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DEVELOPMENTS IN PATTERNS OF FARM UNITS

(1) NEW LANDS AND NEW SETTLEMENTS

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THERE is still settlement of new land in many countries, but the primary concern in most countries in recent years appears to have been with the reorganization and resettlement of existing farms.

There is little doubt that these settlement activities will continue. The world population is expected to nearly double, that is increase to about 5 billion, by the year 2000.[1] This pressure of food and the inability of farms in vast areas to take advantage of technological advances will encourage new land development and the reorganization of existing farm land on a more productive basis. Adding impetus are the prevailing 'winds of change' calling for improvements in income and in working and living conditions of millions now at subsistence level.

Major land uses and estimates of potential changes (Table 1) are provided also by Schickele.[2] These suggest that it is technologically possible to double the land under cultivation.

Recent Settlement Activities

In recent years irrigation assumed importance in bringing new lands under cultivation and it will continue to do so. India brought 18·5 million acres under irrigation between 1950 and 1960.[3] Between 1945 and 1955 the irrigated acreage increased by 1·2 million acres in the Near East and 3·5 million acres in Latin America.[4] Irrigation acreage expanded substantially in the United States, but much of it

[1] Rainer Schickele, 'The Role of Land and Water Development in World Food and Agricultural Progress', reprint from *1958 Annual Report*, International Institute for Land Reclamation and Improvement, Wageningen, the Netherlands, p. 8.

[2] Ibid., p. 10. There are variations in estimates, for example see J. Russell Whitaker, 'World Land Resources for Agriculture', *World Population and Future Resources*, Proceedings of the Second Centennial Academic Conference of Northwestern University, Mar. 1951, and Robert M. Salter, 'Bring New Lands into Cultivation', *Chronica Botanica*, vol. xi, 4 (1947–8).

[3] *Third Five Year Plan*, Government of India, 1960, p. 18.

[4] Rainer Schickele, op. cit., p. 13.

did not involve new settlements.[1] Project proposals for specific irrigation schemes amount to perhaps 100 million acres and include huge expenditures in Pakistan, a 5-million acre, 1-billion dollar development in Iraq,[2] nearly 1 million acres in Chile,[3] and 1·3 million acres in Egypt.[4] Canada[5] and Australia[6] have plans for ½–1 million acre projects.

TABLE 1

Major Land Uses, by World Regions, 1955

Regions	*Agricultural area*		*Forested land*	*Unused and waste land, &c.*
	Arable land and tree crops	*Permanent meadows and pastures*		
	million acres			
Europe (excl. U.S.S.R.)	373	210	341	294
U.S.S.R.	544	660	1,836	2,498
North America	566	689	1,651	2,409
Latin America	252	909	2,407	1,495
Near East	215	670	358	2,056
Far East	897	675	1,186	2,674
Africa	514	1,203	1,574	2,513
Oceania	59	932	133	986
World total	3,420	5,948	9,486	14,925
Potential changes	+3,459	−988	−1,483	−988

The largest and most rapid transformation of virgin lands to cultivation in recent years occurred in the U.S.S.R. Between 1950 and 1956 the crop area expanded from 360 million to 480 million acres.[7] Most of the new land is operated by State farms.[8] Although Canada has a vast area of 2,272 million acres, only 100 million acres is presently under cultivation, and the potential, taking into account the limits of climate, topography, and soil conditions, is only

[1] Elco L. Greenshields and William I. Palmer, 'Some New Jobs for Irrigation', *Yearbook of Agriculture*, U.S. Department of Agriculture, Washington, 1958, pp. 339–46.

[2] Rainer Schickele, op. cit., p. 13, and Montague Yudelman, 'Some Issues in Agricultural Development in Iraq', *Journal of Farm Economics*, vol. xl, No. 1 (Feb. 1958), p. 80.

[3] *Fortnightly Review of the Bank of London and South America* (25 Feb. 1961).

[4] Ragaei El Mallakh, 'Some Economic Aspects of the Aswan High Dam Project in Egypt', *Land Economics*, vol. xxxv, No. 1 (Feb. 1959), p. 17.

[5] *Annual Report, Prairie Farm Rehabilitation Branch*, Regina, 1955, p. 35.

[6] Mary Ellen Long, 'Agriculture's Dominant Position in Australia and New Zealand', *Foreign Agriculture*, U.S. Department of Agriculture (Apr. 1960), Washington.

[7] W. Anderson, 'Technological Developments in World Agricultural Production', *Canadian Journal of Agricultural Economics*, vol. vi, No. 2 (1958), p. 1474.

[8] J. J. Khorochilov, *Cereal Crops in the Seven Year Plan, 1959–65*, Moscow, 1959 (translation, H. W. Trevor), p. 13.

between 40 and 50 million acres.[1] Apart from the demand for farm products, land clearing,[2] drainage, and transportation costs limit its development. Improved land increased by 3 million acres between 1951 and 1956.[3] The present irrigated acreage of 1·1 million can be doubled and drainage may reclaim another 2 million acres.[4]

Perhaps one of the most dramatic reclamation and settlement programmes has been that of the Netherlands.[5] It is the most densely populated country of the world and about one-half of the area would be uninhabitable without its 1,200 miles of dikes and drainage systems. About 1·6 million acres have been reclaimed from the sea. The Zuider Zee project was made possible by an enclosure dam 20 miles long and will reclaim 550,000 acres.

In the United States during the past fifty years the acreage reverting to forests exceeded that being cleared.[6] In Australia, under War Service Settlement, nearly 8 million acres were settled between 1945 and 1952.[7] In Japan 2 million acres, 1·1 million of which were reclaimed, were sold to 136,000 families. Between 1947 and 1954 in Turkey, 2 million acres of unused farm land were distributed to 184,000 families.[8]

Some Patterns of Settlement

Several forces have initiated settlement activities. Although in some countries more than one are evident, patterns of settlement are discussed under what appears to be the primary motivating force.

Land reform. Probably the main force underlying recent resettlement activity in most countries has been a desire for land reform.

[1] A. Leahey, *Appraisal of Canada's Land Base for Agriculture*, paper prepared for 'Resources for Tomorrow' Conference held in Montreal, Oct. 1961, p. 1. See also H. G. Dion, 'Land Use in Canada—Present and Future', *Agricultural Institute Review*, vol. xv, No. 2 (Mar.–Apr. 1960), Ottawa, p. 57.

[2] Land clearing and breaking costs vary depending on density of tree cover, but the average is about $30 per acre. Knud Elgaard, unpublished data, Economics Division, Canada Department of Agriculture, Edmonton (1960).

[3] Census of Canada, vol. ii, *Agriculture*, Dominion Bureau of Statistics, 1956, Ottawa.

[4] A. Leahey, op. cit., pp. 13–14.

