Rural extention in a developing country; a comparative study

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Summary

Economists are coming to realize the importance of education for economic progress.
There is a special reason why extension as an out-of-school roadside education has in general to take the lead in education of the rural population in a developing country, essentially still agrarian in tts structure. The available institutes for learning are for the time being busily engaged in training of supervising experts for the various rural development projects. Intellectual investments, however, have to accompany material investments in a synchronised way in order to reach a harmonious develoment. In this regard the role of rural extension, which will require relatively little financial expenditure, is of primary importance. Comparative extension studies should include developing countries.
In order to bridge a gap between, those already made in more respectively less developed regions, the extension situation in a developing country like Surinam is described in comparison with the Netherlands. It deals successively with aspects like the extension background, scope of extension, the working procedures and methods in extension, the relation between extension, applied research and (vocational) teaching, the internal organization of the extension service, extension staff and intellectual investments in agriculture.

1. The rôle of extension in developing countries

At the well-known meeting in Hot Springs in 1943 which gave rise to the foundation of FAO two years hence, it was stated that two thirds of the world's population was undernourished, that the same percentage was still active in agricultural production, whilst it would be possible to ensure an adequate nutritional level by a rational increase of production and distribution of the food grown. This statement has not lost any of its significance which is clearly demonstrated by the "World Anti-Hunger Campaign" that has been planned for the period 1960—1965.
Although agricultural production throughout the world as a whole has increased by 2,5 % in the past few years and the world population has increased by 1,5 % only, there are substantial regional differences. In many developing countries the population has been increasing at a more rapid rate than agricultural production. The opposite is the case in highly developed countries.
In this regard the gap between the respective countries seems to be widening instead of narrowing. The problems involved as to foreign surplus disposal are still under discussion, since some principles in this regard were formulated at the FAO-conference (6) and experience gained in this respect during the last seven years (19).

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Anyhow, the general opinion prevails that production must be stimulated in the developing countries themselves. For in those countries the population participates largely in the agricultural production process — which represents a great part of the national income — whereas labour productivity in agriculture is still low. Increasing this productivity is a prerequisite for employment outside the agricultural sphere. Agricultural productivity and the establishment of solid manyfacturing industries — to start with rural industry in less developed rural countries — are closely interrelated particularly if these industries are spread regionally.

A few figures may show the great differences between countries in regard to the percentage of the population still directly engaged in agriculture and as to labour productivity in agriculture. Both figures are to some extent interrelated.

Whilst for instance in the Netherlands and the United States approximately 10 % of the population is actively engaged in agriculture — one man producing food for more than 25 persons — this percentage is still more than 30 in Italy, more than 50 in Greece and Turkey and nearly 70 in India, Pakistan, Burma. COLIN CLARK (3) calculated that whereas an average of only 0,5 % persons was required for agricultural production on one square kilometer of standard agricultural land in New Zeeland, the United States required 2 persons, China 40 and Egypt 75.

Developing countries in their understandable desire to accelerate delayed development are faced with great efforts to create the necessary capital for productive investments from "internal" savings and "external" financial aid from more developed countries. According to ROSTOW (17) a start to self-sustained economic growth would require at least 5 % of the national income for nett productive investments. Even then only an equilibrium might be achieved as to the nett income per capita taking into account the substantial growth of the population in these countries; which is increased by the gradual introduction of medical health services. The nett income per capita will only increase, say by 2 % p.a. when 10 % of the national income is invested, an amount which must become available from savings within the country or from foreign financial aids. According to estimates, the countries of southern Europe would have to invest 1600 million dollars annually in order to obtain a 2 % increase on prosperity. If these countries could save 5 % of their national income for this purpose, they would still be short of the necessary amount to be invested which would correspond to 0,5 % of the national income of the northern European countries.

This example chosen from our immediate European environment shows that the term of underdevelopment is a relative notion, also in a certain geographical setting and that accelerated development of many countries outside Europe, where conditions are still less favourable, will require a far greater effort. But these "material" investments and aid are only one side of the matter. The prosperity of a developing, mainly agrarian, country closely related to the welfare of its population is also determined more indirectly by "intellectual" investments, which have to accompany and to be synchronized with more direct productive investments including those for improving the infra structure of the rural regions. The educational facilities — extension and (vocational) teaching — and those for applied research, which will have to act together as a trinity in order to utilize to the maximum extent the limited resources in this regard will foster vital elements for real selfsustaining progress like understanding, knowledge and skill, and more particularly entrepreneurship and incentive amongst the rural population. Economists are coming to realize the importance of education for economic progress. There is obviously a strong relation between

national income and educational investments pro capita in comparing various countries (7).

There is still another important aspect, which will be fostered through education: the social welfare of the population including their cultural adaptation (11). Apart from financial aid and provision of agricultural surplusses more developed countries could certainly provide essential help towards developing countries through technical assistance in the field of rural extension in sending out experts to and receiving fellowships from these countries.

Although teaching in the "know why" should ultimately precede extension in the "know how" and consequently (vocational and general) teaching should from the base for an efficient superstructure of rural extension, there is a special reason why extension as an out-of-school roadside education has in general to take the lead in education as to the rural population in developing countries. The available institutes for higher learning — both on the secondary and academic level — are for the time being too busily engaged in training future supervising experts for the various development projects with the limited teaching staff available, than to be able to reach the masses of the rural population in the meantime. Furthermore, taking into account aspects like the attitude of the respective rural population towards "theoretical" teaching, their possible illiteracy, one may realize that teaching in the traditional sense to be focussed primarily on the rural youth, would require too much time in view of the accelerated development which the respective governments want to achieve. Nevertheless every effort should be made in regard to the latter a.o. through training teachers of elementary schools in agriculture who in turn could start general vocational courses gradually to be extended to elementary vocational schools. Extension could and should also co-operate in this regard and pave the way for expanding teaching facilities in the future. It is for this reason that in low-income countries extension wil have to play a dominant rôle in the beginning as to the provision of education to the rural population.

Strengthening of educational services will require relatively little financial expenditure and may lead to selective expansion as it will tend to adapt agricultural production to market outlets and demands, including decrease of production sosts and invrease of the quality which will ultimately benefit the producer and the consumer. Extension in a developing country is of primary importance in paving the way for vocational teaching through sponsoring a greater demand for the latter service which will ultimately have to form a base for the effective and efficient superstructure of extension.

The "recent" history of the Netherlands, a country poor in raw materials with a dense and rapidly increasing population may serve as an encouragement to developing countries. This is particularly true in regard to agriculture which has been developing rapidly from a relatively backward state at the turn over of this century into an example of modern rationalisation within a few decades, as was expressed by foreign experts (9). In post-war years the ever increasing productivity in agriculture has fostered to some extent the expansion of manufacturing industries through the efflux of agricultural labour, the provision of food at rather moderate prices and finally the exports in the agricultural sector — increasingly surpassing the respective imports — which made it possible to import raw materials for the expanding manufacturing industries. It has developed within half a century from a mainly agrarian country into one where manufacturing industries are dominating. Nowadays about 40 % of the labour force is employed in manufacturing industries

