby districts and who were also members of Pioneer Clubs of the Jamaica Welfare Ltd. were therefore invited to join. The property was divided into 5 Sections, one section to each group. Operations on this basis proved impracticable and it was decided that *all 5 clubs should combine to operate the property as an entity*. This was essentially the first real indication of a cooperative venture in the making.

Stuart¹ records that this type of operation attracted the attention of the Agricultural Adviser to the Comptroller for CD&W who prepared a new scheme for the operation of the entire property on a communal basis, for a 5-year period. If successful the settlers would be granted a long-term lease of the property. The CD&W organisation provided loans for the construction of houses for the settlers, a grant for capital development of the property and to cover the salaries of an Overseer and Assistant Overseer for the 5-year period. Funds for the working account were provided by Government.

There were many problems which derived from the change in the direction which the original request had taken. Much confusion and many amendments followed. However, the decision to adopt a cooperative approach was reinforced by the fact that the property on the basis of its physical aspects was unsuitable for subdivision into small plots for land settlement on a freehold basis. Indeed it was felt that if this experiment was successful it would provide an answer for treating many properties whose physical characteristics would render it impossible to subdivide them into small parcels for land settlements.

Revised Scheme

A revised scheme was eventually approved in March 1952, and it was subsequently registered as a cooperative society in December 1952. The Lucky Hill Cooperative Society signed a 99-year lease agreement with Government in 1953, that is 12 years after the initial project started and 8 years after Government had purchased the land. The terms of the lease were:

- (a) the property must be operated as one unit and must neither be subdivided nor sublet;
- (b) the Cooperative Society must pay rent to Government, as well as taxes and rates;
- (c) the land should be farmed according to good husbandry practices as adjudged by the Director of Agriculture;
- (d) the Society must employ a Manager who shall be a person approved by the Director of Agriculture;

¹ Stuart, W.G. "A Cooperative Approach to the Problem of Small Holder Land Settlement in Jamaica." M.Sc. Thesis, Cornell University.

(e) the Society must pay interest at the rate of 3% per annum on all loans made by Government.

Other details were worked out concerning the cooperative aspects of the project. Potential members had to serve a probationary period of 6 months working on the farm, then if accepted, would be required to pay an entrance fee plus a deposit on 2 shares of £1 each, pay in 12 monthly instalments. The project was to be directed by a Managing Committee consisting of 9 members consisting of:

Representative of the Director of Agriculture - Chairman
Representative of the Financial Secretary
Representative of the Jamaica Social Welfare Ltd.
3 Farmers
Chairman and 2 Members of the Settlement Council

There were 40 members of the Society. This membership was determined on the basis of the number of persons and their families who would be able to provide much of the services necessary without unduly eroding the per settler revenue expected. Hired labour had to be used, but they would not share in certain amenities and benefits. Each member was required to work exclusively on the farm and also to live on it. The houses were located in a cluster or village pattern largely to obtain efficiencies in providing services. Each member was allotted $\frac{3}{4}$ acre of land to be used as a home garden. Work was assigned individually to members by the Manager on a task basis. Members must work exclusively on the farm for a minimum of 200 days. Differential rates of pay were given for various tasks, e.g., for skilled as against unskilled jobs. Bonus earnings were made on the basis of the maximum annual earning possible within the scheme and the number of days worked, no bonus being granted if less than 200 days were worked. The wage structure was based on those paid for similar operations in the adjoining area.

The Committee of Management was not fully autonomous in practice. However, there were indications that once certain objections could be overcome the scheme had much to offer which the existing land settlement programme did not. Under this project conservation and proper land use were basic features. The number of settlers was controlled thereby obviating the problems of high man/land ratio and cropping of unsuitable land. Returns to farmers were no lower than that expected and obtained by individual farmers - simply because the land had not been cut up into small parcels. Settlers at the time obtained wages ranging between 40/- to 80/- per week, a 3-room cottage free of rent, a $\frac{3}{4}$ -acre kitchen garden plot, and a $\frac{1}{2}$ pint of milk daily for each member of the family. In addition, he was assured of at least 200 days of employment annually.

There were many advantages and disadvantages in this scheme. Success was hindered by the many changes made, by the breach of faith in switching from freehold land settlement to land lease. Reasonable success was assured so long as caretaker management was provided. However, lasting success was unachievable so long as the settlers themselves were unable to provide an individual who himself could ultimately take over the management. The fact that many settlers were illiterate created a tendency to elect the same few (less illiterate members) on the committee thereby ostensibly building up a ruling clique to the resentment of other settlers. Despite its difficulties, the project, modified perhaps, provides a basis for further examination with a strong potential for implementation in many areas of the Commonwealth Caribbean which have land distribution and topography problems - once some rationality can be achieved in terms of the rights of *usufruct* versus those of ownership of land.

Land Settlement Experience After 1963

This year of reference is used largely because it forms the beginning of the Five-Year Independence Plan (1963-1968) for Jamaica. Much consideration had been given since about 1960 to the development of more meaningful settlement programmes. The major requirements included the purchase of better grades of land for settlement, specification of precise criteria for selecting settlers, the use of income targets as a basis for determining the size of allotments and the provision of housing and infrastructure. The tempo of the dialogue increased and the Independence Plan included provision for land reform. 'Land Reform' in this

context implied the settlement of farmers on small-sized farms of 5-14 acres and on medium-sized ones of 15-30 acres; some of the latter to be used for establishing dairy farms.

