UNIVERSITY OF PAPUA NEW GUINEA

DEPARTMENT OF PRIMARY INDUSTRY

HISTORY OF AGRICULTURE

WORKING PAPER NO. 22

Agricultural Innovation in a Peripheral Area: Finschhafen District of the Morobe Province.

DON TOWNSEND

November, 1978

Editor:

Catherine Snowden,

History Department,

University of Papua New Guinea,

Box 4820, P.O.,

UNIVERSITY,

Papua New Guinea.

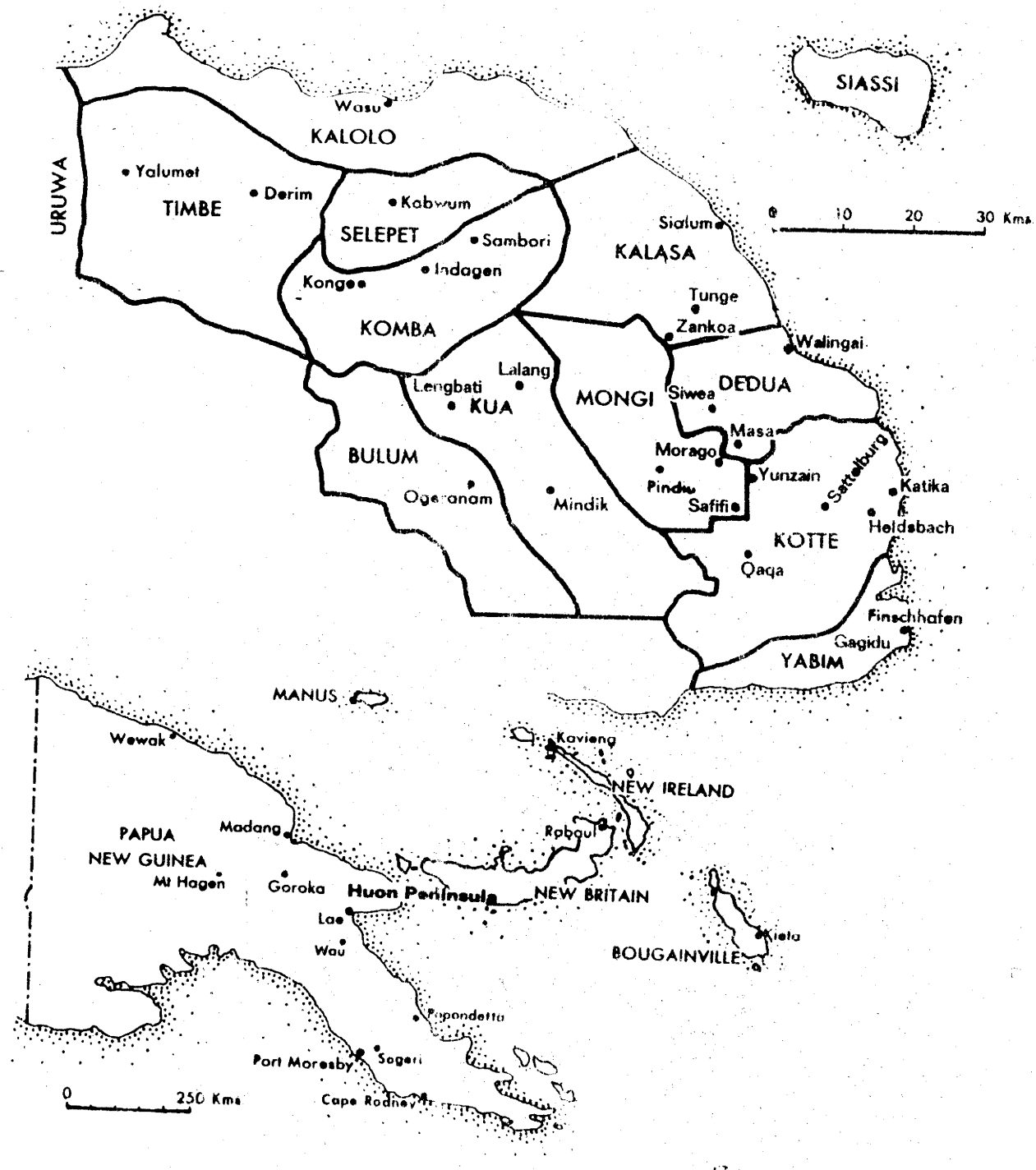

Figure 1 : LOCATION MAP OF THE HUON PENINSULA (Finschhafen District includes Yabim, Kotte, Mongi, Kua, Bulum, Dedua, Kalasa and Siassi)

1. Introduction

The penetration of the international political and economic systems into Papua New Guinea required the establishment of centres or cores of relatively intensive investment and production. There was no overall organisation of this penetration, so that there was wide variation in the impact of the international on the indigenous system. Amongst the religious missions, there was great diversity in their origins and destinations, in their purposes and methods, in their resources and manpower, and in their reactions to the indigenous cultures and societies. Similarly, there was great diversity amongst the agents of political and economic penetration and incorporation. Therefore, attempts to provide a general structure for understanding political and economic penetration in Papua New Guinea are often frustrated by the significance of particular and sometimes unique factors in individual regions or localities of the country.

However, in this paper, we describe and examine the course of agricultural innovation in a peripheral area, to seek an understanding of the actions of promoters and the reactions of the indigenous people. The underlying idea is that relative location does influence people in particular ways,

despite the apparent dissimilarity between areas in the experience of contact with the introduced systems.
The spatial sense of the term "peripheral" is apparent. But there is also a deeper meaning in political and economic terms - that peripheral areas have weak links to the political and economic cores, that these links express a condition of dependency and reaction, and that this condition of dependency makes it probable that the periphery will be exploited to the advantage of the cores. It is this condition of dependency and relative impotence that results in recognisable behaviour patterns of peripheral peoples despite peculiarity in the events or methods establishing and sustaining the condition.
The area to be discussed in this paper is the Finschhafen District of Morobe Province. This District was once a core of foreign dominance; later development of Lae and its hinterland has cast most of the District into a peripheral, dependent relationship.

2. Background:

The international system did not simply penetrate and overlay a dormant and stagnant indigenous system. Some aspects of indigenous society and economy have continued their evolution to the present time. Certainly the physical and environmental variation within the District has affected significantly the evolution of the indigenous system, and the penetration of the international system.

In Finschhafen District, the physical environment is hostile to travel and communication. A narrow coastal fringe in the south and north, and terraces of uplifted coral in the north-east, provide the only terrain which could be considered "easy" in terms of mobility or extensive cultivation. From the coastal fringe, the land rises to the west, reaching heights of 1500 metres just 10-15 kilometres from the coast. In the north, the land then rises steeply into the massive Cromwell Range; in the south, a westward transect passes into the three interior valleys of Mongi,,Kua and Bulum, and then rises dramatically into the Saruwaged Ranges.

The numerous powerful and active streams have cut sharp, narrow ridges and steep valleys, all of which inhibit pedestrian and vehicle movement, especially into and within the three interior valleys. The restrictions on circulation, and the definition of territory by mountains, ridges and valleys have fostered a strong sense of place and society that translates into parochialism within organisations and institutions which have been introduced into the District.

Generally, land 'and subsistence resources have been abundant in the Finschhafen District. The current population density is about 20 people per square kilometre. There are some concentrations of up to 60 people per square kilometre (around Siwea, Pindiu, Mindik and the south-east corner of the District), but these are generous ratios

when compared with the concentrations of 200-300 people per square kilometre in parts of Kabwum District, or of Chimbu and Enga Provinces. In Finschhafen, there is still plenty of rainforest in the upland areas, and only in the areas of heaviest population density has the vegetation complex been reduced to a "kunai" or "pit-pit" regime.

Development of the cash economy has created some land pressure in the south-east corner of the Finschhafen District. Land has been alienated to mission-owned plantations (coconuts, cocoa, coffee and cattle), and to the government, mission and business establishments for housing, schools, workshops, hospitals, offices, stores and wharves. Smallholders have become involved in raising of coconuts, cocoa, coffee and cattle, thus intensifying the competition for land between peoples and between uses. Elsewhere in the District, cash cropping has been adopted with little disruption to the land requirements of the subsistence system.