[5] Patricia Lauber, *Battle Against the Sea*, Van Rees Press, New York, 1956. *From Fisherman's Paradise to Farmer's Pride*, Netherlands Government Information Service, The Hague, 1959. J. Van Veen, *Dredge, Drain, Reclaim, the Art of a Nation*, Martinus Nykoff, The Hague, 1955. Sjverd Groenman, *Land Out of the Sea*, A. Roelop Van Goor, Meppel, the Netherlands. *The Delta Plan*, Information Department, Ministry of Transport, 1958.

[6] James R. Anderson, Adon Poli, and Lawrence A. Reuss, 'Clearing Land for Different Uses', *Year Book of Agriculture*, U.S. Department of Agriculture, Washington 1958, p. 409.

[7] *Progress in Land Reform*, United Nations, New York, 1954, p. 113.

[8] Ibid., p. 28.

Vast numbers of cultivators lived in extreme poverty and in low social status. They had smallholdings and insecure non-incentive forms of tenure. At the same time there was extreme concentration of land-ownership. The most common feature of reform has been providing ownership to cultivators. This has involved the breaking up of large estates either by expropriation, more commonly with compensation, or by purchase.[1] Among the most far-reaching was the Land Reform Law of 1946 in Japan.[2] Under this law tenanted land owned by absentees and tenanted land in excess of 2·5 acres (10 acres in Hokkaido) owned by residents was expropriated and owner-operated or tenanted land operated by any individual was limited to 7·5 acres (30 acres in Hokkaido). The expropriated land was resold to tenants. By June 1951 more than 4 million persons (more than one-half of the farm households) received 5·9 million acres under this measure. In addition 735,000 families received more than one million acres of reclaimed land.

In India the elimination of intermediaries and resale of land to cultivators were accompanied by limits on sizes of holdings. The limits varied from State to State, but generally holdings were restricted to between 30 and 50 acres.[3] Owners were compensated and the land was sold to the tenants. Reform in East Pakistan also aimed at the elimination of intermediaries, but ownership was held by the State and tenants were given secure, heritable, and transfer rights. In West Pakistan legislation sought to give security to 'tenants-at-will' and to give proprietory rights to 'occupancy tenants' who have acquired rights by custom.

Several European countries expropriated large estates and placed limitations on size of holdings. Among these were Italy, West Germany, Finland, Czechoslovakia, Yugoslavia, and Poland. Maximum holdings vary from country to country but generally range from 25 to 375 acres.[4] In Egypt individual holdings above 200 acres were subject to expropriation. Holdings of King Farouk and other descendants of Mohammed Ali were confiscated.[5] Similarly, Syria

[1] In India the unique Bhoodan movement, under which land has been voluntarily surrendered by large landowners, resulted in the donation of 3·7 million acres of land. *Progress in Land Reform, Second Report*, United Nations, New York, 1956, pp. 24–25.

[2] See *Progress in Land Reform*, op. cit., pp. 62–64. David E. Lindstrom, 'Outlook for the Land Reform in Japan', *Rural Sociology*, vol. xxi, No. 2 (June 1956), pp. 164–70, and R. P. Dore, *Land Reform in Japan*, Oxford University Press, London, 1959, pp. 129–200.

[3] Manilal B. Nanavati and J. J. Anjaria, *The Indian Rural Problem*, Indian Society of Agricultural Economics, 1960, pp. 209–10.

[4] *Progress in Land Reform*, op. cit., pp. 65 ff.

[5] Kenneth H. Parsons, 'Land Reform in the United Arab Republic', *Land Economics*, vol. xxxv, No. 4 (Nov. 1959), pp. 319 ff. [Dr. A. El Tonbary of Egypt subsequently

and Iraq imposed limitations on size of holdings. In December 1959 a Bill was introduced in Iran for the distribution of private lands.[1]

In Latin America, Mexico and Bolivia have had extensive land reforms.[2] In Mexico nearly one-half of the 34·6 million total cultivated acres was transferred to the ownership of village communities between 1916 and 1944. A notable feature of the Mexican experience in spite of increasing population pressures was the increase in the size of grant from an average of 10·9 acres to 25 acres. In 1953 Bolivia introduced measures with features similar to those of Mexico. Chile also introduced a law to break up large estates.

Economic farm units. New patterns of settlements in several countries appear to be primarily directed toward establishing efficient farm units. Although resettlement programmes in the U.S.S.R. and China may have received their main impetus from desires for political and land reform huge collective and State farms were established to obtain maximum efficiency from mechanization. Large-scale farms, however, are the subject of another paper in this series and will be discussed there.

The United States and Canada are countries of family farms and most of the agricultural development there has taken place under the strongly prevailing concepts, *family farms* and *freedom*.[3] Thus, in spite of large farms in these countries, there has been little agitation for limitations on sizes of holdings. Most of the more recent new settlement in Canada has occurred in the prairie provinces and on Crown lands. Unlike earlier settlement in these provinces, lands are now inspected for suitability and only limited areas are opened for settlers. Because of limited demand for land there is relatively little settlement of new lands at the present time.

In Manitoba Crown lands are disposed of by sale,[4] in Saskatchewan by 33-year lease,[5] and in Alberta by sale and lease.[6] Some drainage and

pointed out that the figure of 200 acres should have been 200–300 feddans, and that this was changed in 1961 to 100 feddans. M. E. A.]

[1] Baldur H. Kristjanson, 'The Agrarian-Based Development of Iran', *Land Economics*, vol. xxxvi, No. 1 (Feb. 1960), p. 6.

[2] *Progress in Land Reform*, op. cit., pp. 81 ff.

[3] J. F. Booth, 'Policies and Experiences Relating to Farm Land Tenure in Canada', *Family Farm Policy*, University of Chicago Press, Chicago, 1957, pp. 139 ff., and M. Harris and J. Ackerman, 'The Farm Tenure System in the United States', ibid., pp. 39 ff. Harris and Ackerman state: 'Family farm policy is the most fundamental idea interwoven throughout the very warp and woof of our tenure garment' (p. 45).

[4] Burke G. Vanderhill, 'Post-war Agricultural Settlement in Manitoba', *Economic Geography*, vol. xxxv, No. 3 (July 1959).

[5] *Annual Reports*, Saskatchewan Department of Agriculture, Regina, Saskatchewan, 1955–60.

[6] Wm. Odynsky and V. A. Wood, *Public Lands Open for Settlement in the Peace River*

other work has been done by Manitoba and Saskatchewan governments prior to entry. Saskatchewan adopted leasing arrangements to prevent speculation and to provide farms of sufficient size to those with satisfactory ability and experience but with limited financial resources. Rental rates were based on soil productivity but did not exceed one-sixth of the crop. In Alberta rental rates were one-eighth of the crop out of which taxes were paid. Because earlier experience showed that 160-acre units were too small the present policy in the three provinces is generally to permit units of 320 acres and in some cases to provide for subsequent additions. Canadian long-term credit legislation generally provides that credit will be given only if the farm unit established is one of economic size. Supervision has become associated with some farm credit programmes because efficient production requires interest in the settler after the loan is granted.