and only about 12 % directly in agriculture.
During the past ten years the rate of structural change in agriculture is gradually becoming nearly equal to that of the United States. It has become a country whose competition as to agriculture the other partner countries of the Common Market have come to fear. Agricultural extension in the Netherlands which is one of the most intensive in the world does not even take up 0,5 % per annum of the gross value of agricultural production; combined with teaching and research it does not yet come up to 2 % of that amount, which percentage has been doubled during the last decade in view of the structural changes in agriculture confronting the farming population. It is estimated however that a percentage of 5—10, dependant on the varying conditions in the various countries (areas with a favourable land: men relation versus areas where land is scarce and already intensively cultivated) vould be a profitable investment through greater productivity of about 1,5 % or more annually to be achieved over a number of years (20). It might be interesting to mention that in a developing country like Surinam — to be dealt with more in detail lateron — where an accelerated development is aimed at, this percentage has already achieved 6 % of the gross value of agricultural produce.
Although agricultural extension has the task in all countries of promoting the integration of agriculture into the national economy which is expanding beyond the national frontiers, this integration will assume an entirely different character in the developing countries on the one hand and in the more highly developed countries on the other.
In the former production will have to be stimulated in view of the fact that still a rather high income elasticity is prevailing in regard to the demand for agricultural products, whereas in the latter the advisory services will have to concern themselves more and more with the problem of marketing, including remunerative market outlets, processing agricultural produce, consumer education etc. For the former countries, the principal aim will be to raise production pro acre unit whereas for the latter production pro man will become more important.... and the rentability of the capital which has to be used to replace and rationalize human labour. As to the farm managerial side the former countries will have to concentrate chiefly on farm operation whereas in the latter, farm organization will be the point of emphasis of the advisory services. Although economic aspects might become of greater importance in the latter countries, technical relations, becoming more complicated must not be lost sight of in either case.
A further element of importance in agricultural extension in both cases is, that of structural changes and social aspects of agriculture and rural life. However, they are of a different nature in some aspects. Thus e.g. the former will require land reform measures in order to achieve rational production and the latter will have to carry out an accelerated but orderly migration of manpower from agriculture towards other industries and an elimination of the marginal soils as well as the creation of non-agrarian sources of production (regional industrialization). In either case, home economics extension will constitute an indispensable element as to its content. In the former case, the farm women will in most instances participate to a great extent in the production process, in the latter they will relinquish their part in the agricultural production proper at an ever-growing rate with a.o. all the consequences ensueing for a co-ordination between agricultural and home economics extension regarding farm and home management aspects.
In development projects in highly developed countries the co-ordination will require

particular attention in view of the greater differentiation and specialization in the economy organizations. This usually applies also to the extension services themselves. In developing countries this problem is less acute. Here more centralization may be needed and development projects may require some autonomy. This difference excists both on the local and national level as well as on the international level and development projects are carried out.
Two different views are held on the way to achieve progress in low-income countries. The golden path may lay between the obvious hurry for accelerated economic development and the apparent more slow process of community development.

1.1. Directed development projects

The first viewpoint is expressed in rural development projects in several developing countries which gained political independence in recent times. Governments in their quite understandable desire to bridge the wide(ning) gap between more and less developed countries are emphasizing primarily material investments accompanied by highly advanced and quite often spectacular technological implications drawn up through experts. It is assumed by the intelligentia that the villagers "or new settlers" response to these projects will be favourable. The governments might overestimate the supposed enthusiasm aroused amongst masses of the rural population through the political independence gained or the political change carried out as a force to overcome inherent limitations to self-sustaining progress.
One should not overlook the various factors holding down the level of the villagers or new settlers current technology. Incentive and enterprise — being of vital importance — may be inhibited by institutional limitations to improvement as for instance insecurity of land tenure, lack of credit on reasonable terms, uncertainty of profitable outlets for the marketable surplus etc. These limitations may not be changed directly by the technological "innovations". Furthermore, the lack of educational facilities of the past can't be overcome rapidly. These projects are generally directed by more of less skilled supervisors going to the extreme in kolchoses or sowchoses in some communistic countries. To most, collective and co-operative farming seem to be synonymous. The first is certainly the form that has attracted most attention but experience has shown that it is not the only form for "new" rural settlements in developing countries. Collective farming is a very difficult form of co-operation and makes little appeal to the peasant proprietor, particularly on the "old" land. Co-operative farming presupposes voluntary membership, self-determination and self-administration. A newly settled country like Israël is offering an interesting study field in this respect, as gradually a wide variety in forms of settlement is developing, ranging from co-operative farming to individual farming and several transitions between these two forms (12). The level of agricultural skill and training facilities offered to the settlers play a rôle in this regard. The well-known kibbuts movement is at present numbering less than 5 % of Israël's Jewish population.
Several agricultural development projects in new countries are directed by official (Governmental) experts, the original villagers or new selected settlers acting more or less as employees or hired labourers. Co-operatives, also in the field of agricultural production as for instance mechanized production and water control are initiated and directed by officials. There are many examples in this respect. One of these is for instance the so-called "cellules de mise en valeur", a kind of irrigation and in the meantime settlement projects carried out on a great scale throughout a country

like Tunesia (13). In order to avoid collectives and its socio-economic consequences educational activities should be intensified in a synchronized way and care should be taken constantly that the initiative of the future farmers is stimulated to the maximum extent also in regard to their co-operative spirit. The "directing" stage could thus gradually develop into a "supervising" stage, the latter also as to credit to be provided. Co-operative farming can also be carried out gradually on an individual base (18). The development of real co-operatives through which independent small farmers can exert some influence on the buying-selling and credit market will require also a separate training of managers for these co-ops. Finally — with the increased level of knowledge, skill and understanding of the respective people — the supervising stage might proceed to the "educational" stage in which intensive extension is provided. It might be interesting to mention in this regard that although (vocational) teaching should ultimately form the base for a superstructure of rural extension — the "know why" thus preceding the "know how" — it will be difficult to apply this principle in new developing countries for the time being. In order to accelerate the development planned by the respective governments. Apart from the fact that there is a limited teachingstaff and schools to be built up, the available schools are to be engaged primarily in training experts to initiate and guide the various development projects. Extension could and should however pave the way, in the meantime, for the teaching facilities to be provided gradually to the masses of the farming population.

1.2. Community development

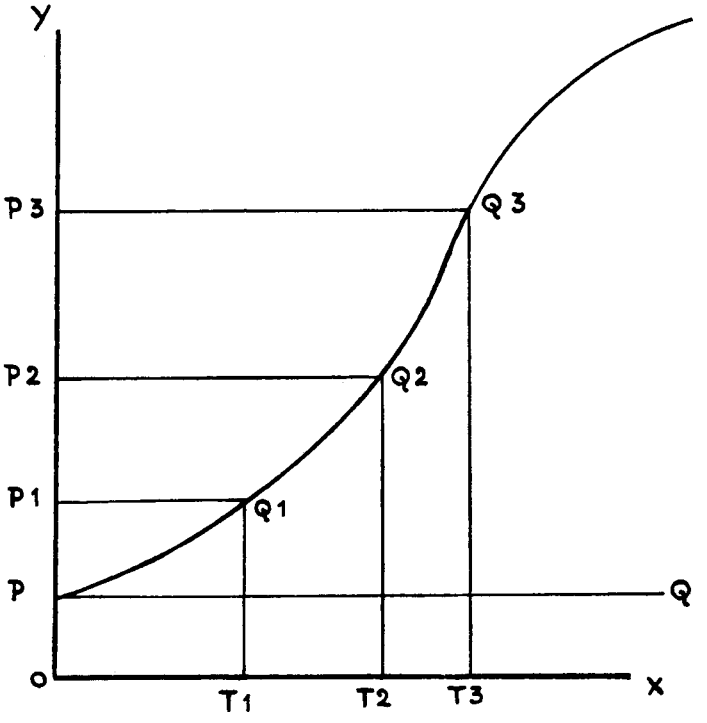
The second viewpoint is expressed in community development projects in India and Pakistan, emphasizing primarily intellectual investments, accompanied by an intensified overall scheme of extension relying to a great extent on the "felt need" of the villagers, the expression of which is to be stimulated purposely. It is an idealistic scheme though it might overestimate the villagers incentive and enterprise as the sole force to economic development which has to be accelerated: taking into account the widening gap between more and less developed countries. The development officers's rôle is of an educational character primarily and even more a stimulating one as to the expression of self felt needs, than an instructional one.