3. Cash crops in relation to earlier innovations.

Because of its widespread distribution, its relevance to economic change and its effects on labour organisation in the society, cash cropping is regarded by outsiders as the most significant innovation brought by the international system. However, the village people might not attach to it the same degree of significance - many of them tend to

see cash-cropping as just another in a series of sequential and sometimes competing innovations. Some people in Finschhafen would rank cash-cropping just ahead of formal education, but well after the "mission way", government law, and migration for wage-labour, in terms of their impacts on rural life and society. The point is that the economic bias in the outsiders' view of development can impede the understanding of the relative importance of cash-cropping as a systemic or structural change in rural society.

Until the 1930's, Finschhafen was a core area of investment and innovations. Finschhafen was the first headquarters for the "Neu Guinea Kompagnie"and the Lutheran Mission. The "Kompagnie" moved to Madang in 1891, but the Mission stayed on, and by 1911, had established its base, three coconut plantations and a small complex of processing and service activities along the coast between Gagidu and Sattelburg. Missionaries, using an advance guard of local evangelists, had made contact and established some influence through to the western and northern people by 1906.

Mission activity was stalled by the First World War, but was revived and pursued enthusiastically in the 1920's. The first external division experienced by the local people was into "circuits" based on the mission bases of Sattelburg and Kalasa; and the second was into corresponding language groups, Kotte in the north and Yabim in the south.

Along with language and the gospel went ideas of pacification, village organisation, village leadership, hygiene and so on; and in the 1930's, the sporadic diffusion of coffee seedlings from Heldsbach was attempted by the missionaries. An important linkage was established between Finschhafen and the New Guinea Highlands, through the Mission's training and dispatch of indigenous evengelists as far afield as Mt. Hagen.

The self-contained orderly world, of a slowly changing indigenous society under Mission hegemony, was rather dramatically opened up about 1930, by organised recruitment for work on the goldfields around Wau and Bulolo. This innovation "came in the back door", from the south coast east of Lae into the three interior valleys, and included about 30% of the men of the 1930's decade. A lesser proportion were drawn from the men of the northern census divisions of Dedua and Kalasa. At the same time, a small proportion of the men, drawn from all over the District, was recruited to work on plantations in East New Britain, New Ireland and Bougainville.

The present survivors of that period clearly favour the goldfields work over the plantation work. Most say that the pay and conditions were fairer, some say that they learned more useful things at the goldfield; some say that the workers at Wau - Bulolo were more homogeneous in culture and origin. People involved in the 1950's wave of plantation contracts confirm the bitter experiences of the previous generation. They were eager to grasp the

1956-65 diffusion of coffee growing as an alternative to the cash from plantation work; but they were also eager to migrate out to jobs in Lae or gold-seeking in Kainantu and Wau.

The most profound change to the world of Finschhafen people came with the Pacific War. The War had a devastating impact. Mission work was curtailed for almost a decade. The overwhelming power of the white men was forced out by the sweep of a new invader. Unimaginable means of destruction and mobility passed through and over the precious land and shores of the indigenous society. In many areas, the nucleated villages were abandoned. Men of all ages were drafted for service with the Japanese, Australians or Americans. Then came the colossal build-up of structures, men, machines, and materials at Finschhafen, with an endless line of ships unloading mountains of goods which were consumed or discarded with unconcern by the invaders. The indigenous people were introduced to new diets, saw black American soldiers participating on apparently equal terms, saw the strange ritual, ranking and fallibilities of men concerned with some God other than the one they had been taught. As Wagner interpreted the situation (1964:105):

> "they could not harmonize their Christian, and, by the way young belief with the awe-inspiring reality they saw. They fell back to the religious ground they had come from".

The ultimate act of destruction was beyond the comprehension of local people and contributed greatly to the resurgence of 'cargo-cult' beliefs in this region.[1] Most of the material surplus to the American requirements was dumped in the sea or burned. Wagner (1964: 105-6) reports the following comments by some local people, recorded in interviews in 1963:

> "If they had made the stuff themselves they would have taken it along when they went. Because it had come up by itself, they left it behind".

The underlined indicates the belief that the white man, particularly the Americans, had access to a spirit world which actually provided the material goods.

> "Some of us even today when we buy a thin blanket or a cheap knife in the store feel sorry upon thinking of the good-quality things we had seen during the war".

The underlined indicates the belief that what later white men brought back to trade with the indigenous people was the reject produce or technology from the privileged part of the world.

---

1. Pre-war movements derived from biblical stories and from the obvious gap in the power of white and black men. Post-war movements were more clearly materialist - oriented.

The war brought the real beginning of the 'government period'. Quite a few local people were kept on at Finschhafen for re-construction work, but the majority returned to the villages where the more important reconstruction was going on. Missionaries returned to a formidable task of regaining their organisation and re-establishing their following. Out-migration to plantations and the goldfields began strongly in 1947-48, at about the same time that a popular "cargo-movement" began in the Mongi interior. Successors to that movement continue today, though they are being slowly transformed into more conventional business activities (Adams, 1975). 'Millenarianism' and migration were the expression of the desire for material advance stimulated by the War. Wagner's interviews support this:

> "...the people have already eaten the marrow of the gospel and found it without taste... During the War we have eaten delicious food with the Whites...and we saw an overwhelming abundance of goods. Then we thought: 'This is the true thing'...Now, too, many young men run to the whites". (1964:78)

Until 1950, formal training in literacy and education had been performed by the Mission, in the indigenous languages of Kotte and Yabim. The opening of 10 primary schools in the 1950's, the greater presence of the administration, and the increasing circulation of migrants

Mission schools still use the vernacular, but they have been somewhat discredited because of this limitation on the ability of graduates to socialise and find work outside the sub-region. Kotte and Yabim still remain an effective means of communication in the sub-region, a fact which could be exploited by extension workers trying to influence the village-bound population.

After 1953, the administration started to give considerable attention to agriculture, especially to cash-cropping. Progress was hampered by changes in policies and personnel, but the next ten years saw a rapid diffusion of cash-cropping, particularly cocoa and coconuts in the south-east corner and coffee through the coastal uplands and Mongi interior. The local enthusiasm for cash-cropping was fed by those workers (plantation, or war activities) who had returned from New Britain and Bougainville, with stories of the potential, yet relative backwardness of Finschhafen.

It is important here to point to some changes in the wider system. Decolonisation was proceeding rapidly elsewhere in the world if not in Papua New Guinea. The Australian administration was expanding its role and its staff throughout Papua New Guinea. The large populations of the Highlands were being contacted, pacified, and, particularly through the contract labour scheme, brought into a more national system. Expatriate businesses were growing in number and in range of activities. Large

towns were evolving, mainly on the coast. The Finschhafen District was gradually becoming 'peripheral'. In the supply of missionaries with their gospel and vernacular, of labour to the plantations and goldfields, of educated people to the government services, and of capital to incipient enterprises, the people of Finschhafen particularly had had a 'central' position. The expansion of the cash economy elsewhere in Papua New Guinea, the evolving linkages of Lae with the Markham Valley and the Highlands, and the increased movement of government and private services into other regions; all of these things meant that in political and economic terms, the District was becoming peripheral. Some outside observers believe that the control of the mission, with its emphasis on social stability and social improvement, and with its organisation of many aspects of life and behaviour, actually reduced or contained the motivations of rural entrepreneurs. (Adams 1975; Macaulay 1975, Sakein 1978).

So while the indigenous and expatriate missionaries tried to re-establish the hold of a previous model, and while agricultural officers strived to provide some local opportunities; contrary influences of increasing literacy, education and wage employment were working their effects on the local people, such that migration increased rapidly and evolved from an 'organised' circular pattern to a more 'independent' character. (Ward, 1972). Almost certainly until the mid-1960's backwash effects were more noticeable

than spread effects in the District - that is, innovations took more labour and capital out of the region than they supplied to the region.