Settlement policy in Australia since 1945 has required that holdings shall be of sufficient size to produce a reasonable income.[1] Applicants are selected on the grounds of suitability. Tenures vary between States and include freehold and perpetual lease.

In the United[2] States and Canada[3] the *small farm problem* has assumed importance, and the United States Rural Development Programme[4] is one of the remedial measures. In Canada a Bill on Agricultural Rehabilitation and Development was introduced to Parliament on 23 March 1961 to make appropriate adjustments in low-income areas.

Land settlement in the Netherlands in newly reclaimed areas involved comprehensive study and planning of both technological and socio-economic aspects. Comprehensive research was carried out to establish the best scientific basis for development.[5] The State carefully managed agriculture in large farms for the initial 3–5-year period. During this period tile drainage systems were laid, service facilities and farm buildings were constructed, and work was begun on the villages. The Dutch experience has been that notwithstanding

District of Alberta, Department of Lands and Forests and Research Council of Alberta, Edmonton, Alberta, 1957.

[1] *Progress in Land Reform*, op. cit., pp. 98–99.

[2] Message from the President of the United States relative to the *Development of Agriculture's Human Resources—A Report on Problems of Low-Income Farmers*, Washington, 1955.

[3] For example, see *Proceedings of the Special Committee of the Senate on Land Use in Canada*, 2nd Session, 24th Parliament, 1959, Reports 1–12, and *The Small Farm Problem*, Report of Third Annual Workshop, Canadian Agricultural Economics Society, Ottawa, 1959.

[4] For an 'outside' view see J. F. Booth *et al.*, *A Review of the Rural Development Program in the United States of America*, Canada Department of Agriculture, Ottawa, Feb. 1960.

[5] *From Fisherman's Paradise to Farmer's Pride*, op. cit., pp. 19 ff.

population pressures the establishment of economic sizes of farms was of major importance. Substantial State investments in reclamation were protected by retaining ownership and generally leasing the land to farmers. Some adjacent State farms were retained for continued experimentation and demonstration. The primary requirements of settlers were professional qualification for economic and technical aspects of modern agriculture and personal aptitude for farming. Priorities have been given to people whose farms were devastated by flood and others whose land was taken for public purposes. An important feature of the Netherlands' Rural Development Programme[1] was the enlargement of farms. It depended on a voluntary re-allotment of agricultural land, training of farmers for other farms or new occupations, and financial assistance from the Government. This programme of resettlement in old areas has been co-ordinated with the settlement programme on new lands. Farmers on uneconomic units in old areas have opportunities to settle in reclaimed areas. The land they leave is thereby made available to enlarge the farms of those who remain.

Fragmentation of holdings has been a problem in several European countries and considerable effort has been made in resettlement on more efficient consolidated units.[2] This aspect of establishing economic farm units is the subject of a paper to follow.

Large-scale migration. Settlement problems of some countries have been associated with large-scale migration of people. Finland was one of these and enacted a programme for the resettlement of people displaced from the territory ceded to the U.S.S.R.[3] Land was obtained by expropriation and by 1952 more than 5 million acres had been acquired and settled. This large-scale resettlement resulted in a reduction of farm size, and some wastage of fixed capital (buildings). On the other hand, there were the new possibilities of more intensive use of land formerly in outlying areas. The cost was heavy but the programme was not undertaken for economic considerations alone.

Israel also has made provisions for a large influx of settlers. Irrigation provided new land for the settlers.[4] Settlements included large areas which required further reclamation before they could become cultivated. About one-fifth of the land is owner-occupied, about one-third is held under hereditary leasehold, and the rest is rented.

[1] F. De Soet, *Rural Development in the Netherlands*, Ministry of Agriculture and Fisheries, The Hague, 1959.

[2] Erich H. Jacoby, *Land Consolidation in Europe*, International Institute for Land Reclamation and Improvement, Wageningen, the Netherlands, 1959.

[3] *Progress in Land Reform*, op. cit., pp. 68–71.

[4] Rinna Dafni, *Israel Today—The Negev*, Israel Digest, Jerusalem, 1960.

Leases given by the Jewish National Fund, a public corporation, may not be transferred or mortgaged without the consent of the owner. The land allotted per family shall not be more than can be worked by that family. Settlement includes individual, semi-co-operative, and voluntary communal farms. The village community characterizes all three forms.[1] By the end of 1953 there were 200 communal villages each having about 200 families[2] and which made up about 30 per cent. of the rural population.[3]

Land use adjustment. Original settlement in the prairie provinces of Canada took place without knowledge as to the best use for the land. Large areas were subsequently proven unsuitable for cereal crop production and a programme was developed for turning these relatively unproductive lands to community pasture use.[4] The pastures with associated services were available to the remaining farmers at moderate cost. Families located within the proposed pastures were given assistance to move to better land and if none was available they were assisted in moving to irrigation projects. Since the inception of the programme in 1937, 1·8 million acres were transformed in this way. An even broader application of this principle is envisaged in the Bill on Agricultural Rehabilitation and Development.

Some Elements of Successful Settlement

A review of these settlement patterns indicates certain elements of successful settlement.[5] The importance of each depends on objectives of settlement, concepts of values, and the physical, economic, social, and demographic characteristics of the country involved. Successful reclamation and subsequent settlement requires, first, decisions to allocate sufficient resources including competent management for the development of plans and for the follow-up of physical works and settlement. Secondly, the fund of scientific information on soils, crop, and livestock must provide the basis for farming practices.

[1] Lawrence Halprin, 'Israel, the Man-Made Landscape', *Landscape*, vol. ix, No. 2 (Winter 1959–60), p. 20.

[2] Joseph Shatil, 'Communal Farming in Israel', *Land Economics*, vol. xxxii, No. 2 (May 1956).

[3] Herbert A. Aurbach, 'Social Stratification in the Collective Agricultural Settlements in Israel', *Rural Sociology*, vol. xviii, No. 1 (Mar. 1953).

[4] *Annual Report, Prairie Farm Rehabilitation Branch*, Regina, Saskatchewan, 1958–9, and *Progress in Land Reform*, op. cit., pp. 101–3.

[5] For a review of principles of settlement policy see Rainer Schickele, 'Resettlement Problems and Policies', *Netherlands Journal of Agricultural Science*, vol. v, No. 4 (Nov. 1957), pp. 239–54, and D. R. Gadgil, 'Integration of Land Settlement Policies into the Economic and Social Development of Countries', *Monthly Bulletin of Agricultural Economics and Statistics*, vol. viii (Oct. 1959), Food and Agriculture Organization, Rome, pp. 1–7.