1.3. Balanced development projects

A proper balance has to be kept between both viewpoints. Anyhow the most advanced and complicated phase of the ultimate development program must be sufficiently shead of the current position to offer a significant promise of improvement. Yet it must not be so far in advance that the people cannot perceive its relevance.
It might be useful to illustrate the arguments set forth in a graphical form as below referring to S. K. DEY (4) (see DIAGRAM).
In the diagram successive steps in technological advance are measured along the vertical axis and the time taken to accomplish this advance is measured horizontally.
At the start of a project of aid the level of technology practised by a community in the particular subject matter field of the project is at P, while, according to the current state of knowledge and techniques, the maximum advance possible would be at P3.
Left to itself, the community would continue on its present level of efficiency along

the line PQ. The object of extension of aid is to raise the efficiency of the community's own effort to the level of P3 in as short a time as possible.

DIAGRAM



A project could be planned with the target of P3, but even with the best explanation of the extension agency, the community cannot raise its sight beyond its span of comprehension at P2.

On the other hand, a project with its target at P2 will awaken their interest. If outside aid will then promise them support in the more difficult tasks set by the project, the community would be prepared to exert itself beyond its present level to P1, which is the limit of its span of distension.

The project will then consist of two segments, PP1 representing the tasks to be accomplished by the people themselves, while P1P2 would be the responsibility of outside aid. The level at P2 would be the ceiling of aid in respect of its magnitude and complexity. The level at P1 would be its floor. PP1 would be the planned gap in its execution by the outside agency.

What the project would accomplish would be to raise the level of the community's efficiency to P1 in the first instance. But this would not happen instantly. It would take time, measured here by the distance OT1. That is to say, the technological level of the community will rise from the present horizontal along PQ to the slope PQ1.

With the progress of the project, the span of distension will become wider, moging towards P2. That is to say, the community will be able to assume increasing responsibilities for the program. The segment of outside assistance, initially measured

by the distance P1P2, will correspondingly decline. The technological competence of the community will climb up along the curve from Q1 towards Q2.
At the same time the span of comprehension will also extend beyond P2 towards P3 and the community will be ready for a more ambitious program presented through a further instalment of assistance.
If the project were initiated with the target at P3, it would heve had no distension effect and the entire program would have to be executed by outside agency. It would no doubt be completed in much shorter time than OT3, which would be needed by the people themselves to make progress up to this level; but it would fail in its purpose of raising the people themselves. It would also continue to be maintained by outside agency even after completion.
If the project were undertaken with more lavish assistance reaching below the level of P1, the initial distension would nor carry the people forwart to Q1 and their potential for progress would not be exploited to the maximum.
Assistance will need to be brought down below the level of P1 only when a community is in a state of arrested development. The extension assistance stopping at P1 will need to be supplemented of which the community is capable will be less.
But P1 cannot entirely coincide with P as long as the community is alive and is capable of any response at all.
To guard against misunderstanding it may be emphasized that the terms extension and community development — as the latter is quite often used in less developed areas — do not correspond with quite different concepts if extension is taken in the comprehensive sense and community development as a self-liquidating process (5). Extension may be defined as a self-generating process, it has in common with community development that several former pioneer tasks will (have to) be gradually left to the extension "clients" developing into extension co-operators, whereas the professional extension staff will take up new urgent tasks for which the demand may not yet be aroused.
Extension in the comprehensive sense and community development are to a great extent similar and no different services would be needed in dealing with depressed communities. Extension in the restricted sence of external transmission of knowledge and techniques to the community could be defined as outward bound though this definition does not hold true as there has to be a reverse flow of information from the receiving community too, as the knowledge and techniques to be conveyed have to be suitable to their conditions and requirements. Community development could be defined as inward bound it might be called distension as contracted with extension. It has to deal with depressed communities, where the normal processes of human growth — inherent in man's nature in terms of heart, mind and will in free association with other men — have been arrested or are dormant and therefore will require special treatment to be stirred. It is concerned with removing obstacles which hinder the urge for growth within the community. Community development carries extension forward beyond the point where it would normally end and as such is an auxilliary aim of extension a continuation of the extension process community development is a self liquidating task and should therefore not be a permanent feature of extension in the comprehensive sense — just as extension proper in regard to special fields of action which may become routine tasks — as soon as people minds and will do exibit normal liveliness. The respective local groups will then have developed their capacity to directly benefit from extension advice as the people are prepared to grasp and use innovations brought forward to them. The final stage in

community development might be defined according to Ross (16) as "a process by which a community indentifies its needs or objectives, orders and ranks these needs or objectives, develops the confidence and will work at these needs and objectives, find internal and or external resources to deal with these needs and objectives, takes action in respect to them and in doing so extends and develops co-operative and collaborative attitudes and practices in the community." Any development program aiming to engage the people in its operation must therefore on the one hand contain tasks — being complicated and more responsible — to be undertaken by the extension officer of community development worker, on the other hand leave other tasks deliberately unfinished, to be filled by the self-help of the people. This procedure goes along with the general working procedure to be applied in extension: helping the people to help themselves. We conclude that the terms extension and community development are different aspects of one indivisible process the emphasis being laid on the one or the other depending on the stage of development of the community.

As to extension methods the group approach as a basic extension method (10) is of particular importance in less developed areas as the group affinities and group norms are very tight in "closed societies" prevailing in these areas. Tradition bound to the social and cultural pattern of the society plays a dominant rôle. The style of farming is rather uniform irrespective of differences in the different resources as for instance the size of the individual farms. Therefore individual methods should succeed group methods and finally mass methods will have to support both.

2. Comparative extension education

It goes without saying that any rural extension service should be regionally orientated, that is to say be adapted to the often widely varying situations prevailing in the respective rural areas. Nevertheless exchange of views and experiences including successes and failures on the bases of a historical analysis, and last but not least more systematic comparative extension studies among countries will be valuable, taking into account the dynamic process of extension in a fast changing agriculture. It may arouse greater awareness of the position of rural extension in one's own country, stimulate improvements of existing shortcomings to be realized and it may finally lead to general guide lines as to gradual adaptation in countries that find themselves in different stages of development.

Expanding international co-operation in rural extension during the last decade, multilateral and bilateral, through study tours and seminars, are providing a base for effective comparisons.

The study tours since 1950 sponsored by O.E.E.C. for the western European countries, later on expanded to the Atlantic Community, including the United States and Canada, have undoubtedly laid a fundament for appraisals of the extension services in the western area, also in regard to follow-ups through periodic working conferences (1).

The international seminar in comparative extension education at Cornell University in Ithaca (the United States) started in 1955, has lead to a series of publications eith special reference to developing countries (8).

The annual international training centre on rural extension at Wageningen (the Netherlands) started in 1953, is introducing comparative extension studies in late years, a.o. by papers for the western and eastern world (2) (14).

These multilateral projects of international co-operation in extension are in the meantime building up an effective background information framework for bilateral co-operation.

3. The extension situation in Surinam in comparison with the Netherlands

In order to cast a bridge between so-called more and less developed areas an attempt will be made to outline some characteristic aspects of the extension service and its situation in Surinam in comparison with the Netherlands. The former country laying at the extreme north of the South-American sub-continent has been undergoing an accelerated development in recent years and shows in its structure (and history) analogies to various other young nations. Following a request by the Surinam government in 1955, the Netherlands issued a report on the country's extension services which report was based on a six-weeks study tour (15).

