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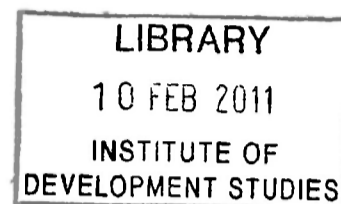
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INTRODUCTORY CHAPTER TO:  
"INNOVATION AND EQUITY IN RURAL DEVELOPMENT  
RESEARCH AND FIELD EXPERIMENTS IN KENYA"

by

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of

"INNOVATION AND EQUITY IN RURAL DEVELOPMENT:  
RESEARCH AND FIELD EXPERIMENTS IN KENYA"

(As proposed Feb 1973)

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CHAPTER 1. INTRODUCTION

1.1. HISTORICAL ROOTS

1.1.1. Tribal Beginnings.

The broad pattern of change in Africa in the past century is perhaps familiar. The usual point of departure, the tribal society, was, though highly sophisticated in its elaboration of relationships between people, vulnerable in the relationship between people and environment on which livelihood depends. The arsenal of technologies for manipulating the environment was small, so that many of the environmental vicitudes which impinge upon well-being could not be controlled. The pantheons of Gods and spirits, as well as the important role of magic and witchcraft, attest to the uncertainties of tribal existence.

The relatively low level of technology implied that only small surplusses could be generated, so that most members of the tribal society had to engage in subsistence activities; while only few could specialise in trades and crafts. The low ceiling of well-being dictated by the level of technology meant that even those, powerful enough to collect whatever surplus was generated, could use that wealth only to buy allegiance and services and not to buy freedom from the hardships and uncertainties faced by the common man. Meanwhile, fiercely democratic traditions mitigated against the emergence of a landed gentry and other elites.

The resultant of such forces was a very egalitarian society, further equalised by an elaborate system of mutual obligation and aid between clansmen and members of the extended family. The similarity in lifestyles within the tribal society was, in fact, so great that early anthropologists had no need for statistics. One could describe the house, the food, the dress, etc., which characterised all members of the tribal society.\*

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\* See for instance, J. Kenyatta, 1938, p 81-83, on the Kikuyu house

Meanwhile, technological change was slow, so that there was ample time for beneficial technologies to spread to all, without disrupting the egalitarian structure.

The relative abundance of land made labour the scarce resource, especially in East Africa where the major tribes had only settled a few hundred years ago and were still in the process of expanding their frontiers. But then, very strenuous labour on subsistence crops was only required during certain peak periods, leaving much time to maintain the elaborate social structure. Thus underutilised land and labour resources were, as we shall see later, an important feature of the tribal society.

1.1.2. The Colonial Period.

It was this egalitarian tribal society which became part of Europe's periphery. After an initial period of disruptive trade in slaves, ivory, gold, gin and guns, the situation was formalised by the Treaty of Berlin in 1885 which allotted Africa to the colonial powers without regard for tribal boundaries. The Treaty initiates a 70-year period of colonial rule with only few changes, such as the birthday gift of Queen Victoria to Kaiser Wilhelm, Mount Kilimanjaro, and the subsequent deposal of the Germans of their African territories after the First World War.

The impact of Colonial Rule on the tribal society was immense and varied. For our purposes, mention of only a few of the main effects suffices.

Most important was, perhaps, the introduction of money, both in terms of generating a need for it and in terms of introducing methods for obtaining it. The need for money was generated, not only by introducing taxes, which forced people to sell surpluses, but especially by the demonstration effect of the products...



of the sophisticated European technology which created a strong desire for cotton dressed (many so-called traditional dresses still reflect Victorian styles), iron sheeted roofs, methods of transportation, medical services, steel cutlasses, etc. The introduction of European technology implied a discontinuity in the gradual evolution of African technology and destroyed much indigenous initiative. (Roalney, 1972, p 114).

The introduction of methods for making money depended upon the co-incidence of Europe's need for agricultural products which required a tropical climate, such as cocoa, spices, rubber, palm-oil, coffee, sugar, etc., on the one hand, and the existence of the under-utilised labour and land resources in the tribal society on the other. Soon after the formalisation of the Colonial structure, Africa's hinterland was linked to convenient ports by a network of railroads, which allowed the evacuation of the agricultural products needed by Europe's markets.

Sometimes, the effects of the new need for money preceded the efforts of the colonial power to supply its home market, as in case of Western Nigeria where cocoa spread very rapidly without the help of a single extension worker and before a good transportation network allowed evacuation of the produce to Lagos. In fact, Yoruba elders can still tell of the times when people would trek for days to carry a few kilos of cocoa beans to the nearest produce buyer.

In other cases, the colonial power tried to promote the production of "cash crops" in places where a sufficient need for money had not yet been generated, leading to the temporary phenomenon of the "backward sloping supply curve", the economic model for a situation in which people have a target income so that they supply less if the price of their product rises.

Whatever came first, the colonialist's need for tropical produce or the tribal man's need for cash, the ultimate effect was the addition of a cashcrop to the tribal subsistence farm, a cashcrop which utilised the surplus of land and labour available and therefore did not greatly affect the system of subsistence farming itself. In some cases, as in Kenya and Rhodesia, where climate and natural environment compared favourably with Europe, white settlers started to produce the cash crop. In such places, the need for money generated among the Africans soon necessitated prohibition of African production of cashcrops, such as coffee.

Thus Africa was effectively incorporated in the periphery of Europe and made completely dependent upon the European market for its monetary economy. Large quantities of cash crops were produced at a low price, but total demand for industrial goods remained low. Even today, the combined demand for industrial goods of Kenya and Uganda does not exceed that of Manchester, England.

The administration of taxation, law-and-order and cashcrop production required a bureaucratic structure to maintain it. The higher echelons of this civil service were, of course, filled by Europeans. The lower echelons, the policemen, chiefs, extension workers, clerks, etc., and the supportive services of house-servants, messengers, drivers, etc., were filled by Africans. The administration's need for skilled labour, shops and special services was usually filled by non-autochthonous groups, such as the Asians in East Africa and the Lebanese, Greeks and sometimes ex-slaves, in West and Central Africa. Only when the colonising power was poor itself, such as in case of Portugal or Italy, did citizens of the colonial power provide such services.

The administrative structure required money to maintain itself. Since the cashcrops were the only source of money, apart from mining in a few areas, an

essential feature of the colonial system was the taxation of the cashcrop. Elaborate Marketing Boards with the monopoly of buying and exporting produce, were usually created and allowed the concentration of sufficient surplus to permit an upper-class European lifestyle for the Colonial Administration.

1,1,3. Towards Independence

The system was not foolproof. The seeds for its destruction were present from the start. We have seen that the tribal society needed a Pantheon of Gods and spirits to account for those events which could not be controlled by indigenous technology. It soon became evident to the African that European technology could fill much of this vacuum. Besides, the European technology demonstrated beneficial outcomes, such as cotton dresses, which were hitherto unknown to tribal society.

The result of such processes was the rapid spread of desires to benefit from the new technology. The small enclaves of wealth in the colonial capitals did thus not exist in splendid isolation. They had a profound effect on the tribal society by making it poor by comparison, that is, by generating a gap between African desires and outcomes. This gap motivated the tribal society to tremendous efforts to improve its outcomes.

We already saw how these efforts led to the very rapid diffusion of cash crops. But the efforts made themselves felt on two other significant fronts as well. In the first place, the new poverty unleashed equalising forces seeking the distribution and leveling of the accumulations of wealth in the colonial enclaves. The emergence of these forces becomes evident if one compares Countess Blixen's description of her Kenyan paradise, where doors and windows could be left open at all times, with present-day Kenya where the rich

have to protect themselves with thiefwire, burglar alarms, fierce dogs and the services of the mushrooming private protection companies.

In the second place, the desire for education as a means of advancement spread rapidly. At first people resisted it. Stories tell of chiefs who sent slaves to school instead of their own children, much to their regret when those slaves were later placed in positions senior to them or cheated them in landcases. An Ibo elder told one of the authors with similar regret how his ability to outrun the chief's assistant accounted for his present illiteracy.

But the initial resistance to schooling soon changed to wholehearted acceptance when it became obvious that schooling opened the doors to initially junior, but later also more senior, positions in the colonial administration which provided enough money to partake in the benefits of Western technology. Education became so popular that missionary societies could use the provision of education as the main carrot for spreading the gospel.

The rapid spread of, sometimes advanced, education and the concomitant rise in understanding and self-confidence, soon combined with the equalising forces generated by the enclaves of colonial wealth to erode colonial supremacy. This erosion was only aided by the fact that the colonial power usually felt conscience-bound to provide health services (though not an equitable opportunity structure) which led to an unprecedented population explosion which put further pressure on the enclaves of wealth. A case in point is the Mau Mau uprising against the Kenya settlers largely for the sake of land which often had not been part of the original Kikuyu settled area.

It is such forces which eventually led to Independence in the decade between 1955 and 1965.

1,1,4. After Independence.

As we observed, the new poverty not only motivated a search for methods to increase the cake through innovation and education but also released pressures for redistribution of the cake, especially where the accumulation of wealth in the colonial enclaves was concerned.

Immediately after Independence, the first order of business was redistribution, not so much from rich to poor, as well as from non-African to African. In fact, the period was characterised more by a game of ethnic musical chairs than by structural change. Africans simply filled the positions vacated by the Colonialists. They took over their houses, leave benefits, salaries, etc and adopted their upper-class lifestyles with a vengeance, often stopping at little in their pursuit of wealth -no longer ceiling-bound.

For the people it was immensely gratifying -and hope-raising- to see brother Africans take over the colonial enclave. In fact, it seemed for a while that the equalising forces and the high hopes raised in the political campaigns leading to Independence could be satisfied by the game of ethnic musical chairs. No matter how much Africans accumulated, as long as it was Africans doing so, the masses seemed satisfied with such fruits of Independence. And, as long as colour-based differences in wealth persisted, the efforts to redistribute wealth from Europeans and Asians to Africans could continue to occupy the headlines.

