

# SMALLHOLDER AGRICULTURE TO FACILITATE BROAD ECONOMIC DEVELOPMENT

**Alan R. Quartermain**

**The University of Goroka**

quartermainar@gmail.com

## **Abstract**

In Papua New Guinea there are repeated calls for greater investment in agriculture and for more resources to be allocated to the agriculture sector. But there are very few well researched suggestions as to what the existing or additional resources should be spent on, nor believable predicted outcomes. The statements and questions that arise, and hence the conclusions of this paper, are based on public documents such as press releases, reviews, conference proceedings and released technologies. Phrases like freeing up the land for agriculture or mobilizing the land are common. These beg questions such as – what do people think has been happening to the land up until now; where is this land that has to be mobilized; what do freeing up or mobilization really mean; what happens to the people currently using the land with increasing intensity; how can any predicted benefits be equitable and sustained? There is a singular excess of wishful thinking and a lack of attention to available published information on land use, productivity and the ways that smallholder farmers are coping with the pressures to change. It is important that attention be paid to the new National Strategy for Responsible Sustainable Development for Papua New Guinea and sensible suggestions for action being developed in consultations such as those promoted by the Fresh Produce Development Agency. Smallholder farmers continue to produce the bulk of the food consumed by the ever increasing population. This cannot change in spite of promotion of the dubious benefits of large scale, mechanized, capital intensive agriculture. But these smallholders are crying for help and so it becomes critical that increasing attention must be paid to making informed decisions about how to spend the riches from oil and gas to support and empower farm families. Three main areas can be identified – Research and Technology Development; the Enabling Infrastructure Environment; and Human Capital Development. Suggestions can be made as to what planned actions can be taken in these areas.

## **Introduction**

A PNG Update must look to the future as well as assess progress to date in broad economic development and evaluate the current situation. Of course we must know from where we start but also have a clear idea of where we are going. It is important to understand what is meant by broad economic development but in the context of what should happen in the agriculture sector it suggests that agricultural development should fit with and contribute to overall national development, defined as ensuring food security and improving access to quality education and health services. All available indicators, although the statistics may be only approximations,

show that Papua New Guinea (PNG) has been and remains an agrarian society, meaning a total reliance on agriculture for sustenance and welfare. All else in what might conventionally be included in development should follow as the nation progresses into the future. The question is to what extent can agriculture continue to support and drive the economy as it has been doing for the past 10,000 years. In the LNG Era the development challenge for agriculture is how to secure and use wisely the increased revenue that might become available. Hence it is the duty of academics, researchers and those in responsible positions in the agriculture sector to propose and implement strategies to ensure that agriculture can be successful in continuing to underpin progress towards harmony and happiness across all sectors of our society. However, these strategies must be based upon well researched evaluation of the available options for agricultural development that ensure equity and security for the farmers expected to continue to feed the nation. A University such as the University of Goroka (UOG) has a responsibility to examine public policy, to act as a think tank to evaluate strategies and plans for national development. Hence, academic staff of the Division of Agriculture and Rural Development have an obligation to challenge expressed conventional wisdom and assess policies in the light of collective experience and research findings. As senior academic in the Division, with 40 years of close involvement in PNG agriculture and continuing access to the collective wisdom of academic and other colleagues and farmers, I have a particular responsibility to take a lead in such activity. Hence I do not apologise for unconventionally using personal pronouns in this presentation.

## **Plans and Strategies**

There have been a plethora of plans and strategies since Independence, culminating in the PNG Vision 2050. However, in 2014 the Department of National Planning and Monitoring took a new approach when releasing its National Strategy for Responsible Sustainable Development for Papua New Guinea (DNPM 2014). This strategy focuses on long term sustainability requiring more attention to be paid to the responsible management and use of both renewable and non-renewable natural resources with an implication that returns from the latter should be used in a priority way to promote and assist the former in its development. The concept of innovative green growth includes not just the conventional and traditional green agriculture of the smallholder farming sector but also ensuring that research and education priorities support the concept and that resource and land rights regimes protect the interests of those with informal rights such as customary land owners, effectively over 80 percent of the population. So we must explore the implications for agriculture.

