



Foods Crops, Nutrition, Farming Systems, the Labour Market and Economy

Food and Nutrition Workshop with IFPRI & DAL - 12 June 2019,

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During 1970s wide antipathy towards cash crops from some nutritionists and social scientists in PNG and worldwide, that cash crops were a major threat to food crops and nutrition...

The dispute, including in PNG, was drawn up on somewhat simplistic grounds, that food crop production was invariably at odds with cash cropping. Reality is somewhat more complex and varied from place to place.

Unlike in many parts of the developed and developing world where much of the land has been consolidated in medieval or colonial times under the a few powerful families or the State, Papua New Guinea has retained customary tenure over most of its land. Some valuable areas of agricultural or urban land were apportioned off for copra and rubber plantations in the late 1800s and early 1900s, and largely smaller portions after the war for coffee, cocoa and more rubber estates and then for oil palm estates and settlement blocks since the 1970s. Post-war, the colonial administration was very aware of local population pressure and need and largely restrained those eager to secure estates for coffee, although unpopulated swamps, as in the Wahgi valley, were made available for some of the largest estates.

Since Independence, and the onset of the Land Redistribution Scheme, most of the estates, apart from those in oil palm, and a relatively few in other crops, reverted to customary control, with only a small portion retained as locally-owned and operated estates and a very few still under foreign ownership. Since then land had largely remained in customary control, until the large scale land-grabbing associated with SABLs and FCA from the mid-2000s to the present and some prei-urban developments.

Cash cropping of the long-established tree crops was adopted as part of village agricultural system. Coconuts were already there and extended to copra production, cocoa also started to become a smallholder crop in the Gazelle already back in the 1930s, and then with coffee in the Highlands particularly from the 1950s, but particularly in the 1960s and 70s.

Clearly in those locations with major displacement of populations there may have been some loss of food from gardens, but population density was low then, and competition over land less; although how the release of land to estate in the Gazelle peninsula occurred is somewhat of a mystery!

The fear amongst nutritionists was that, quite apart from the estates, adoption of cash crops by smallholders would divert land, labour and time from food crops and hence jeopardise their food intake from gardens. As it turned out, although this scenario could occur if the majority of garden land was diverted to cash cropping, and particularly, mono-cropping, initially, at least, this didn't seem to be the case and incorporating some cash crop production seemed to complement the food crop production. No doubt there was some displacement of hitherto food garden, potentially reducing the fallow cycle, but largely the cash crops supplemented the food crop production, maybe allowing more regular access to protein and, by providing cash income, which could be saved and used during traditional periods of food shortage, or taim hangri, reducing risk and easing seasonal shortages. Nevertheless, even in 1984, it was demonstrated that increased dependence was occurring to a narrow range of largely imported protein and staple food products, even though still much less than those on fixed incomes (including as agricultural workers) and others with little or no land for home production.

It would be fascinating to see findings showing how conditions have changed since the research for the paper '25 Years of Dietary Change', based upon a village in Sinasina in Chimbu was undertaken back in 1980. Unfortunately hands on agricultural and nutritional field research has been limited in recent decades, especially any longitudinal studies. The capacity of the Institute of Media Research in the field of nutrition and the network of provincial nutritionists faded away as other priorities came to the fore. DAL's capacity in agricultural economic and field work fell evaporated, leaving NARI and some of the commodity institutes, which should have had some farming systems and socio-economic capacity, but funding was virtually absent for the past 25 years.

Nevertheless, some valuable work has been done reflecting landuse and aspects of dietary change that have been occurring, notably by Prof George Curry and Dr Gina Koczberski and some of their students, in various ecosystems and farming systems across PNG; by Bryant Allen, revisiting his PhD study area of shifting cultivation near Drekikir 40 years later, as well as outcomes from successive DHS and HIES surveys and analysis notably by Prof Gibson in Waikato uni, together with

It should also be noted that PNG does have very thorough and extensive surveys and analysis of landuse and change covering the 1975-1995 period, notably based upon PNGRIS and MASP, providing detailed information and trends as a strong basis for updates and trends.