4. Developments associated with cash cropping

Thus the innovations of cash cropping came to an expectant and disturbed population - expectant because they had actually touched the apparently unbounded wealth of a new world, disturbed because of their apparent inferiority and impotence in the new system.

The reaction was bitter, as recounted by Mr. W. Fugman, a man with vast experience in the region. He wrote (1969:2):

> "'These Europeans want to exploit us'. 'Let us get busy making up for lost time'. Old army trucks were pulled out of the bush. Trade stores were opened. There was plenty of cash available as the people received their war damage insurance. 'Cargo cult' ideas, too much ready cash, suspicion and ignorance of fundamental economics precipitated feverish activity. The people simply were not ready to listen. Any remark made by a European, whether a government officer or a missionary, was misunderstood".

But the people did have ground and labour, and many of them had seen how resources could be organised to "grow money on trees". They had been encouraged many times by the missionaries to try various crops, mainly for the supply of the mission stations, but also for export to get money to

support the missions and schools and to buy a few basic tradegoods. Wagner (1964:93-118) recounts the various efforts amongst the Kalasa - Dedua people to produce tropical fruits, coffee, potatoes, rice, tobacco, cattle, sheep, chickens, timber, and spices. These efforts, and similar efforts elsewhere in the District, followed the pattern of promotion, enthusiasm, instruction, diffusion, production, inadequate returns, failure, disillusionment, rejection, hostility - and reinforcement of inferiority.

It is to the credit of the extension officers of the 1950's that they adopted some of the lessons from this pattern. Despite the handicaps of staff shortages, staff turnover and changes in policy, they did organise and execute a programme of planned, widespread, gradual and co-ordinated promotion and diffusion of cash crops, particularly of cocoa on the coast and coffee in the uplands and interior.(White, 1958; Sakein,1978).

The second important lesson that was applied concerned the simultaneous promotion of activities vital to the adoption of and successful returns from cash-cropping. The intention of the promoters, both Administration and Mission, was to encourage agriculture through the development of growers' cooperatives, trading and retailing services and transport and communications systems.

To set the scene for the account of adoption and exploitation of cash-cropping, it would be useful to sketch first the development of these related institutions.

Ideas for collective action on economic change grew up in many part of the District in the early 1950's. The first widespread organisation outside of mission control energed from a series of meetings at Siki near Heldsbach in 1953 and 1954; and, under the guidance of an administration officer, the Finschhafen Marketing and Development Society was formed. It raised capital from numerous small contributions all over the District, to establish trading, retailing and transport facilities.

At the time, the Lutheran Mission was very concerned about the burdens of trading.

> "How could the mission perform its main task of looking after the spiritual welfare of the people and start a large education programme involving approximately 1200 teachers yet, at the same time, smoothly run a marketing and supply service for people living in faraway places?. Thus as early as 1951, the possibility of separating the industrial and business activities of the mission was discussed. Because of lack of staff, however, it was not until 1957 that a survey was made of the economic situation and proposals put forward"
>
> (Fugmann, 1969:3)

Mr. Fugmann has organised in 1954 and then managed the Circuit Bulk Store" or "Kikefung" group, with bulk stores at Walingai, Salankaua and Sattelberg . "Kikefung" bought produce, and supplied goods to 48 independent village stores throughout

Finschhafen District. But Fugmann felt that church work and business work should be more clearly separated, so he advocated an organisation with a large investment by villagers.

In 1958, a program of share promotion work was established, and in April 1959, the "Namasu Company" began operating. According to Fugmann, the most energetic promoter, "New Guineans invested their hard - earned money not because they understood this idea but because they trusted the people who told them that this would be the best long-term investment for their savings" (1969:4). Their expectations were exaggerated, (because of their belief in the profit-making magic of the Europeans,) and because of the apparently simple terms in which Europeans talked about business organisation.

The rivalry between Namasu and FMDS reflected the deeper rivalry between Mission and Administration. Some Administration staff resented the Mission's expansion of its limited business role (as did some missionaries, for other reasons) as an attempt to control the lives of Finschhafen people. Some village groups "sided" with the one operation, some with the other; many individuals felt that they were ensuring their business activities and their relationships with field staff by contributing money to both organisations(Sakein, 1978).

Genuine attempts had been made to combine the organisations of FMDS, Kikefung and some local groups. A senior administration field officer wrote:

> "I should not like the Mission to have full control (of the proposed combine) ....Unfortunately, Mission and Native relationships, particularly with the more advanced native, are not as good as they might be. Natives often voice their opinion that the Mission should be concerned only with their spiritual life, and that it interferes far too much with politics and economic matters". (White, 1958:15).

Later, he wrote about people's reactions to the proposal:

> "There is also a group of natives who think it is a good idea to have two rival business concerns, probably to see which one does the better job or perhaps to keep apart the two main groups of Europeans in the area" (White, 1958:16).

On the whole, the people have benefited by the competition between the two trading and transport systems. Namasu has provided a continuity and stability in operations without strangling or excluding the initiatives of the people or of the Administration. The strong association with the Mission has helped in those aspects of continuity and stability. On the other hand, the cooperative has been hindered in the turnover and personalities of administration staff, and in the apparent concentration of control and benefit in the south-east corner of Finschhafen.

The administration recognised the problems of parochialism and management in the FMDS and encouraged the subdivision of the Society, in 1968, into independent cooperatives serving smaller populations in groups related to census divisions and language divisions. Thus "Jamu Cooperative" was set up in Kalasa, "Modele" in Dedua, "Kaya" in Yabim - Kotte for the coffee and copra growers, "Akua" in Yabim - Kotte for the cocoa growers, "Kesawing" in Mongi and "Kuso" in Kua - Bulum. In 1976 "Somba" split off from "Kuso", to serve the Bulum people.

Administration staff, from the Department of Commerce and its predecessors, have had to carry the management burden of the cooperatives. There are recurring problems of inadequate accounting and misappropriation of finance. The "Jamu" society failed, because of mismanagement and heavy competition from Namasu, the "congregation trade stores" and an expatriate businessman. "Modele" also failed for a few years, but has been revived in 1977. Some of the other operations have been closed for periods of months while re-organisation and re-financing have taken place.

Most of the people are disappointed in the cooperatives and Namasu, because of the lack of dividends, but they seem to appreciate the system of "forced saving" due to rebates or deferred payments on produce. Many of the people laugh at their earlier, exaggerated expectations.

Some complain that their profit - money has been squandered by the storekeepers, or used for expansion of business assets elsewhere; most see the absence of dividends as the cost they pay for the service provided by the institutions in marketing and supplying goods.

Local initiative tried to find outlets in trading operations. One ambitious man set up a crop-buying and goods - selling operation at Katika, near Heldsbach, in 1954. The operation soon failed, from a policy of overpaying for crops and under-charging for goods, in an attempt to out - compete the Mission-based trading system.[1]

In Kalasa and Dedua villages, similar collections were organised, with more emphasis there on attempts to buy a ship to provide a regular link with Lae and Madang.

Most village entrepreneurs restricted their operations to retailing, and throughout the 1950's, each village saw a succession of ephemeral "canteens" and trade stores - in the 1950's, these were supported by funds from war damage compensation and contract labour, rather than from cash crops. Later, many operators subsidised their trade stores out of income from cash crops, for reasons of prestige and a sense of involvement in the bisnis of the extra-village system. The main benefit of this rather feverish activity went to the wholesalers, transporters and foreign manufacturers while many village people had their feelings of impotence and inferiority reinforced by the succession of failures. However, it is fair to say

---

1. A local man temporarily in charge of the Kalasa congregation store, adopted a similar scheme of over-paying and under-charging. The people thought they had discovered the correct and decent way of trading - until the missionary returned and insisted on repayment to the store's cash reserve.

that some lessons were learned about the inadequacy of individual operations in such difficult economic and geographic conditions, and some stimulus to cash-cropping was provided by the wider availability of trade goods.