In 2007 the government released the National Agriculture Development Plan 2007-2016 (NADP) (Government of Papua New Guinea 2007) with much publicity that said that now the apparently stagnating agriculture sector would be revitalized and grow. It is said that this did not happen because of mis-management and corruption. However the plan never had a chance because there were no clear strategies in the plan as to how the huge sums of money requested were actually to be used. A plan to be effective must specify unequivocally who should do what,

where and when. The NADP failed in this respect. Publicised sector plans and strategies of the National Department of Agriculture and Livestock (NDAL) focus on increasing the volumes of production, quality control and assurance, linking farmers to markets, agro-processing and improving the enabling environment.

The promotion of the availability of local fresh produce through linking smallholders to markets is the primary function of the Fresh Produce Development Agency (FPDA). Emphasis is on the horticulture value chain. It is a well known phenomenon that wealth in farming is largely generated outside of the farm gate, through processing and marketing. Hence it makes sense for farmers and farmer groups to be involved as much as possible in post-harvest activities. They may also, but not necessarily, get better returns at the farm gate if their produce can be marketed more efficiently and post-harvest losses reduced. A useful set of recommendations arose out of FPDA's Inaugural Horticulture Value Chain Conference in 2014 and published in the proceedings (FPDA 2014).

PNG is exceptionally well endowed with data bases and assessments of traditional and current farming systems. The Agricultural Systems of Papua New Guinea 23 working papers (Bourke et al. 1998) contain arguably the best descriptions of traditional subsistence farming systems available for any country in the developing world. The NADP also contained much data and assessments of the status of agriculture. A significant Food and Nutrition Conference in 2000 resulted in a Proceedings (Bourke et al. 2001) containing 115 papers providing a comprehensive coverage of all aspects of agriculture related to food security by a formidable range of PNG experts. A Summary and Recommendations gave guidance for future policy and programs. Finally, Dr Bourke and his associates (including the current writer) produced (Bourke and Harwood 2009) the most comprehensive coverage of food and agriculture in PNG imaginable. Hence there is no shortage of background information upon which to build agricultural development plans for today and into the future.

## **What Kind of Agriculture**

Recently much debate on alternative strategies for agricultural development has been generated by politicians, the Department of Agriculture and Livestock, the National Research Institute and others. It is not clear what has initiated or driven this debate but in essence it revolves around the relative contributions of smallholders and larger scale corporate enterprise and the related issues of land availability and tenure. Changes in land tenure will not ensure that smallholders will be able to continue to feed us. Useful discussion on the debate over land tenure and an assessment of the issues have been given in papers by Khandakar (2012), Elahi and Stilwell (2013) and Fingleton (2004). Dr Thomas Webster, Director of the NRI, recently laid out the two main competing options for accessing land for development purposes (Webster 2015). It is clear that NRI's work on the option of voluntary customary land registration offers a viable way of mobilizing land for larger scale development should a consensus of land owners so desire. But is this necessary and have we considered all of the longer term implications to be weighed against

possible short term gains? It is clear also that there is only a very limited quantity of high quality land for agriculture and only about a quarter of the total land area of PNG is suitable and used for agriculture at all (Bourke and Allen 2009). All land in PNG is owned by someone and it is reasonable to assume that all suitable agricultural land is well used.

In my Quartermain (2014) paper I argued that the needs for food and its production have been and remain the primary determinants of land use and hence the priority of food garden systems in traditional societies. Food production and hence food security remain priorities even as PNG slowly becomes urbanized and industrialized, and customs slowly change. The contribution of smallholder/subsistence/family farming to the economy and food security is well documented although not appreciated as it should be and hence the poorly substantiated calls for land mobilization and freeing up of the land for agriculture must be countered. It is well substantiated that smallholder gardening using traditional and more recently available cultivars and technologies to best effect is clearly the most efficient use of the limited amount of good garden land with the most equitable distribution of benefits throughout the society as a whole (Bourke 2005). The question may be asked – are we using our traditional agricultural knowledge well or even understand the technology involved? But, agriculture in PNG has a long and diverse history characterized by a high degree of farmer research, innovation and acceptance of change (Bourke and Allen 2009).