3.1. The extension background

Since Surinam obtained its independence as an autonomous part of the Kingdom of the Netherlands in 1954, the country has chiefly received bilateral support from the Netherlands including technical assistance in extension. The United States are providing technical assistance more particularly as to rural home economics and rural youth extension work. In 1954 a ten-year plan was initiated for the development of the country; one third of the investment capital required, was given by the Netherlands, one third loaned on long term and one third was supplied by the country itself. These monies form one fifth of the entire national budget. The investment capacity pro capita during the period covered by the plan is greater than in the Netherlands itself. In view of the fact that Surinam is chiefly agricultural in character and the infrastructure of the country is still very poor, one fourth of the monies appropriated under the ten-year plan is destined for the agricultural sector resp. the infrastructure. Although the cultivated area is of a rather limited size (100.000 acres). The problems the country has to face as a result of its accelerated development and in view of its history are just as great. Around 1800 the country was still the scene of florishing plantations, numbering 600 eninterprises in all, which were run on cheap imported labour, i.e. slaves, in a world that had not been entirely opened up. The abolition of slavery and the construction of the Suez Canal subjected this form of farming to an irreversible crises so that at the moment we find only some 30 plantations left which have great difficulties in obtaining labour. After the abolition of slavery, agricultural workers were immigrated on the basis of employment contracts: Chinese, Javanese, Hindustanis helping to relieve the labour shortage. They were the forebears of the present-day smallholders (approx. 20.000). The Creoles (descendants of the slaves) show little predilection for agriculture, i.e. for psychological reasons which are a remnant from the period of slavery. In the practically inaccessible virgin forests there are Indians and bush negroes, some of them descendants of escaped slaves.

In taking account of the background of a country, the historical aspects must not be neglected if a judicious assessment of the present-day situation is to be obtained. Some other features, preconditioning the scope and working procedures of extension may be described. What strikes one particularly in Surinam and may be held up to the world as an example, is the manner in which the population groups differing

greatly as to race and origin appear to gradually fuse into one community and will be able, it is hoped, led by a wise policy,to build up one common nation; this despite some sombre prophesies regarding a menacing hegemony of one particular ethic group. This aspect deserves special attention in the world of nowadays and makes financial and technical assistance in this case particularly worthwhile.

1. Surinam is an essentially agricultural country, with a little differentiated economy.

More than half of the population makes a living from agriculture as has been the case in the Netherlands one hundred years ago where at present about 10 % of the labour force is employed directly in agriculture as in the United States.
Bauxite, a raw material for industry, is exported as such and provides two fifths of the country's income. The export under contract to the United States presents both advantages and drawbacks, the latter in regard to the Surinam currency. The Surinam guilder is quoted at twice the value of the Dutch guilder and is linked to the American currency as a consequence of these contracts. This constitutes a drawback with regard to the export of e.g. agricultural produce apart from the transport difficulties. Industry is still in its infancy and at present, the possibilities of labour intensive industrialization are still inadequate.
The plans for a hydro-electric scheme (barrage) include the construction of an aluminium processing plant. Endeavours are made to establish some modest industry for agricultural produce, i.e. storage (rice), dehydrating (cacao) and processing (coconut oil mill, dairy factory).
A department of agricultural technilogy of the Agricultural Research Station and the agricultural extension services are participating in the initiative for the establishment of these industries. Home industries are stimulated by the home economics extension branch. Agricultural industry and commerce have not yet been developed to any great extent or rationalized, in contrast to developed countries where they get an increasing share of the "agri-business". In the Netherlands the number of people employed in agricultural industry and commerce is already equal to that employed in agricultural production. In the United States it is twice that number.

2. The drift of the rural population to the capital gives rise to grave concern; there is not enough productive employment to be found there, although dwelling is more attractive from the hygienic and socio-cultural viewpoint.

Here too the flight from the land, a heritage from the days of slavery, forms the historical background to this development. At the capital there is a far too numerous class of traders in agricultural produce (exerting relatively great political influence) which is considered to be adequate to supply a population ten times as big. Agricultural policy is therefore not so much directed toward migration of manpower from agriculture (as is the case in more developed countries, e.g. in the Netherlands) but rather towards the maintenance of labour in agriculture for which aim both the conditions of production and living in rural areas must be improved.

3. Agriculture is carried on, with the exception of a relatively small number of large estates (occupying a quarter of the cultivated area and ensuring the major proportion of agricultural exports, by small familysized farms. Agricultural export (rice, cacao, citrus fruit, coffee) constitutes half of the value of the agricultural import of agricultural produce of foodstuffs (dairy produce, meat, coconut oil, pulses, fruit, fish). Agricultural policy, in addition to promoting the export of certain agricultural produce aims at promoting increased self-sufficiency, the country offering great potentialities in this field. This latter fact should indicate that developing

countries wich a chiefly agricultural orientation will not in the long run provide a safety-valve for the agricultural surplusses of more highly developed and chiefly industrialized countries unless it be propagation material, agricultural production aids such as fertilizers, insecticides or herbicides, machinery and the preserved high quality agricultural produce.

Extension for the benefit of the estates is chiefly carried out from the relatively well equipped agricultural research station directly. This phenomenon can also be observed in more developed countries with regard to large specialized farms which often apply to research establishments directly. The agricultural extension servises are chiefly addressing themselves to the family farm.

4. Large parts of the country are still unreclaimed. Land reclamation and soil improvement schemes play an important part in the development of the country in view of the shortage of capital of the chiefly agricultural population. Although Surinam covers an area 5 times that of the Netherlands, only a fraction of 1 % of the surface — 80 % of which is covered by virgin forests and has hardly been explored — is used for agricultural purposes. This area of less than 50.000 hectare (125.000 acres) is only a little larger than that of the North-East Polder in the Netherlands where three quarters of the surface are occupied by agricultural land. In Surinam only 5 % of the young coastal clay plain, where we find the majority of the farms, has been reclaimed although according to estimates, approx. 1 million hectares (= $2^1/_2$ million acres) that is 20 times the present cultivated area, is considered to be suitable or could be rendered suitable for cultivation by means of land and water use measures.

During the past 10 years, approx. 10.000 ha (= 25.000 acres) — one fourth of the cultivated area — was reclaimed by means of dike construction and water management; Dutch reclamation companies are entrusted with this task, the cost of which amounted to approx. S.fl 2.000 per hectare, almost identical to the average amount spent in the Netherlands for schemes in land consolidation projects along a scheme of 40.000 ha (100.000 acres) annually. This expansion of land for agricultural purpose is carried out in order to relieve the population pressure on the existing cultivated area. A special section of the Department of Agriculture is charged with the supervised credit as to cultivation and housing for the new settlers to be selected from the "old land".

Special reference may be made to a Dutch project (21) for mechanized rice growing in the "Wageningen" polder which covers 6.000 ha (15.000 acres) started in 1950. The cost involved amounts to *f* 10.000 per hectare, a cost comparable in order of magnitude to that of the Zuiderzee polders in the Netherlands and in total identical to the money devoted for agriculture in the 10-years plan. That area is run on a plantation scale, on a commercial basis and contributes almost half of the total amounts of exported agricultural produce. Although originally destined for settling Dutch farmers, this plan was abandoned later for social, political and financial reasons. As to the latter mention may be given to the fact that the farms would have to be at least three to six times as large as had originally been estimated, i.e. 72 hectares (180 acres). For reasons of comparison it should be noted that the average farms of the local population cover an area of 2,5 hectare ($6^1/_2$ acres) half of which only is actually under cultivation and that in the newly polders created for colonists moving from the "old land", farms of an acreage of 10—25 acres are planned.

3.2. Scope of extension

The scope of extension is largely determined by the level of development of agriculture and the rural population as well as by the available provisions or the external conditions that have been satisfied in order to warrant further development. This frequently renders the scope of extension in a developing country rather wide although it may be less specialized in particular aspects than it is in highly developed countries.

Farm people are faced with strong limitations to their endeavours of acieving higher productivity. These limiting factors may be summarized as follows:

1. The farms are small on the average and are parcelled out in an inefficient way; water management is defective in the rural areas which still lack an adequate infrastructure.