Another important change in social organisation came with the formation of local government councils. This was a development from the system of village officials, intended to encourage cohesion, local responsibility and collective action in area improvement. Despite the efforts of countless officials and local promoters, the purposes and functions of councils were never properly understood. The people's aspirations were towards bisnis and material rewards, and they invested grand expectations into each of the successive and sometimes overlapping innovations including councils. Finschhafen Council was established in 1957, Pindiu in 1964, Tewae in 1968. The achievements and popular esteem of these Councils have never amounted to much - only the Rural Improvement Programme has kept them alive in recent years.

A second important outlet for local initiative and energy was in the attempts to improve transport and communications. The people of Dedua - Kalasa repeatedly organised for the buying of a ship and they are doing so again in 1977-78. People of the upland and interior gradually improved on the walking tracks made in the pre-war period under the encouragement of the missionaries. The most earnest, continuous and, in the end, frustrating

activity was on the part of the Hube people, trying to build a road eastwards to Yunzain and then to Sattelburg and the coast. Today, one can see numerous pieces of road - bench (and numerous plans in government files), evidence of the efforts of Hube people to break out of their "imprisonment".

With much regret and bitterness, the people worked on the less favoured alternative of airstrips; Pindiu airstrip was opened in 1961, and Mindik in 1965; the Bulum people laboured on until Ogeranang was opened in 1975. An attempt to build an airstrip at Lalang, in the headwaters of the Kua, was abandoned in 1975 after many years of cutting and clearing; a strip may be completed in 1978 at Lengbati, also in the headwater Kua area. With the encouragement of an expatriate businessman,* an airstrip at Siwea, in the Dudua highlands, was opened in 1969. Attempts to cut an airstrip at Qaqa", in upper Mape, have dragged on for seven years; a great amount of work on an airstrip at Morago was abandoned in 1975, and recent efforts have been directed to the working of an airstrip at neighbouring Masa village.

There can be few areas in Papua New Guinea that have expended so much thought, time and energy in trying to overcome their geographic disadvantages, as the Hube area has done. Not surprising then, that "cargo-cult" movements, as an expression of frustration about breaking into the modern systems of bisnis, have found frequent and strong support there, even up until 1975. Nor is it surprising

---

* now a citizen of Papua New Guinea

that many Hube people have tried to find the road to success through wage-labour and business associations in the towns of Lae, Wau and Bulolo. Adult male absenteeism from Mongi and Kua reached 40% in the period 1954 - 64, the same decade which saw the organised diffusion of coffee - growing. Very strong and apparently beneficial links were established with Kainantu and Wau goldmining, and with specific employers in Lae. Some Hube men became foremen in the mines or independent lease-holders, and thus preserved opportunities of employment for successive waves of young migrants. As early as 1957, a group of Hube workers had bought their own mining base near Wau, and this still provides a lot of work for the young men of the late 1970's.

Clearly, coffee - growing and migration were not mutually - exclusive activities. Perhaps coffee was the ideal innovation , in terms of climate and demands on labour and on social organisation. Absenteeism was lower in the villages that had had less migration experience before the War and that lacked the links to places of specific employment; but it was also lower in those villages closer to the transport, trading and administration nodes. This suggests that absenteeism would have been lower, and exploitation of coffee trees greater, if the promised transport infrastructure had reached into the interior.

Along the south-east coast, where the people were favoured in terms of market accessibility, government and mission services and cash - earning opportunities, absenteeism peaked at a lower level, and has declined earlier, when compared with the upland and interior. The coastal and near-coast areas of the south-east corner have had experience with coffee, coconuts, cocoa, fishing, rice, cattle, stevedoring contracts in Lae, and employment on local public works; as well, they have had the benefit of good access to Lae, to schools, hospitals and the services of the small town at Gagidu. Though thoroughly knocked around by the War period, these people have emerged as the most content with the evolved combination of traditional subsistence and export - monetary systems.

This south-east corner has been the first base for most innovations spreading out over the District - the Mission organisation, the Mission trading system, coffee growing, cooperatives, local government councils, bank accounts, roads, cattle, savings and loan societies and schools. The main exceptions are, as one would expect, "cargo-cult" movement and migration for wage - labour. The difficulties of access and changes in climate, vegetation and social organisation have acted against the even diffusion of most of these innovations. Thus it is significant achievement of the Mission and the administration, particularly of the agricultural field officers, to have helped spread coffee-growing so widely and evenly throughout the District during the 1956 - 65 decade.

5. Diffusion of coffee growing

> "For a period after 1954 the District Officer called for accelerated cash crop plantings...nearly all coastal villages planted some new coconuts. Highland villages planted coffee seedlings but nearly all on a communal basis. Little interest was shown in these collectives and few have survived to this day. To date, since 1953, there have been four changes of the Agricultural Officer ... Only during the period of the present and previous officer has there been evidence of a definite plan for development based on sound principles and a show of continuity of policy". (White, 1958:2).

That was the view of a disappointed but determined officer. A later view came from Mr. D. Ruthenberg, of the Lutheran Economic Services:

> "One particularly good man (government extension officer) made quite good progress in getting the work going, but, because of a government policy, that a lot of people could not understand, he was soon transferred to another area. Then his successor had no interest at all in the program and it soon collapsed

> for the want of supervision. After he was transferred a man with the energy to walk through the mountains took over, and when he found the coffee gardens had been neglected, he roundly abused the people, and not only that, he changed the methods of working and even the type of coffee planted. This continual change over the years has totally confused the issue, until today the people of the (District) bend in whatever direction the wind is blowing, sooner than argue with the government officers". (Ruthenberg, 1971:1).

Ruthenberg's comments are a little unfair to the officers and to the people, and some remarks apply to only a part of the District; nevertheless, he is correct in emphasising the aspects of confusion and lack of continuity. The fact remains that diffusion was carried out widely and evenly in this period, which attests to the energy of the particular officers, and to the energy and receptivity of the people.

A strong team of Native Agricultural Assistants was recruited and trained in planting methods. In addition, people from various villages were given some training from two to three weeks at Gagidu under the supervision of the Agricultural Officer. Employing the former doing continual patrols, and the latter at the village level, land had been prepared for or had received an estimated 100 000 trees by mid - 1958.

The Mission had tried to set off a chain of diffusion before the War, by giving each one of its trainees at Heldsbach a number of coffee seedlings to plant on return to the upland and interior villages. Clearly, this kind of contagious diffusion could not go far in a short time, partly because of the lack of instruction in coffee husbandry, partly because of the other primary commitments of the Mission workers; and partly because of the delay in obtaining new seedlings, most of which were expected to come from the transplanted trees and not from a central nursery. The diffusion of the 1956 - 65 period was more deliberate, coordinated and widespread. Because so many people in such a wide area were exposed to the idea and techniques of the innovations, extension workers were able to create a wave of enthusiasm and competitiveness between individuals and between villages. In other words, such an organised diffusion created and exploited a "bandwaggon" or "snowballing" effect.

It is important, for a proper understanding of this diffusion, to remember that coffee was not an entirely new plant,* that people had some awareness of cash-cropping, that there was a fairly strong desire to find the activity

---

* Quite different problems were experienced with the introduction of new plants like cardamom in Finschhafen, and of pyrethrum in the Highlands of New Guinea. Some people say that the Administration officers showed them how to "tame" the Mission's coffee trees, which had grown rampant and woody.

which would give people access to more money and give entry to the sophisticated and powerful world of bisnis. Since the coffee diffusion was propelled by the Administration, in the minds of the people already conditioned to fear and reaction it could not be easily refused. The "targets" of planting, somewhere around 250 trees for each head - of - household, were interpreted by many people as orders with some special significance. Also, "lining" and arrangement of coffee trees in particular rows and intervals was interpreted more for its symbolic than agronomic significance** an interpretation reinforced in those cases where a later agricultural officer forced a few village people to uproot apparently healthy trees, and to plant new seedlings at the "proper" spacing.

Table 1: Progress of Coffee Plantings - New Plantings totals, selected years from 1949 to 1960 (thousands of trees).