What is demonstrated from the recent surveys and the past baseline data, together with outcomes from demographic surveys, is that in much of PNG population growth has continued at a high pace and population densities have been reaching high levels in several parts of the country, with landuse pressure, shortening of fallows, falling yields reaching or exceeding sustainable levels using current production technology. Change has been forced on communities in various ways, from changing crop cycles, notably shortening fallows, use, or increased use of new staples, notably cassava and newer cultivars of kaukau, and discontinuation of others, like yams and taro. In some places social behaviour has changed, such as women growing yams in Maprik.

It is clear that there hasn't largely been any universal shift to tree crops or cash cropping, as feared by earlier nutritionists, but farmers, including settlers on oil palm blocks, are eager to retain some food crop production, both for own use and sale, even when they've chosen, or been pressed by growing household numbers or high commodity prices, to increase their tree crop production (e.g to the full 6 ha of a standard oil palm settlement block).

Farmers are rational decision-makers given the information available to them on markets, production systems, pests and diseases and impending threats, whether pests or climate change or other factors, etc. By and large farmers have been ahead of the game, and certainly ahead of many researchers and extension workers, in determining how to use or prioritise their limited time, land and resources, given their own specific conditions and opportunities. So, for example, traders, industry boards and corporations and extension workers were often driving specific mono-cropping regimes, when farmers were optimising their own farming systems, to provide good food or alternative cash

crop returns, even when their main cash crop was still immature. Likewise they often forfeited higher potential yields from a main cash crop to gain food or income from other crops and maybe to reduce risk. Some researchers and extension staff, and even whole programs, have cottoned on more lately, with for example, PPAP encouraging cocoa farmers to intercrop with galip, instead of more traditional shading, to gain completely food, incomes and potential timber, and recognising that there is also some agronomic gain from this crop combination. Of course there are many other some complementarities available involving traditional and introduced crops and livestock.

Again variations occurring, e.g Hagen (more specialist or commercialised production of veges for market) and Goroka (still more of an add on, with women producing and then marketing their produce). A logical shift towards whatever provides better returns, like greater planting up of settlement blocs for oil palm when prices are high, or shifting out of coffee into freuit and veges for market, particularly in the hinterland of the main transport links (ag around Hagen and the Highlands Highway) when coffee prices are down and fresh produce offers a greater return and as coffee trees age.

Different strategies, e.g. in LSS, of obtaining more land from neighbours, or customary owners if fully planting to OP, but this has a tenure secutiry risk. Inter-cropping more during the life cycle of clearing and replanint of the OP, including through lower planting densitites. (used to have Stab Funds, it now depanedns on application of the successor risk sharing pricing arrangement, which needs to work, if settlers have little food cropping to fall back upon.

Other producers diversifying or adapting their cash crops, to vanilla or food crops, or using more fertilising/pesticides as fallow periods fall... Population practices (Maprik staunchly Catholic...)

Hydroponics.. competition from, adoption by...

Urbanisation and using of peri-urban land

So, the challenges for PNG:

- PNG has one of the most rurally based populations worldwide (2nd most according to some UN stats, or 87% of the total population according to the World Bank), albeit that urban growth has increased considerably in recent years, as a result of push and pull factors, and that Statistics in PNG are widely flawed