But there is little to distribute and the basic structure has not changed very much. There is still an upper-class enclave, supported by creaming off cash crop production. There is still a supportive cadre of junior staff, shopkeepers, organized laborers, small traders and such. And there is still the tribal peasant society, with its new desires but basically unchanged

outcomes, which normally makes up around 90% of the population. Within this basic hierarchy, a fourth category continues to emerge: Those who no longer find a future in farming due to the growing scarcity of land, the decreased viability of the rural area or the expectations raised by having acquired some formal, though often irrelevant, education. These people thus seek to escape from peasant life by finding paid employment as beer/changaa brewers, petty traders, shoe shine boys, hawkers of lottery tickets, maize roasters, prostitutes, artisans and other jobs in what is usually called the "informal sector". It is to this category that the call of "back to the land" is frequently directed.

Admittedly, some African Governments have gone far in their efforts to create an equitable opportunity structure. Admittedly, also, the new African Governments have done much to stimulate the adoption of income-, and welfare-generating innovations among the rural tribal masses. Admittedly, finally, there is a softening of income differentials by the adherence of the first-generation elites to the traditional system of mutual obligation and aid.

But the new poverty is spreading fast and the population continues to grow extremely rapidly (3.3% in Kenya). Thus the equalising forces are still at work. And the day when the last Asian or European has been expropriated and the last acre of unused land has been allotted is drawing near -and with it the day when the equalising forces will be at work among Africans themselves. The signs are already beginning to emerge. Not only in the disgruntled rumblings of those "misguided payukaring individuals who criticise the achievements after Independence", but also in the villages where some have refused to build self-help roads which "will only bring us the dust of the Mercedes's of the big shots".

We are here not predicting the revolution. We don't believe in it as a Panacea for problems. Also, distribution of available wealth is only one road to satisfying popular desires, the other being the growth of the available cake. Finally, all evidence suggests that the tribal peasant is unlikely to rise up. If any group does, its is more likely to be one which has progressed rapidly but then experienced a set-back (Davies, 1962).

What we are trying to show is that the new poverty continues to provide an undiminished motivation. That, therefore, the same forces which helped destroy the colonial system are still at work; that they cannot be kept at bay for long by the game of ethnic musical chairs; and that they cannot be negated or suppressed, except perhaps in rigid and oppressive class structures which mitigate against the heritage of African socialism.

Such then is the, perhaps familiar, problem facing African Governments: to chart a strategy for development which, on the one hand, utilises the motivating forces generated by the new poverty, but on the other, avoids being destroyed by them. Such a strategy must, for reasons implicit in the above historical sketch, consist of a careful mix of growth and equitable distribution. African Governments are indeed faced with a very difficult problem, for the solution of which a blueprint does not, as yet, exist.

This book is concerned with that problem and seeks to contribute to its solution, for as far as policies for the development of the peasant sector are concerned.

1,2. THE PROBLEM FOR EQUITY

1,2,1. Equity and Growth.

To satisfy the single-minded popular interest in money and improvement of the quality of life, all African Governments have embraced development as the one over-riding goal of national endeavour. Their strategies for development differ, however, especially with respect to the emphasis placed on either growth or distribution. Since there is no prescription for their long-run optimal mix, the choice of emphasis is more a matter of faith than empirical know-how.

Of course, growth and distribution are not independent. If one emphasises distribution, one must still grow to have something to distribute, a truth often neglected. If one emphasises growth, one must still distribute to stimulate purchasing power and to alleviate the pressures which led to the embrace of development policies in the first place.

Yet, there are reasons why over-emphasis on distribution may harm growth and vice versa. Often, for instance, growth can only be bought at the expense of accumulation by few, not only when it comes to satisfying the conditions under which foreign capital is usually provided, but also in case of agricultural production which often grows fastest when credit services and extension are concentrated on large, educated and progressive farmers. Thus socio-political goals may conflict with production targets and policies geared towards growth may be incompatible with equitable development.

What's more, policy makers of every shade of concern with equity all face an ongoing process which can best be described by the age-old generalisation: "To him who has shall be given"; or the newer generalisation: "The rich get richer and the poor get children". Yes, our society seems characterised by the fact that desires,



not subject to scarcity, spread rapidly and equitably, leading to the equalising forces described before, while the means to satisfy those desires, very much subject to the laws of scarcity, tend to accumulate in the hands of few, leading to differentiation. Of course, it is the policy maker's option to affect the outcome of these conflicting tendencies. The challenge is, then, to choose a pragmatic policy which avoids equitable distribution of hunger as well as the creation of enclaves of wealth which only evoke injustice and poverty.

General models have, in the past, been developed to guide such policies or to rationalise them after the fact. One Western theory, for instance, led to the belief that the negative effects of rapid growth on the equity of development would only be of short duration. Those who lagged behind would, one day, eventually close the gap and catch up. This older model thus compared development to a track event. Some, such as Kipchoge Keino, run faster than others, but all eventually reach the finish (Gaastra van Loon, 1972).

The older model was inspired by the histories of Europe and the United States, where strong labour unions could at least ensure a proportional share in the increment of the national cake. In this situation, the strong popular desires for a better life are satisfied by the fact that everyone benefits from the rapid growth and thus experiences some improvement, even when wealth remains inequitably distributed.

As soon as such economies stop growing, however, pressures towards greater equity can, of course, be expected. Necessary conditions for the long-run validity of the older model are thus continuous growth and an unlimited supply of resources to support it. And it is these conditions which seem increasingly untenable. In fact, one can speak of the emergence of a new "image of the limited good".

This phrase was originally coined by Foster (1965) to describe the worldview of traditional peoples faced with limited opportunities. Such people believe that, since all good things are limited, the acquisition by one man of a larger share of the cake automatically led to a smaller share for other. The image is illustrated by some Nigerian villagers, with whom one of the authors was acquainted, who begged the extension worker to stop introducing fertiliser because it allegedly pulled fertility (a limited good) from neighbouring fields to the one on which it was applied and hence caused great discord among the villagers.

The new image of the limited good seems to emerge as the typical product of a period in which the rich countries are reaching their limit of useful growth and become aware of the easily exhaustible and pollutable environment on "spaceship earth".

A typical protagonist of the new awareness is the Club of Rome Report (1972) on "Limits to Growth" which drew attention to the fact that the world's reserves of coal, iron, copper, etc., all prerequisites to growth, would, even under the most favourable assumptions, not last beyond the year 2100. Such studies also pointed out that the reserves of minerals are not sufficient to allow every one of the world's citizens the same level of wealth as presently enjoyed by the average US citizen.

These studies thus not only revived the image of the limited good, but also put in sharp focus its corollary: the acquisition of a large share of the limited good implies that proportionately less is available to others. At the international level, for instance, the control of access to natural resources by developed countries can, in this light, be taken to imply the permanence of poverty of presently developing countries. That is, accumulation of the limited good by some preempts the opportunity for others.

For these reasons, a newer model of development (Gaastra Van Loon, 1972) speaks of two football teams, one of which wins some games, becomes popular, commands high box-office receipts, buys the best players and coaches, acquires TV contracts, etc., and thereby preempts the chances of the other team to ever get off the ground. In other words the development process has many of the features of the small band of Marabu storks outside the Public Service Club in Nairobi. The biggest stork commands the choice territory immediately outside the windows and therefore gets all the bones thrown out by the patrons, fiercely attacking other birds who come too near.

It is such rules of the game which, if unchecked, seem to govern the relations between rich and poor, be they developing nations, urban versus rural sectors, rapidly innovating versus stagnating tribal regions, or rich versus poor farmers within the tribal region itself. We mention these other inequities because an image of the limited good seems to be valid also at the national level. Land, the scarce positions in the best educational institutions, the revenues from cashcrops, the working time of the extension worker in the sublocation, the funds available for agricultural credit, yes even the demand for agricultural products, are all examples of limited goods. Their control by few, and the implicit preemption of opportunity for others, in the early stages of development, even if it has spin-off effects in terms of creating employment and demand, may lay the foundations of a society in which inequity is a permanent feature. In such a society, class structures and other oppressive mechanisms must be developed to contain the equalising forces which originate in the "Revolution of Rising Expectations" (Lerner, 1963), especially when rapid growth is not forthcoming, and when organised labour is part of the elite, while the peasant mass is not organised and has no bargaining power whatsoever.

The above raises some implications for the blueprint for development. Should African Governments accept a future in which inequity is a permanent feature? Should they, at the international level, aim at maintaining the status of a poor country among the world's nations? And should they, at the national level, aim at a society which has, as its permanent feature, a mass of semi-subsistence peasants and a well-protected enclave of wealth? Should the Masai, for instance, be incorporated as part and parcel of the ecology of National Parks, as some East African experiments would suggest?

We don't believe that such a course should be followed, although it is feasible, as the history of some Latin American countries indicates. We reject the option, however, not because our conscience, dictated by prevailing and mod norms, makes us feel we ought to reject it, but because we know that permanent inequity is not compatible with the equalising forces generated by the awareness of the good life possible. Permanent inequity, therefore, cannot lead to a stable society in which dignity and well-being are undenied, and in which human endeavours, other than the pursuit of money to catch up with the well-to-do, are made possible.

To now briefly conclude: we have observed a great gap between the well-being known to be possible and the one actually experienced. We also observed that a policy choice can be made between (1) allowing some to go all the way to fill the gap and pulling up the others later; and (2) allowing all small increments of improvement at a time, which means that initially only few will enjoy the level of well-being known to be possible. We then argued for an emphasis on the latter approach because allowing those who can to go all the way implies that they will preempt the opportunity for others which makes it impossible to pull up those others later.

Throughout this book we shall thus assume the need to search for pragmatic policies which ensure equity while optimising growth, and reject policies which either maximise growth at the cost of equity or maximize equity at the cost of growth. In our search we shall limit ourselves to equitable development within a given peasant society, leaving aside inequities between nations, between cities and their rural hinterland, and between different tribal societies, not because such other concerns are irrelevant or even independent of our concern, but because we do not have the expertise to deal with them.

1,2,2. The Causes of Inequity in the Peasant Community.

In an earlier section of this chapter, we had occasion to observe that the pre-colonial tribal, and rural, society was egalitarian to the extent that statesmen can evoke African Socialism as a blueprint for a future which is firmly rooted in the past. We are now no more than 70 years from those tribal beginnings. Yet, if one now travels through the former tribal "reserves", especially the more advanced ones, one observes a great deal of differentiation.

