

INDEPENDENT STATE OF PAPUA NEW GUINEA



Papua New Guinea National Food Security Policy 2016-2025

Growing agriculture for food security, good nutrition and health

Draft, November 2015

Department of Agriculture and Livestock
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Foreword



The National Goals and Directive Principles in our Constitution call for improvement in the level of nutrition and standard of public health to enable our people to attain self fulfilment. However, some 40 years since the adoption of the Constitution the problem of malnutrition continues to be a significant impediment in our nation's health, social and economic development. The poor public health situation reflects weaknesses in the country's food and nutrition security which is undermining our efforts to reach the Vision 2050 targets of being a healthy, empowered, educated, happy population and the placing of our country in the top 50 in the Human Development Index ranking.

Food security is a basic human right. Ensuring our nation's food security is fundamental for sustainable human and economic development and is central to social and political stability. The Papua New Guinea Food Security Policy 2016 affirms our Government's commitment to strengthening national food security to sustainably improve our people's wellbeing and quality of lives in both the rural and urban areas of the country.

In terms food security and nutrition Papua New Guinea's agriculture sector has special importance. It continues to be the main source of food, employment and income for over 85 percent of the population, who mainly live in rural areas. Therefore, agricultural growth remains one of the best ways to generate income for the poorest in in our country who need the most help buying nutritious food. Moreover, because of the prominent role our women play in food production and marketing, agriculture can provide an important entry-point for enhancing women's control and management of resources, knowledge and status; plus child nutrition outcomes can improve along with women's empowerment through agriculture. Agriculture also provides a significant amount of food to townspeople and earns an important amount of foreign exchange from crop export products, thus enabling the nation to better access food imports.

Therefore, investment in agriculture provides a critically important opportunity to build food security, improve nutrition and promote good health. However, while growing, value adding and marketing more quality food is essential to meet the demand of a rapidly increasing population, it may not alone be sufficient to achieve good nutrition and health outcomes. In particular, along with improving the quality of diet, there are also important elements relating to nutrition outcomes and health practices, including reproductive health (family planning), infant feeding practices and issues of clean water access and sanitation, and education to improve understanding on good nutrition practices. Only by ensuring self-reinforcing, synergistic interventions across all these areas will we gain sustainable food and nutrition security in our country.

Consequently, the Government is committed to taking action to address food and nutrition security issues through a range of measures across all the key sectors such as agriculture, fisheries, trade, health,

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education plus transport infrastructure and water, sanitation and hygiene services (WaSH). A National Nutrition Policy, a National Food Safety Policy and a WaSH Policy and the National Rice Policy complement this National Food Security Policy and together they will provide the framework for strengthened food and nutrition security in Papua New Guinea going forward.

The National Food Security Policy will strengthen the platform for joint planning, and guide coherent programs and actions from all key stakeholders to build and sustain food security in Papua New Guinea. The Government recognizes the vital role the private sector has in driving the food economy and developing the efficient food value chains necessary to supply quality food throughout the country. A primary aim of the policy will, therefore, be to foster strong public-private partnerships to leverage agriculture's potential to promote improved nutrition and health by bringing profitable smallholder farming, efficient food value chains, small and medium enterprise development, women's income and child nutrition together.

The successful implementation of this policy will contribute towards improving the lives of the majority of PNG's citizens, enhancing their productivity and participation in the sustainable development of our country through growing agriculture for food security, good nutrition and health.

Hon. Assik Tommy Tomscoll, MP
Minister for Agriculture and Livestock

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Acknowledgements



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We thank all members of the DAL Management team and in particular the National Project Coordination desk, the staff of Policy Division and the Food Security Branch who committed their time and technical expertise in the evolution of this policy.

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Our special thanks must be accorded to the stakeholders at national, provincial and district levels that gave freely of their time and shared valuable information which underpinned the development of this document.

DAL senior management believe that the National Food Security Policy 2015-2016 charts a smart pathway to sustainable food security and to realizing our national Vision 2050 and the target for food and nutrition security set in the global Sustainable Development Goal 2. We therefore commend this policy and trust that all stakeholders will give their continued and full support to ensure successful policy implementation.