Thirdly, the capital requirements of more difficult reclamation projects, the diversity of interests in resettlement programmes, and more complex technical requirements have placed increased responsibility on governments. Substantial responsibilities must be assumed by individuals, governments, and organizations in implementing settlement programmes. Fourthly, the efficient application of technology and the attaining of a satisfactory level of income requires at least a moderate scale of operation.[1] Population pressures and the fervent desire of many people to own at least a plot exerts powerful pressures for the fragmentation of holdings. Excessive fragmentation leads to inefficiency, inadequate incomes, and costly remedial programmes. However, an economically optimum size may have to be reached by progressive stages. Inadequate farm size in countries with relatively advanced technology and in some only recently settled, such as Canada, emphasizes the importance of size. Perhaps the most common economic failing in recent programmes has been that the units have been too small. Because technology continues to advance and become more widely adopted, the optimum size and kind of farm will constantly change. Settlement patterns and institutions must therefore be flexible if mankind is to reap the substantial benefits which technological advances permit.

Capital requirements and the nature of capital formation must be recognized in successful settlement. Capital requirements are high and the supply is frequently low. Capital can be created only by production and then only at a cost to current consumption. However serious current needs may be, capital formation requires the withholding from consumption of a part of the fruits of increased productivity.[2] Some of the capital requirements must be met by credit.[3] Since private credit institutions have not generally been adapted for agriculture, governments frequently must supply not only credit but appropriate credit facilities. Qualitative aspects of credit are fully as important as the amount. Supervision, for example, ensures that interest in the settler does not end as soon as he is settled.

The choice of settlers is an increasingly important element, since greater skills are now required for farming successfully. Settlers with

[1] A case for small-scale holdings under certain conditions can also be effectively made. See Price Grittinger, 'On Returns to Scale in Crowded Peasant Economies', *Land Economics*, vol. xxxv, No. 1 (Feb. 1959), pp. 66–67.

[2] The difficulty of choosing between desirable alternatives is recognized in several countries. See *Third Five Year Plan, Government of India*, June 1960, p. 44. Baldur H. Kristjanson, 'Agrarian-Based Development of Iran', op. cit., p. 3.

[3] Horace Belshaw, *Agricultural Credit in Economically Underdeveloped Countries*, Food and Agriculture Organization, Rome, 1959.

agricultural experience, industriousness, and ability are desirable. Countries differ, however, and population pressures and the desire to provide land to the landless may make it difficult to choose settlers only on the basis of their skills and industry.

Finally, there must be the institutions and conditions providing incentives for all to produce. Ways must be found of getting people to improve their lot.[1] Well-conceived plans require the follow-up of practical application and effort on the farms. The interest and confidence of settlers must be obtained. Tenure conditions must be such as to provide security and incentive. Wasteful and unproductive practices must be recognized as an alternative to successful settlement. Gradual improvements in living and working conditions including health, education, and hours of work, are important in generating an interest in self-improvement. International agencies have done much to study and report on experiences in settlement activities. These reports provide useful yardsticks and guides to future programmes.

Arising out of these considerations certain broader questions arise. To what extent are reclamation and settlement activities economically oriented? Would inter-regional competition and comparative economic advantage lead to the current steps being taken to increase food production? What would be the relative costs of obtaining food by permitting and encouraging an increased flow of trade? Nutritional requirements, by almost any standard, call for substantial increases in world food supplies. What would be the costs and what kind and scope of reclamation and resettlement would best meet those needs?[2]

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It is an old saying that the Lord created the world but the Dutch created Holland. This may be the reason why a Dutchman is honoured to open the discussion on this paper about land reclamation. I find myself largely in agreement with Dr. Andal's review of what is going on in this field in different parts of the world. At the end, however, he poses certain questions. 'To pose a question rightly is

[1] George V. Haythorne, *Provisional Record*, No. 15, International Labour Conference, 1960, Geneva, p. 185.

[2] D. R. Campbell states: '. . . the *physical possibility* (of meeting world food needs) . . . does not constitute the basic problem. The basic problem consists of *institutional* limitations. . . .' See 'World Exploding Population—How will they be Fed?', *Agricultural Institute Review* (Jan.–Feb. 1961), Ottawa, p. 14.

already half the answer', is a wise saying, and Dr. Andal has put some crucial questions on this subject.

In the short time at my disposal I shall try only to make a small contribution to finding an answer to one question, namely 'To what extent are reclamation and settlement activities economically orientated?' I shall venture to give some ideas about what economically orientated could mean with relation to land reclamation.

In Holland we are confronted with this problem particularly in connexion with our very costly undertakings to reclaim or improve farmland, undertakings charged direct to government account—as in the case of the draining of the Zuyder Zee—or carried out with the aid of large government subsidies granted to private persons for soil improvement and land re-allotment schemes. Here it became fully evident that, judged by the standards of private enterprise, the accounts did not balance. But is it sound to rely entirely on the yardstick of profitability as used in the private sector, when deciding upon an investment policy in agricultural land? My opinion is that it is not. We have to take a broader and longer view, namely that of the community's interests. A broader view than private enterprise can adopt should be taken on the use of input factors, of which labour is the most important, for land reclamation and, of course, for any other investment. In many countries there is open and hidden unemployment of labour in agriculture. From a national point of view the use of this unemployed labour for land reclamation does not involve costs in real terms for the national economy. There are no benefits foregone or at least they are much lower than the money costs involved.

During the thirties a lot of labour that otherwise would have been wasted was put to good use in land reclamation in Holland, and this proved to be a great asset during the hungry forties. In this case capital formation can take place even without 'withholding from consumption a part of the fruits'. However, the case should not be overstated as is sometimes done.

In the first place it seems to be unrealistic to suppose that not only during the investment period, but also during the operation period, there would otherwise be constant agricultural unemployment and that therefore real costs to the community would not be involved. In most cases it is only in the investment period proper that it is safe not to calculate the full money costs of labour. In the second place the multiplier effect of the spending of the additional income resulting directly from the investment should not be brought into account. The multiplier seems to have a great appeal to technicians and semi-

economists. I can understand that, as I too like fairy tales. As a kind of magic wand the multiplier seems to make it easily possible to escape from such restricting everyday realities as 2 plus 2 makes 4.

Without any doubt the multiplier effect has positive results if there is a general kind of unemployment, but this is never due to a particular investment. This investment is only one of the many possible channels for extra spending. Whether a net multiplier effect will show itself depends on the over-all monetary policy; it can even be created without any investment at all. It is also the reason why the so-called social marginal productivity cannot be used as a yardstick, as some authors advocate. The social marginal product of an investment includes the entire increase of production, regardless of whether this is due, causally and economically, to the investment as such, or results from a monetary cause. The use of the concept of real costs for the community warns us against the phantoms of the multiplier in relation to a particular investment, but at the same time makes possible a broader view than private business can take of the cost of land reclamation.