Half of the land under cultivation consists of farms smaller than 4 ha (10 acres) which according to an investigation carried out to this end constitutes the minimum size for a profitable mechanization. There is less than 1 ha of land under cultivation available per manpower unit. The possibilities of labour-intensive industrialization including the planned aluminium refinery are still limited. In the Netherlands the average acreage of agricultural land per manpower unit amounts to 6 ha (15 acres) with a higher level of production. During the past ten years, the average farm acreage has been steadily rising as a result of industrialization and we have witnessed a constant drift of workers from agriculture which expressed statistically amounts to one tenth resp. one fourth.

One difficulty encountered in trying to increase the farm size and to carry out land consolidation schemes on the old land in Surinam arises from existing legal conditions as to the use of land with allodial property and from the arising indivisible inheritances which comprise more than half of the land under cultivation. Moreover, the landownership has not been adequately registered and regulations in this matter are still in the planning stage. In the Netherlands the demands for reallocation of land are many times greater than the capacity avaiable.

One of the difficulties in water control is that the polders in a landscape which, due to the lack of dunes, conveys an impression of being still lower than that of western Netherlands, have not yet developed into actual water control organizations with administrative and legal powers sanctioned by public law.

2. Little capital is available to the agricultural population. The major part of the farm families earns less than S.fl 2.000 per year, which is one third of the wages of an agricultural labourer in the Netherlands, including social charges. The rate of interest for normal credits is twice that charged in the Netherlands. Although some agricultural credit institutes were founded already half a century ago, the few existing institutions of this kind have by no means grown into should agricultural credit institutes as has been the case in the Netherlands where we find one such institute for every 200 hectares (500 acres) of land under cultivation. For some years past endeavours have been made to satisfy the credit requirements of the farmers by means of supervised credit with a government guaratee, with a particular view to the farms to be established in the reclaimed polders, under the supervision of a special section of the Department of Agriculture. Credit has already been awarded outside this framework with a view to rationalizing cacao-plantations, with the co-operation of the extension services. We find a certain analogy with the Agricultural Guarantee Fund in the Netherlands in which the extension services co operate with

regard to counselling, in efficient investments, in co-operation with the agricultural credit institutes and the agricultural bookkeeping offices.

3. Not only the credit market is little developed but also that concerned with the purchase of farm requisites and sale (including processing) of agricultural produce.

There is no adequate distributive system in rural areas yet. The sales both on the home and foreign markets still cannot satisfy the essential requirement of stability in quality and supplies of agricultural produce, a fact which is detrimental both to producers and consumers. For this purpose a special service has been established by the Ministry of Agriculture for the marketing of agricultural produce, comprising a central depot in order to stabilize the local market and to prevent strong price fluctuations; this service is doing pioneer work in this field, in co-operation with research and extension.
The extension services are likewise collaborating with the agricultural technology section of the Research Station in the implementation of individual and collective subsidy system in an effort to popularize storage installations for rice, dehydration installations for cacao, etc.

4. The inadequate training of the rural population, heterogeneous in race, origin and attitude and the concomitant lack of initiative constitute one of the greatest stumbling blocks in the path of rapid development. Therefore agricultural organizations in general and the co-operative system in particular have not had a chance of developing. The population thinks rather in terms of traditional product economy than in terms of modern monetary economy. Economic thinking and action have not developed much hitherto.

In essentially agricultural countries, like most developing countries are, agricultural extension is faced with a very important task, but in the light of the conditions outlined here, it is also a difficult task in view of the accelerated development aimed at. The conditions for an increased productivity in agriculture which must provide for the essential needs of life and the welfare of the rural population, which is closely linked to this productivity, particularly in those countries, have been satisfied to a limited extent only. The extension service, which in many developing countries such as in Surinam, is practically the only field service of the Ministry of Agriculture, is faced with an important task in view of the limited facilities available in the rural areas. The rural extension services therefore aim at the overall development of rural areas whereas in a country like the Netherlands the agricultural extension service is ever more concentrating on technical and economic farm counselling. The methodology of extension is evidently influenced by this situation.
Some aspects in regard to the scope of extension are preconditioned by the circumstances described above. In general the following aspects will have to be considered:

a. Specialization in the extension services may be limited to a modest scale in view of the relatively low level of development of the farm and rural household; specialization of agriculture and agronomics research have not reached an adequate level of progress either. Consequently animal husbandry and horticultural extension — for which sectors only a few specialists are available at the central office — come under the jurisdiction of one and the same agricultural extension service. Agricultural extension work is mainly concentrated upon specific aspects of farming, such as increased production per head of cattle and per acreage-unit (average milk yield is 700 kg per cow as compared to 4.000 kg in the Netherlands). The most

important goal is the introduction of high-quality selected propagation material for crops and cattle, as well as the introduction of chemical fertilizers and the control of diseases and pests; all these measures are rather simple single means aimed at increasing production and do not give rise to any complications in the general management of the farm. Increased production is almost always economically justified in terms of productivity, also with regard to the intensified utilization of the family labour available.

This applied to the Netherlands too until about 1950. From that time on the extension services concentrated more on farm management, that is to say, the operation of the farm as a whole, in view of the high level of production that had been reached, and further, also due to the rapid structural changes, they concentrated also on farm and labour organization and on financing in regard to rational investments.

However, in the backward agricultural areas of the Netherlands where the production level is less high, the extension services in the so-calles pilot areas are endeavouring almost automatically, and in the first place, to increase production.

Yet the need for farm economics research and training of the extension personnel in this respect is gradually becoming an urgent problem, also in Surinam. The growing trend towards mechanization which is not only based on economic motives alone, calls for this development if mechanization is to be applied in a justified way.

Good farm planning is essential in development projects such as the establishment of new farms in the newly reclaimed polders. In this respect it is regrettable that the extension services have not been called upon to co-operate in the advise with regard to the type of new farms planned and to extension in regard to the supervised credit systems in the new polders, which would help this service to enlarge its hitherto limited experience.

In view of the heterogeneous composition of the agricultural population in Surinam — according to racial origin and historical background as well as mentality all of which will influence the process of development — socio-agrarian research could provide more concrete indications to the extension services in the case of reclamation schemes, the construction of barrages etc. necessitating the shifting of certain population groups. Such research is particularly necessary when the extension officers are not of the same racial origin as the local population, as is the case in Surinam.

b. Integration of family and farm in extension is of particular importance in developing countries. The household is closely linked to the farm and as a consequence of inadequate agricultural educational facilities in rural areas, rural youth extension assumes a special importance. In Surinam — as also in Latin American Countries under the influence of technical assistance offered by the United States — rural home economics is relatively substantial, comprising approximately 25 % of the total numbers of agricultural extension officers.

Although agricultural extension in Surinam has been practised in one form or another for 50 years, it has only begun to concentrate on this activity since 1894. In 1954 rural home economics and in 1957 rural youth extension services were founded; from the very start they formed divisions of one overall rural extension service. The provincial director of the agricultural extension services directs the rural extension team whereas the technical subject matter aspects and the way of approach are the responsibility of the personnel of the individual divisions mentioned above. Rural home economics have not only been very successful in actual practice but are also of great direct importance for the general prosperity of the farm family in

view of the limited capital at the disposal of the latter. This particularly applies to clothing, vegetable gardens, efficient preparation of food and nutrition (for which a separate programme was drawn up in 1958), child care, hygiene, home furnishing (in 1957, pilot homes were introduced at the same time as in the Netherlands) and the stimulation of cottage industries. Rural youth extension assumes particular importance in view of the need of future leaders for the agricultural organizations hitherto little developed for which this branch of extension can serve as a "nursery" school.