Hence the strategy to follow is to empower the existing smallholder farmers to improve productivity and the marketing systems to take advantage of the opportunities, rather than alienating large numbers of landed villagers and forcing them into idleness or urbanization where there are few available opportunities for employment. Do we really want to create a large underclass of landless ex-gardeners (Quartermain 2010)? Local food production is keeping pace with population growth, there are thriving food markets everywhere (Busse 2014) and substantial urban gardening ventures in and around Port Moresby. But for how long can this satisfactory situation continue if population keeps growing and demand for food begins to outstrip local supply and even the availability of food imports. Good land for food production per head of population is in decline world-wide.

Calls for unemployed urban dwellers and retired public servants to go back to the land are nonsensical when all available good land is already over-utilised. Influential retirees may be able to secure land, perhaps by purchase from misled wantoks or the dispossessing of relatives, but most are already alienated and young people are unknown in the village or clan. Who are you? They may well be asked. Young females are particularly vulnerable, especially if of mixed cultural heritage and increasingly having no rural background experience. Qualified people with tertiary agricultural qualifications can, however, become the new rural elite but in a variety of cooperative ventures. Economies of scale are limited in agriculture, except in marketing, but Cooperatives are one way, proven in PNG (Mwayawa 2010; Mwayawa and Kurika 2014; Navus and Quartermain 2014), of harnessing what advantages there may be in increasing sizes of operations. Increasing farm size in developed economies such as New Zealand has been driven

by the need to maintain incomes and has been enabled by technologies and alternative employment opportunities.

## **Two Relevant Commentaries**

### **Comments on the Ministry of Agriculture and Livestock, Ministerial Statement on the Proposed “PNG National Rice Policy 2015-2030” (Tomscoll 2015), Circulated UOG staff 20/3/15 (edited).**

It is necessary to differentiate between the agronomic ability to grow rice with 100 years of proof and the capacity to grow it on a large scale commercially. The latter has not been proven so far or has failed. This new policy is dependent on “unlocking customary land” for economic development. “The trigger strategy is to develop large scale, mechanized, commercial, irrigated farming along the economic corridor”. The concept is to bring unused arable land into production and increase per capita consumption up to 30-50 kg per annum, thus improving nourishment for health.

The premise is that PNG has large areas of land that are suitable for growing rice but are currently not productive and underutilized. Where are the data to show this? In fact the statement says that the policy now is to focus “on unlocking the vast areas of customary land for wealth creation by our people in the rural areas”. It must be noted that garden land is not just decreasing in rice producing countries but also in PNG. It must be acknowledged that every square centimeter of land in PNG is owned by somebody or some collective entity. So how do these landowners benefit in an equitable sustainable manner from having their land “unlocked”, even accepting the doubtful assumption that much of this land is currently unused or not being used efficiently. Again, where is the evidence?

So what happens to these landowners? A fortunate few may become shareholders in viable companies and idle away the rest of their lives. Others will live on royalties like the mine landowners until these disappear or there is not enough to go around and satisfy growing needs. It is likely that the policy will increase the rate of urbanization so what will happen to these people? And who will produce the increased needs for the other components of healthy diets? Do we really understand the possible or likely consequences of such a policy in a country where over 80 percent of the population relies on gardening to produce the food and income for their families and the bulk of the marketed food for the others? Where is the research?

It is acknowledged that rice consumption is growing nationally and that current production does not meet this demand. But the reasons given as to why smallholder production has not and may not meet this growing demand are a commentary on government failure to empower smallholder farmers and is not a reflection of a failed concept. The reasons given are “poor planning, inadequate and inconsistency in funding, and lack of capacity in the relevant government agencies”. Factors limiting rice farmers are “poor transport, communication, energy, market and extension infrastructure, as well as lack of appropriate credit services”. Who is to blame for these

deficiencies? How is the new policy going to address these contradictions or factors that apply to everyone, large and small?

It is stated that “the focal aim of this policy is to provide evidence-based strategic guidelines”. So where are these guidelines and who is going to provide them? What is clear is that the policy is designed to entice foreign investors, leaving local smallholder farmers to continue to produce rice for their own local consumption if they wish but without any support.