- Although PNG still has a relative low population density by global standards, this conceals considerable variation, with relatively high population density (from various islands with very high rates, and certain provinces, such as Simbu, and districts, such as the Gazelle and Maprik, with high rates) and shortening fallow periods in most areas, and real land use pressure and decline in fertility and productivity in some areas, and population growth continues to rise
- The complementarity between cash cropping and food production is still there, providing farmers some choice in how they commit their land, time and effort, and therefore their food and income sources, but as land use pressure rises, whether on customary or settlement blocks, the options and capacity to meet diverse household needs diminish
- Around the world, including PNG, the option, or necessity for many, is to shift towards town and urban employment. In most countries this entails for most a partial initial shift, with one foot firmly established still in the village, and trading food to urban centres or returning home for the harvest seasons or such times; this is occurring in PNG, to urban centres and closer proximity of highways, although the drift to NCD, which is by far the main draw, is restrained by proximity and the absence of easy road links, which also handicaps the capacity to drift back and forth or engage in ongoing production and trade in fresh produce or other products; although many do.
- PNG unfortunately has had a mixed track record in terms of economic development, and despite being termed a resource rich economy, for much of the post-Independence period this has not translated into sustained economic growth or more specifically per-capita growth or employment growth. For the first 25 years after Independence economic growth was sluggish, or through the 1990s fluctuating severely; the 2000s saw steadier economic growth and some formal sector employment growth, culminating in the PNG LNG construction phase, but thereafter, despite strong apparent GDP growth in 2014 & 2015, economic growth has subsequently regressed back to or below the population growth rate; formal sector employment has been stagnant or retreating going back further to about 2012.
- So, absorption into the formal or specifically the urban formal sector has not been readily available to aspiring rural migrants for this decade, and even before that the formal sector, both urban and rural, has only

comprised some 15% of the total labour force of around 3 million working age persons during this decade, with the urban formal sector only a portion of that, as 'agriculture, hunting and forestry' are the second largest category after the education, providing 13% of formal sector jobs, and various other jobs also remain outside the towns and cities. So, on current trends, even in the event of some major new resource projects and associated real estate and other developments in the towns and cities, it would be many years before the urban, or even overall formal sector, would be able to absorb the ever increasing number of school leavers, let alone much of the rest of the rural population.

- That leaves the urban informal sector, which is also hard pressed to absorb increased numbers, in the absence of jobs and income growth in the formal economy.
- Once again, we've seen specialisation, with, according to an earlier NARI/NCD/FPDA study of NCD urban gardens showing that Eastern Highlanders made up a major portion of the gardens, with those from other provinces such as Simbu well behind. Fresh produce traded from home provinces, such as WHP, and the betel nut trade, largely traded from other provinces than home, have been a major providers of informal urban employment, and the number of dependents relying on the relatively few formal or informal income earners has been accumulating, as are the households on the oil palm settlement blocks, notably in West New Britain.
- It is hardly surprising that, with the growing urban populations, high rentals (partly related to limited land availability) and limited employment, particularly well paid employment, available, urban poverty, including prospective malnutrition, have become an increasingly prevalent, as highlighted in Gibson's analysis of the successive HIES.
- Urban/peri-urban ` +--+`
- I won't go here into the major policy challenges of managing a dual economy, notably with seeking to respond to, or restrain the needs or influences of the enclave, particularly extractive, industries, with the needs of the rural industries, which continue to generate the vast majority of livelihoods from subsistence agriculture, cash cropping and some livestock, rural formal sector employment or some combination of

them all. Sustained low commodity prices for most cash crops has partly been mitigated in recent years by a weak kina, partly brought about by the failure to remit proceeds from resource sector exports. If, or rather when these proceeds and revenue pick up, and potentially new, and better negotiated resource projects come on-stream, there will likely be increased upward pressure on the kina again, and, in the absence of agricultural commodity price improvements, returns and incentives for cash crop agriculture will slip further. Various major cash crops, including coffee, are seeing global imbalances, with supply increases continuing to outstrip continued growth in demand, putting further downward pressure on prices.

- A stronger kina, would also reduce the cost of imported foods, undermining incentives for domestic production and marketing of fresh produce for the domestic market, in the absence of other interventions.
- On the other hand, significant and sustained resource sector and wider economic growth, percolating in the urban centres would generate increased demand for food and other agricultural produce, which could be largely supplied domestically, if transport infrastructure and other factors currently driving up domestic marketing costs could be better addressed
- There is a myth that PNG is a vast fertile foodbowl waiting to be developed. Some parts of PNG are highly fertile, notably some of the volcanic ash soils on the coast and parts of the Highlands. Even they, however, have been showing substantial falls in fertility and yields in many areas, from increased population and intensity of use, with shorter fallows and multiple cropping. Favoured crops have been replaced by those less demanding of soil nutrients. Most of PNG agricultural land is much less fertile, with significant production constraints result from depleted soils, certain nutrient deficiencies, extended dry seasons or regular flooding, salinization on atolls or a variety of other factors, quite apart from a variety of pests and diseases affecting specific crops.
- Most deficiencies can, of course, be addressed with levels of physical or human capital, ranging from use of fertiliser, pesticides, to irrigation. Urban agriculture has been a growing phenomena, to reduce costs of living and access fresh produce, or to reduce the costs of transport, but clearly there are issues with potential urban contamination. Use of greenhouses, hydroponics and other devices enable intensification to