The co-operation of agricultural extension with other services in order to promote productivity in agriculture is generally very far-reaching and where such services do not (yet) exist, the advisory services are doing pioneer work in that field. The former case (co-operation) is found in the fisheries service, in regard to fresh water fisheries and in particular sawah fishing — an effective use of inundated fallow land and weed control — and with regard to the veterinarian service in the control of animal diseases. The latter case (substituting for non-existant services) arose in land and water improvement projects. From the very beginning, the agricultural extension services were charged with putting into effect certain simple technical measures as to land improvement in order to better make known their importance for actual practice. The success obtained in this manner has helped to establish a land improvement service though still on a modest scale, for the "old" land so that nowadays the extension service can confine themselves to counselling in this respect. The extension service also participates in the compulsory inspection of certain crops such as e.g. rice. With regard to cacao destined for export, this work is carried out by the staff of the agricultural research station.

c. Administrative tasks are likewise effected by the agricultural extension services — familiar with local conditions — in the absence of other field services. These tasks include the collection of data for agricultural statistics, e.g. registration of acreage, sampling, a.s.o. This work occupies a great deal of the working capacity of the extension services. On the basis of a report elaborated by a Dutch Technical Assistance Expert, endeavours are now made ao collect these data more efficiently and to process them centrally in a newly established agricultural statistics division of the Department of Agriculture.

d. A distributive apparatus both for purchasing and sales is practically non-existent so that the extension services are likewise closely associated with this activity. They act as intermediaries in the distribution of ever larger quantities of seed, fertilizers, pest control, chemicals a.s.o.

Thus the danger arises that the extension service might become too closely associated with the marketing organization of agricultural produce; some failures in this field have affected the population's confidence in the co-operative system and in the extension service for quite some time. Nevertheless the promotion of agricultural organizations in general (among them water control boards) and of co-operatives in particular, with regard to purchasing, marketing and credit, constitutes some of the most important aims of agricultural extension. In the Netherlands, these activities were likewise promoted by the extension services in the past, although there the pioneering task was performed to a great extent by the vocational teachers in agriculture.

A special aspect of extension concerns the inaccessible interior inhabited by bush Creoles and Indians. This aspect is of interest because of its social implications and it is particularly important when these populations migrate to the towns for which

move they are mentally not fully prepared. This branch of the extension services is handicapped by a limited staff which at the same time has to be mentally adjusted to deal with these problems. The catholic and protestant missions in these areas are rendering valuable work with regard to simple but effective agricultural education.

3.3. Working procedures and methods in extension

Extension methods in a developing country like Surinam are determined by the fact that they often represent the only field service at the disposal of a backward agricultural population in rural areas that also lack adequate infrastructur. The agricultural development to be fostered by the extension services is hampered by limiting factors of production and living conditions and by the lack of other facilities. Therefore, as already stated, routine and administrative jobs must be performed which are not the direct concern of the extension services and require a great deal of time; these activities ought to be carried out by other personnel, possibly under the supervision of the extension services.

Also in more highly developed countries, like the Netherlands, care must be taken to avoid burdening the advisory staff with routine- or administrative activities. This holds particularly true for the local extension workers. A recent survey in the Netherlands revealed that local extension offices spent an average of four fifths of their working time on counselling of which two thirds on individual counselling, including a substantial proportion of farm management counselling. Group extension only took up one tenth of their time.

More particularly, tasks with a supervisory and controling activity (inspection of agricultural produce, supervision of whether farmers comply with water management regulations) are incompatible with extension work proper that must be able to rely at all times on the full confidence of the population. It is therefore richt that, as already mentioned, a separate division of the Department of Agriculture has been entrusted with the selection of colonisers of the new polders and the allocation of supervised credit to them. As in Surinam, the reclamation of new polders in the Netherlands comes under the jurisdiction of a different Ministry, in urinam it is the Department of Reconstruction and in the Netherlands the Ministry of Public Works. It is also right that the extension services are not directly concerned in the implementation of public works such as water control measures. The inundation of polders that occurred in Surinam in 1958 must not be ascribed to seeming shortcomings of the extension services. Therefore rightly a different authority was entrusted with the task of carrying out land and water use measures. In the Netherlands this latter service has developed particularly since the war into a relatively fast apparatus that is charged with structural improvement projects with a view to external production and partly living conditions in rural areas; these projects are carried out by firms specialized in this field.

It is not desirable either that the extension services be directly concerned with the establishment of co-operatives. Failures that have occurred in the past, e.g. the shipping of oranges from Surinam to the Netherlands on common account, a project that was literally shipwrecked, or the rice-quota co-operatives in 1953 that were abused by some traders, and the failure, in the first instance, of a coconut oil mill due to inadequate technical facilities of the plant in question, have all served as a lesson and a warning. The stimulation of the co-operative mentality is much more desirable. Meetings of an informative character have proved highly successful in this

regard. A nucleus for the stimulation of local associations — a kind of extension association — of farmers for the rationalization of certain crops appears to have given satisfactory results. The progress of Dutch agriculture derives in the last (and most important) resort from the increased participation of the farmers in their own highly developed and specialized organizations of a technical, economic, social and cultural character. It is an accepted fact that the dense network of agricultural education in the Netherlands has substantially contributed to this progress. The extension services had a considerable share in the development of co-operatives, particularly in horticulture.

Although programme building of the rural extension services, including home economics end rural youth services is carried out (within the limits imposed by the personnel advailable in the respective districts) according to existing rules throughout the country it is almost entirely carried out by professional personnel, without any appreciable participation of the population. Yet this participation must be considered a condition sine qua non for extension in general and extension programme buildinng in particular.

One might assert that in a more developed country, programme planning in the comprehensive and integrated sense, as a co-ordinated systematic working procedure in extension, is possibly more difficult to achieve in view of the widely differentiated services and authorities concerned in extension work. For that reason the Netherlands will begin with a more integral extension programme building only in 1961 within the framework of the agricultural extension councils in which the governmental extension services and the private rural organizations are participating.

As regards the premium system which is frequently applied in Surinam for stimulating a rational production, the experience obtained — as also in the Netherlands — is that one must proceed with the necessary caution. This system must not go further than to encourage the farmers and to induce them to more active participation. Otherwise such systems tend to degenerate rapidly into camouflaged subsidies upon which the population relies without fully or effectively utilizing the subsidized projects within the framework of their farming activity. — In the Netherlands the premium system in extension originated during the thirties and developed gradually from so-called "project" premiums to farm rationalization and lastly pilot area schemes, in which the premiums as such are constituting an ever lesser amount of the total additional extension activity and in the meantime the group approach versus the individual approach did expend.

Extension methods are lastly also determined by the density of the professional advisory personnel. This density is relatively great in Surinam with regard to agricultural extension. A summary of the activities of the agricultural extension service demonstrated that an annual average of 4.000 farm visists is made and a similar number of individual counselling acts is carried out at the advisory offices, distributed over a total of about 20.000 farms.

In the Netherlands where individual extension methods are rather intensively applied, it is estimated that more than one third of the farmers entertains regular contact with the local agricultural extension officers, one third has occasional contact, one fourth has no direct contact. Only ten percent of their working time is devoted to group methods. In Surinam no pilot farms have as yet been established. These latter were most effective in the Netherlands, particularly in areas where small family-sized farms are dominating. In Surinam — and likewise in the Netherlands — a combination of pilot farms with pilot homes would be highly desirable.

Demonstrations are generally considered to be the cornerstone of extension methods, particularly in developing countries. The introduction of the competitive element in extension with prizes in KIND (seed, seedlings, fertilizer, chemicals for pest control) might have fruitful results.
In home economics extension in Surinam group meetings and demonstrations occupy a relatively large place like in the Netherlands. This also applies to rural youth extension which is highly significant in view of the low state of development of (agricultural) education. These two branches of extension devote a great deal of attention to the selection and training of local leaders. Farm visits made in areas outside their immediate surroundings help the farmers to distantiate themselves from their traditional way of farming, and are to be considered a valuable aid in extension in those rural areas which are still rather inaccessible. In the Netherlands too this extension method is applied in pilot areas. Evidently, audio-visual aids will be welcome complements to individual and group methods in extension. However, the actual effect of such mass methods should not be overestimated as has been proved in the United States recently. In the United States as well as in many European countries and Surinam, so-called "information services" were established in the post-war period side by side with more or less developed agricultural extension services; these information services will have to be integrated into the extension services in order to become fully effective.
In view of the heterogeneous ethnological composition of the rural population in Surinam it is finally desireable for the extension staff on the local level to understand and speak the language of the population group concerned, both in the literal and the figurative sense.