**Then the following email was also circulated to all UOG staff 9/4/2015 (edited).**

We now we have a new set of problems that could arise from a proposal by the DAL Secretary in collaboration with SP Breweries to entice “thousands of farmers throughout PNG in small scale projects” to grow cassava and sell it to SP for making beer (National Newspaper 7/4/15). Again the problems are – where is the spare land for growing this cassava and where will the farmers grow the food we need in increasing quantities into the future? The danger is that land currently in fallow between food crops will be taken up or used up for non-food purposes and then the farmers may discover that they have no good garden land available to feed even their own families, let alone feed the rest of us.

On the same page in the same National there is a “Plan to develop agriculture businesses” in which the Minister states that he is currently developing an investment vehicle (Agriculture Investment Corporation Bill 2015) so that he and his Department can control all Government investment in agriculture, together with the Commodity Boards, to avoid the disastrous misuse and misappropriation of funds as occurred with the earlier NADP. This is scary if the development plans envisioned are as poorly informed as to possible consequences as his rice and cassava projects.

## **Pressures on Land Use and Farmers**

How do we deal with the pressures on land use and land users? It is worthwhile to itemise the identified pressures, some internal to gardening societies, some from external sources, and some dependent upon the effects of others. There is research being done by students of the University of Goroka to clarify and prioritise these pressures.

1. The key pressure is population increase and changing demography, with many farming communities having an excess of older people, but these pressures are not addressed by operational policies or feasible plans. There is a new, third population policy (National Population Policy (NPP3) 2015-2024) introduced by the Minister for National Planning and Monitoring that puts emphasis on the realization of universal basic education and improving health care delivery if the population growth rate is to be slowed (Abel 2015).
2. The need for income by rural families for a range of requirements.

3. Deterioration of access infrastructure. Although Bourke and Allen (2009) argue that the availability of road access is not an impediment to agricultural production, the state of the roads and other transport infrastructure is a major concern.
4. Land disputes – largely a consequence of increasing family size, income needs and deterioration in land productivity.
5. Declining soil fertility as a consequence of intensification of land use, in turn a consequence of population pressures, and resulting in longer cropping cycles and shorter fallows.
6. Market variability and pressures to convert garden land into commodity or non-food crop production.
7. Lack of education, poor health and other poverty causing consequences of isolation and failures in government services.
8. Land alienation for logging, mining and urbanisation – a major problem only in specific circumstances but a problem nevertheless.
9. Climate change. This phenomenon attracts much publicity and research attention. It is an increasing problem but is amenable to technical solutions, unlike population increase which remains a much more serious problem.

The Global Consultation on Agricultural Research for Development, GCARD 2010, concluded that all agreed the solutions to many of these problems lie in mobilization of the knowledge, resourcefulness and aspirations for incomes and improved livelihoods of the smallholder farming and fishing families which dominate rural populations throughout the developing world. These families and their communities are constrained by changing demographics, poor nutrition and health, deteriorating resource bases, low literacy, isolation or access to markets, neglect by governmental agencies and lack of science-based knowledge for low input productivity improvement. They are extremely vulnerable to natural hazards, especially the unpredictable consequences of climate change.

### **Spending the LNG Money Effectively**

So the question remains as to how to recommend the efficient and effective spending of any additional funding that can be secured through LNG or related activities. I have identified three broad areas of intervention that can be suggested as being priority.

1. Targeted Research and Technology Development.
2. Enabling the Infrastructure Environment.
3. Human Capacity Development.

I wish here to concentrate on the smallholder food crop and livestock production sector while not discounting the importance of the other components of the National Agricultural Research Sector – particularly oil palm, cocoa and coffee – and the research done by these components.

The reporting done for the Pacific sub-region for GCARD 2010 (Quartermain 2009; Singh 2010) presented the conclusion that there is a need for priority research into soil management in view of the identified declining soil fertility and productivity (for example Bailey et al. 2008; Hatemink et al. 2000). Over the years since 2003, the National Agricultural Research Institute has released 40 recommended technologies for smallholder farmers (NARI 2010 and 20120) and the focused work of the Institute will continue, enhanced by additional funding. The three universities with agriculture departments will add their contributions, increased if the Higher Education Sector funding is increased for both teaching and research. Research is needed to supply the necessary data on both land and farmer capacity to increase production as indicated in this paper. The conservation, management and utilisation of PNG's crop genetic diversity and its enhancement is another necessary area for continuing research, as is the range of crop protection issues.