Some farmers have stone or wooden houses with iron sheeted roofs. Others still live in round huts which, to the unwary observer, seem on fire when the smoke of cooking oozes through the thatch. Some women haul heavy drums with water up the ridge. Others apparently do not have to do so, witness the galvanised tanks for collecting and storing rain water in their farm yards. Parts of the road lead one past well-fenced paddocks with Friesian cows, but further on one sees an old man in a World War II trench coat herding a small band of sickly looking native cows. And so on and so forth.

What, then, has happened to the formerly so egalitarian tribal society? What will happen to it in future if present trends continue? And what can be done to ensure its more equitable development? These are the

questions which will occupy us throughout this book, the research problem of our focus.

In trying to account for what has happened to the tribal society, we shall concentrate on the consequences of innovation, and especially the introduction of cash-crops, since neither the Colonial nor the African Government have done much to develop and diffuse innovations which could improve subsistence. We shall focus on innovation because it, and the services such as extension, credit and marketing, which seek to promote it, have so far been the source of rural wealth and must, therefore, contain the seeds of the present disparities. Several reasons can, in fact, be given why innovation could cause inequity.

Important is that innovations are never adopted by all at the same time. Instead, their diffusion pattern usually follows a growth curve (Rogers and Shoemaker, 1971) which implies that the earlier adopters benefit longer from the innovation. This may be an advantage, for instance, when money is at their disposal before land prices have gone up. Also, the early adopters come in the market at a time when prices for the product concerned are still high and thus reap a pioneer profit, while later adopters just glut the market. Those who have not adopted at all may even find themselves barred from adopting because quotas have been established to maintain the price, as is the case with coffee in Kenya, or their income may actually decrease when the innovation leads to over-production -and price decline- of a substitute for a traditional crop, such as hybrid maize.

Initially small differences between neighbours based on differences in adoption behavior, may thus have grave consequences for the income differential between them later. The one who adopted coffee ten years ago acquired the money to buy a grade cow and

an extra plot of land. A loan from his coffee society allowed him to put up a fence to protect his cattle from rampant diseases. Meanwhile, he sent his son to school when the going was still good and gained a foothold for his family in the urban society. In fact the income of the son now helps pay the schoolfees of other children. Yes, by the time the other farmer wakes up, it may be too late for him ever to catch up with his neighbour, even though, ten years ago, one would not have noticed any difference between them.

It is understandable that literally hundreds of reasearches have sought to answer the question: "Why the difference?" Let us look at some of their answers to determine whether past stupidity, laziness or other faults justify the present poverty of the late or non-adopters.

One would expect the early adopters to be the ones who came into contact with Western lifestyles earlier and therefore experienced relative poverty which motivated them to change when others were still content with tribal life. One Yoruba elder, for instance, told one of the authors, when asked why he had introduced cocoa into his village, that he had seen cotton dresses and galvanised iron roofs when working on the raildroad in Lagos and had wished to acquire them. Research bears out that the early adopters usually have more contact with the world outside their village through travel, education, and exposure to mass and other media than later adopters (Rogers and Shoemaker, 1971).

Of course, the question remains why the Yoruba elder went to Lagos in the first place and why earlier adopters in general have greater external contact. Empirical research has only come up with few differences between early and late adopters which can be thought to have existed before contact with the West. One is that early adopters usually have larger farms than late

adopters and another that early adopters hold more traditional leadership positions which may have allowed them greater access to labour, the scarce resource in the early days. Yet another, and related, reason for earliness may be the phase of one's lifecycle during which one was hit by the initial wave of change.<sup>@</sup> If one was a venturesome young man, just barred from showing one's prowess as a warrior by the Pax Britannica, as was the case after the Yoruba wars (Toxopeus, 1970), one might have been more ready to adopt than an old man who prepared himself for a dignified end. Alternatively, a man with a large number of young children, and hence a large labour force, may have faced less risk in experimenting with an innovation than an older, feeble, man whose children had all married.

Apart from such mundane reasons for the difference between "progressive" farmers and late adopters, researchers have also sought for psychological mechanisms which might explain them. A great variety of these have been proposed, such as the difference in culture pattern (Hofstee, 1964), need for achievement (McClelland, 1961), efficacy (Inkeles, 1966) or the expectancy of internal control (Rotter, 1966; Roling, 1970). The problem with most of these concepts is, however, that they describe the result of success -and hence predict further success- rather than explain why success, be it in controlling the environment or in excelling over others, was experienced in the first place.

The work of Carolyn Barnes, quoted in this book, tries to throw some light on the latter question. However, even her work does not seem to provide reasons which justify punishing present late adopters with poverty or banishing their children, or even grand-children, to a life without outlook.

One essential difference between progressive and non-progressive farmers, observed all over the world, is the greater use by the former of Government services,

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<sup>@</sup> Personal communication, Wicky Meynen.



be it extension, credit or marketing. Not only do the progressive farmers, having experienced their benefits, actively seek those services, those offering the services also concentrate on the larger, more innovative farmers, a practice usually referred to as the "Progressive Farmer Strategy". There are several reasons why this practice is followed.

At the policy making level, it seems wise to concentrate scarce resources available for planned change on large farmers who are ready to change and can plant large acreages, allowing production targets to be reached quickly. The field worker has similar considerations: concentration on progressive farmers brings quick rewards and leads to dramatic monthly reports. Other factors may, however, also operate at the field level. Progressive farmers actually demand services and complain when they are not forthcoming. Also, there is less social distance between them and the field worker than is the case with less progressive farmers. Meanwhile, the larger farmers are often influential enough to actually affect the career of the field worker, through politicians and senior officers, or rich enough to regularly reward the field worker. There must, for instance, be a reason why some field workers are willing to vouch that a farmer has the 15 acres of maize required for a GMR\* loan while he has only four.

Such processes explain why, as the rural area advances, field workers spend more and more time on helping to maintain the enterprises of progressive farmers and less and less time on promoting innovation among other farmers. Of course, these observations largely refer to extension, but credit services also benefit the large, progressive farmers most, if alone because of eligibility requirements, such as the 15 acres in case of GMR loans, or the need to provide surety in case of other loans.

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A special seasonal crop loan called Guaranteed Minimum Return.

Thus Government services usually help those who need least help (van den Ban, 1963), that is, those who are already on the road to accumulation and could probably have helped themselves. In other words, government services usually only strengthen the inequities which originate in the diffusion process itself. They help innovative farmers maintain their lead and rapidly expand once they have taken the first steps on the road to "progress".

1,2,3. The Consequences of Inequity For the Peasant Community

What, then, are the consequences of these processes for the peasant society? In the first place, the relative prosperity of some implies the relative poverty of the rest. That is, the better outcomes of the progressive set the norm for the good life seen as within reach for everybody. Of course, the colonial enclaves had already created desires, but when one's neighbour is able to satisfy some of them, the latent desire changes to virulent expectations.

A typical example is a village in Nigeria which had produced an internationally famous economist. When one of the authors asked farmers what they wanted their sons to become, many of them replied: "professor, like Dr X". Thus the comparability or empathy within reference groups, which originate in the egalitarian tribal past, continue to operate even when differentiating processes have seriously undermined their validity. No one yet says: "His outcome is not for me because I am different" as happens in a class society.

Thus the outcomes of the progressives set the norm for the good life and increase the level of well-being at which the rural community is subjectively experienced as viable. This means that those, who have not progressed, experience a decrease in the subjective viability of their rural life (Constandse, 1962). Sometimes, viability also decreases in absolute terms when prices decline as a result of over-production, as can be expected soon in case

of hybrid maize in Kenya. Farmers who still grow their acre of local maize will get less for whatever surplus they usually sell than they did before.

Unless the less progressive farmers escape the decrease in viability by boozing or other unrealistic behavior, they will be motivated to try and improve their situation. What options do they have to do so?

In the first place they can try to escape the constraints facing them in the rural area by seeking wage employment in the towns. The problem is that the less-progressive farmers are probably least qualified and thus have a disadvantage in the struggle for scarce jobs.

In the second place, they can try to improve their farms by adopting innovations. The problem is that Government services promoting innovations bypass them, as we saw earlier. If they adopt, they are still faced with low prices or even quota regulations barring them from adoption. What's more, innovations most suited for small scale enterprises have hardly been developed, while suitable candidates which helped small farmers in developed countries, such as broiler production and horticulture, are often pre-empted by big companies such as the BAT or Delmonte in Kenya.

Thus the third, and most realistic, prospect for less progressive farmers is for them to accept their different status, resign to the fact that they will be poor compared to the progressive farmers and become casual laborers on the latter's farms to obtain some cash to support their small subsistence enterprises. This, of course, is the blueprint for the peasant areas developed by the Colonial Regime. Thus the Swynnerton Plan (1954) states: "In future....former Government policy will have to be reversed and able, energetic or rich Africans will be able to acquire more land, and

and bad and poor farmers less, creating a landed and landless class.... This is a normal stage in the evolution of a country".

The predicament of choice for non-progressive farmers, described above, must be seen in the light of a future characterised by two processes which make the situation more desperate.

In the first place, the population explosion continues to increase the pressure on the resources of the peasant community. Should fathers subdivide their land for their sons, banishing them to greater poverty than they experienced themselves? Or should they continue to sacrifice their well-being to pay for education which usually does not lead anywhere? Or what?

In the second place, as the peasant sector becomes more modernised, not only in Kenya, but also in other countries with similar climatic conditions, the production of such cash crops as coffee, tea, and sugar will increase, leading to glutted markets because the demand for agricultural products is notoriously inelastic. Nobody eats twice as much when the price of food is cut by half. Meanwhile the local market for agricultural products is very small because 90% of the population lives by subsistence and/or has little purchasing power. In Kenya, the local market is further reduced by the fact that members of the elite usually own a piece of land, from which they obtain whatever they need, if they don't actually compete with peasants by producing cash crops. Thus the terms of trade will become increasingly unfavourable for the peasant society as a whole. This means that only large and efficient farmers can persist, and small inefficient farmers are driven out, as happened in Europe (where farmers now make up as little as 5% of the working population) and may happen here soon because of the "quantum leaps" of agricultural productivity in developing countries.