occur in urban and rural settings, on a larger and smaller scale, but any intervention or activity, whether for food and other subsistence needs or for cash, requires the returns or benefits to exceed the effort and the risk involved.

- And this has been the problem in PNG over the years; the big advantage, as stated, has been the community control retained over most land, providing some valued safeguards for most households (at least in the absence of land grabbing for SABLs/FCAs in certain provinces). By and large food production for domestic needs has kept pace with growing population and cash cropping has increased intensity of land use, albeit that much of the area planted to the traditional tree crops, like coconuts, coffee and cocoa, involves mature or senile trees, providing very low yields, and that, as described in Dreikir, the increased production of the past 40 years, in the face of constantly growing population is unlikely to be repeated over the next decades, without some radical alteration of the farming system and increased inputs of effort and other inputs. The sector has enjoyed a level of capital, largely natural inputs from rotating land and human effort, most notably by women. There has been a marked absence, particularly over the past 30 years or so, in finance, research or other technical input, let alone accessibility, for the most part.
- Take the fresh produce market and its potential....traditional food and produce exchange has been long established in PNG society, including the complex exchange system based around pigs in the Highlands, but also the traditional relief arrangements between communities, for example during or following droughts or frosts.
- Fresh produce trading was encouraged during colonial times, partly to supply local government outposts with food supplies, but because major sources of household income for various purposes. Clearly local markets were limited in scale, and during the 1970s the government established various mechanisms to encourage the rural economy, including the Development Bank, Agricultural and Commerce offices, Provincial Development Corporations, Provincial Savings and Loans societies, Rural Development Projects, and the Food Marketing Corporation (FMC) to foster domestic food marketing to major centres, including Lae and to the Capital. FMC had its weaknesses, but also strengths, but around

1981 Sir Julius Chan as PM had it closed, ostensibly as it undermined private sector investment and trading in this field.

- The reality, however, was that the private sector had little commitment to invest in developing production and marketing, and found it easier to import the produce that wasn't immediately available locally. The domestic market has been and remains limited in scale and relatively remote from the main producing areas and the shipment costs are relatively high, owing to poor infrastructure and limited capacity to secure economies of scale. A 1987 study conducted by the ADB with DAL highlighted the potential to supply the domestic market more adequately and generate trade and employment for farmers in the Highlands and other localities, by investing in core marketing infrastructure (including consolidation and deconsolidation depots), but to be managed by the private sector, not the State, even whilst owned as a national unit. The initiative was perhaps ahead of its time, or trod on some toes, but it wasn't funded, with the only part of the report adopted being the establishment of a small market intelligence unit, which was funded by NZ Aid, namely FPDA.
- What was highlighted in that report was what was needed to encourage opportunities in the sector, which could have subsequently provided the platform also for export market development. That has not yet materialised, but clearly some industry consolidation has occurred, and concentration and specialisation of farmers and traders in the highlands, but particularly in the Wahgi valley has occurred, following the investment in the new Market facilities there; less so in other areas (ref Mark Busse), with the absence of the same level of local investment, although local specialisation has developed in locations like the Upper Chimbu valley, with bulb onions, thanks partly to FPDA's efforts.
- Agriculture...long given lip service, long taken for granted but long neglected. Needed to continue to absorb much of the growing workforce and population into the future, even if the rest of the economy does pick up; but to do so it needs markedly more assistance to sustain and achieve its multiple functions. Commend the work of NGOs like NTC on looking at land use needs, UNDP on supporting land use review etc...requires effective resources for research, extension etc...infr/access, technical and vocational training....etc...focus on

engaging with young people (NSW - agric in High schools)...population
planning...stop land grabbing and engage with communities...