A longer view should also be taken—by which I mean a view further into the future. Shortages and surpluses, combined with excessive price fluctuations, are special characteristics of agricultural products. The price inelasticity of demand and the short-term rigidity on the supply side explain this situation. But at the bottom of this phenomenon lies the fact that agricultural products are of vital importance to human well-being. Market prices of agricultural products —if free—indicate only the value of the marginal quantities, without paying attention to the consumers' surplus. Agricultural products have a large consumers' surplus, much larger than many other products. The risk of a substantial rise in price is far greater in the case of products with a large consumers' surplus than with those with a small consumers' surplus, if it is difficult to expand production at short notice. The increase in agricultural production depends mainly on two components: the advance of technology and the expansion and improvement of the acreage used for agricultural production. Land reclamation adds to the acreage, but it mostly requires large investments and is consequently a time-devouring business. To be on the safe side, to prevent painful shortages of food in the future, the community has a stake in reclamation, as an alternative or, better, as an addition to financing research and extension. I know it will sound like heresy to many to bring intra-marginal values into account, but I think it is appropriate for the community; and land reclamation seems to me to be a case in point.

In conclusion I think I am right in my interpretation of *economically orientated* as including the payment of a government's subsidy to cover a large part of the wage bill if otherwise unemployed labour is used in land reclamation, and a risk premium for preventing shortages of food. To prevent misunderstanding I must say this does not mean that I am defending the very generous subsidy policy for land reclamation in Holland. I am rather of the opinion that the Dutch Government is overshooting the mark widely. But leaving that aside, I think there are some good reasons for not restricting *economically orientated* to what it means in private business.

(2) THE CONSOLIDATION OF AGRICULTURAL HOLDINGS AND THE IMPROVEMENT OF THEIR INTERNAL STRUCTURE

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THE theme of this report is part of a larger one which aims at analysing the influence which structural improvement of agricultural units, obtained by means of changing social-agrarian conditions, can exert on the progress of agriculture, and by means of this, on economic development.

All agricultural progress is the result of decisions taken at the farm level, whatever the social structure, from the purest free enterprise system through to the most thorough planning scheme. But, if we begin with a collection of basically erroneous decisions translated into results which are individually unsatisfactory, no result will ever be achieved which can be considered compatible with the demands of an agricultural system able to contribute to economic development.

In most of the countries which have a long-standing agrarian civilization as well as in some of the more modern ones where the development of the agrarian structure has been uncontrolled, the world-wide effect of the decisions taken at farm level is far from providing the conditions necessary to obtain maximum returns, moderate production costs, and fair distribution. In such countries, since the agrarian structure has not evolved in keeping with technical development, besides being old fashioned it has become quite simply backward, so that the units of production in which the cultivators take their decisions are not a result of a plan, based on a concept,

whether good or bad, but are merely the result of haphazard evolution. It is not at all surprising, therefore, to discover that these units present a faulty structure which hinders their adaptation to contingencies and leaves them unfit to respond effectively to the needs of progress or to the stimulus or demands of public authorities to modify their procedures or to speed up their rate of development. Moreover, their limited returns lead to their being ill-trained, incapable of keeping up with progress, and of adapting themselves to the dynamic pace of present-day life.

To account for this there are two kinds of cause, distinct although often cumulative, those which depend upon the abilities of the man who takes the basic decisions (the farmer), and those which are due to the defects of the holding of which this man is in charge, defects often so frustrating that the most able men wear themselves out in the struggle. In connexion with the first, the specific remedy lies in the influence of education on the knowledge and will of the farmer. With the second, the only remedy is a more or less extensive reorganization of the system so as to enable a farmer to co-ordinate the natural and human factors, and to give him an incentive to do so.

Once agriculture is brought within the general problem of development its intrinsic weaknesses must be recognized, whether they be mere inertia or a straightforward resistance to technical advance and economic expansion. The problem of defects of structure therefore comes to the fore. All agricultural progress is fundamentally dependent on the agrarian structure. This is true, indeed, from the purely technical to the purely human progress which ranges from the efficiency of the man working in the fields to rural well-being in general. It is in this way that the countries of Europe (as well as those of Asia and the even younger ones of Latin America) have begun the task of correcting or mitigating structural defects which have become serious obstacles in the way of the modernization of agriculture and of the improvement of the standard of living of rural populations. From this attitude springs the need to study the origin of such defects with a view to finding methods for eliminating them. It is in this context that we find the theme of the *remembrement* or consolidation of rural property on which I have the honour to report. *Remembrement* or consolidation is a procedure which aims at correcting certain structural defects which hinder agricultural progress. That is why we are discussing it in this Conference under the theme of the contribution of agriculture to economic progress.

Although the idea and practical application of consolidation are far from new, the speeding up of the operation only takes place

when, in countries having an agrarian structure characterized by the scattered nature of the ownership of land, rapid technical progress becomes imperative. After the last war these operations became more intensified and are still going on. This may be the reason why a speaker has been chosen who belongs to a European country where this problem is in the foreground. In Portugal, as in other countries of southern Europe, certain structural defects, and above all the scattered nature of land ownership (so marked that it even becomes fragmentary), are not academic questions or matters of doctrine, but are pressing, even vital, problems, for which a solution becomes daily more urgent. I shall not put forward anything new; the subject does not lend itself to that. The bibliography is very extensive and repetitive. The experience gained in the course of the considerable amount of work carried out in our day shows that the problems are more or less identical everywhere, and that the tentative solutions show very little variation. My report, then, must lack originality and can claim only to provide a synthesis of a good deal of material bearing on the many aspects of the subject.

I shall begin with a few definitions. By *property* I mean the collection of lands and basic improvements belonging to one specific body (individual or collective) in a country or specific region. A *plot* is a parcel of continuous, uninterrupted land belonging to an owner. In these conditions a rural property may be made up of one or more plots. It is only when an owner possesses a single plot that there will be an identity of meaning between property and plot. By *division into plots* or *parcelling out of land* I mean the breaking up into plots of the land in a given area. This idea once developed, although it may have different legal senses, can be applied to all countries, whatever the legal system under which their landed property is held. Indeed, in all countries a cadastral survey shows the division of land into pieces of varying size, of more or less regular shape but with distinct boundaries, separated by *frontiers* from their neighbouring plots. The men who run a Russian kolkhoz or an Israelite kibbutz must certainly have as precise an idea of the boundaries of the land they administer as any European peasant has of his land. The facts present themselves differently when one goes from the concept of straightforward division, translated in terms of local topography, to the legal concept of the *allocation of property*. Faced by a territory divided into plots, one has to know to whom they belong, a question which is only applicable where private property exists.

Distribution of property will be the way in which the properties are shared among those who, owing to inheritance, legacy, gift or

purchase, have become the owners. To understand the difference between division and distribution it is sufficient to remember that rural property has been defined as a collection of plots belonging to a single owner.

The distribution of property is the fundamental phenomenon of agrarian structure where private ownership predominates. One can envisage it in several ways.