Dr. Vele Pat Ila'ava

Secretary

Department of Agriculture and Livestock

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List of Acronyms and Abbreviations

CEPA	Conservation and Environment Protection Authority
DAL	Department of Agriculture and Livestock
DAL FSB	Department of Agriculture and Livestock Food Security Branch
DAL WiADU	Department of Agriculture and Livestock Women in Agriculture Development Unit
DSIP	District Services Improvement Program (DSIP)
DOH	Department of Health
DNPM	Department of National Planning and Monitoring
ENSO	El Niño Southern Oscillation
FAO	Food and Agriculture Organization of the United Nations
FPDA	Fresh Produce Development Agency
HAZ	Height for Age Z Score
HIES	Household Income and Expenditure Survey
INA	Institute of National Affairs
LLGSIP	Local Level Government Services Improvement Program (LLGSIP)
M&E	Monitoring and Evaluation
MTDP	Medium Term Development Plan
NAQIA	National Agriculture Quarantine and Inspection Authority
NARI	National Agriculture Research Institute
NCD	Non-Communicable Disease
NEC	National Executive Council
NFA	National Fisheries Authority
NFSP	National Food Security Policy
NGO	Non-Governmental Organization
NNP	National Nutrition Policy
NNS	National Nutrition Survey
NRI	National Research Institute
NSO	National Statistics Office
OCCD	Office of Climate Change Development
PEM	Protein-Energy Malnutrition
PGK	Papua New Guinea Kina
PNGDSP	Papua New Guinea Development Strategic Plan
UNITEC	University of Technology
WAZ	Weight for Age Z Score
PNGCCI	Papua New Guinea Chamber of Commerce and Industry
PNGWiADF	Papua New Guinea Women in Agriculture Development Foundation
PNGWCCI	Papua New Guinea Women's Chamber of Commerce and Industry
VC	Value Chain
WASH	Water, Sanitation and Hygiene Services
WHO	World Health Organization
WHZ	Weight for Height Z Score

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1. Background

Intent of Policy

This policy replaces the Papua New Guinea National Food Security Policy (NFSP) 2000-2010. The policy sets the medium to long-term direction and signals priority areas to focus resources (financial and human) to build sustainable food security for all Papua New Guineans. It provides a platform for joint planning to guide coherent programs and actions from all key stakeholders to strengthen food security in Papua New Guinea. A primary aim of the policy is to foster strong public-private partnerships and thus leverage agriculture's potential to promote enhanced nutrition and health by bringing profitable smallholder farming, efficient food value chains, women's income and child nutrition together.

Successful implementation of the policy will contribute to advancing the nation towards the Vision 2050 of being a *smart, wise, fair and happy society*, and achieving the global Sustainable Development Goal 2 to *end hunger, achieve food security and improved nutrition and promote sustainable agriculture*.

The policy complements other agriculture policies such as the National Rice Policy and the promotion of export crops under the national agriculture plan framework which are also areas vital for livelihoods, employment, economic development and food security.

Audience

The NFSP 2016-2025 will benefit all Papua New Guineans who each have a shared responsibility and stake in achieving sustainable food security. The policy will guide all key stakeholders working to improve food security in PNG; including relevant government agents at national, provincial, district and local levels, academic and research institutions, development partners, non-government organizations, faith-based organizations, private sector and community stakeholders.

Policy Development Process

The National Executive Council Decision (NEC) No. 347/2013 pertaining to the review of the PNG Development Strategic Plan (PNGDSP) 2010-2030 and Medium Term Development Plan (MTDP) 2011-2015 in the context of responsible sustainable development approved immediate interventions on strategic food security policy development. Consequently, the policy development process was initiated by the Government of PNG through the Department of Agriculture and Livestock (DAL) and supported by the Food and Agriculture Organization (FAO) of the United Nations.

Facilitated by DAL's Food Security Branch a policy development team was assembled in September 2014. The team included expertise in food policy, food production, nutrition and gender issues. The team was guided by a Food Security Policy Advisory Group. The team conducted a desk review on the food security landscape in PNG and undertook extensive consultation with key stakeholders to review the NFSP 2000-2010 implementation and gain insights and inputs into the formulation of the new food security policy framework. A broad range of stakeholders were consulted in bilateral meetings and focus group sessions, including national departments and agencies, development partners, NGOs, provincial administrations and program managers, CBOs, farmers, private sector and agriculture industry representatives. Provincial and district agriculture program visits and consultations were also held in

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the provinces of East Sepik (Wewak, Maprik), Sandaun Province (Nuku), Madang (Madang, Usino Bundi), and Morobe (Markham, Lae). During these missions meetings were held with government officers, farmers, women's groups, and youth groups.

In April 2015 a national workshop, attended by over 50 interested stakeholders, was held in Port Moresby to discuss outcomes of the policy review and strategic priorities for food security policy going forward. Subsequent to this workshop, building on the review findings and discussions held with stakeholders, a draft policy document was prepared and circulated to stakeholders for their comments in September 2015. Further comments and direction was sought through a series of seven focus group meetings held with various interest groups in October 2015. Benefitting from the comments made on the initial policy draft the policy document was finalized in November 2015 ready for endorsement.

2. Definitions and Concepts

Definitions

Food Security: Food security exists when all people have, at all times, physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (*reaffirmed definition at the World Food Summit, 2009*).

Average Dietary Energy Requirement: The average dietary energy requirement refers to the amount of energy considered adequate to meet the energy needs for normative average acceptable weight for attained height while performing moderate physical activity in good health.