Relatively few farms have been established under this new system and these were mainly for dairying. The formulation of the project along these lines takes considerable time even where a single enterprise, e.g., dairying is involved. For the dairy project, interesting features were the full or near full development of the farm, provision of housing, livestock, water etc., prior to settlement. In addition, the system is based on leasehold tenure during the first 15 years with the option to purchase after that.

Prior to settlement selected participants were required to undergo a year's training in dairying and ancillary operations and to assist in the development of the farms to be settled. The intention was to provide each farmer at the time of settlement, with an enterprise from which he would be able to start earning an income immediately. Repayment is made on a phased basis. Rental paid for the land is used to offset the land charges, thus by the end of 15 years he would have repaid 60 per cent of the cost of the land and house. At this stage he could elect to continue the lease or pay the remaining 40 per cent thereby becoming a freehold operator. Under this system which has had its successes and short-comings it has been shown that on this basis dedicated operators earn incomes far in excess of their counterparts. Initial capital costs for a 25-acre farm were J\$28,000. The dairy herd becomes stabilized at about the 10th year of operation. Projected net income from the 7th year onwards increases from J\$4,000 to \$6,000* from dairying alone.

The use of a similar approach on smaller plots of land for mixed enterprises was also proposed. These were tied in with the nucleated village approach for the siting of housing and public services in the most economical manner. A net family farm income target of J\$900 per year was used as the basis. Whilst the principle involved has been accepted not much has been implemented in spite of the considerable amount of work which went into formulation of the project. By the time this had been done there were pressures to settle land as hastily as possible because of the demand for land and the increasing level of unemployment. The intention, however, was to continue the old pattern of land settlement particularly where the grades of land precluded any other acceptable form of settlement, and to use the income target where better grades of land are available.

Land Acquisition and Development

Table 1 shows relevant data for Government's land acquisition programme for settlement during the period 1929-1971. A total allotment of 173,835 acres among 39,381 settlers results in an average of 4.4 acres per allotment.

Cost data for the entire period are not readily available, however, for the period 1929-1950, the figures are as follows:

Expenditure on Land Settlement Schemes, 1938-1950

Acquisition	J\$1,832,512
Development	971,700
Administration	608,480
Miscellaneous	231,254
Total	J\$3,643,946

Average Cost Per Acre - \$30

The cost of land at settlement of \$30 is almost twice the original cost of land. Settlers were however

offered the land at \$18 per acre; financed by an interest-free loan!¹ These two elements of subsidy were present in the cost of land to settlers.

Similar data are not readily available for the period after 1950. However, the purchase price for land has ranged from about \$80 to \$440 per acre. This wide range in price is caused by changes in the time value of money, inflationary aspects as well as differences in the grades of land purchased for settlement. Usually lower priced land was less developed and pre-settlement costs have been greater than the purchase price. For purposes of comparability where certain crops (e.g. sugar cane), livestock (cattle) and sometimes fixed assets, were purchased with the property as a going concern it would be necessary to exclude their market value from the price paid in order to obtain a fair valuation of the land price.

Data is not available on the returns from farming during the early period of Land Settlement in Jamaica. Because of the conditions under which the settlers farmed - poor quality of land, uneconomic size of allotments and an orientation towards subsistence farming - it is likely that such returns were relatively low. In addition, many of the settlers knew very little about farming and consequently their agricultural practices were very poor. Originally little provision was made to accommodate these aspects of production.²

With the passing of time and with the assistance of extension and other staff, significant changes were made in cropping patterns. Previously, land acquired for settlement had either been uncultivated, ruinate, or highly tenanted. Land use on these farms was diversified to a great extent producing not only sugar cane and bananas but also citrus, cocoa, coconuts and food crops, usually in mixed stands. Livestock were also produced. Available data indicate that there was a steady increase in the output of most crops produced on Land Settlements between 1957 and 1961. These were made possible through assistance provided by Government.

From 1963 the 'income target' approach to land settlement was used on the assumption that if farmers were carefully selected, given some specific training and given 'good' land with the necessary infrastructure provided, agricultural production would increase rapidly. Data extracted from the operations of the first 17 dairy farms established on these bases are of some relevance.

In spite of many initial problems the data show that actual performance compared very favourably with what was projected. It seems realistic to assume that as the new concept of land settlement becomes more widely applied in practice, actual productivity will approach nearer to planned expectations.

A New Approach to Land Settlement in Jamaica

Many questions have already been raised concerning the effectiveness of the types of land settlement which are found in Jamaica. Specific reference has been made to land fragmentation, the grades of land used for settlement, potential incomes which can be obtained, the large demand for land, and the overwhelming attachment to a freehold form of ownership. Reference has also been made to the fact that the topography, slope and productive potential of much of the land are such that some of the land used for settlement could be used to better economic advantage if treated as an entity, possibly on a cooperative basis. The major objection to this approach was seen to be the fact that it prevented farmers from owning land individually.