If the percentage of owners is high in comparison with the local agricultural population, and if the average area per owner is small, the rural property is sure to be very divided. This high rate of distribution corresponds sometimes to a situation of equality and sometimes to a situation of inequality for the owners, since a small average acreage can result just as well from a collection of properties of equal size as from a small number of very large properties associated with a large number of very small properties. If the proportion of owners is small in comparison with the population and if the average area per owner is large, the rural property is concentrated or not very divided. This situation, like the former, can correspond sometimes to a state of equality, and sometimes of inequality.

The *scattered nature of the property* or its *parcelling* is obvious when the number of plots is higher than the number of owners. Marked scattering normally coincides with the existence of a very much-divided ownership, i.e. it is to be found especially in the regions where small and medium-sized properties predominate. When the scattering is extensive and marked, the plots being for the most part extremely small and unsuitable for reasonable cultivation, there appears what is termed *fragmentation*, a form of division and distribution of the land considered to be very unsound and to remedy which is the purpose of *consolidation*. To the broken-up property some authors give the name of *pulverized properties*. In certain parts of my country, as in other countries, such pulverizing has proceeded to an incredible degree. Ignoring the very frequent cases when the plots are of such minute area that it is not only impossible to use a tractor but also impossible to use draught animals, I can also cite the fairly frequent occurrence of enclaved trees (*arbres enclavés*), i.e. where division and successive purchases have dissociated the ownership of the land from that of the trees; the land belongs to one owner and the trees planted on it to another, or even to several others. I could even cite examples, less frequent but not exceptional, of a single tree belonging to several owners.

To what causes can we attribute fragmentation, the worst example of scattered holdings? Equal inheritance of real estate is doubtless

the most important. The system of sharing in equal lots rests upon the French Civil Code of 1804 (the Napoleonic Code), which was immediately adopted by the majority of European countries and later by many in South America. The fundamental principles of this code are well known:

(*a*) the decree that equal division could be in kind and not only in value, once joint heirs were allowed to exact their shares in the form of real or personal estate which formed the inheritance;
(*b*) the division was to be made as soon as one of the heirs demanded it, no other justification being necessary;
(*c*) to the head of the family the law conceded a very small disposable portion of the estate, which did not allow him to resist effectively the principle of equality, especially as this portion could not exceed the value of gifts made during the lifetime of the deceased.

This legislation in fact established principles which corresponded to the personal preferences of the farmers to such an extent that its absurdly rigorous application was carried much further than the legislators intended. The prejudice in favour of equal shares in real estate was carried to such exaggerated lengths that it led to the breaking up of all land of whatever type of cultivation or production, and was therefore conducive, through successive inheritances, to the increased scattering of plots, attaining in many cases real examples of fragmentation. It is a known fact that contemporary legislation tends to put a stop to this regrettable phenomenon. Apart from the countries which have never adopted the Napoleonic Code (of which England is a traditional example) and which maintain various methods of inheritance in favour of one privileged heir, those which have adopted the most individualistic doctrines finally reacted against them and began to make it legally possible to exempt legacies made up of family-operated rural estates from the effect of the common law. France herself, who was the classic example of equal inheritances, has clearly embarked on this course.

Apart from the right of succession, other causes contribute to the fragmentation of rural properties. The most important is population pressure, always increasing, which for centuries showed itself exclusively in the primary sector; egalitarian legislation was in fact only a door yielding to such pressure, so that legislation to the contrary merely means nothing more than that a breakwater has been erected against it. The desire which every tiller of the soil has always had to own at least one piece of land in the more fertile part of his locality,

is of greater significance than is readily apparent. The ambition to increase the surface area of an estate is no less important, and since plots for sale do not always adjoin those already owned, numerous sales of land have contributed to the scattered nature of properties. Again, the custom of settling land on farmers' daughters when they marry has also caused division into plots as have other changes in inheritance. Another factor is the high price of land relative to the purchasing power of the farmer. This leads him to acquire here and there, with his savings, pieces of land which are sometimes minute. Finally, the larger works of construction in the country-side (roads, railways, canals, dams, large buildings), have contributed appreciably to the mutilation of plots, breaking them up into fragments which are often impossible to cultivate.

Everyone knows the disadvantages of an agrarian structure characterized by scattered plots, above all when it ends up as fragmentation. It starts with difficulties of access, illogical arranging of paths, the obligation to allow rights of way giving rise to queries and legal proceedings, and leading on to the enforced rotation of crops and old-fashioned cultivation, to the impossibility of mechanization, and the difficulties of practising plant hygiene on an adequate scale. All these concomitants of broken-up estates underlie the backwardness of many agrarian regions.

Thus: (*a*) the separation of the plots, some in relation to others, and some in relation to the farm buildings, causes considerable loss in time in going to and fro; (*b*) the loss of arable land owing to the dense network of paths and numerous fences is important; (*c*) the difficulties which arise in carrying out basic improvements beneficial to the public are considerable; (*d*) boundaries between properties which are too long, frequent enclaves, difficulties of access, problems connected with rights of way, utilization of water, and other practices are major causes of conflicts which often end up in the law courts and result in troubles and expense and threaten to disturb the peace; (*e*) all these defects, nearly always combined, tend to diminish the value of the land and consequently to create difficulties for the farmer who wants credit facilities.

The subject could easily be enlarged upon. I shall do no more than state the fact that owing to the continual impact of these defects on the cost of production, the yield of a rural estate which is excessively broken up is far below that which would normally result from the work and sacrifices of the farmer and his family.

To put this situation right, the solution generally suggested is

remembrement or consolidation. One must say, however, that it is only a partial solution and that, in general, one must go further than the straightforward rearrangement of the scattered plots of each property. Consolidation thus presents itself as a measure which is part of a very complicated whole.

Among the definitions suggested for *remembrement* or consolidation are, the operation of expropriating for the public good, applied to all rural estates (excluding built-up areas) of a given district, and compensating each dispossessed owner, giving him a property which can be worked with the maximum efficiency, on plots corresponding to the following conditions. They must (*a*) be sufficiently large and contiguous; (*b*) be suitably shaped for cultivation; (*c*) be placed in the most favourable conditions for cultivation from the point of view of access and surface drainage.[1]

Consolidation can have more or less far-reaching effects and assume various forms. Hence the advantage of classifying it according to different criteria: (1) General or special. (2) Relative to the property or to the holding. (3) Optional or obligatory.

It is considered general when it aims at a systematic redistribution of the plots enclosed within a given perimeter, nevertheless tending to correct all the recognized defects in the division of the property, yet without affecting the allocation of the latter. It is considered special when it aims at curing only some of the disadvantages of scatter such as suppression of enclaved plots and trees, or of plots of less than a certain minimum area, or of those with shapes unsuitable for cultivation, modification of the network of paths to facilitate cultivation, &c.