3.4. Extension staff

The extension service in Surinam dates back fifty years and took its origin from the Agricultural Research Station. The agricultural extension service as a separate organization took its origin in 1948; the rural home economics extension and rural youth extension services were combined with the former in an exemplary manner in 1954 and 1957. There is only one academically trained agronomist (from the Imperial College of Trinidad) at the head of the entire service. The sections which coincide with the 6 administrative districts of the country and are partly again subdivided into sub-districts are for the major part headed by officials having graduated from an agricultural high school (the Tropical Agricultural Highschool in Deventer, the Netherlands). They have a staff of 100 assistants in all, the majority of khom has had elementary schooling only. The proportion of the latter to the former is approx. 3 : 1.
In the Netherlands this ratio, although on a different level, of academically trained personnel to graduates from a secondary of higher agricultural school is 7 : 1.
Prior to the last war, the agricultural extension service in Surinam, having to satisfy the growing requirements as the only available field service and in order to deal with actual extension problems, began to employ peasants' sons who got practical training in carrying out routine work and simple counselling in their immediate environment. The original aim was that these youg men should return to the parental farms after a few years' service in order to implement what they had learned and thus to form local leaders in extension. However, this plan did not work out and as a rule these "leaders" remained in the service and were in the long run promoted

to local, sometimes even to regional extension workers on a permanent base. In view of the fact that the leading staff of the extension service is of a different racial origin than the population to be couselled this system of "leaders", who are often selected from the major racial group in the area concerned, must be considered to be very useful, since these leaders act as contact persons with the population.

We notice that the same development took place in the Netherlands almost simultaneously. The assistant advisers — graduates from the agricultural winter school, of the so-called Smallholders Service established in 1936 became gradually absorbed in the agricultural extension service as a whole, which expended in postwar years rapidly. Gradually these non-academic trained extension workers formed the back-bone of the agricultural extension service, particularly on the local level.

The division of rural home economics employed the first qualified rural home economics teacher in 1955; this teacher is now head of the department assisted by an expert of the American Office of Technical Assistance. In 1956, work was started in one district, and in 1957 two further districts followed. Gradually the nimber of home economics extension workers is growing so that at present every district has a rural home economics expert. The lack of office space and housing in the districts constitutes a problem. The staff at Paramaribo devotes a substantial part of its time to assisting in programme planning for rural home economics and to the training of apprentice home economists. These latter receive further training in special courses organized at Puerto Rico. The comparatively inadequate training still forms a stumbling block for the development of rural home economics extension. Liaison is maintained with the domestic science school at Paramoribo which has been organized in an exemplary manner. The results achieved, despite the scarcity of personnel, deserves respect.

3.5. Internal organization

Extension must in principle adopt a substantial degree of decentralization in view of the great diversity of agriculture and of the rural population. The latter aspect is particularly pronounced in Surinam. This applies also to the quantity and quality of the extension staff to be located in the respective rural areas. The latter, that is to say, the quality of the extension staff is of particular importance in a developing country like Surinam in view of the great and difficult task, taking into account the wide scope of extension already mentioned and the necessity to accelerate the development under limiting conditions. A high degree of decentralization may go along with the necessity of co-ordination at the central and more particularly at the regional level, which however does not need to correspond with a great number of personnel at the central office, as this might tend to centralization again.

The Central Agricultural Research Station in Surinam has a highly qualified staff which compares favourably with the staff employed for extension and education. The staff is composed of twelve academic trained persons and ten persons with secondary school education, whereas the division of agricultural extension has two academically trained (or equivalent) persons and twenty persons with secondary school education; the division of agricultural education has no academically trainded staff at all, but is staffed by five persons with a secondary education at the central department.

It is doubtful whether this proportion should be considered to be right. The agri-

cultural extension service should be able to have at its disposal a proportionately larger number of university graduates or officcers of equivalent level. Besides, the rural areas should have at their disposal a number of academic trained agronomists, if necessary at the expense of the Department in Paramaribo, the capital. Such a move would certainly benefit the development of rural areas in Surinam.

As already stated, the principal extension officers of districts and sub-districts are mainly graduates of higher agricultural schools; the field staff has no academic trained staff. Practically all the academic trained agriculturists, i.e. 25 in tqtal, are at present concentrated at the Departments in Paramaribo.

In the long run it would however be desirable to entrust the direction of the 6 rural districts — which will be maintained as a unit in view of the fact that they also form an administrative unit — to an agronomist with scientific training. Let us state right away that too formal a link with pre-service-training is not meant here. It should remain possible to entrust with the direction those selected persons who may not have had academic training but who have proved to possess leadership in their practical work, as is the case with some of the present-day district leaders. It has already been stated that this increased accent on academic education does not necessarily entail an overall expansion of the academically trained officials. A relative quantitative shift of the agronomist staff from the capital to the districts can ultimately only be beneficial to the reputation of agricultural extension. Moreover, the advantage attaching to such a move is a psychological one: the rural areas will have higher staff members able to assist the local government concerned to enhance the value of rural life in the light of the frightening rate of urbanization. In view of the gradual opening-up of the rural districts it is also possible to gradually comply with this requirement. The appointment of leading personnel in the rural districts, with special indemnities, should in no way be regarded as discriminatory.

As regards the field service, a greater uniformity might be desirable in the present-day subdivision into districts and sub-districts. It is further desirable to staff the future districts as much as possible according to the number of farms and the acreage under cultivation. The Department of Rural Reconstruction together with the division for Agricultural Statistics of the Department of Agriculture have elaborated the necessary objective criteria for a proportional staffing of extension personnel.

Every district should be subdivided into several sub-districts according to the number of farms and the surface under cultivation; persons with a secondary agricultural education could be in charge of these latter; this system would therefore include a number of the present-day district and sub-district leaders. Moreover, an adequate number of assistants should have to ensure continued, direct and personal contact with the farms. These local extension workers could serve approx. 100 holdings taking into account the total number of personnel employed presently. They would have to be selected from farmers' sons with practical experience and with a good general education adapted to the circumstances of rural areas in Surinam. Since there are no agricultural schools in Surinam yet, these leaders could be trained by the advisory staff in conjunction with the staff of the Agricultural Research Station and of the division of Agricultural Education.

As regards the functional organization finally, emphasis remains to be given to all-round advisers for field service in view of the level of development of the Surinam farmers and of agriculture as a whole. The staff members of the Research Station act as specialized extension officers for farming on a plantation scale.

3.6. Relation of extension with research and vocational teaching

Each of the three allied services, namely extension, education and research must be attributed equal importance. A close liaison between these three equivalent branches must be considered a primordial condition for the effect of each of these branches on productivity in agriculture and rural welfare in general.

Practical experience has shown that if extension is to work effectively and lasting by, it must be preceded by as complete as possible an agricultural education in the "why's", whereas applied research will have to supply the necessary basic material for education and extension which latter can play an useful part in the planning of central research and the implementation of research on a regional basis to the mutual benefit of both disciplines. In the Netherlands this basic principle has been applied wherever possible. In many countries, particularly in developing countries, there is a trend of building up the central research institutions (as a consequence of the inaccessibility of many areas) and to devote relatively little attention to agricultural education and extension and.... applied research, including experimentation work on the field level.

In the Netherlands, agricultural education originated in 1875 when the first agricultural school was founded, followed by agricultural research: the first agricultural experimental station was established in 1876. Later, in 1890, the first governmental agricultural teachers — later governmental agricultural advisers — formed the beginnings of extension as an organized service; it was preceded by the employment of some itinerant agricultural teachers by the provincial agricultural associations in the eighteen-seventies.