Census Division	Up to 1953	1954	1955	1956	1957	1958	1959	1960	TOTAL
Kotte	14.4	-	2.6	77.5	41.7	15.9	23.9	8.9	184.9
Dedua	5.6	8.6	13.0	44.4	47.0	21.9	16.3	14.4	171.2
Kalasa	13.8	1.7	7.4	18.0	48.6	20.1	20.3	17.6	147.5
Mongi	11.7	33.0	16.5	33.0	23.4	15.0	3.8	3.0	139.4
Kua	8.7	12.6	11.7	8.5	17.4	4.0	4.5	1.8	69.2
Bulum	12.9	13.4	8.6	21.3	28.4	18.0	2.2	1.3	106.1
	67.1	69.3	59.8	202.7	206.5	94.9	71.0	47.0	818.3

** Some old people have recently told me that they saw, in those early days of rapid change, some significance in the white man's concern for physical arrangement - the rows of trees, of policemen, of soldiers, of lines on the page, of columns of numbers, of garden paths and of ships tied up in the harbour.

It is clear from the Table that 1956 and 1957 were the busiest years of coffee planting over the whole District. A fairly high degree of activity continued in 1958-59-60 in Kotte, Dedua and Kalasa, but the activity slackened off in the three interior valleys, probably because of the combination of high out-migration, recognition by the people of their greater difficulty in marketing the produce from their maturing trees, and diversion of labour effort into the cutting of roads and the Pindiu airstrip. According to the most devoted of the extension workers:

> "The other factor restricting extension work is the high proportion of adult males absent from many villages. It is likely that cash cropping will provide an incentive for men to remain home and develop their own areas, but this initial development is difficult to introduce and get underway under such circumstances". (White, 1958:11).

By 1960, the main wave of coffee diffusion was completed - over 600 000 new trees planted in just five years. Over the next thirteen years to 1972, about 330 000 trees were added, 60% of which were in Kua and Bulum census divisions. These interior areas had lagged behind in the numbers of trees planted, until the opening of Pindiu airstrip and the enthusiasm of a new agricultural officer encouraged a further effort at planting.

Table 2 relates coffee planting to population in the various areas, in 1960 and 1972. The census populations of Kotte, Dedua and Kalasa have been reduced to exclude those coastal villages unsuitable for coffee growing. The Table shows that Dedua villagers were the busiest adopters, and this is mainly because of a group of energetic leaders showing the way in the excellent lands of the "Dedua Highlands", around Siwea.

There were some significant factors which combined to retard the rate of adoption in the interior valleys, particularly in Kua. First, these areas were the least accessible from the centre of promotion and supervision. Second, a change in the agricultural field staff adversely affected the more remote areas - until a new appointment and posting to Pindiu was made in the early 1960's. Third, the perceived marketing effort was much greater for the interior populations, certainly until the Pindiu and Mindik airstrips were opened. Fourth, some labour effort was diverted into the cutting of roads and airstrips. Fifth, the absence of social services and retail services in the more remote areas meant that the utility of money and the general incentive for cash were lower than in coastal areas. Sixth, there was still a busy search for alternative ways to participation and success in the new systems, one realistic and one rather fanciful. Many men from Western Mongi and the Kua valleys became very much involved in the gold-mining at Wau, and gold-money was regarded as more accessible and interesting than money-from-trees. The other alternative was in "cargo-cult" ways, and Kua and Bulum people harboured strong feelings in this direction even into the 1970's.

Table 2: Coffee trees planted, in relation to total population in areas suitable for coffee, 1960 and 1972.

	Kotte			Dedua			Kalasa		
	Trees ('000)	Popn. ('000)	Av.	Trees ('000)	Popn. ('000)	Av.	Trees ('000)	Popn. ('000)	Av.
1960	190	6.0	31.7	160	3.2	50.0	148	4.0	37.0
1972	258	8.2	31.5	175	4.3	40.7	162	5.9	27.5
Popn increase%		36.7							

	Mongi			Kua			Bulum			Total		
	Trees ('000)	Popn. ('000)	Av.	Trees ('000)	Popn. ('000)	Av.	Trees ('000)	Popn. ('000)	Av.	Trees ('000)	Popn. ('000)	Av.
1960	145	5.4	26.9	80	5.4	14.8	95	3.5	27.1	818	27.5	29.7
1972	181	6.2	29.2	221	6.7	33.0	162	4.3	37.7	1159	35.6	32.6
Popn increase%		14.8			24.0			22.9			29.4	

However, interest in coffee in Kua and Bulum particularly was boosted by an energetic agricultural officer,* and by the opening of Pindiu and Mindik airstrips. By the mid - 1960's, the rate of adoption in the interior came up to the District average.

Throughout the District, new plantings of coffee since then have been desultory and few, until the 1976-78 boom in prices has given a new wave of interest, mainly among the younger men who were not involved in the 1956-65 diffusion. For most people, coffee growing had become a discredited, annoying activity until 1976, and was seen as yet another innovation that had failed to live up to promises and expectations. As much as 50% of the coffee cherries were left unpicked and yields per tree in 1974 were down to 0.34 kilograms in Kotte, 0.24 in Mongi and Kua, and 0.12 in Bulum.** Migration, especially from the interior valleys, continued unabated, not just because of the apparent failure of coffee, but also because of the capacity of the Wau goldmining to support more workers and their dependents, and because of the growth of Lae. In more general terms, the "push" from the interior was reinforced by the failure to get a road to the coast, and by the envy of the better - endowed and better - serviced villages of the south-east corner of Finschhafen.

---

* Mr. Ian Rowles, an almost lengendary character; the antithesis of the bureaucrat and perhaps a model field worker.

** In Western Highlands Province in 1976, yields were about 0.48 kgs/tree.

6. Comparisons with other areas.

So far adoption in the Finschhafen District has been discussed on the scale of areas or census divisions, so it is appropriate to compare with other areas of Papua New Guinea, before going on to a more detailed discussion of villages and individuals.

Table 3 sets out the data available from diverse sources. Each researcher represented in the Table has cautioned on the accuracy of the statistics, so that we should view the numbers in the Table as indicative rather than precise.

Indications are clearly that growers in the central areas of the Highlands of Papua New Guinea have planted larger gardens. The causes for their scale of activity include the powerful demonstration effect of expatriates' plantations, the intense competition between men for status and control of resources, the generally higher estimation of the utility of money, and the superior buying and transport services. The figure for East Goroka has probably risen in recent years, but I would suspect that further adoption in Sinasina, Gumine and to a lesser extent Okapa, has been severely limited by population density and pressure on land for subsistence.

In the peripheral areas; (Finschhafen, Boana, Dreikikir) the ratios of trees per adult male were probably converging at around 150, by the mid - 1970's.

In each area, migration was a significant alternative to coffee growing and processing. In coastal Finschhafen, cocoa and cattle were also alternatives and partly - competing activities; in Dreikikir there was rice - growing; and in Boana, vegetable - growing for Lae market was another activity encouraged from time to time.

In Wosera and Maprik, population density and the consequent demands for subsistence have been the main limiting factors on coffee-growing. Also, the ecological conditions are not so suitable for coffee as in Boana, Dreikikir, interior Finschhafen and the Highlands. In Wosera and Maprik, both the average size of garden and the ratio of growers to adult males are significantly below the other peripheral areas.

The figures indicate that a garden size of 200 to 300 trees allows the most acceptable fusing of commercial activity with the social and subsistence organisation of the village people. The competitiveness of the Highlands' males, with its stimulus to the commercial and subsistence system, is quite unlike the relative calm and stability of the societies of interior Finschhafen. Reasons are the relative abundance of land, the longer period under Mission organisation and influence, and the high degree of migration (particularly of the more energetic younger men).