Are the processes described above a "normal stage in the evolution of a country" as Swynnerton wanted us to believe? It cannot be denied that they characterised a historical phase in Europe. But then that same phase was also characterised by an industrial revolution demanding so much labour that Britain had to enact enclosure laws to force people off the land. Meanwhile there was no competition from a highly efficient industry in developing countries, no concern for misery, no minimum wages, no population explosion and even then an escape to America, Australia or the colonies.

No, the history of the UK does not seem replicable in East Africa and can, therefore, not be a guide for policy. In fact, Swynnerton's blueprint might well pave the way to a permanently polarised rural society, which contains the seeds for future misery and unrest, as is the case in Latin America.

1,2,4. The Options for Policy-

Indeed, it seems easy to extrapolate a bleak future from the trends presently at work in peasant society. Some observers have, therefore, become very pessimistic. They have lost all hope that the peasant society can make it in the present set-up and see, as the only solution, the imposition of a system which does not allow private enterprise and thus removes the usurpers and accumulators from the scene.

Such views assume that, in a private enterprise system, the poor will not be given an opportunity to improve their situation, that they will therefore become poor and poorer, to eventually reach a point where they lose all hope and only find recourse in fatalism, apathy, and the egoistic struggle to stay alive. Since they have nothing to lose, such people will be susceptible to ideas which promise the imposition of a more equitable system by force.

Of course, such situations do exist. Several countries in Latin America, for instance, seem characterised by a fatalistic peasant mass which has nothing to lose and, therefore, does explode in frustration, as during the "Violencia" in Colombia. The only way in which the equalising forces can restore a natural balance in such a situation is probably indeed a revolution.

The African peasant society is, however, still far from that point. In fact, the African peasant seems an activist who struggles on because, so far, his conditions has steadily improved. One of the authors remembers how he, after having learnt about "traditionalism" in his student days, went to Southern Italy where he recognised many of the traditionalistic traits, such as distrust, fatalism, lack of innovativeness and resistance to change. His next assignment was in Nigeria, where he expected to find even worse "traditionalism" because that country seemed so much closer to a traditional past than Southern Italy. He was very surprised indeed to find a trusting and open society of which the members were actively engaged in the pursuit of "progress" and constantly pressed their Government for assistance in development activities which they usually initiated themselves. Thus it became clear that "traditionalism" is more a product of misery and oppression than of tradition. And also that the African peasant, though close to a "traditional" past, is an activist because he has not yet been oppressed.

In Kenya, activism also characterises the majority of the peasants. Foreign observers at Farmers' Training courses in Kenya are, for instance, surprised at the proud, if not tough and no-nonsense attitude with which small-holder course participants, including women, approach teachers and senior officials addressing them. Similarly, one finds peasants who refuse to pay school fees for the days on which their children have to line up along the road to wave to high officials. Womens' groups,

based on indigenous initiative, are responsible for the very rapid replacement of thatch by corrugated iron roofs in Central Province. And so on.

What emerges is the possibility of a policy which keeps alive and stimulates such peasant activism and thus allows the equalising forces to operate continually and gradually towards maintaining a humane and balanced state, instead of hemming them in by oppressive measures until they explode.

A necessary condition for such a policy to be effective is not the abolishment of private enterprise, but the stringent control of its tendency towards disparity and the avoidance of processes by which the equalising forces are hemmed in.

And it is this necessary condition which often does not seem to be fulfilled in present-day Africa. Instead, leaders and elites take advantage of every chance to enrich themselves in an incredibly short-sighted opportunism. What's worse, they clamp down on budding expressions of the equalising forces and weaken the mechanisms for their gradual and continuous operation. Yes, even those who publicly pay lipservice to equitable development, all too often turn out to be hyenas in disguise.

It is such conditions which eventually lead to the impoverishment and desparation of the peasant mass. And it is such conditions which tempt people to embrace more radical policies, which, in turn, elicit greater oppression, etc. Thus, it is the gluttony of leaders and elites which threatens the future of African society, rather than private enterprise. Of course, there are those who claim that one cannot control the former without destroying the latter. We, however, see the two as potentially independent of each other.

That means that we believe that a stable future for a country like Kenya, which is based on private enterprise and has achieved so much through that system,

can only be safeguarded if its leaders and elites accept self-imposed limitations to accumulation and allow the operation of equalising forces - even when it hurts a little.

We have, perhaps naively, assumed that such self-control is possible, feasible and probable and based our work on that assumption. That is, the utility of our work depends on the existence of a sincere intent to vigorously promote equitable development. We thereby admittedly take the risk that our work remains - irrelevant.

But the risk is a calculated one. We have encountered many policy makers who do have the sincere intent. We have seen the 1972 Kenya Budget which slaps heavy taxes on urban luxury goods. And "how many other states have the honesty and the nerve to commission inquiries, similar to the one ILO carried out in Kenya, into the shadier and more disturbing aspects of their own national life" (Hughes, 1973).

But the risk we take is a calculated one most of all because equitable development is increasingly becoming a matter of rational choice, rather than a matter of conscience, sincerity and human compassion. And this not only because of the threat to instability. The newest evidence suggests that a country such as Kenya which allows "its now beginning stratification by incomes and education to continue until it becomes a rigid and institutionalised barrier in the next generation", (ILO, 1972, p...) will actually lose in terms of development and growth.

In a recent article, James Grant (1973) shows that rapid growth, the goal of the first development decade, was successfully achieved in many countries. In Kenya, "the economy has even grown much faster than in most developing countries in Africa or elsewhere" (ILO, 1972, p ). But says Grant, "the trickle-down theory



of development - whereby the poor supposedly benefit from overall economic growth or policies benefitting the rich - is proving utterly inadequate to the needs of the poorer halves of the population in developing countries....Country after country reveals the same pattern of relatively high growth rates, combined both with a failure to meet other major needs and with dramatic inequities in the distribution of economic and social benefits".

As a result, Grant says, many people turn to China for a solution because it "appears to have found a pattern that combines increasing national output with full employment, falling birthrates and comprehensive, low cost, social services". But other, non-communist, countries have found such a pattern as well. "South Korea, Hong Kong, Singapore and Taiwan had much higher rates of increase in their work forces during the sixties than did China, yet they achieved rapid growth and drastically reduced unemployment, while improving income distribution and dramatically reducing birth rates". In fact, The East Asian experience shows that "the right kinds of social justice policies" (such as the ones proposed for Kenya by ILO) "can increase production rather than cause its stagnation". The GDP of Taiwan and Korea actually grew at 9.9 and 9.2% respectively during the sixties.

The East Asian experience also shows that "it may now be possible to attack several problems simultaneously. For example, a comprehensive land reform programme, backed up by an effective credit system, simultaneously increases savings, output, farm employment and demand for labour intensive products, while improving income distribution and attitudes towards family planning."

William Rich (1973) goes deeper into the relationship between the equity of the distribution of income and social services on the one hand and the reduction of birth rates on the other. Not only seem "family planning programmes to be much more successful in those developing

countries which have assigned high priority in their development programmes to a more equitable distribution of incomes and social services", but "the very strategies which cause the greatest improvement in the welfare of the entire population also have the greatest effect on reducing population growth", "despite low per capita incomes and despite absence or newness of family planning programmes". In other words, Governments which buy equitable development policies get reduced birthrates thrown into the bargain. Table 1, 1 illustrates the point.

Table 1, 1. Selective Indicators of Conditions in South Korea and Brazil		
	SOUTH KOREA	BRAZIL
Population growth rates 1958	3.0%	3.0%
1964	2.7%	2.9%
1971	2.0%	2.8%
Income per capita (1971)	\$ 280	\$ 395
GNP growth rates in the 1960s	9.0%	6.0%
Ratio of income richest 20% to poorest 20% (1970)	5 to 1	25 to 1
Literacy (1970)	71.0%	61.0%
Infant deaths per 1000 births (1970)	41	94
Joblessness	negligible	serious
Effective land reform	Yes	No
Family Planning Programme	Yes (by 1964)	No
Source: William Rich, "Smaller Families through Jobs and Justice", International Development Review, Vol 14, number 3, 1972/73, pp 10 -15.		

Thus we assume a sincere intent to embrace policies promoting equitable development because such policies seem best to serve the interests of the nation. "We know, in effect, that there is no rational alternative to moving towards policies of greater social equity" (Robert Mac Namara, 1972). Given such policies, we must now ask what options are available in the conditions presently prevailing in peasant society?

We begin with that old war horse, the "back to the land" policy, which is aimed at those who have left the rural areas because they saw no future in them. Such a policy would therefore only work if the viability of the rural area could be greatly improved, not only by providing amenities, but also by providing individuals with land, capital and knowledge to enable them to earn a living. Even then, the limited land and the fast growing population would allow provision for only few not now living in the rural areas. For the rest, including those who leave the rural area because they are members of large families reared on small farms, urban or rural non-farm employment will have to be created.

A country like Kenya is, of course, very much aware of this exigency. Long term plans for urban development have been made which take into account phenomenal growth of present and even planned urban centers. For instance, during the present plan period, with its heavy emphasis on rural development, only 12% of the average annual budget was spent on rural development ( ). This seems pragmatic policy.

Couldn't large scale settlement on virgin or ex-settler's land remove the limiting factor to the "back to the land" policy? Admittedly, around .000 poor or landless peasants have been settled up to 1972 ( ). What's more, peasants themselves have swarmed like bees to virgin territory. Areas such as Mau Narok,

which are still shown as a forest on the map, are now densely settled small-holder areas. Kenyan farmers can apparently even be found in Southern Tanzania near the Zambian border. Such settlement has thus provided many who had no future in the "reserves" with an opportunity. But the land remains a limited good and settlement policies can thus only buy time, a safety valve with limited capacity.

Of course, an Israeli driving through East Africa might well exclaim at the vast expanses of high-potential semi-desert still available, a call quickly picked up by those who resist family planning. But irrigation requires a great deal of capital which thus presumes cash crop production and, therefore, large markets. The irrigation schemes now on the drawing boards will probably satisfy existing demand for the time to come, as the Mwea and Kano Schemes do for Rice. And they can only absorb few of those seeking a livelihood.

No, wherever one turns, the problems of peasant society can not, ultimately, be solved by settlement, be it on ex-settler's farms, virgin lands, or irrigation schemes. Still, settlement performs a useful function by buying time.