Any rational approach to land settlement must take into account the acreage of land of different

¹ Redwood, P. *Statistical Survey of Government Land Settlements in Jamaica, 1929-1949*. (Unpublished.)

² Redwood, P. *Op. cit.*

grades on which farmers can obtain acceptable levels of income, while at the same time adopting appropriate measures of conservation. The first step is to determine what is considered to be an acceptable income level. The land use capability provides the basis for determining the acreage necessary for generating that income target, bearing in mind the enterprise mixes possible. In view of the fact that incomes should not be regarded as remaining static provision has to be made to accommodate this factor.

The labour requirement is a very important consideration. The assumption is made that family labour will be supplemented with hired labour, where necessary. The enterprise mixes should be such as to provide as equal a distribution of labour as possible over time. Labour availability becomes a critical factor under conditions where there is a disinclination by farmers to use the fork and hoe, while at the same time topography rules out the use of mechanical tillage.

Against this background a project has been formulated for the development of a property under the land settlement programme at Kennilworth in the parish of Hanover.

The project includes the provision of infrastructure, e.g., roads and water supply, and a community centre. For purposes of efficient use of these resources the proposals include centralized housing for an estimated 250 families. These houses would be provided mainly for farmers, but tradesmen etc. living in the neighbourhood may also qualify for houses. An interdisciplinary team approach was used in the formulation and preparation of the project.

Land Capability Classification

The land demarcated for the project covers 2,032 acres. It has been classified by its most intensive use within which development would be accommodated.

<i>Land Capability</i>	<i>Acreage</i>	<i>Percent</i>
Cultivable land	1,048	51.6
Land for Fruit trees	248	12.2
Land for Pasture	258	12.7
Land for Forest	478	23.5
Total	2,032	100.0

Proposed Land Use and Soil Conservation Treatment

The proposed land use has been guided or limited by the following considerations:

- (a) the experience gained under similar conditions on adjacent lands using a variety of crops;
- (b) the land capability from the viewpoint of soil conservation
- (c) the suitability of the soils to the crops proposed;
- (d) the economic potential of the crops considered;
- (e) the simplification of management by placing crops in concentrated blocks;
- (f) climatological variations within the property.

The land capability classification provided the basis for land use planning. The land capability depended largely on permanent limiting factors, while the land use considers the present socio-economic conditions in addition to the land capability.

Conservation Needs

The principle followed is to use the land as intensely as possible within its capability and to adopt appropriate conservation and management treatments as the basis for the development of the property,

taking into consideration steepness of slope, rainfall intensity and degree of erosion.

All recommended soil conservation treatments have been tried out fully and successfully in a Demonstration Centre established specifically for this purpose. The construction costs of these treatments are based upon the actual costs derived from operating in the Demonstration Area.

Farm Size and Production

Types of Holding

The gross farm area excluding roads, streams, etc. will be 1,076 acres. This will be divided among 250 farmers. This number of farmers was determined on the basis of the land use capability and the acreage required to generate a net family farm income of \$900. The physiographic features of the property and the wide variety of enterprises possible, necessitate the use of different farm types. This will allow the easier subdivision of the property and at the same time reduce the number of enterprises that any one farmer would have to manage. Two major types of holdings are proposed with a slight modification of one to give a third type. The proposed farm types are as follows:

<i>Farm Type I</i>	
	(acres)
Gross Farm Area	5.0
Net Farm Area	4.4
<i>Proposed Crops</i>	
	<i>Acreage</i>
Yams & Vegetables	1.3
Pineapple & Pasture	3.1
	—
	4.4

<i>Farm Type II</i>	
Gross Farm Area	3.8
Net Farm Area	3.2
<i>Proposed Crops</i>	
	<i>Acreage</i>
Yams & Vegetables	1.3
Citrus & Coffee	1.9
	—
	3.2

<i>Farm Type III</i>	
Gross Farm Area	4.8
Net Farm Area	4.2

<i>Proposed Crops</i>	<i>Acreage</i>
Yams & Vegetables	1.3
Citrus, coffee & cocoa	2.9
	<hr/>
	4.2

On the basis of these 3 farm types, each of which is estimated to generate the minimum net farm family income of \$900 per year, it is proposed that there will be about 250 farms, consisting of 77 type I, 168 type II and 5 type III. The principles of allotment are based on farmer acceptance, and on land use capability.

It is envisaged that some farmers will be given two parcels of land. Ideally, it would have been better to have just one parcel, but certain existing physical conditions prevented this. All the squatters on the land are accustomed to growing yams, and they all want to continue doing so. If the subdivision were restricted to one parcel, some farmers would have to be allotted lands on which yams should not be grown. This would cause a certain degree of dissatisfaction among the farmers. If farmers continue growing a single crop the high degree of underemployment which now exists during certain periods of the year would continue to exist, but with more crop diversification employment will be better distributed throughout the year and farmers can also spread the risks of crop failure. (Details concerning average annual costs and returns using the different Farm Types are shown in the Appendix.)