Table 3 Comparative data on coffee - growing

			Trees per head of population	Trees per grower	Trees per adult male	Period of most of intensive adoption
a)	Finschhafen District	1960	30	-	110	1956-7
		1972	33	-	165	1956-7
b)	Coastal Finschhafen	1963	-	150	90	1956-7
c)	Hube	1955	-	95	35	-
		1963	-	200	100	-
		1977 Survey	32	250	-	-
d)	Boana	1964	-	180	110	1957-8
e)	Sinasina	1964	14	287	-	1955-6
f)	East-Goroka	1971	-	323	-	-
g)	Okapa	1972	24	-	-	1964-6
h)	Gumine	1972	18	-	-	1964-8
i)	North Wosera	1965	-	126	25	1968
		1969	-	118	39	1968
j)	Maprik	1964	-	93	27	
		1969	-	105	39	1969
k)	Dreikikir	1972	-	192	115	1967-9
l)	Western Highlands	1976	52(est.)	604	-	
m)	Highlands	1976		535		

Sources: a) Department of Agriculture Reports; b) Department of Agriculture Reports; c) 1955 and 1963 - Department of Agriculture reports; 1977 - see Townsend, 1978; d) Shand and Straatmans, 1974; e) Hatanaka, 1972; f) Monlik, 1973; g) Bouchard, 1972; h) Bouchard, 1973; i) Shand and Straatmans, 1974; j) Anderson, 1976; k) Allen, l) Dick, 1976; m) Anderson, 1976.

The point of these comparisons, and the consequent speculations, is that the same innovation can be turned to very different effects, depending on the organisation and motivations of different societies. Coffee - growing is not simply a means of earning money - it requires profound changes in organisation of labour, leisure, land and supporting services. Quite clearly the peripheral areas, generally with abundant land, did not feel the need to exploit the innovation to a high degree but preferred the alternatives of migration, leisure and subsistence activities.

7. Rates of adoption of coffee planting in Finschhafen

Records on the village and census division bases are quite good, but most of the surveys of individuals, from which the larger-unit figures were compiled, are now lost or destroyed. Contemporary reports, and present-day informants agree that there was wide variation between individuals in the number of trees planted in the busiest decade. There are many complex motives in the minds of adopters of any kind, and given the "feverish activity" reported by Fugmann, the confusion reported by White, Wagner and Ruthenberg, the sequence of rapid change and the occasional competition between villagers in the manipulation and control of labour and land and other assets, it is understandable that commitment to coffee growing would have varied widely.

However, as mentioned before, heads - of - household were encouraged or cajoled into "respectable" targets by the

the various promoters. A report from Hube interior in 1955 showed that the average garden had about 95 trees; another report from Hube in 1963 estimated an "average of 200 trees, though a few have up to 1000 trees". At the same time, the less suitable lowland areas of Kotte, Dedua and Kalasa had about 150 trees per garden. With normal yield of about 0.24 kgs per tree, growers in Hube could make about K15 per year in the early 1960's, compared with about K50 per year in contract work.

It is probable that later plantings in the 1960's were done by those villagers who had been less enthusiastic, or absent, in the early days of diffusion - not because they were convinced by the returns on coffee, but because of the gradual pressure to conform, that village society inescapably applies.

In Table 2 we saw that the overall District ratio of coffee trees to population was about 33 in 1972. But the range is from 18 to 77 in upland Kotte villages and from 10 to 62 in Hube villages, a wide range that reflects the varying importance of such factors as attitudes to innovation, experience with growing and marketing; dependence or preference for migration, and local growing conditions. The rate of adoption, whether measure in number of trees, or in trees per adult male, or in number of adopters per village, is not statistically associated with distance from the present marketing services.

* return per man-day, however, favoured the coffee - growers.

Only in the higher villages of Kua Bulum valleys are distance and declining adoption significantly associated - the linking factors here are probably the relative isolation, perceived marketing effort, ecological limitations on both food and coffee crops, and in the Kua case, strong preference for migration to Wau. Similarly, in neighbouring Boana District, adoption by adult males was "universal" in two of the census divistions, but significantly less in the higher and more remote Naba census division, (Shand and Straatmans, 1974:17).

Table 4, Percentage distribution of coffee trees per grower.

	1-100	101-200	201-300	301-400	401-500	501-600	601	Total Number Surveyed
l) Western Highlands 1976	..... 34		.... 33		..... 16	17		449
m) 'Highlands 1976	..... 15		.... 39		..... 23	23		104
i) North Wosera 1969	43	39	8	6	3	1	-	1431
j) Maprik 1964	54	32	8	3	2	1	-	386
e) Sinasina 1965	57	27	9	4	2	1	-	292
d) Boana 1964	65	25	6	2	1	1	-	3655
c) Finschhafen interior 1977	21	21	16	12	13	17	-	190

l)m) i) j) e) d) c) - see footnotes for Table 3.

For the four areas surveyed in the 1960's, there has probably been some later planting that would shift the distribution a little towards the larger categories - though, as mentioned before Wosera, Maprik and Sinasina growers have probably been limited by land shortage. In both the Western Highlands and Finschhafen interior, the upper 30% of growers have an income - earning potential three times that of the lower 30% of growers. (Another 10% of resident men, who do not have coffee gardens, are excluded from these comments). Clearly then, the much-publicised egalitarian basis of village society (if it ever existed) has been much disturbed by the coffee innovation. An argument might be raised that non-adopters or low-level exploiters of coffee - growing have found their income and status from other activities. However it is clear from surveys (reported in a later section) that the same group of men tend to dominate in all the innovations from the introduced systems.

In the Finschhafen coffee growing areas, adoption and exploitation have varied widely even between neighbouring pairs of villages. For example, a line of eight villages in Kua valley (average 33) have the following numbers of trees per head of population - 32, 23, 55, 48, 15, 39, 14, 24. As mentioned earlier, there are many specific and unique factors which account for the reaction of particular factors. However, the general factors of distance, altitude, and declining utility of cash-cropping

eventually come together in the truly peripheral areas, so that head-water Kua has an average of 20 trees per head, upper - west Bulum valley has an average of 15 trees, and north-west Kalasa has about 20 trees per head.

At the other extreme, there are a few definable areas with high rates of adoption such as Tumnang - Mindik around the Mindik airstrip (1200 - 1400 metres altitude); Aregenang-Selimbeng - Maran area (1200 - 1400 metres) in central Bulum (near the Ogeranang airstrip which was opened in 1975); the headwater Mape area between Mawaneng and Safifi (900 - 1100 metres); the Siwea area (in the early days, but not in the 1970's); and around Tunge - Rua (700-800 metres) and Karako - Zakupep - Zankoa (1600 - 1800 metres) in the south-west uplands of Kalasa. Of all the possible factors leading to such concentrations, I can discern from records, reports and today's informants:

a) that the efforts of an enthusiastic extension officer were an important factor in the first three areas; and
b) that local leadership and popular enthusiasm was an important factor in the last three areas.

Within villages, too, there is wide variation in the rate of adoption. In almost all the surveys cited in this report, there is a special mention of just a few men, perhaps one percent, who planted gardens three or four times larger than the average size. Surveys have shown that villagers with special positions or status have larger

gardens than others; have higher incomes from coffee, and keep their gardens in better condition (Townsend, 1977; 1978). Generally, older men (say 45 years and above) have bigger gardens than others, produce at higher yields and higher incomes and show better management of gardens. (Anderson, 1977 Table 2; Table 10; Townsend, 1978).

At least up until the 1976-78 coffee boom, the gardens of younger men have generally been smaller. This fact can be interpreted in a number of ways. First, some younger men are or soon will be the inheritors of the gardens planted in the 1950's; perhaps in terms of labour, effort and income, some are already de facto owners. Second, younger men have not been subjected to the same organised and sometimes coercive diffusion of a generation ago. Third, they have generally viewed the returns from coffee-growing as inadequate, and have sought returns from other activities. Fourth, with better access to towns, to education and to the information that prepares one for migration, the younger men have been less village-bound than the older men, and have tended to prefer migration for wage - labour to the development of rural assets. Fifth, in some areas there may be greater competition for land and for labour than prevailed during the 1950's and 1960's. Even now, in the Finschhafen survey during the coffee boom, new plantings are distributed quite evenly throughout the age groups - there is no tendency of younger men to be more active than older men in recent new plantings.