More time can be bought, of course -and much bitterness avoided- if people with good incomes and pension schemes were forbidden to own land, except for a small plot to build a country home. Indeed, some peasants fail to see the difference between the former white settlers and the African elites who own large tracts of land- and more will do so as differences in nationality and ethnicity are forgotten and differences in wealth and opportunity become paramount. Yes, redistribution of African owned estates will be the next source of land, unless the leaders take recourse to oppressive measures, mute the Parliament,

and thereby destroy the chances for the gradual operation of the equalising forces towards a just society.

But resettlement can not ensure the equitable development of rural areas in the long run. What policies can those with a sincere intent embrace, given a peasant area settled to capacity? After all, that is the narrower focus of this book.

One's first thoughts go out to Tanzania's daring and sympathetic Ujamaa experiment, which is so often criticised without being given time to prove itself. Its two years of operation have demonstrated that peasants in very poor subsistence areas are very willing to collectivise, especially when it becomes clear to them that Government services such as water, and credit will only be available to those who live in Ujamaa villages. In the more advanced cash crop areas, however, where progress has been rapid -and where most differentiation has thus occurred- many farmers, especially the relatively prosperous, see collectivisation as a threat and resist it. Thus Tanzania's Kilimanjaro/Meru farmers seem disinclined to accept Ujamaa. In Kenya, farmers in Central Province, Kisii and other relatively advanced growth centers would probably not react differently.

Are such hard-working farmers potentially Kulaks, to be sacrificed for dogmatic convictions, as they were in Russia? Or is it possible to develop a pragmatic and less drastic policy which achieves equitable development via alternative routes? It is our conviction that such a policy can be developed and this book reports on our efforts to demonstrate the feasibility of some of its strategy elements.

Let us briefly list the elements of the policy which we deem a feasible alternative route to equitable rural development. They are:

1. Vigorous continuation of the development of welfare services which are available to all, such as roads, water, electricity, health services, schools, recreational facilities, etc. This implies continued support of Harambee (selfhelp) efforts to develop amenities and services.
2. Vigorous development of agricultural innovation packages specially adapted to small farms, combined with strict control of preemptive production by big companies or large farms using such innovations.
3. Rechanneling of extension, credit and marketing services to those small-holders who lag behind in development so as to enable them to adopt the innovations packages. The "progressive" farmers will forge ahead anyway with less assistance.
4. Strong emphasis on group extension over individual extension methods to increase coverage of scarce Government resources so as to enable inclusion of small farmers.
5. Support of the elements listed above by (a) imposition of a ceiling to land ownership and redistribution of excess land, (b) the vigorous promotion of contraceptive methods, and (c) the development of rural industries.

A policy based on these elements could ensure the stable, equitable development of peasant areas, while maintaining the freedom and the benefits of the free enterprise system as a source of rapid growth. The authors consider such a policy politically feasible in Kenya, because it fits with the basic guidelines laid out in Sessional Paper No 10 (1965) and what's more, beneficial for the efficiency of the allocation of the

country's rural resources. It is well known, for instance, that Kenyan peasant farms of less than 10 acres have a higher gross output per acre, a higher net profit per acre, a higher percent of land under crops and a higher labour use per acre than farms with more than 10 acres (ILO, 1972, p. 167).

A Policy based on the elements outlined above has also been strongly recommended by the influential report of the ILO Mission to Kenya in 1971. With regard to agriculture, the report makes the recommendation that "there must be a major shift in agricultural policy in favour of the small farmer, through a whole range of extension, research, credit, input, pricing and marketing policies, as well as through land and land-tax policies designed to encourage further subdivision of large holdings" (ILO, 1972, p. 326). Within this broad recommendation, the report pleads (p. 153) for (1) more research to develop innovations suited to intensive small-holder production, (2) a concentration of extension services and credit on the forgotten and poor farmers among the small holders (here the report actually quotes our experiment in Tetu<sup>\*</sup>) and (3) the "use of group and mass extension techniques instead of approaches to the individual farmer which has been the main method used in the past".

In this book, we shall be concerned with innovations and especially with their dissemination among poor, laggardly farmers through group extension methods. We have concentrated especially on the latter two policy elements because their implementation by a policy maker poses severe practical problems which people with our profession could help solve.

Of course, planned diffusion of innovations to poor farmers via group extension methods presupposes the existence of suitable innovations. Therefore, we

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\* The method we used in Tetu has also been enclosed by the the Wamalewa Training Review Committee (Kenya Govt, 1972, p 39)

shall, before coming to the narrower research problem of this book, deal briefly with the innovations themselves, although we do not have the expertise to provide detailed assistance in the issue.

So far the rural areas in Africa have witnessed two agricultural "revolutions". The first was the cash crop revolution, which is losing some of its steam because it was based on a few export crops which now suffer the consequences of over-production. The cash crop revolution provided the first source of money income for the tribal society, but also laid the foundations for its present inequities.

The second revolution has not spread to all African countries but has definitely hit Kenya. It is the "Green Revolution", the rapid dissemination of new high yielding foodgrain varieties. In Kenya, the Green Revolution is based on hybrid maize and 1972 marked the first time in Kenya's history when the Minister for Agriculture could confidently predict that from now on maize surpluses could normally be expected.

But the Green Revolution is also losing some of its steam as the markets for food grains become glutted. Besides the Green Revolution further consolidated the advantages of those who had benefitted from the cashcrop revolution, and left a large proportion of the peasants relatively, if not absolutely worse off than before.

One cannot expect to solve the present inequities by promoting the innovations of the two revolutions among those who have not adopted them yet. It will be necessary to do so, but it will be especially necessary to develop new innovations suited for small-holder production. Such money earners for smallholders must be developed because the old innovations have lost much of their steam and cannot allow the laggards to catch up.



The development and testing of such new innovations requires a reorientation of present agricultural research, teaching and input industry. So far, research has been largely geared to the conditions on large farms. Agricultural teaching has produced people who feel that large, mechanised enterprises are the only dignified form of agriculture, and are little concerned with the peasant farm and its particular problems. Thus one finds a DAO in a peasant area who talks of "harrowing" when referring to land preparation by hoe. The input industry, finally, is only slowly coming around to producing small quantity packages which suffice for  $\frac{1}{2}$  an acre, although labeling and instructions still leave much to be desired. The same can be said for the input distribution services in rural areas, which often require farmers to travel many miles on foot to bring inputs to their farms.

Yes, the task laid out for research, teaching and input industry is enormous, if they want to come up with innovation packages suitable for small and tiny holders and geared towards sophisticated foreign markets and/or the local urban population which is expected to increase 6 fold by the year 2000 ( ). Some strides have been made but most remains to be done. The fruit available in urban markets, except Mombasa, is of abominable quality. Methods for improving the production of goat meat, mutton and beans are not yet available. Chicken and pig production, both very suitable for small holder enterprises, remain very risky ventures for small farmers and little assistance is provided to them. Instead, BAT has just been given approval for a large broiler industry. Small scale grain storage facilities, and methods of silage and fodder crop production are still hardly available. And so on and so forth.

Activity is urgently required, Research and the dissemination of its results taken a long time. The Green Revolution bore fruit in Kenya in 1972, but the research on which it is based was initiated in 1955.

The present lack of innovations adapted to the conditions on small scale farms was apparent not only in Nigeria where farmers asked: "After cocoa what do we do?" but also in Kenya. After long discussions with the agricultural staff we finally had to settle on hybrid maize as the most suitable innovation on which to base our experiments. Apart from coffee (which has a quatum), tea and pyrethrum (which are limited to certain ecological zones) and dairy production, only a handful of innovations was available, even in the high potential area in which we worked. And none of them could be recommended by the agricultural staff because they did not provide a reasonable margin of profit at reasonable risk to the small scale farmer.

It was only towards the end of our involvement in the experiment that an innovation became available which seems well suited to small-holder conditions. Developed by Jan Mulder of FAO, it is a method of stall-feeding dairy cattle on a mixture of Napier grass and urea molasses, a by-product of sugar production which had, so far, only caused severe pollution in the rivers in which it was dumped. The method allows increasing the number of cows kept on an acre from 1 to  $2\frac{1}{2}$  and can double the profit per acre compared with conventional methods. A package deal consisting of training and a loan for purchasing cows, building the feedlot and establishing the Napier grass could greatly intensify small-holder farming, although it would have to be supported by vigorous advertising and home economics extension to increase the consumption of

milk and by improvements in its collection, processing and distribution facilities.

Another innovation which is available, but cannot be used because of the monopolistic practices of the Maize and Produce Marketing Board, is small scale maize storage. The farmer brings his maize to the store immediately after harvest. He then gets paid the amount which his maize is worth at that time. The store keeper sells the maize at the time when the price seems highest and the balance is given to the farmer, minus storage and handling fees. The store can benefit, the small farmer can benefit and the country can benefit, given its present storage problems. In Indonesia such a storage scheme has been very successful.\*

With these examples of what is possible, we conclude our appeal for serious efforts to develop and proto-type test innovations which can intensify and diversify small holder farming, and embark on a more detailed discussion of our specific concern with methods of rechanneling Government services to those farmers who lag behind through group extension methods for greater efficiency and effectiveness. But the reader must bear in mind that the utility of our work depends on the availability of innovations suited to the conditions on tiny farms.

1,2,5. The Specific Research Problem of this Book

With an economic system which is characterised, not by collectivised agriculture, but by the free enterprise of millions of peasants, each having decision making power over the small piece of land under his control,

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\* personal communication Klaas Kuiper, AFC.

the task facing the persuasive capacity of the agencies responsible for agricultural development becomes enormous. After all, the development of agriculture depends, to a large extent, on the adoption of productivity-increasing innovations by each of the millions of peasants. And adoption only occurs on the basis of conviction, itself the product of persuasion, with or without intent. That is, thousands of farmers must be convinced, instructed and guided to achieve a given production target.

In Africa, the magnitude of this challenge is even more awesome than in developed countries with private enterprise agriculture. Roughly 100,000 African peasant farms are needed, for instance, to produce as much grain as 200 middle size European farms (Collinson, 1972, p. 66). One of the authors remembers an American advisor to the then Eastern Region of Nigeria who claimed that he produced as much maize on his farm back home as the whole Region did in 1966.

But African agencies of rural change not only face a greater task than their counterparts in more developed countries, they also have to surmount special problems in order to achieve it.