Services - Success of the land settlement will depend to a considerable extent on the provision of adequate supervision and guidance. It is proposed therefore that Extension Officers be assigned specifically to the project. In addition, it is proposed that a Farm Machinery Pool be provided for the project, and that it should be administered by the Land Authority in which the property is situated.

Infrastructure - As mentioned earlier, it is proposed to provide the basic infrastructure of roads, water supply and housing for the settlement.

Roads - The road system proposed is designed to provide access for vehicular traffic to all sections of the property. The maximum gradient is 12 per cent. The system is comprised of 4.6 miles of 'connecting road' and 29 miles of penetrating roads.

Domestic Water Supply - The source of domestic water will be the White Gut river on the eastern side of the property. The flow in the river is regarded as adequate to supply the daily requirement for the estimated population in this settlement.

Housing - Proposals are for 253 houses to be constructed in the village site. Each unit will be approximately ¼ acre. Areas are reserved for commercial purposes, a school, a cemetery, a playfield and public buildings to be established by other agencies as required.

Credit Facilities - Settlers will be provided with adequate credit through the Grange Hill Area Land Authority in which the project area falls. This Authority, like the others work in collaboration with the Agricultural Credit Board, a Statutory Body of the Government which provides credit mainly for small farmers throughout Jamaica. Interest rates will vary from about 4 - 7 per cent, depending on the purpose for which the loan is granted.

Holdings - Settlers will pay for their holdings over a period of 25 years at 4 per cent interest. Payments to be made either in 50 semi-annual instalments or 25 annual instalments.

Marketing - Domestic crops will be marketed through the Agricultural Marketing Corporation which gives a minimum guarantee price for most of the crops. Export crops will be marketed through their commodity organisations.

Development Costs

It is proposed that Government should bear the full cost of road construction and provision of domestic water supply. This is justified on the basis that it is a service to the country as a whole and not just to the few farmers in the project area. It is also proposed that Government should bear 25 per cent of the cost of soil conservation, the majority of this going to terracing. This again is justified, since the country will gain from the reduction in erosion, better stream flow, etc. It is reasoned therefore that the farmers should not bear the full cost of financing. For details of repayment of the farm development costs are shown in the Appendix.

Economic Justification of the Project

The economic rate of return for the project is 9.0 per cent. Although slightly lower than the opportunity cost of capital in Jamaica, the project can be justified on other grounds. There will be considerable reduction of soil and water loss by erosion on the property due to the improved conservation measures proposed. It is difficult to quantify these benefits in monetary terms. In addition, the project, if implemented, would provide considerable employment opportunities in the area, and this should greatly alleviate unemployment and underemployment in the area. Since the opportunity cost of such labour in this area is very low (near zero), the project would look more attractive for financing if such labour were shadow priced nearer its opportunity costs.

The 4.6 miles of connecting road estimated to cost \$359,600 is not charged to the project. It was felt that this road would have to be built even if the project is not implemented since Government is making an effort to improve rural roads, and this road is of vital importance to the development of several districts in the area.

It may be worthwhile to note that the present agricultural production on the property was valued and this was deducted from the benefits after the project, since this is really production foregone.

It was not valid to present a financial rate of return, because the farmers whilst not required to contribute to the initial investment will obtain a sizeable income during and after the investment period. As a result of which the financial rate of return to the participating farmers would be virtually infinite.

Land Settlement on Private Lands

This presentation would be incomplete without comments on aspects of land settlement involving the private sector. We earlier made reference to the Land Lease Scheme under which owners of large properties leased land to Government for sub-lease to small farmers. Land settlement insofar as it relates to a project managed by the private sector has neither been as extensive nor as precisely determined as that which is operated by government. The profit motive, understandably, has been the dominant feature where settlement on privately owned land is concerned. More recently with the enactment of the Idle Lands Law and the setting up of a Land Development and Utilization Commission this has forced some large owners with idle land to lease land for agricultural purposes. Proprietors of large properties unable to operate them on their own account for one reason or another have on occasion subdivided and sold land as farms of 10 acres or so. There is little documentation of the extent to which this has been done. On the other hand, where leasehold tenure is concerned, the extent is much greater. Many properties have been heavily tenanted and ultimately some of these have been acquired by Government under its own Land Settlement Programme.

Non-Government agencies are mainly involved in making land available to farmers on a leasehold basis

of tenure. Although documentation is not complete in some instances, and particularly in relation to land owned by companies mining bauxite, reliable information is available. At 31/12/69 the bauxite companies were collectively the largest land owners in the country owning a total of 191,050 acres. The distribution of this acreage by broad types of use follows:

Use	Acres
Plants, Offices, Housing etc.	6,432
Currently being mined	14,386
Company farming	58,638
Tenant farming	75,979
Resettlement	10,557
Forestry	16,880
Other	8,178
	191,050

Agriculture is practiced directly by the companies for their own account and also by tenant farmers on lands owned by the companies. These companies in acquiring land for mining perforce have to displace a number of landowners, big and small. This means that consideration has to be given to resettlement. In addition, in accordance with mining regulations, mined-out lands must be adequately rehabilitated. This means that in the final analysis it would not be difficult for the companies themselves to become as fully involved in agriculture as they are in mining. The policy of the companies appears to be that of leasing land to farmers until it is required for mining.