The observations on adoption rates between areas showed the levelling effect of organised promotion and diffusion, as areas' averages reach a level that reflects both the general behaviour with regard to motivation, desire for cash or for status and the perception of marketing difficulties, and the commitment and enthusiasm of particular promoters and field staff. The observations on adoption rates between villages and between individuals show us more about the sociology of the villages and the relationships of villages and some village people to opportunities outside the village. Despite the propulsion of the coffee - growing innovation through the suitable areas, individual initiative and response have not been overwhelmed. This is particularly true for the younger men. In the peripheral and/or land - short areas, the distribution of garden size is skewed markedly to the right (to a small minority of very large gardens) while the effects of organised promotion and confromist pressure in the villages cause a concentration in the smaller categories, which is most pronounced in the early years of adoption.

As a general perspective, we can conclude that a return to more local initiative and less official promotion by field officers in current and future innovations will probably result in the adoption and "capture" of those innovations by the minority of already established and motivated individuals. Typically, these are the "big men" who have the information and the influence over present assets and resources to organise for or against innovations.

The kinds of innovations likely to come into rural areas in future will be less "democratic" than crop trees - such activities as poultry raising, liquor licences, crop trading and vehicle ownership will cause further economic and social differentiation, probably in favour of the established "big-men". The challenge to those people will probably come from younger people, with formal education or some specific training in the core areas and perhaps some accumulated capital; who can carry back to the villages innovations which they have "captured" at the cores. If, as one suspects, field extension services are contracting and weakening, there will be a higher value on the mobility and communication skills of the younger people.

8. The exploitation of coffee trees

The coercion and persuasion of the promoters applied mainly in the adoption phase, whereas the management and exploitation of gardens over the long-term depended mainly on the individual needs, perceptions and motivations. Occasionally, the village people were pressed or encouraged into better management, especially in clearing gardens and pruning trees; by forceful or enthusiastic field officers. The incentive factors in production were gradually improved (processing, marketing, trade goods' availability, transport) though not at the pace desired by most villagers. Generally, returns from coffee did not keep pace with the general inflation of imported goods and services. Occasionally, a new burst of enthusiasm and exploitation came from

improvement schemes in infrastructure or bisnis promoted by local big-men, councillors or optimistic entrepreneurs. On the other hand, some popular local movements have led on to positive neglect of cash-cropping.

Generally, however, there was a gradual decline of interest in and exploitation of coffee in the 1966 - 75 decade, attributable to three main factors - disappointment of expectations, stagnant prices and the continuing increase in migration. The first factor was perhaps inevitable, since exaggeration of returns is often the people's and promoters' approach to motivation and mobilisation of local effort.* Behind this approach was the people's feeling or belief that "development" is a state to be achieved, rather than a dynamic progression of small, incremental changes in resources and their application.

Continuing migration was a result of increased education, information and mobility in the rural areas, along with widening job opportunities especially in Lae. The stagnation of prices and disappointment with coffee growing meant that the relative advantage of towns over villages was widening. Increasing absenteeism (that is, the proportion absent from the village at a particular time) came more from the slowdown of the "traditional" circulation rather than from a large increase in the proportion of young men moving out from villages.

* The "fundamentalism" in promotion of economic activities was similar in some respects to promotion of Christian religion.

In 1955 the average period of absence of those currently absent was about 3.5 years, whereas in 1975 it was about 9.5 years. Because of better wages, wider opportunities, more familiarity with town life, better housing and the ability to support wives and families in towns, we can conclude that the "pull" or "holding" factors in migration were increasing in the 1966-75 period, rather than that the "push" factors from rural areas were increasing.

Coffee prices improved little in the 1960's, though there was a short - lived boom in 1968-9. The 1963 price in the rural trading centres was 29 toea per kilogram; and in 1974, it was about 34 toea. Increasing regional production came from the maturing of trees, and not from increasing exploitation of the stock of trees. Enthusiastic field officers in the 1950's wrote about production based on potential yields of 0.50 - 0.75 kilograms per tree. By the mid - 1960's, the more realistic reports were talking in terms of 0.24 kilograms per tree; and by the early 1970's, there was a general feeling that probably 30% (over the whole district) and 50% (in the most remote areas) of cherries on the trees was not being harvested. In Boana in 1963-4, the average yield was about 0.36 kgs/tree (Shand and Straatmans 1974.19); in 1974, average yields in the coastal uplands of Finschhafen were about 0.32, and about 0.20 in the interior valleys **. In the central areas of the New Guinea Highlands, Anderson (1976, Table 24) found an average yield of about 0.48 in 1976.

** Similar figures were reported for Sinasina in 1965, and for Maprik and Wosera in 1969 (Shand and Straatmans, 1974: 46; 120)

A survey of Finschhafen cash - cropping in 1974 prepared some estimates of income and exploitation.(Townsend 1975; 1977). About 65% of resident men had coffee trees, and about 8% of those with trees did not sell any coffee, mainly because the price was so low. The average income was about K15, but 50% of sellers earned K10 or less. The average income of sellers according to villages ranged from K32 in the upper Mape to K5 in the headwaters of Bulum valley, and there was a statistically significant relationship between distance from the selling-point and average income per village. It was clear from the survey that a majority of men were not meeting even necessary expenditure out of coffee production (council tax alone was K6 - 10) implying some dependence on remittances from town relatives. At the other extreme, about 10% of the men in positions of status and with large gardens had average incomes 3-5 times above the general level. The conclusion from the survey was that overall participation was higher where distances to selling points were shorter and average local prices higher, and where there were no competing activities to coffee growing.

Production in the District in 1974 was 308 tonnes of which 132 tonnes came from the three interior valleys. With the 1976 coffee boom exploitation of coffee trees increased dramatically. The price rose from an average 34 toea per kilogram of parchment in 1974, to 70 toea in 1976 and to 102 toea in 1977. Production increased from 308 tonnes to 383 in 1976 (185 interior), and average yields rose from about 0.28 kgs per tree (0.20 interior) to about 0.33 kgs/tree (0.25 interior).

The reaction in 1977 is surprising. Though price increased substantially (25% district production declined by about 5%. Nationally, production was also down by about 20%. One is tempted to adopt the economists' argument that growers did not harvest all the production because they were satisfied with the income levels obtainable from a reduced effort of harvesting, processing and marketing. But since plantations' production in the Highlands was also down by 20%, it is probably more correct to adopt the agronomists' argument that less favourable growing conditions and a relatively dormant stage in the trees' bearing cycle have caused a lower production by the trees.

In Finschhafen District, a decrease in production was observed in the uplands of Kotte and in Bulum valley, but not in the Kalasa - Dedua uplands or in the interior valleys of Mongi and Kua. These variations in response support the agronomists' argument rather than the economists' argument. Further, respondents in the 1977 survey (Townsend, 1978) clearly indicated that they had put more effort into management and exploitation of gardens, than in previous years. As a result of higher yields and higher prices, average income for the growers of the 1977 survey was about K60, with only 14% registering below K25 (compared with about 90% in this category in 1974).

Because of the boom in coffee prices, the general level of incomes has risen, the big-men growers have substantially increased their incomes, and both groups

enjoy returns for effort which compare favourably with those of urban workers (Anderson 1976; Townsend, 1978). Furthermore, new plantings have significantly increased for the first time in a decade: in the 1977 survey, 28% of the respondents had planted new trees in 1976-77. All this is the long - awaited pay-off for the adoption and management of coffee trees over the last twenty five years - However growers are too wise and experienced to imagine that a new era of material rewards has been attained. Consumption has been raised to new levels, and new bisnis activities have been made possible, so that future exploitation of coffee may be at a higher level than that of the 1966 - 75 period.