Whereas developed countries are usually characterised by media saturation in terms of access and exposure to radio, newspapers, pamphlets, magazines, films and TV, the African peasant is linked with the center with only few or none of these media. This means that the African rural change agency has to rely on the word-of-mouth communication efforts of thousands of field workers to promote innovation.

But, whereas the Government field worker in the developed country is assisted by a host of commercial agents representing seed companies, chemical factories, etc, his African counterpart must do most of it alone. Even then the latter is often hardly equipped to handle his responsibilities.

The Junior Agricultural Assistant in Kenya, for instance, usually has no professional training whatsoever, except for refresher courses of a few weeks duration. It was only in 1971 that Kenya started to give its JAA's a 3-months professional training course which was welcomed by the lucky ones selected for it with such exclamations as "now I can face my farmers" (Rciling, 1972).

With their larger responsibilities, the lack of help from the media and their lack of training, African fieldworkers are also fewer in number relative to the of farmers who need their services. Fieldworker/farmer ratios of 1:1000 and above, as compared with 1:500 in more developed countries, are the rule rather than the exception, and that does not take into account that even within agriculture, fieldworkers are specialised so that the one covers only annual crops, the second only animal health and the third only tea.

Given the enormous task and the constraints facing African change agencies, they have been rather slow in taking up the challenge. The responsibility of promoting the use of contraceptives to slow down the awesome population growth is usually left to midwives and nurses working in clinics. Ministries of Information seldom play a key role and are usually more concerned with supporting the political system and with ensuring adequate newscoverage of the activities of political leaders than with providing the peasants, who make up

90% of the population, with information which is useful to them. Schools of journalism hardly pay attention to agricultural journalism. Newspapers devote many columns to golf tournaments but very few to the problems of peasantry. Provincial agricultural offices and farmers training centers may have an archaic stencilling machine or two for printing staff directives ("rockets") but not for supporting field staff in their operations.

Thus the media which could be available for supporting the persuasive capacity of the rural change agency are not used. This neglect does not so much reflect unwillingness to help the peasant, but is rather the result of a misperception of the role of communication in rural development. This misperception is evident in hundreds of instances. Large quantities of improved cocoa seeds may be made available for distribution to peasants without telling them about the existence of the improved variety, let alone the availability of the seeds. Farmers joining settlement schemes may sign longterm loan contracts without being told about the rights and obligations of loanees in general or the specifics of the loan in question in particular, and so on and so forth.

Perhaps the most detrimental effect of the misperception of the role of communication is the inefficient use made of the thousands of field workers who ultimately carry the responsibility for agricultural development. These fieldworkers rely virtually solely on the individual farm visit as their method of extension and seldom use group extension methods. This individual approach further aggravates the effects of already unfavorable fieldworker: farmer ratios.

With 104 sundays and saturdays, 12 paydays, 10 holidays and 30 meeting days, the average field worker has about 200 working days left. Out of these, at least 50 go to report writing, work for superior officers and days when heavy rain makes field work impossible. Of

the 150 days available for fieldwork, much time is spent on walking long distances to reach farmers. In all, it is probably optimistic to estimate that the fieldworker intensively visits with an average of only 5 farmers on a day, making a total of 750 visits a year.

Given areas with sometimes thousands of farmers, the fieldworker has to make a choice. And the choice logically falls on the larger, progressive farmers on whom visits have most impact. Such farmers cannot be visited only once a year. If we assume that the fieldworker visits each of them an average of 3 times a year, he can have direct, regular and intensive contact with no more than about 250 farmers in a year, as long as he uses the individual approach. Even over a five-year period the number will not be substantially different because the fieldworker will continue to visit the same farmers. A Kenyan provincial official once told the authors, for example, how, when he was a boy, visitors to his home area would always be taken to the same three farms. Now, 30 years later, the same three farms are still used to demonstrate/visitors from outside the progress made in the area.

The individual approach thus leads the fieldworker to establish a regular clientele. Much of his time goes into maintaining the innovative enterprises on these clients' farms and very little time into promoting innovation on other farms. The others are forgotten farmers. Confirmation of their existence came during our experiment which tried to reach them "our" farmers said "we had never seen the fruits of Uhuru but now we are eating them".

If the individual approach has so many disadvantages, what can be a feasible alternative? What is this group extension method we have mentioned?

The method itself is very simple. Instead of visiting farmers individually, the field worker organises gatherings of groups of farmers at a school, a training center or under a tree. He addresses the group and the group discusses whatever he has proposed. Simple as it seems, the method has several advantages.

One is greater coverage per unit of time. In our experiment, for instance we needed only  $2\frac{1}{2}$  days to convince up to 50 farmers to grow hybrid maize and to teach them how to grow it.

A second advantage is that the group approach allows the field worker to use properly prepared messages and to utilise visual aids, and even mass media messages, such as pamphlets, book chapters or radio, as in case of radio farm forums. Thus the group approach can greatly increase the accuracy and understanding of the message delivered.

A third and very important advantage is that members of the group convince each other and that an adoption decision taken in a group usually leads to a much higher rate of actual adoption than is the case with adoption decisions taken as a result of the individual approach.

As early as 1952, Lewin demonstrated this in an experiment. A substantially higher percent of housewives adopted unfamiliar foods such as horsemeat for their families when they had been party to a group decision than when they had been approached individually. (Krech, Crutchfield and Ballachey, 1962, p 228).

Given such advantages of group extension methods and given the tremendous task facing the field-worker, it is surprising that the individual approach is the main tool used by him. It is the more surprising if one considers that Communist China, which is rapidly



turning its peasant society into a superpower, has used group methods for most of its adult education and indoctrination. It is, for instance, largely due to group methods that China can claim to be the only country in the world which has licked its venereal disease problem (Newsweek, ).

In short, the fieldworker is virtually the only channel through which the benefits of modern science presently reach the peasants. His time is a limited good which is unnecessarily made more limited by individual extension methods. It seems evident that group approacher could allow the fieldworker to use his time more effectively and efficiently.

Let us now turn to the selectivity in the distribution of extension services implied in the individual approach. We saw that field workers can seldom achieve complete coverage. They are, therefore, forced to allocate their time selectively and usually select the most progressive and larger farmers for a variety of reasons. Thus allocation is governed by the rule that those who least need it get most of it.

This "progressive farmer strategy" has been rationalised by studies of the process by which innovations diffuse throughout a social system over time (Rogers and Shoemaker, 1971). Such studies have shown that the innovation is usually adopted by a very small group of highly change-prone people who hear of the innovation through extension (and the mass media in developed countries). These people are rich enough and have sufficient land to risk a new venture, while their position in the social system makes them less subject to the forces of tradition and social control working against change.

These very innovative people are soon copied by a larger number of well-off notables who cannot risk their position in the community by adopting an innovation unless it seems beneficial to do so.

From then onwards, the innovation spreads at an accelerated pace, snowball fashion, largely by word-of-mouth, until most people in the social system have adopted it. The last to do so are poor, unventuresome individuals with small farms usually referred to as "laggards".

Thus people differ in the degree to which they are relatively earlier than others to adopt an innovation, i.e., they differ in "innovativeness" and the ones who are early have different characteristics from the ones who are late.

In a nutshell, this is the pattern of diffusion observed around the world. It has been documented so often that the pattern seems inevitable. One is told, for instance, that it is useless for a field worker to visit laggards because they will adopt last anyway and then only on the basis of word-of-mouth advice of fellow farmers and not on the basis of extension advice.

Thus diffusion theory gives a scientific underpinning to the "progressive farmer strategy", according to which a field worker can optimise his impact by concentrating his efforts on the most progressive farmers who are quick to grasp new ideas and have the money to implement them.

One thereby not only maximises the pay-off from the limited resources available but, on top of that, the diffusion process will ensure that the innovation spreads throughout the community until all its members have adopted it. Thus the progressive farmer strategy will, one is told, not only maximize the direct impact of the field worker, but his indirect impact as well.

Alas, we know it is not as simple as that. Diffusion theory completely neglects the consequences of the diffusion process on the equity of income distribution in the rural area. Yet we have already seen how diffusion processes do, in the short run, lead to decreases in the subjective viability of the rural area for a large proportion of its inhabitants.

We quoted, as an example, the Green Revolution in Asia which gave rise to serious political unrest (Brown, 1970, p. 770).

In the long run, diffusion processes force thousands of farmers to leave their land to a point where only 5% of the working population can make a living by farming. We have tried to show that African countries cannot afford to allow such processes to operate uncontrolled. It will be difficult enough to create employment for those rural youths who obtain sufficient education to make a bid to escape from peasant life, incidentally draining the rural area from its best intellect in doing so. No, the only hope for Africa's peasant areas lies, as we have repeatedly argued, in equitable development.

This means that we must use diffusion theory, not to predict the inevitable, but to predict what would happen if we didn't do something about it. If our experiment is theoretically relevant, it is because we do not use diffusion theory to determine inevitable outcomes, but as a source of useful knowledge about the environment which allows us to manipulate it to a point where the prediction of diffusion theory will NOT become reality.

After all, we gather knowledge not to be able to adapt to our environment, but to be able to control it to a point where it yields outcomes we desire. And we don't desire the results of the diffusion process. We don't desire the results of the progressive farmer strategy which reinforces it. We don't desire the teacher who only teaches his best pupils in the hope that they will teach the rest.

What's more, we don't believe that justice is served by the diffusion process or the progressive farmer strategy. Lateness in adoption does not seem to be the result of traits which must be condemned. Instead, it seems that the degree of a man's innovativeness is very

much determined by serendipity and the haphazard frolic of historical events. In fact, we see every farmer as potentially able and willing to progress, depending on the quality of the strategy with which he is approached unless that farmer lives in an oppressive system which has repeatedly punished him whenever he tried to make some progress. And it is such oppression which can be avoided by equitable development.

In short, diffusion theory provides us with the challenge to nuffify its deterministic predictiveness.

Which is a beautiful phrase for the social scientist but leaves the policy maker with little alternative but to ask "So what?". So what indeed. And that brings us to the core of the strategy for equitable development which we have proposed.

We saw that diffusion processes have inequity as their consequence. We also saw that Government services are only given to the most progressive and so reinforce inequity. And thus the strategy for equitable rural development seems obvious: to turn the scales and concentrate the Government services on those who lag behind in innovation, while leaving the development of the progressives in their own, very able, hands. After all, a good teacher not only teaches ALL his pupils, he also gives special attention and remedials to those who need it most.