Consolidation proper is that *which has a bearing on ownership* although it is always based on the idea of helping cultivation. However, thanks to the modern tendency towards integrating the concepts of ownership and operation, owing to the theory of the social function of property and in particular to the legislation protecting tenants, one can conceive consolidation which concerns the working of the land, that is, it sets out to recognize not the legal, but the economic units. Until recent times consolidation was optional, being carried out only according to the decisions of and at the request of the owners. In the twentieth century some States have intervened by first offering the opportunity to the owners and then making the actual processes obligatory once they had been accepted by the majority, and finally regarding themselves judges in the matter. Thus, whether it is the

[1] Jean-Marie Schmerber, *La Réorganization Foncière en France. Le Remembrement Rural*, pp. 116–19.

authorities who take the initiative, or whether they merely accede to the petitions of the interested parties, consolidation tends to become obligatory, i.e. to be no longer subject to the majority of the interested parties. This evolution means that modern consolidation is based on the social utility of the arrangement, in accordance with the modern conception of the rights of ownership.

Taken thus, consolidation cannot correct situations resulting from an excess of population pressure giving rise to an excessive breaking-up of the land, but it does present these appreciable advantages:

(1) Increase of the productivity of the land owing to an increased area of cultivable land relative to the size of a region (by eliminating paths and fences), and to the possibility of employing more effective methods of cultivation.
(2) Increase in the productivity of labour, owing to economizing in manpower, in transport and journeying, and to the greater likelihood of being able to mechanize, and to better facilities for supervising the work of cultivation and stock-raising.
(3) Reductions, always considerable, in certain expenses such as for seed, manure, transport, repairs to fences, &c.
(4) Improvement of the technical efficiency of fixed capital (especially buildings and machines).
(5) Prospects of realizing basic improvements, initiated either by individuals, or collectively, or by public authorities.
(6) Greater opportunities for encouraging agricultural co-operation.
(7) The removal of obstacles discouraging the initiative of competent and progressive farmers, obstacles such as the small size of the plots, their awkward shape, and difficulty of access.

These are the strictly economic advantages, all in terms of lower costs. Other advantages make themselves felt by contributing towards reducing friction between neighbouring owners, discouraging absenteeism of landlords, improving irrigation, extending, simplifying, and speeding up credit facilities, defining the rights of ownership with greater precision, and, above all, assuring greater prospects of success to the family enterprise in the development of their land. This all contributes to an improved standard of living among country people and to reducing the rate of their emigration.

I have already mentioned the inadequacy of consolidation as a solution destined to correct the more serious defects in the agrarian structure. If the problem lies only in the scattered nature of the

property, and if, as a result, the mere joining together of what was separated, can create sufficiently economic holdings, all well and good, consolidation alone can constitute the solution to be recommended and applied. Nevertheless, allowing for exceptions, the situation which has been reached through successive redistribution is typified not only by the scattered nature of the plots, but also by their totality being too small in area. The scattered property constitutes a serious problem but one which can be put right without social upheaval, but when the further problem is superimposed of the really minute total area, a very serious situation arises which can be solved only by more energetic measures.

The fundamental question of having an agrarian structure consisting of units of economically workable size, such as to assure full employment to a farm family, and to afford them a good standard of living, is not solved by consolidation. To eliminate or to reduce the scattering can be equivalent to increasing productive capacity, and reducing costs and thus to increasing the economic opportunities of the holding, but it seems to me irrefutable that this is seldom sufficient to ensure that the new units will satisfy the demands of modern organization and techniques.

Recognition of this fact leads to the concept of *comprehensive* consolidation in which the aim is not only to join together the plots belonging to each owner but also to increase the economic size of the holdings thus consolidated. This must be at the expense of land belonging to other owners and to the public, and results in a decrease in the number of owners. Thus it becomes a question of a harmonious and planned combination of measures which must always be integrated into local planning and finally into a national plan for reorganizing the agrarian structure. The aim of this comprehensive consolidation is to increase simultaneously the productivity of the land and the labour, improving structural conditions for cultivation, replacing the unsatisfactory scatter of plots by a new arrangement where each owner's plots constitute a continuous area, sufficiently large and of such shape as to facilitate cultivation, with independent access and good contacts with a generally improved environment. Whenever such an arrangement does not result in units economically capable of providing a livelihood, *strictly functional enterprises*, the creation of such units is to be encouraged by purchase or by the expropriation of plots enclosed in, or close to, the development zone, or by using publicly owned land. Where there is publicly or collectively owned land not suitable to remain so, one can envisage the state taking it over for the express purpose of increasing the areas of

the holdings which, after a simple re-grouping, continue to be below the established minimum defined as an economic family unit. Nevertheless, it is seldom that land for this purpose can be found at the disposition of the state, and thus it is only by having recourse to private property that land can be provided for adding to holdings which are too small.

Two conditions can thus be distinguished, either there are in the district large privately owned estates, considerably in excess of the required minimum, of which the expropriation or purchase (partial or total) would solve the problem; or there are no such estates, in which case the elimination of a certain number of owners (again by means of purchase or expropriation accompanied by offers of alternative employment) would be the only hypothesis to envisage. Comprehensive consolidation always implies that it is justified on grounds of technique and economy. It is the realization of a whole lot of basic, general collective improvements destined to enhance the prosperity of the region: irrigation and sanitation, protection against erosion, reafforestation, opening up of roads, provision of drinking water, electric power, postal and telephone services, &c. The promulgation of legislative measures destined to avoid the break-up of the new units resulting from consolidation, to discourage the absenteeism of the owners or at least to establish stable conditions for the tenant farmers are also characteristics of complete consolidation. Finally, it is indispensable to proceed to the creation of conditions which stimulate the co-operation of the farmers towards improving the possibilities of buying and selling, use of machines and pedigree breeding animals, access to credit and insurance, &c. Included in this are various other difficult questions, well known and adequately studied. The time at my disposal does not allow me to refer to them in greater detail. Moreover, I have no other aims apart from demonstrating the great complexity of comprehensive consolidation which, carried to its furthest extent, ceases to be a straightforward measure of basic reorganization and becomes an authentic agrarian reform.

I shall not present you with the details of a consolidation project and its execution. Time is too short, and it is not of sufficient interest. Besides, the experience gained in studying consolidation in numerous countries is so old and so extensive that there is no lack of relevant laws, rulings, reports, and plans, and the description and criticisms of results obtained are well known. Nevertheless, I do not wish to close without recalling the difficulties caused to society and the individual when a consolidation project is carried out. No

one should think that I consider the remedy easy, nor that resistance can always be overcome. My views are almost the opposite.

The difficulties of achieving consolidation projects are of four kinds: (1) psychological, (2) economic, (3) technical and economic, (4) judicial and administrative.

The main *psychological* obstacle is that which comes from the almost physical love of the small farmer for his property, especially when it has a long family tradition, or when he has given his land very special care, or thinks he has. This instinctive reluctance to relinquish land which one has come to consider one's own and to love as such, is often aggravated by the fear of seeing it fall into alien, even hostile hands. The best way to iron this out is to assure a generous share to the farmer in the carrying out of consolidation. Here, undoubtedly, is a very difficult problem, but the proof that it is not insuperable is the fact that it has often been solved. Another psychological obstacle lies in the fact that the farmer tends, when he takes part in an exchange, to overestimate the value of his property and to underestimate that of other people.