9 Conclusion

Perhaps the most important point from this account of coffee - growing in Finschhafen is that an innovation is not viewed as an independent event by potential adopters, and therefore should not be promoted in isolation nor regarded by observers as having an independent history of its own. From the earliest days, the missionaries recognised that material and spiritual changes had to move in step; and by 1951, many missionaries and church officials believed that the material "leg" was going at such a speed and such a course as to disturb the progress of the spiritual "leg". The missionaries also recognised the devastating impact on their work and objectives of the contract labour system, the War experience, the apparent power and opulence of expatriate settlers and businessmen, and the consequent material desires and self-image of the indigenous people. The missionaries had adopted a gradualist and protectionist policy towards indigenous involvement in imported innovations, which inevitably conflicted in many ways with the 1950's bisnis aspirations of the people and the organised promotion of activities by the expanding Administration.

The second important point is that adoption and exploitation of an innovation depends more on its relationship or relevance to existing structures, aspirations and capabilities of a society, than on its intrinsic characteristics. Adoption and exploitation depend very much on evaluation of "worth", or "returns for effort", which can only be related

to a scale which includes a whole range of complementary and competing activities. Fundmentally, the black man's struggle was and is to obtain the foreigner's organisation, power, affluence and leisure - which many people see as a state rather than a stage in economic evolution - so that innovations were evaluated according to their perceived capability of delivering an adopter into that state.

It is clear that coffee growing fitted quite well into the structure and organisation of society. Subsistence systems in Finschhafen have not been dramatically disturbed, and the traditional internal stratification has not been shattered by an innovation which is equally available to all men in the village.* Most Finschhafen people planted gardens on a scale that was manageable in terms of land uses, labour organisation and leisure activities. On the other hand, returns from coffee have not matched the aspirations of the society, and many people chose other activities as a way to material and personal aggrandisement.

The innovations which came with coffee - growing have strained or exceeded the capabilities of the local society. The cooperatives have struggled on with foreign supervision and management, but countless indigenous trading ventures have failed, at least in simple economic-accounting terms. Namasu still depends on non-indigenous management; Councils could not deliver the much - needed improvements in communications, and have staggered along with outside funding and

---

* quite different results have come from the innovation of formal education.

supervision. A few indigenous people have had ephemeral and unreliable coffee - buying schemes, always hampered by mismanagement in the buying side, or by unwise or mismanaged use of the accumulated profits. Surpluses from coffee-growing or trading have often been lost through trade store operations, or lost to questionable or inefficient bisnis operations promoted by a few persuasive entrepreneurs. Attitudes to coffee-growing are affected by failure in these other schemes, through the effect of the latter on feelings about the external system and about the self-image of the local people.

The third important point is that adoption and exploitation of an innovation depends very much on the quality and distribution of leadership. Even though all ants can smell the honey, it still requires a leader or two to take them there, and to show the followers how not to get stuck in it. It requires a leader to choose between the honey consumed on the spot, or the crystallising grains which can be carried back to the nest. In the case of coffee - growing in Finschhafen, the first leaders were the mission officials and teachers, whose primary roles were in other activities. The post-War leaders were those enthusiastic and energetic agricultural officers and their assistants, complemented by a scattering of highly influential adopters whose motivations came from personality, or from exposure to cash-cropping in other parts of the country.

But of course, leadership in innovations must find sympathy and support in the affected population. Coffee, and the idea of cash cropping, were not entirely new to the people being persuaded and cajoled by the promoters of 1956 - 65, and they served at least a small part of the aspirations and "feverish activity" of the area. But when the strong leadership of the adoption period passed, and the individual decisions of the exploitation period prevailed, the incentive factors were just not strong enough to maintain the interest in management and exploitation of coffee trees. The competitiveness, and the superior supporting services, which prevailed in the core areas of the Highlands of New Guinea, sustained interest and yields there but these factors did not generally apply in Finschhafen.

The fourth important point to come out of the Finschhafen coffee story is that use of an innovation depends on its position in geographic and economic "space". More energy and resources are required to transmit an innovation to the more remote areas, and to maintain the exploitation of it. When the enthusiastic field officer is replaced by the office - bound scribe; or when diffusion depends on contagion rather than promotion or propulsion, progress of the innovation will falter, ever retract. When the aware and energetic sections of the population migrate from an area, exploitation of an innovation will probably decrease.

The migration factor was very important in the Finschhafen case, and throws light on the above comment about economic space. Certainly the earlier contract and circular migration helped to bring into the peripheral areas motivations and ideas about bisnis, cash - cropping and rural improvement. But also, as was shown in the case of west Mongi and Kua, migration militated against the adoption and exploitation of coffee. The economic centre from the point of view of the migrants, was in the apparently easier returns from Wau goldmining, and later in the gradually more amenable towns with their wider employment and social opportunities. The centre or core became the desirable and accepted space in which to make and use cash. Thus the failure in the coffee story was because the burgeoning, introduced socio-economic system prevented the re-arrangement of economic space which could have provided the services, stores and activities in peripheral areas to provide more uses for the money-from-trees.

The final perspective from all this, is that innovations which objectively or intrinsically offer benefit and improvement to peripheral populations will never be fully adopted and exploited if the system of rewards in the whole socio-economy heavily favours the cores or centres in geographic and economic space. The coffee boom of 1976 - 78 has temporarily tipped the scale of rewards in favour of the peripheral areas, if only because it has provided such a long-awaited relief from frustration. But in the long term, if the promoters of innovations, especially of

government services, go through the ritual and work routines that appear to give rewards and status at the centre, then there will be no redress to the present disadvantage of peripheral peoples in terms of access, information and political influence. Promoters such as Fugmann, White, Newton and Rowles showed the way to reach peripheral areas - for which, at long last, Finschhafen coffee growers are now grateful.

In agricultural extension work, the paraphernalia of vehicles, camping equipment, offices, overseas study trips and conferences are no substitute for the work of contact, persuasion, demonstration, active concern, reliable assistance and regular reviews of progress.

References:

Adams R.(1975) The Pitenamu Society (mimeo), forthcoming in May R.J. (ed.) Micronationalism in Melanesia

Allen B.J. (1976) The Diffusion of Innovations in the Dreikikir Sub-district of Papua New Guinea. Ph.D. thesis, A.N.U.

Anderson D.A. (1976) Smallholder Coffee Survey, 1976. (mimeo). D.P.I. Port Moresby.

Bouchard J.F. (1972) The Impact of Roads on the Monetary Activities of Subsistence Economies in the Okapa Region. Department of Geography, UPNG. Occasional Paper 4.

Bouchard J.F. (1973) The Impact of Roads in the Gumine Region. Department of Geography, UPNG, Occasional Paper 5.

Dick G. (1976) The Hagen Coffee Grower (mimeo) D.P.I. Port Moresby.

Fugmann W. (1969) Chapter 1 in Fairbairn I.J. Namasu: New Guinea's Largest Indigenous - owned Company. New Guinea Research Unit, Bulletin 28.

Hatanaka S. (1972) Leadership and Socio-Economic Change in Sinasina. New Guinea Research Unit, Bulletin 45

Macaulay D. (1974). Comments on the development plan for Finschhafen and Kabwum. (mimeo) D.P.I., Lae.

Ruthenberg D. (1971) Rural Development in Finschhafen (mimeo) Lutheran Economic Service, Lae.

Sakein S. (1978) The Story of Salein Sakein, MBE Didiman of Finschhafen. forthcoming in "Oral History".

Shand R, Straatmans W. (1974) Transition from Subsistence: Cash Crop Development in Papua New Guinea. New Guinea Research Unit, Bulletin 54

Townsend D.F. (1977). Distance and Participation in the Cash Economy. Australian Geographer vol. 13. P. 408-416.

Townsend D.F. (1977) Finding the Road: the Factors of Distance and Transport in Socio-Economic Development in Huon Peninsula. Ph.D. thesis, Monash University.

Townsend D.F. (1978) A Survey of Coffee Growers' Response to the Record Prices of 1976-77, Huon Peninsula. forthcoming mimeo from Dept. of Geography, UPNG.

Wagner T. (1964) The Outgrowth and Development of the Cargo Cult. 18th Field Conference, Lutheran Mission of New Guinea. Lae.