But simple as it sounds, serious problems of implementation can be raised. How does one give credit to a poor farmer with a few acres of land without destroying him or the revolving fund from which the credit is made available? How does one reach the farmer who lags behind? And, once one has reached him, how does one convince him?

It is an empirical fact that those who are relatively late to adopt are not reached by as many media as those who are relatively early. It is not so that

one can reach the former say by radio and the latter with the paper. No, one can reach the early one with both and the late one with neither.

It is also an empirical fact that late adopters are difficult to convince and that they usually only adopt as a result of word-of-mouth communication with other farmers.

A third empirical fact is that there are very many farmers one has to reach if one follows the "non-progressive farmer strategy" which we propose.

The solution to the practical problems we have just enumerated lies, we believe, in the group extension approach we described before. It allows a greater number of farmers to be covered. It allows group members to influence each other, exactly the kind of persuasion the late adopter needs. Finally, it requires purposeful selection and recruitment methods which allow the field worker to reach where other media fail. In case of credit, loans to grouped individuals may create group pressures and social control mechanisms which facilitate repayment and may obviate the need for surety.

In short, the core of our proposed strategy for equitable rural development is rechanneling Government services to small farmers who lag behind in innovation, a rechanneling which becomes possible through the use of group approaches.

We hope that the policy maker no longer says: "So what?" But we expect that he will not regard our "solution" as more than a possibly feasible hypothesis - which it is. Until it is proto-type tested in the field, our proposal can only be of use to students and other academicians. It therefore behooves us to prove its feasibility.

This book reports on our efforts to carry out baseline research, and to develop, test and evaluate prototype strategies which the policy maker, with a sincere intent to promote equitable rural development, can replicate.

### 3. THE PURPOSE OF THIS BOOK

#### 1. Problem solving Research

Most social scientists do not carry out problem solving research. This is not a criticism of their tendency to seek "precise, elegant and quantified answers to trivial questions" instead of "approximate answers to important questions" (Reynolds, 1971, p.64). It is rather a criticism of their tendency to abandon the research task before it is completed.

Like all science, its social disciplines have the primary function of helping to optimise man's condition on this planet. Social science must, therefore, help to solve problems. Problem solving implies the performance of a sequence of necessary functions, which are: (1) identification and formulation of the problem, (2) identification of the bottlenecks which presumably cause the problem, (3) development and testing of prototype strategies which can remove the bottlenecks, (4) evaluation of the impact of those strategies and (5) large scale replication of successful strategies through dissemination.

These are normal and essential steps in problem solving research. One recognises them, for instance, in the activities of agricultural researchers. They carry out problem solving research because they are aware that only such research can produce the recommendations which society expects of them (Fairweather, 1967, p.29).

Social science, on the other hand, seems to have completely lost sight of its duty to recommend improvements over current practice based on problem solving research. A country like the US, with literally thousands of the best trained, best financed and best equipped social scientists, has not been able to solve its social problems, witness the tragic demise of Johnson's "Great Society".

Thus a recent study of the Brookings Institution says of US welfare programs (quoted from Newsweek, June 26, 1972):

"Today the Federal Government has more money than know-how. The Government literally lacks the techniques for remaking people and conditions. Nobody knows what these techniques are, or whether they can be developed and applied, and if so, by whom. We are fighting wars against poverty, urban blight, against pollution and numerous similar adversaries. The scenarios of those wars sounded fine when the legislation was enacted and the appropriations voted. But the wars have not gone according to battle plans.... We have learned that money alone does not do the job. But neither is the job likely to get done without money. We need experimentation to see what works, and then the financial muscle to apply those lessons on a broad front" (underlining, by us).

The main reason for the inability of social science, with the possible exception of social psychology and economics, to contribute significantly to society is that it hardly considers experimentation and prototype testing a legitimate function (Fairweather, 1971, p 13 and).

Instead, it stops at identifying problems and, at its very best, at identifying manipulable bottlenecks, although it usually wastes much effort on the non-manipulable ones as well.

Thus, the logical sequence of the problem solving process is not completed by social scientists. They can, therefore, only give the policy maker or practitioner some vague "implication for policy" based on studies of current practice, but they cannot provide tested and new alternatives to current practice. They therefore leave the policy maker or practitioner the burden of translating the "implications for policy" into workable solutions which he is usually unable and ill-equipped

to do. And thus social science remains irrelevant. It is significant, in this respect, that the Brookings Institution, quoted above, does not even mention social scientists as people one might turn to for help in solving social problems.

Two of us have worked for 4 years on a million dollar international research project which, when it came to writing up "implications for policy", proved largely useless. All we could recommend were such circularities as "Since we find opinion leaders to be important channels for transferring new ideas from change agents to other farmers, we recommend that change agents use opinion leaders as channels" (which we had just found them to do already). Or we placed the policy maker in an impossible position with such recommendations as: "Since we find that the extent to which a farmer adopts innovations is closely related to the frequency of his contact with the extension worker, we recommend increasing the coverage of extension workers" (without indicating how this could be done).

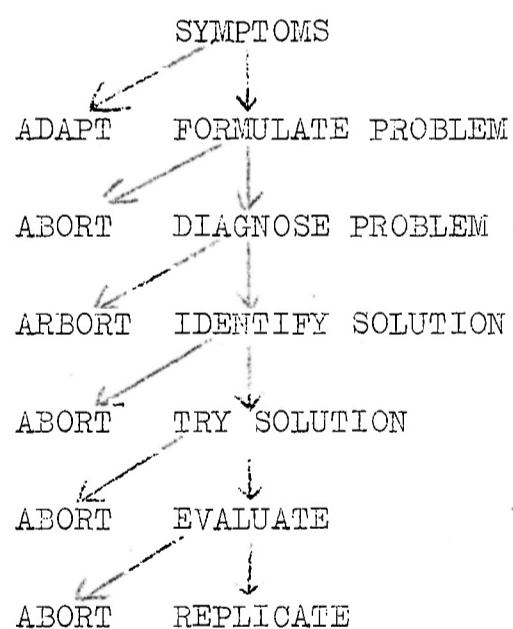
The saving grace of the project was its last phase in which experiments with such communication strategies as radio forums, farmers' handbooks, and rural newspapers were carried out (Rogers, Ascroft and Roling, 1971, p ). It is this phase which gave us a taste for the power of proto-types testing. The radio forums in Eastern Nigeria are apparently still in operation, even after the Civil War.

With such experience as a guide, we decided to make an effort to provide the policy maker, not with vague "implications for policy", but with a tested proto-type which improves on current practice and contributes to the solution of a significant social problem. The work reported in this book thus reflects our effort to carry out problem solving research.



Problem solving research is a systematic variant of the problem solving process which underlies human progress. Where animals adapt to the conditions in their environment, man tries to adapt the environment to his wishes. He seeks control rather than adaptation. If what he gets out of life does not correspond with what he wants, he is faced with a problem. Since both gets and wants are very subject to change, man is usually faced with problems and spends most of his life in solving them. In doing so, he performs functions which we have dubbed the "problem solving process". The process consists of a set of rational and systematic procedures for reaching a subjectively determined objective.

A paradigm of the basic functions of the problem solving process can briefly be outlined (Rohling, 1970):



Let us now define each function in more detail. A symptom is the conscious or unconscious experience of a difference between gets and wants. People can adapt and continue to live with symptoms, or they can try to do something about them. Thus generations

of villagers may bend their head to avoid a branch on a forest path, until someone decides to solve the problem and cuts the damn thing down. Similarly, a Farmers' Training Center may continue for years to mount courses at which very few farmers attend, without trying to change recruitment practices, until someone either removes the word "Farmers'" from the name of the centers (adaptation) or decides to change recruitment practices (control).

Thus the first step in solving the problem is to formulate it, to change a vague awareness of symptoms into a conceptually manageable sentence, including a clear definition of objectives (wants) and a clear specification of the actual outcomes (gets). Problem formulation is a big hurdle in problem solving. Not only is becoming aware and working up a determination to do something about a problem difficult, especially for those who have often experienced failure, but even with a full awareness and desire to solve a problem it is often difficult to clearly state objectives and to identify the variable one wants to change. Every consultant knows this and realises that the problem he is called in for is probably not the one which troubles his client.

The next hurdle is the diagnosis, the identification of those factors in the environment which presumably cause the gets to be different from the wants. That is, diagnosis is the identification of those factors which must be manipulated to achieve the objective. It is in diagnosing that man's mind is capable of remarkable leaps. Thus a god, manipulable through sacrifice, may be invented as the cause of small pox. Frustration to achieve objectives may lead to the identification of scapegoats as the cause of all problems. The European settler may blame Africans

for whatever goes wrong in life, for instance, and a fieldworker may blame the traditionalism of his farmers. A very clever escape from frustration is to attribute the cause of one's problem to intrinsically unmanipulable forces, such as luck, fate, or, in case of frustrated youths, "the system". The methods of science are mainly geared to overcome such subjectivity in the diagnosis.

The identification of environmental factors which presumably cause the problem allows search for solutions, that is, combinations of ideas and resources (technology) which seem suited for manipulating the causes of the problem.

It is one thing to identify a cause and quite another to develop technology to remove it. That is why "implications for policy", even if they identify manipulable bottlenecks, do not help the policy maker very much if he is not told how to remove the bottlenecks. Most desert tribes are quite aware that water is the limiting factor in their environment. But the building of irrigation channels requires another level of civilization so that they usually create rain gods.

Problems in searching for solutions are the availability of resources, ideas on how to utilise them, or both. It often does not help for instance to give credit without training or vice versa. In the tribal society, however, land and labour resources were available and only required an innovation to spark off the cash crop revolution.

With a possible solution identified, the next hurdle becomes its small scale implementation, or trial, the actual effort to test the solution identified on its ability to change the environment. The focus, at this stage, is on how to do it, on how to get the bugs out. It is the stage which requires instruction rather than persuasion or explanation.

Evaluation of the small scale trial is the proof of the pudding. Evaluation allows one to obtain feedback on the extent to which the implementation of the treatment reached the objectives. A difficulty in evaluation is measurement. One reason for the problems in promoting preventive medicine as a solution to problems is, for instance, the fact that their effect is difficult to demonstrate. How does one show what the baby would have looked like without proper nutrition?