There is no need to say too much about the need for maintaining and improving the transport infrastructure to facilitate development across all sectors of the economy. This is an obvious area of focus for the Government. One component of the infrastructure that is currently totally inadequate is the provision of abattoirs or slaughtering facilities for livestock, especially to enhance the capacity of the National Agriculture Quarantine and Inspection Authority to fulfill its tasks in relation to animal welfare and product quality control.

In my 2012 paper on human capital development in the natural resource sectors (Quartermain 2012) I discussed the essential need for enhancing the capacity of all stakeholders – farmers, potential farmers, formal and informal education suppliers, research and extension agencies, and other service providers – to meet the requirements of smallholder agriculture as it continues to intensify and increase productivity. The aim is for a more highly educated workforce in all facets of employment and entrepreneurship. Of particular importance is increased funding for the state universities which need more highly qualified staff in greater numbers in order to drive the whole education sector. There is a very real and urgent need for investment in Higher Education, especially in the support areas of food, health and education for without this the Visions will collapse. There is no point asking for percentage increases in graduates if we cannot find classrooms, libraries, laboratories and highly qualified staff to do the job. The universities are also being encouraged to be more involved in research and post-graduate training. They cannot pretend to be universities without these dimensions very strongly developed.

There is no doubt at all in my mind that our existing smallholder farmers can rise to the occasion, feed the nation, and continue to be the backbone of the economy if given the necessary support and empowerment. This includes the technical support from our graduates at all levels and research findings, not only from applied research for development but from research that will enable us to understand the science underlying the production processes and explore options for the future. These are our challenges and opportunities which the nation, with LNG funding support, will ignore at its peril.

## References

- Abel Hon. C. 2015. National Population Policy 2015-2024, Volume 1 – Policy Statement. Foreword by the Minister for National Planning and Monitoring. The National, Wednesday March 11, 2015.
- Bailey J.S., Ramakrishna A. and Kirchhof G. 2008. An Evaluation of Soil Fertility Constraints in the Highlands of Papua New Guinea. Technical Bulletin Number22, National Agricultural Research Institute, Lae.
- Bourke R.M. 2005. Agricultural production and agricultural land in Papua New Guinea. In: J. Fingleton (ed) Privatising Land in the Pacific. A Defence of Customary Tenures. Discussion Paper Number 80, Australia Institute, Canberra.
- Bourke R.M., Allen B.J., Hobsbawn P. and Conway J. 1998. Papua New Guinea Text Summaries. Agricultural Systems of Papua New Guinea Working Paper No. 1. Australian National University, Canberra. Volumes 1 and 2.
- Bourke R.M., Allen M.G. and Salisbury J.G. (eds) 2001. Food Security for Papua New Guinea. Proceedings of the Papua Food and Nutrition 2000 conference, PNG University of Technology, Lae, 26-30 June 2000. ACIAR Proceedings No. 99.
- Bourke R.M. and Allen B. 2009. Twenty myths about Papua New Guinea agriculture. In: R.M. Bourke and T. Harwood (eds) Food and Agriculture in Papua New Guinea. ANU E Press, Australian National University, Canberra.
- Bourke R.M. and Harwood, T. (eds) 2009. Food and Agriculture in Papua New Guinea. ANU E Press, Australian National University, Canberra.
- Busse M. 2014. Urban food security and ther Goroka fresh food market. The University of Goroka, Journal of Post Graduate Studies and Research 1: 30-47.
- DNPM 2014. National Strategy for Responsible Sustainable Development for Papua New Guinea. Department of National Planning and Monitoring, Port Moresby.
- Elahi K.Q. and Stilwell F. 2013. Customary land tenure, neoclassical economics and conceptual bias. Niugini Agrisaiens 5: 28-39.
- Fingleton J. 2004. Is Papua New Guinea viable without customary land groups? Pacific Economic Bulletin 19: 96-103.
- Fingleton J. (ed) Privatising Land in the Pacific. A Defence of Customary Tenures. Discussion Paper Number 80, Australia Institute, Canberra.