The purpose of this section is merely to indicate the measures associated with tenant farming on bauxite lands. It is not possible to generalise in this respect and this reference is made specifically to tenant farming as carried out by Alcan Jamaica Limited. These experiences in tenant farming are cited to indicate some of the benefits which can be derived from a system of tenure, namely leasehold tenure, for which there is little attachment in Jamaica. An evaluation of Alcan's farming programme was recently undertaken by that Company with assistance from selected staff of the Agricultural Planning Unit and The Faculty of Agriculture, University of the West Indies, St. Augustine, Trinidad.

The survey covers the period 1/7/69 to 30/6/70 at which time Alcan owned approximately 48,500 acres of land. The gross acreage of land then used for farming was about 44,000 acres of which 21,830 acres were regarded as being cultivable.

Occupancy	Cultivable Land (acres)	Grassland (acres)
Company farming operations	8,155	
Tenants (paying)	13,255	19,284
Tenants-at-will	420	
	21,830	48,500

As indicated in Table 6, the size (gross acreage) of 3,275 holdings (78 per cent of the total) was less than 7,000 acres. This relatively small area provided for rental from Alcan did not provide economic units in themselves, but helped to supplement production from other land owned or rented by the farmer.

Note: Source (for table above): UNDP, *National Plan for Jamaica*.

A total of 19,255 acres is rented to Alcan tenants who will continue to occupy these lands until required for mining, provided they meet the conditions set by Alcan. The land is rented at \$2 to \$3 per acre per annum. Rented land is used mainly for the production of cash crops, but in some instances livestock rearing (e.g. cattle and poultry) is practiced. Nearly 50 per cent of these farmers have been tenants on the Alcan land they now occupy for periods of 15-20 years. Many of them also have their own land. The stated policy of the Company is that farmers who were displaced to facilitate mining will receive restored land.

Tenant Programme - Alcan provides certain services to tenant farmers. This includes a "concentrated extension programme" for 213 tenants or approximately 5 per cent of the total number. The Company estimates¹ that its extension programme assists an additional 500 non-Alcan tenants directly and through its demonstration efforts. All farmers, however, benefit from the extension services provided by Government. In addition, Alcan provides tillage services, collective marketing facilities and residential training courses. Fertilizer is also provided on cash and loan bases.

*Rent*² - Alcan imposes a rigid system of rent collection. Except under extenuating circumstances Alcan repossesses all land for which rental is outstanding, such land being available for renting to other farmers. Properties are inspected once per year to ensure proper maintenance. Land may be repossessed where there are indications of faulty management. Initial tenure period is 3 years with provision for an extension to 7 years depending on the mining plans. The officers of the Company are assisted by 99 agents who are themselves tenants and who operate their land on a rent-free basis.

Fertilizer - Quantities not exceeding 2 cwts. are provided on a loan basis but on a cash basis may be unlimited. Payment for rent and fertilizer are made at the same time, and on a basis which makes it virtually impossible for debts to accumulate. About 2,400 tenants have acquired fertilizer under the scheme.

Implement Loans - The Company operates an implement loans scheme, whereby it purchases equipment such as motor blowers and knapsack sprayers for loan to tenant farmers. Farmers are first taught to use the equipment with the expectation that after learning to use them they will eventually wish to purchase their own.

Tillage Services - The Company acts as an intermediary between the tenants and 8 tractor operators. An estimated 1,000 acres are tilled annually.

The land use of the cultivable area of 13,255 acres was distributed as follows:

(a) Crops	4,764 acres
(b) Grassland	5,272 "
(c) Ruinate/Fallow	3,219 "

	13,255 "

The main crops produced were yams, sweet potatoes, Irish potatoes, peas and beans, and corn. Comparative acreages, volume of output and yield per acre are shown in Table 7.

It was pointed out that the tenant farmers used Alcan land mainly for subsistence and to supplement production from their other land holdings. The data presented indicate that although yields are lower than those

¹ *Survey of Agricultural Production in Holdings Farmed by Alcan Tenants*. Alcan Jamaica, 1971.

² *Land Use Policy and Tenant Operations*. (Memorandum), Jamaica, 1971.

obtaining elsewhere in the country the total output is a useful contribution to national output. Although the survey carried out did not cover costs of production it is safe to conclude that except for rent, fertilizers, weedicides and pesticides, the average gross output per acre is largely the return to farm family labour. The gross value of this output was approximately \$1.28 million with the overall average value per cultivable acre being \$96.4. An interesting feature was that as the size of the holding increased, the average value per cultivable area decreased. This can be explained by the more intensive utilization of land, labour and management on smaller areas. Cultivable acreage, gross value and value per cultivable area are shown in Table 8.

Conclusion

The presentation thus far has shown up some of the advantages and disadvantages of the existing settlement programme. Certain built-in features which have developed over time, have tended to become rather 'institutionalized'. On the assumption that a land settlement programme will be continued it is necessary to state in somewhat precise terms the pattern which will be adopted. Clear objectives need to be stated. A distinction must be made between settlement which aims merely to give land to individuals who can at best be only subsistence operators and as such largely part-time farmers, and individuals who are intended to develop into *bona fide* farmers. The activities of these farmers should be geared to full-time farming and the generation of farm incomes which are able to secure an improved level of living.