In Surinam agricultural research started in 1904 and, as already mentioned, it has reached a relatively high level, in regard to the staff available there.

Historically it is not only the oldest institution but has aldo continued as rather autonomous development until the present. In the period from 1926 to 1949 it was even a separate department of the governmental authorities; thereafter it became a special division of the Ministry of Agriculture.

Agricultural extension developed later out of the Agricultural Research Station. During the period from 1905 to 1920 some advisory personnel was added to the staff of the Experimental Station in order to assist the subsistence level peasants. As already stated, the Research Station has remained the most important advisory authority for agriculture on a commercial basis (plantations).

Although the leading staff of the extension services was reduced during the crisis of the thirties — as opposed to the Netherlands — the lower ranks of extension workers were expanded prior to the war, which was also the case in the Netherlands. In the post-war years, the extension services were considerably expanded, as also in the Netherlands, where this expansion has likewise affected research and education. As a consequence the extension services in Surinam are now proportionally, with regard to financial means and manpower, even more intensive than those in the Netherlands.

The contact between research and extension has been growing closer in Surinam in recent years. The extension service is represented in working parties, planning research as to the different crops. Extension personnel to be newly employed undergoes a training period of 6 months at the Experimental Station. On the occasion of monthly in-service meetings of the extension staff — who have to undergo a

further training period of one month at the Experimental Station every three years — there is an opportunity of exchanging ideas between representatives of research and of extension. It would, however, be desirable to have some research officers detached temporarily to the rural areas to study some urgent problems in actual practive. What has been stated about the relatively less developed extension service in regard to pre-service training, if compared with research does not imply that research should be imparted less significance. The recent outbreak of an unknown disease affecting the rice crops (Hoja blanca) has proved that point.

Although the Education Act of Surinam, making the education of children compulsory, dates a long time, the general educational level of the rural population has remained rather low; the hinterland has remained largely inaccessible and therefore there are not enough competent teachers available for the schools. As recently as 1954, a resolution laid down that the head of an elementary school in the capital had to have the headmaster's diploma (nearly identical to that required in the Netherlands), whereas the assistant teacher's diploma is considered sufficient for the districts.

The first agricultural course dates from 1906, when staff members of the Agricultural Experimental Station acted as lecturers. In 1915 the first course for the training of agricultural teachers took place according to the Dutch example; this was followed in 1953 and 1956/58 by two further courses lasting for 2 or 3 years. At present ten agricultural teachers run some 20 two-year general agricultural courses on two afternoons or evenings a week. In view of the fact that these teachers remain resident in the capital, only relatively small area of the countryside — in the vicinity of the capital — is covered by these courses; moreover, the acceptance of the theoretical courses by the men of practice is subject to some doubt. As late as 1948, the Ministry of Agriculture organized a division of agricultural education headed by a former district chief of the extension service. A valuable initiative was taken by this division with the publication of a periodical "Agricultural News" with an issue of 6.500 copies which is rather large considering the total number of approx. 20.000 farms. This publication is very important since it transmits simple knowledge in the field of agriculture and spreads Dutch as one common working language amongst the rural people. School kitchen gardens have acquired great importance as a first attempt at teaching the yougsters some knowledge of agriculture and of acquainting them with vegetable growing so that more vegetables are eaten. These kitchen gardens have been laid out in some 50 rural schools; at the same time, some practical agricultural subjects have been included in the curriculum. In the implementation of present-day plans for the expansion of continued education in rural areas, the training of male agricultural and female home economics teachers for rural schools and the establishment of elementary agricultural schools according to the (former) Dutch model would seem effective. In the Netherlands agricultural teachers were incontestable among the promotors of agricultural development and have acted as pioneers of extension.

Since the training of the rural population is indispensable to the promotion of the still very poorly developed rural organizations a closer link between education and extension would be highly desirable. The latter could e.g. contribute practical hints to the periodical mentioned and could furthermore participate in the organization of practical courses.

At the present moment, elementary agricultural education should be extended as a first measure, by means of courses and elementary agricultural schools; the time

is not (yet) ripe for higher (agricultural) education. A similar development was observed in the Netherlands in the past. The failure of a higher agricultural school recently established in Surinam has proved that. Higher agricultural education can at present best be obtained abroad, so that future officials of the Ministry and possibly also some managers of plantations can be trained. For this purpose students go to the tropical agricultural highschool in Deventer and a few to the agricultural university in Wageningen. The Imperial College of Agriculture in Trinidad appears to be more attuned to the actual practice of tropical agriculture as we find in Surinam.

Surinam will be able to fulfil a valuable function as a tropical area within the Kingdom of the Netherlands, in affording a better practical training to Dutch and Surinam agronomists. By more intensive co-operation between the Agricultural University in the Netherlands and the Agricultural Research Station in Surinam, as has been planned recently, greater competence could be achieved in tropical agriculture which will be of value in technical assistence programmes within a wider international sphere.

3.7. Intellectual investments in agriculture

Let us quote some comparable figures in order to indicate the great value that the government of Surinam has attributed to intellectual investments in agriculture in order to accelerate its development.

For the financial year of 1958 the agricultural extension division had a budget of S.fl 6.000.000 or 25 % of the entire budget for agriculture, animal husbandry and fisheries. Of this amount approx. S.fl 100.000 have been set aside for direct material aid to the rural population, such as paddy seed, artificial fertilizer, insecticides, chemicals for spraying and machinery. An amount of S.fl 450.000 is available for the division of agricultural research of the Agricultural Experimental Station, and S.fl 50.000 have been set aside for the division of agricultural technology, that is a total of S.fl 500.000. If half of the expenditure for the Animal Husbandry Service is added to agricultural research (i.e. S.fl 100.000) the budget for research will be identical to that of extension. A sum of S.fl 150.000 is destined for agricultural education, i.e. one fourth of the amount spent on research or extension.

Within the framework of the Ten-Year-Plan an amount of 1 million Surinam Guilders has been appropriated for research, extension and education; this amounts to S.fl 100.000 p.a. or 20 % of the total amount set aside for these services.

For the sake of comparison we would indicate that the department for land improvement has been allotted S.fl 200.000 for the ordinary service and approximately the same amount for the additional service in the budget, i.e. a total of S.fl 400.000. Fisheries have an appropriation of S.fl 100.000 and the still very young Agricultural Marketing Service has been allotted S.fl 50.000.

This means that an overall amount of 2,5 % of the value of the total agricultural production is spent on agricultural extension, an identical amount is devoted to research in that field and 0,75 % to agricultural education, i.e. a total of 6 %. If this is computed per hectare of land under cultivation, we find an annual investment of S.fl 10 to 15 in extension and research, S.fl 4 on education, i.e. roughly a total of S.fl 30 per hectare of land under cultivation for the three branches, or capitalized (taking into account the rate of interest applying in Surinam); approx. S.fl 400 per hectare. In this context I should like to recall that the government

invests amounts varying from S.fl 200 to 700 per hectare for land reclamation and improvement.

Although conditions in Surinam differ totally from those in the Netherlands due to difficulties of transport and the envisaged accelerated development we may mention for comparison's sake that during the same year, the Netherlands' government spent on its (relatively intensive) extension, research and education system 20 million (of which 5 million for backward regions and farms), 25 million, and 30 million Dutch guilders respectively; that is 0,4; 0,5 and 0,6 % or a total of 1,5 % of the gross value of the agricultural production of the Netherlands. This equals D.fl 7.50, D.fl 10 and D.fl 12 per hectare respectively or a total of D.fl 30 (after capitalization D.fl 600) per hectare. During the same year, the Netherlands' government has spent approx. D.fl 3.000 per hectare on technical development projects ("new style").

The foregoing reveals that intellectual investments in Surinam as a developing country are relatively great. They are comparatively greater than in the Netherlands, which country ranks first in this regard amongst the more developed countries.

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