If the evaluation demonstrates the utility of the treatment, it can be replicated by others, or when the same problem occurs again. The tested treatment then becomes part of the arsenal of available technologies -until better methods are developed for reaching the same objective. The problem at the replication stage is dissemination. One of the main challenges facing developing countries is to disseminate existing solutions to those who have the problems.

It is obvious from the above discussion that the functions of the problem solving process underlie a great variety of human behaviors. The use of medical jargon is no accident, for instance. But one can recognise the functions also in a TV advertisement for toothpaste. The camera focusses on a girl who sulks alone while her friends are dancing in the background. Her problem: she is a wallflower - and who wants to be unpopular? The next shot shows her girlfriend in the role of fieldworker. She says: "My dear, you have bad breath" and thus diagnoses the problem. The girlfriend also shows the technology to remove the bottleneck: toothpaste X. The last shot shows evaluation: the happy girl surrounded by males burning with desire. And the message is: viewer, go and replicate, buy toothpaste X.

Although our treatment of the problem solving process and toothpaste advertisements seems to suggest that problem solving follows logical steps, this is

often not the case. Many problems are solved through serendipidity, the accidental stumble on a solution by someone able to recognise it as such. One can safely assume, for instance, that the use of cowdung to fertilise fields was not developed after painstaking diagnosis etc, but resulted from the observation that the grass grew greener around last month's droppings.

Other irregularities also mitigate against the stepwise conception. There is no doubt, for instance, that the availability of a solution may lead to determination to go and do something about a problem or even to a change of wants.

We therefore speak of the functions of the problem solving process, although problem solving research, its systematic variant, does follow a more stepwise sequence.

Coming now to problem solving research, we must differentiate between the type which focusses on identifying the cause that fits a technique in the arsenal or the medicine cupboard, and the type which focusses on developing an, as yet unknown, solution to a given problem. It is the latter focus which serves the purposes of this book.

The functions of problem solving research correspond closely to those of the more general process. Problem formulation in research usually departs from a given societal problem or policy objective and aims at the identification of the variable of which one wants to change the value. This variable is usually called the "dependent variable". In our case, the societal problem is rural inequity and our dependent variable could thus be the degree of equity in a given rural area. However, we have narrowed that variable down to the income level of peasants with below average incomes. We further assumed that income depends on agricultural productivity and that it, in turn, depends on the extent to which modern agricultural technology

is used on the farm. Thus the variable of which we want to change the value is the extent to which modern agricultural technology is utilised by farmers with below average incomes.

The next step in problem solving research is the baseline study. It has the function of (1) providing the "before measure" of the variable one wants to change and (2) of identifying the independent variables, that is, those one must manipulate to change the value of the dependent variable. In our case, the main independent variables are the access of low income farmers to different Government services such as credit and extension, and the form in which those services are given.

In the experimental treatment one actually engages in activities to manipulate the independent variables. Of course, one must, ideally, design the experiment in such a way that one can attribute observed changes in the value of the dependent variable directly to the treatment one has applied. That is, one must control other influences on the dependent variable which could raise doubts about the impact of the treatment. As we shall see, such control is difficult in field experiments.

Evaluation provides the "after measure" of the value of the dependent variable. Comparing before and after measures allows one to gauge the effect of the treatment. Evaluation should, however, also provide a detailed description of the operations needed to manipulate the independent variables.

Such a description is essential for replication of successful treatments. Replication implies publication, training, or other forms of dissemination.

Having identified our research problem earlier in this chapter, we shall devote the remainder of this book to the baseline research, the experimental treatments, and their evaluation. The book itself is an instrument for promoting replication.

1,3,2. Chapter Outline.

In presenting the results of the work in Tetu, we shall follow the sequence of steps dictated by the problem solving research paradigm. By and large, these steps reflect the evolution of the Tetu research programme over time. Thus Chapter 2 begins with a description of the research setting, not only in terms of the area of operation, but also with respect to the Special Rural Development Programme of the Kenya Government. SRDP provided ideal conditions for carrying out problem solving research - if it didn't actually force us to do such research. The authors of this book were actively engaged in the 1972 Evaluation of the SRDP.

The rest of Chapter 2 focusses on the baseline research. Although the actual field experiments were carried out in Tetu Division in the heart of Kikuyu land, baseline studies, similar to the one in Tetu, were carried out among the Gusii in Kisii and among the Abaluhya in Vihiga. We report the results of these studies also to allow comparison across different tribal regions and to show that the experimental work carried out in Tetu has relevance for other areas as well.

The baseline studies in the three areas focus on the differences between small-holders in the degree to which they adopt innovations, and on the reasons for those differences. These original baselines led to a number of related follow-up studies. We report the results of a few of them: the role of extension workers in Tetu, the marketing of agricultural inputs in Tetu and the characteristics of pioneer coffee growers in Kisii.

The Chapter continues with a detailed report on a 1973 panel study carried out in Tetu with the same sample as the one used in the original 1970 baseline.

The purpose of the panel study is not only to acquire more detailed information about independent variables which proved important after the analysis of the original baseline results, but especially to specify trends of change from the comparison of the 1970 and 1973 data. We were especially interested in the trends in equity.

Chapter 2 concludes with an attempt to identify the dependent variable which seems beneficial to change and the independent variables which can probably best be manipulated to achieve the desired change in the dependent variable.

Chapter 3 summarises the conceptual framework we used to determine and develop the experimental treatment which could be applied to manipulate the independent variables. Earlier, we had occasion to observe that correct diagnosis does not immediately lead to effective treatment. It behooves us, therefore, to report on the considerations which guided us in identifying the treatment used.

Our conceptual guide was, of course, very much determined by the manner in which we were brainwashed. If we had been economists, we would have had a completely different point of departure. As it is, we especially considered disseminative communication, supported by credit to make adoption of what was disseminated feasible. Our results seem to show that we were not mistaken in our assumptions.

To assume, it is said, means making an ass out of u and me. But since only fresh assumptions can break the stranglehold of convention, being one ass seemed preferable to the morass of more-of-the-same. And our preference seems, as said, to have paid off.



Chapter 4 reports on the experimental strategy itself. First we deal with the process through which the strategy was identified, developed and planned for implementation. In the second section of the chapter, we describe the implementation history with all its ups and downs.

The strategy was implemented once in 1972 and twice in 1973. In the first trial, we emphasised dissemination through group extension. In the second trial, we emphasised the supportive credit package and methods for selecting forgotten farmers. In the third trial, we emphasised combining the lessons learned in the first two into a proto-type which can be replicated in small-holder areas by field staff with local resources.

Chapter 5 reports on the evaluation of the experiment. First, we deal with some methodological problems of evaluating field experiments in general and ours in particular. In the second part of the chapter, we scrutinise different aspects of the experiment itself, such as (1) farmer selection and recruitment for group extension; (2) the extent to which the forgotten farmer was actually reached; (3) the extent to which his adoption decisions were influenced and (4) the maize yields and repayment rates achieved. We further make a non-professional attempt at cost/benefit analysis. Finally, we scrutinise the effect of the experiment on rural equity, for that is the variable we tried to change.

After its two years of operation, the Tetu project is still far from complete. Many improvements and complementary strategies can be identified for further testing. We propose some of them in Chapter 6, such as more efficient ways of field worker deployment and alternative group extension methods. In Chapter 6, we also deal in some detail with a more efficient national

system for proto-type testing and for disseminating improvements over current practice in rural development.

Chapter 7 presents the product of the work in Tetu: the policy recommendations which can be justified by its results. The harassed policy maker should read only this chapter. The other chapters describe how we got to the recommendations and show what action should be undertaken to implement them. These chapters are, therefore, more relevant for practitioners and for advisors to policy makers who carry the burden of keeping the gate -- admitting what is useful and keeping out the junk. We hope the gatekeepers will let our recommendations pass. We have reported our production process as accurately and as honestly as we could to allow potential buyers to fully evaluate our product. We are, unfortunately not in the position of the Kenya Breweries in this respect. Their product is consumed with abandon by people who couldn't care less about the way it was produced. All we can do is hope that someone will find the time to read this work, and better still, get enthused to action.

### 1,3,3. The Intended Audience.

A book such as the present one must serve several purposes. In the first place, it is intended for the African policy maker intent on changing the conditions in rural areas from which he has escaped himself. After all, the main reason for writing this book is to disseminate our results in the hope that the prototype strategy which was developed in Tetu is replicated on a large scale. As such, the book supports our other efforts to disseminate the results obtained, such as the numerous papers which were written on Tetu and the seminar for top officials which we held in Nairobi towards the end of our involvement in the experiment. We chose the book as an additional form of dissemination because we feel it might penetrate where other methods fail. To increase its chances

of doing so, we did our best to make it smooth and interesting to read, for as far as authors whose native tongue is respectively Dutch, Kikuyu and Shinyanja can achieve that goal.

Apart from serving the policy maker, the book has other purposes as well. Since the reward structure in social science gives few incentives to prototype testers and other "applied" types, the authors, who are, it must be said, ambitious to make a name for themselves, count on the book also for purposes of recognition. Thus the book is a hybrid because it is also written to make other social scientists pat us on the back. Trying to please policy makers and social scientists in one book must necessarily mean a compromise.

But then, the book does not address social scientists only for purposes of recognition. We believe we also have a message for them. And the message is that social science has to start producing policy recommendations based on field experimentation if it wants to become more relevant. In this sense, the methods we used represent a prototype which we want to disseminate, this time to social scientists - and those who fund them.

The third audience for this book are the institutions which funded and supported us, and, therefore, need to receive an account of our activities. In the first place, Government of Kenya, and especially the Ministry of Finance and Economic Planning (Physical and Regional Planning Unit), then there is the University of Nairobi and especially its Institute for Development Studies of which we are proud members. Thirdly, we must mention the Netherland Foundation for Tropical Research, which sponsored one of the authors and paid a substantial part of the research cost, and the Agricultural University of Wageningen, which released the same author for two years.

Fourthly, there is the Rockefeller Foundation and the University of Iowa who supported another of the authors for two years and allowed him to set the whole research effort in motion. We thank all of them and hope they are satisfied with this return to their investment.