Historically speaking, the tendency has been to create small farms less than 10 acres in size. On a limited scale a number of specialised 25-40 acre farms (dairy) have been created. Recently Government has acquired land from large sugar estates, leaving the estates free to concentrate on the manufacture of sugar and rum and allocating the land to farmers principally for sugar cane production. No details are yet available as to how this scheme will be operated, particularly in relation to the size of farms into which large properties will be subdivided. It would seem, however, that if these lands are to continue to be used for the production of sugar cane one needs to think in terms of the lease size which can be considered economic under present technology and cost/price relationships. The author's view is that this size could be of the order of 100 acres or even greater.

The production of other crops are likely to require smaller acreages than that suggested for sugar cane. If the aim is to create a hard core of farmers who are likely to remain as full-time farmers then it would seem that part of the strategy would be to create farms intermediate in size between existing 'small' farms at one end of the spectrum and larger farms say of 100 acres at the end of the spectrum. Within the broader concept of land reform, *sensu stricto*, considerations must be given to measures for reducing the very wide income earning potential which is inherent in a system which has a highly skewed distribution of land by size group of farms.

Whatever is the decision taken in relation to land distribution on the basis of size of farms, the high cost associated with land purchase, pre-settlement operations, and the provision of adequate infrastructure are likely to pose many problems for new Government policy. One particular question relates to the desirability of pursuing a freehold as against a leasehold form of tenure. This leads to arguments concerning the distribution of the 'bundle of rights' in property.

Another consideration relates to benefits to be derived from schemes. Not only should these be the greatest possible from such an investment but should accrue both to farmers participating and to the entire society. This is necessary because if the schemes are subsidised from national funds then such benefits should ideally be in the form of cheaper prices for agricultural commodities derived as a result of greater production.

The willingness of farmers to participate in schemes will be determined by the extent to which they regard this as an attractive proposition. With the average age of the present farming population being over 50 years it is important to convince potential young farmers that farming can generate a livelihood for them.

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TABLE 1. LAND ACQUISITION SETTLEMENT PROGRAMME: JAMAICA, 1929-1971

Period	No. of Properties	Acreage Acquired	Acreage Allotted	No. of Allotments
1929-1950	140	149,165	122,028	26,859
1951-1962	55	30,430	23,896	6,082
1963-1971	74	54,446	27,911	6,440
Total	269	234,041	173,835	39,381

Sources: Redwood, P. "Statistical Survey of Government Land Settlements in Jamaica, 1929-1949"

TABLE 2. TYPES OF CROP AND OUTPUT ON LAND SETTLEMENT FARMS FOR TWO DIVISIONS, 1957-61

Year	Banana (^{'000} stems)	Sugar Cane (^{'000} tons)	Ginger (^{'000} lb.)	Citrus (^{'000} boxes)	Coffee (^{'000} boxes)	Corn (^{'000} bushel)	Peas (^{'000} bushel)	Food Crops (^{'000} tons)	Vegetables (^{'000} lb.)
1957	133.4	192.1	278.9	40.6	104.8	61.7	15.5	45.7	-
1958	189.3	228.8	534.9	56.7	36.3	49.3	29.7	81.4	-
1959	224.1	225.5	625.7	61.5	7.2	62.6	37.1	71.3	1.5
1960	285.1	247.6	506.7	71.6	33.4	88.2	36.2	105.2	2.8
1961	313.1	264.7	563.5	80.0	33.3	59.1	29.7	133.1	3.0

Source: "Land Reform in Jamaica with Emphasis on Land Settlement." Division of Economics & Statistics, Ministry of Agriculture & Lands, 1962.

TABLE 3. PROJECTED VERSUS ACTUAL AVERAGE PERFORMANCE OF THE FIRST 17 DAIRY FARMERS UNDER THE NEW MEDIUM-SIZED DAIRY FARM PROJECT

Items	Projected	Actual
Size of Farm	25 acres	23.5 acres
Number of cows per farm	23	21
% of dry cows (monthly)	20	24
Daily milk yield per cow in milk (monthly)	20.8 lb. (8 qt.)	19 lb. (7.3 qt.)
Milk price per qt. (Imperial)	10 cents	10 cents
Operational cost per month	\$213	\$210
Gross Revenue from milk less operational costs per mth.	\$157	\$134

Source: Dunn, C.L. "An Interim Economic Appraisal of the New Medium-Sized Dairy Farm Project in Jamaica." *Proceedings of the Fifth West Indies Agricultural Economics Conference, Dominica 1970.*

TABLE 4. STRATIFICATION OF LAND BY TYPES OF USE AND BY SOIL CONSERVATION TREATMENT

Proposed Land Use and Crops	Soil Conservation Treatments	Area on Map (acres)	Useable Area (%)	Cultivable Acres
Yams & Vegetables	Bench Terraces 11' and over, machine and hand made	481	70	337.0
	Narrow Terraces 8' hand made	193	75	145.0
Pineapple	Hexagons 11' machine made	59	80	47.0
Coffee	Hillside ditches 6' hand made	128	80	102.0
Cocoa	Already existing	5	100	5.0
Citrus	Orchard terraces	283	80	227.0
Pasture		266	80	213.0
Forest		605	80	484.0
Nursery		12	80	9.0
Total		2,032		1,569

Source: Agricultural Planning Unit and UNDP Forest & Watershed Management Project, Jamaica 1971.