FPDA 2014. Promoting Local Fresh Produce Through Linking Smallholders to Market. Proceedings of the Inaugural Horticulture Value Chain Conference, Port Moresby, 26<sup>th</sup> and 27<sup>th</sup> March 2014.

Government of Papua New Guinea 2007. National Agriculture Development Plan 2007-2016. Volume 1 Policies and Strategies. Ministry of Agriculture and Livestock, Port Moresby.

Hartemink A.E., Poloma S., Maino M., Powell K.S., Egenae J. and O'Sullivan J.N. 2000. Yield decline of sweet potato in the humid lowlands of Papua New Guinea. *Agriculture, Ecosystems and Environment* 79: 259-269.

Khandakar Q.E. 2012. GHW-Fingleton on PNG's customary land: some critical comments. *Niugini Agrisaiens* 4: 15-25.

Mwayawa N. 2012. The role of cocoa marketing cooperatives in the supply chain: A case study of the Rugusit Cooperative Society Ltd. In: *Application of Science and Technology for Sustainable Utilisation of Natural Resources. Proceedings of the 4<sup>th</sup> Annual Science and Technology Conference, Papua New Guinea University of Natural Resources and Environment 27<sup>th</sup> June – 1<sup>st</sup> July 2011*, pp.151-158.

Mwayawa N. and Kurika K. 2014. Empowering women farmers in East New Britain in vegetable and floriculture production through a collective approach. In: L. Simeon, E. Manson and D. Bitto (eds) *Harnessing Science and Technology for Development: Meeting the PNG 2050 Vision Targets. Proceedings of the Papua New Guinea Research, Science and Technology Conference 2012, Pacific Adventist University, Port Moresby*, pp.75-78.

NARI 2010. *Recently Released Technologies for Papua New Guinea Farmers*. National Agricultural Research Institute, Lae. Revised November 2010.

NARI 2012. *Recently Released Technologies for Papua New Guinea Farmers*. National Agricultural Research Institute, Lae. Revised April 2012.

Navus P. and Quartermain A. 2014. The use of culturally determined management mechanisms to mobilize customary land for agricultural development. Paper presented at the First Conference of the Pacific Islands Universities Research Network, 3-7 November 2014, University of New Caledonia, Noumea.

Quartermain A.R. 2009. *GCARD 2010 Pacific Sub-regional Report. Transforming Agricultural Knowledge into Development Impact for the Pacific*. [www.apaari.org](http://www.apaari.org). (<http://www.apaari.org/wp-content/uploads/2009/10/pacific-sub-regional-report.pdf>), [www.gcard2010.net](http://www.gcard2010.net).

Quartermain A.R. 2014. Local indigenous vegetable economies as determinants of land use in the Pacific. Paper presented at the First Conference of the Pacific Islands Universities Research Network, 3-7 November 2014, University of New Caledonia, Noumea.

Quartermain A.R. 2012. Human capital development for harnessing natural resource science and technology to meet PNG Vision 2050. Paper presented at the Papua New Guinea Research, Science and Technology Conference 2012, Pacific Adventist University, Port Moresby.

Quartermain A.R. 2015. Food Security and Poverty Alleviation through Innovative Smallholder Farming. Paper presented at the 3<sup>rd</sup> Science and Technology Conference, Divine Word University, Madang, 16<sup>th</sup> – 20<sup>th</sup> August 2010. The University of Goroka, Journal of Post Graduate Studies and Research 3 (in press).

Singh R.B. 2010. The GCARD Process in Asia-Pacific. Final Synthesis. March 2010. Global Conference on Agricultural Research for Development, Global Forum on Agricultural Research, Rome. [www.gcard2010.net](http://www.gcard2010.net).

Tomscoll Hon. A.T. 2015. Ministry of Agriculture and Livestock, Ministerial Statement on the Proposed “PNG National Rice Policy 2015-2030”. The National, Thursday March 12, 2015.

Webster T. 2015. Customary Landowner Empowerment vs State Alienation. The National, Friday May 1, 2015, p.28.