Economic obstacles are numerous. The most powerful is the difficulty of finding plots of equivalent value to be exchanged. This becomes more serious when there have been fundamental improvements, above all plantations and buildings; this obstacle becomes so insurmountable at times, that it is common to exclude such plots from consolidation. In certain cases, there need not even be fundamental improvements; it is sufficient if the differences in the techniques of cultivation by some farmers in comparison with others show permanently better yields. In other cases, there are plots of value superior to others because of factors independent of productivity, such as good situation in relation to towns and villages or means of communication; typical of this is land which, although agricultural today, is destined for urban development in the near future. It is better to exclude such plots from consolidation.

The problem of the existence of basic improvements also contributes to the obstacles which I have called *technical and economic*. Admitting that comparative valuation of basic improvements would afford a solution technically correct and acceptable to the interested parties, there would still be the question of knowing whether and to what extent consolidation would not destroy the usefulness of certain basic improvements. It is something which can easily happen, for example, with farm buildings which cannot be removed. Numerous basic improvements, still functioning today, date from the time when preoccupation with property as a source of income was not a

dominant question. These may be so solid as to make it impracticable to establish others of equivalent value in a different place, thus running the risk of rendering a basic improvement useless through not being able to replace it. Again, and more important, is the need to preserve the balance of a holding. This often calls for changes in the use of the arable and forest land which justify and even demand some breaking-up. In my country there are regions where family farming achieves its balance only if there is a certain minimum of policulture, which means that the farmer must have irrigated fields (where he produces what is necessary for his own and his animals' food), hills (where he can harvest olive oil, chestnuts, and grapes for wine), and mountain land, where he cultivates forests and pastures. The breaking-up into plots which results from this need is logical and advantageous, and must never be prevented. This does not mean that there is no justification for joining plots in the plain together in one or in a few blocks, and similarly the hill plots and the mountainous plots, but only that consolidation has technical limitations which must not be exceeded.

Among the parts of Europe where fragmentation has made most progress are the mountainous regions where agriculture is carried on in amphitheatres formed by terraces supported by stone walls. This prodigious effort, a heritage from the past, cannot and should not be despised or spoiled by the present generation. In these places it is seldom possible to obtain plots much larger than the original ones, or with a geometrical shape more suitable for mechanization. Topography is the obstacle. Nor is it possible to increase the width of terraces without excessive expenditure. Nevertheless, even in regions of this type some consolidation is possible without making radical changes. Finally, the great problem, when there is a question of agricultural modernization, is to decide to what extent it is an advantage to continue to keep such land under cultivation instead of simply giving it over to forestry.

It only remains for me to mention *judicial and administrative* obstacles. In countries with old-fashioned agrarian structures where no cadastral map of rural property has yet been made, one frequently comes across substantial doubts as to the identity of the landowners, the boundaries of the plots, the legal position of many of them, the number of people dependent on them, their legal rights (rights of way, rights of pasture, use of water, &c.). It is obvious that one cannot begin to carry out a plan of consolidation so long as the legal position of each landowner has not been defined. It is a question of a heavy, unrewarding task, demanding patience and research into

the archives of various public services, sometimes so difficult, slow, and uncertain that it forms a serious barrier to the working out of the operation unless the authorities promulgate special legislation aimed at regularizing confused situations.

I do not wish to finish without reaffirming once more that the efficiency and stability of the results of consolidation demand complementary measures which, being contrary to the individualistic tendencies which still predominate among those who cultivate the soil, must aim at preventing a renewed breaking-up of estates which have been put together at the price of such great efforts.

Here are some important measures which may be taken to protect the basic cultivation of a workable agricultural enterprise, to keep it economically stable and able to face future responsibilities: legal maximum limits to the splitting up of the plots; revision of the traditional juridical system of inheritance of real estate; special guarantees granted to property cultivated by the farmer himself and his family (exemption from the general principles of rights of succession); technical and financial aid to those who wish to unite small holdings or to join very small ones to larger ones; facilities given to those who wish to exchange plots among themselves; support for the development of an agricultural estate; control of tenancy to prevent the splitting up of an enterprise thus destroying the advantages achieved by the consolidation of the property.

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My views of these problems are mostly based upon my observation of data collected in Japan. Accordingly, some of them may not agree with Professor de Barros's, though others may.

Let me give first a brief illustration of the Japanese situation. Japan is a country whose farming is characterized by the smallness of farm size and by the scattered nature of farm plots. The average acreage per farm is a little less than 2 acres and the farms below this average comprise almost 70 per cent. of the total. The scattered nature of farm plots differs very much according to locality. Generally speaking, the older the farming region, the more scattered are the plots. A survey carried out in Okayama Prefecture several years ago revealed a farm of 2 acres consisting of thirty-six scattered plots far apart from each other, and this is not exceptional. It is a big problem to consolidate these scattered plots into unified efficient units and to enlarge the tiny farm size. The reasons are the same as those pointed out by Professor de Barros.

He attributes fragmentation to three causes: (1) equal inheritance of real estate, (2) population pressure, and (3) the high price of land in ratio to the purchasing power of the farmer. The last two overlap because population pressure usually results in high prices of land through high competitive demand. Professor de Barros thinks equal inheritance and population pressure are the most important causes. It is true that equal inheritance is a cause, but I do not think it the most important. In Japan, at any rate, it is a minor or secondary cause. According to the traditional custom and to the former Civil Code in Japan, the first son is supposed to inherit the whole estate, and in spite of this, the smallness of farm size and the fragmentation have been with us for a long time. Frequent changes of ownership of fragmented plots have caused the present situation. Of course, there are some economists who believe this has been done on purpose by farmers in order to even out the risk of crop failures, but this may not be true. After the Second World War Japan revised the Civil Code and adopted the equal inheritance system. Many people at that time expected that this would accelerate fragmentation and that farm size would become more and more tiny, but this did not happen. The farmers knew better. They did not follow the equal inheritance system or possibly could not follow it.

With regard to population pressure, it is difficult to agree that it can be regarded as a general trend in Japanese agriculture. It has only been true of certain localities.

According to my interpretation, price is the economic expression of the results of many causes of which population pressure is only one. In this sense, a high price for farm land is the most important cause of fragmentation. Professor de Barros says the high price of land relative to the purchasing power of the farmer is another factor. I would rather say that the land price being higher than the capitalized net return value of land (i.e. Ertragswert in German) is the most important cause. This is generally the case in Japan. Under such a situation the farm plot purchased by farmers cannot be an appropriate factor or object of farm management in its true sense. It will reduce a farm's labour return. We have evidence of this from surveys.