TABLE 5. UNIT COSTS AND LABOUR REQUIREMENTS OF VARIOUS CONSERVATION MEASURES

Items	Cost Per Acre (J\$)	Labour Requirement per Acre (Man-Days)
Bench Terraces 11' Dup machine cut	287	15
Bench Terraces 11' hand made	487	209
Narrow Terraces 8' hand made	389	168
Hexagons 11' machine cut	172	10
Hillside Ditches	79	34
Orchard Terraces	196	84
Waterways	80	20
Gully Control	80	20

TABLE 6. ACREAGE OF LAND IN FARMS, RENTED AND OWNED, BY SIZE GROUPS OF FARMS*
AND NUMBER OF HOLDINGS

1 Size Groups* (acres)	2 No. of Holdings	Alcan Land**		5 Other Land	6 Total Land (4) + (5)
		3 Cultivable	4 Gross		
	(nos.)	(acres)	(acres)	(acres)	(acres)
0 - <2	2,021	1,771	2,051	22,371	24,422
2 - <5	1,254	3,017	4,049	21,253	25,302
5 - <10	575	2,605	3,952	1,463	5,415
10 - <25	248	2,111	3,516	696	4,212
25 - <50	45	955	1,552	245	1,797
50 - <100	21	910	1,292	185	1,477
100+	14	1,886	2,872	920	3,792
All	4,178	13,255	19,284	47,133	66,417

Notes: * Size groups relate *only* to Alcan Land

** At 1/1/71 gross acreage rented had increased to 27,882 of which 15,612 were regarded as cultivable.

Source: *Survey of Agricultural Production on Holdings Farmed by Alcan Tenants*. June 1971.

TABLE 7. COMPARATIVE PRODUCTION, YIELDS AND GROSS VALUE OF MAIN CROPS

Crops	Area	Quantity Produced	Yield per Acre	Gross Value per Acre	Island Average Yield per Acre	Island Gross Value per Acre
	(acres)	(s/tons)	(s/tons)	(\$)	(s/tons)	(\$)
Yams	678	2,524	3.7	350	5.3	551
Sweet potatoes	1,042	1,709	1.6	153	3.3	291
Irish potatoes	315	715	2.3	236	4.6	455
Peas and beans	816	252	0.3	104	0.34	108
Corn	1,167	490	0.4	44	0.60	39

Sources: 1. Miscellaneous data, Agricultural Planning Unit, MAF, Jamaica
 2. "Report on Domestic Food Crops 1950." Agric. Planning Unit, MAF, Jamaica, Aug. 1971.

TABLE 8. CULTIVABLE ACREAGE, GROSS VALUE AND VALUE PER CULTIVABLE ACRE BY SIZE GROUP OF HOLDING

Size Group (acres)	Cultivable Acreage	Gross Value	Value per Cultivable Acre
	(acres)	('000J\$)	(J\$)
0 - <2	1,771	275.1	155
2 - <5	3,017	390.8	130
5 - <10	2,605	261.2	100
10 - <25	2,111	138.4	66
25 - <50	955	42.7	45
50 - <100	910	64.0	70
100+	1,886	106.0	56
All	13,255	1,278.2	96

Source: Adapted from "Survey of Agricultural Population on Holdings Farmed by Alcan Tenants." Alcan Jamaica Ltd., June 1971.

APPENDIX TABLE 1. CAPITAL EXPENDITURE (DEBT SERVICE) FARM TYPES I, II & III

Item	Quantity (Areas or No.)	Unit Costs (\$)	Total Cost (\$)	Farmers Contribution	No. of Yrs. Amortization	Capital Recovery 4%
FARM TYPE I						
Land Acquisition	5.03	97.5	490.5	490.5	2	31.40
Soil Conservation:						
Bench Terraces	1.93	353.9	683.1	512.3	25	32.80
Hexagons	0.40	172.0	68.8	51.6	25	3.30
Waterways			273.6	205.0	10	25.27
Farm Roads			286.8	286.8	10	35.38
Irrigation Tanks	1	350.0	350.0	262.5	15	23.61
Cows	2	160.0	320.0	320.0	10	39.45
Watering Tanks for Cows	1	260.0	260.0	195.0	15	17.54
House	1	5000.0	5000.0	5000.0	25	320.55
Total (Type I)						529.30
FARM TYPES II & III						
Land Acquisition*	3.83	97.5	373.5	373.5	25	23.91
Soil Conservation:						
Bench Terraces	1.93	353.9	683.1	512.3	25	32.80
Hillside Ditches	0.60	79.2	47.5	35.6	25	2.28
Orchard Terraces	1.30	195.7	254.5	190.8	25	12.22
Waterways			273.6	205.0	10	25.27
Farm Roads			286.8	286.8	10	35.38
Irrigation Tank	1	350.0	350.0	262.5	15	23.61
House	1	5000.0	5000.0	5000.0	25	320.55
Total (Types II & III)						476.02

* Land Acquisition for Farm Type III is actually \$29.50, i.e., for 4.83 acres.

APPENDIX TABLE 2. ALTERNATIVE FARM TYPE PROPOSALS - AVERAGE ANNUAL COSTS AND RETURNS:

FARM TYPE II

Enterprise	Acreage	Material Cost and Amortised Establishment Cost	Tractor Services Cost	Total Man Day Required	Yield Per Acre	Gross Farm Yield (yield/acre x acreage)	Price Per Unit	Gross Returns
		(\$)	(\$)		(tons)	(tons)	(\$)	(\$)
Yam (partly mechanised)	0.9	324.9	34.2	180	15.0*	18.0*	112.0*	2,016.0*
(hand cultivated)	0.3	108.3	-	72				
Vegetables (tomato & cabbage)	0.2	42.0	8.0	16	10.0	1.0	204.0	102.0
Pineapple	0.4	134.1	-	16	8.0	3.2	70.0	224.0
Pasture	2.7	154.0	-	137				
Milk (pasture)					507 qts.	1,370 qts.	0.1	137.0
Beef (liveweight)					503.7 lbs.	1,360 lbs.	0.2	272.0
Total		763.3	42.2	421				2751.0

Notes: Gross Income = \$2,751.00
 Total Cost = 805.50
 Gross Margin = \$2,751.00 - \$805.50 = \$1,945.50

* Figure for all Yams.

APPENDIX TABLE 3. ALTERNATIVE FARM TYPE PROPOSALS - AVERAGE ANNUAL COSTS AND RETURNS:
FARM TYPE II

Enterprise	Acreage	Material Cost and Amortised Establishment Cost (\$)	Tractor Services Cost (\$)	Total Man Days Required	Yield Per Acre	Gross Farm Yield (yield/acre x acreage)	Price Per Unit (\$)	Gross Returns (\$)
Yam (partly mechanised)	0.9	324.9	34.2	180	15 tons	18 tons	112.0	2016.0
(hand cultivated)	0.3	108.3	-	72				
Vegetables (tomato & cabbage)	0.2	42.0	8.0	16	10.0 tons	1.0 tons	204.0	102.0
Citrus	1.3	104.0		47	250 boxes	325 boxes	0.7	243.7
Coffee	0.6	133.5		54	200 boxes	120 boxes	2.6	312.0
Total	3.3	712.7	42.2	369				2673.7

Notes: Gross Income = \$2,673.75
 Total Cost = 754.90
 Gross Margin = \$2,673.75 - \$754.90 = \$1,918.85

APPENDIX TABLE 4. ALTERNATIVE FARM TYPE PROPOSALS - AVERAGE ANNUAL COSTS AND RETURNS:
FARM TYPE III

Enterprise	Acreage	Material Cost and Amortised Establishment Cost (\$)	Tractor Services Cost (\$)	Total Man Days Required	Gross Farm Per Acre	Price Per Yield (yield/acre x acreage)	Price Per Unit (\$)	Gross Returns (\$)
Yam (partly mechanised)	0.9	324.9	34.2	180	15.0 tons	18.0 tons	112.0	2016.0
(hand cultivated)	0.3	108.3	-	72				
Vegetables (tomato & cabbage)	0.2	42.0	8.0	16	10.0 tons	1.0 tons	204.0	102.0
Citrus	1.3	104.0		47	250 boxes	325 boxes	0.7	243.7
Coffee	0.6	133.5		54	200 boxes	120 boxes	2.6	312.0
Cocoa	1.0	20.0		21	26 boxes	26 boxes	2.8	72.8
Total	4.3	732.7	42.2	390				2746.5

Notes: Gross Income = \$2,746.55
 Total Cost = 774.90
 Gross Margin = \$2,746.55 - \$774.90 = \$1,971.65.

APPENDIX TABLE 5. LABOUR SCHEDULE (MAN DAYS): BY FARM TYPES

Enterprise	Total	Jan. & Feb.	Mar. & April	May & June	July & August	Sept. & Oct.	Nov. & Dec.
FARM TYPE I							
Yam	252	45	45	40	45	37	40
Vegetables	16	4	2	3	-	2	5
Pineapple	16	2	2	2	6	2	2
Pasture	137	23	23	23	22	23	23
Total	421	74	72	68	73	64	70
FARM TYPE II							
Yam	252	45	45	40	45	37	40
Vegetables	16	4	2	3	-	2	5
Citrus	47	8	10	10	6	5	8
Coffee	54	6	3	4	4	24	13
Total	369	63	60	57	55	68	66
FARM TYPE III							
Yam	252	45	45	40	45	37	40
Vegetables	16	4	2	3	-	2	5
Citrus	47	8	10	10	6	5	8
Coffee	54	6	3	4	4	24	13
Cocoa	21	2	4	5	4	4	2
Total	390	65	64	62	59	72	68