Balanced Diet: the food consumption pattern is balanced when the contribution of energy-yielding nutrients to total energy is within acceptable ranges as follows: proteins from 10 to 15 percent; fats from 15 to 30 percent; and carbohydrates from 55 to 75 percent.

Malnutrition: Is a broad term commonly used as an alternative to under-nutrition, but technically it also refers to over-nutrition and imbalanced nutrition. Malnutrition can result from a lack of macronutrients (carbohydrates, protein and fat), micronutrients (vitamins and minerals), or both. People are also malnourished if they consume too many calories (over-nutrition). '**Hidden Hunger**', or micronutrient deficiency, is widespread in developing countries. It occurs when essential vitamins and/or minerals are not present in adequate amounts in the diet. The most common micronutrient deficiencies are vitamin A, iron, folate (vitamin B9), iodine and zinc.

Stunting: Is a condition when a child is too short for their age. It is caused by long-term insufficient nutrient intake and/or frequent infections.

Underweight: Is a condition when a child weighs less than the normative average acceptable weight for their age. Underweight is a combination of stunting and wasting, without distinguishing between the two.

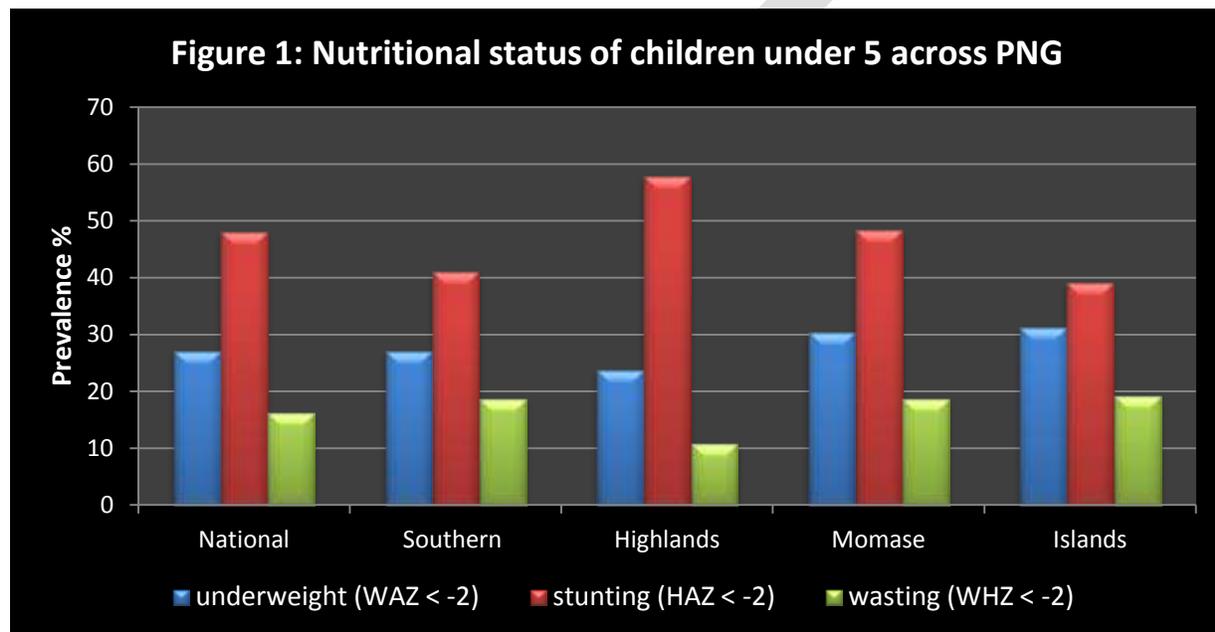
Wasted: Is a condition when a child is too thin for their age. It is usually the result of acute significant food shortage and/or disease. Wasting is considered the best indicator for determining a child's current

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nutrition risk because it reflects the present situation and is a good predictor of immediate mortality risk.

Stunting and other forms of under-nutrition (underweight, wasting) reduce a child's chance of survival and impede optimal health and growth, impacting negatively on brain development, which is likely to result in long-lasting harmful effects for cognitive ability, school performance, productivity and thus future earnings. The consequences of stunting are serious, life-long and irreversible.

Figure 1 below depicts the prevalence of the above conditions in children across the country.



Source: NSO 2009-2010 HIES Summary Report, Table 5.14

Resilience: is the ability of a system and its component parts to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration or improvement of its essential basic structures and functions.¹

Vulnerable Group: A group of people with common characteristics, a high proportion of whom are food insecure or at risk of becoming food-insecure.²

Concepts

It is now widely accepted that four key dimensions of food (and nutrition) security are: 1) *availability* (sufficient quantities of appropriate quality food, through domestic production or imports and their cost-effective distribution to consumers); 2) *access* (of individuals to adequate resources for acquiring

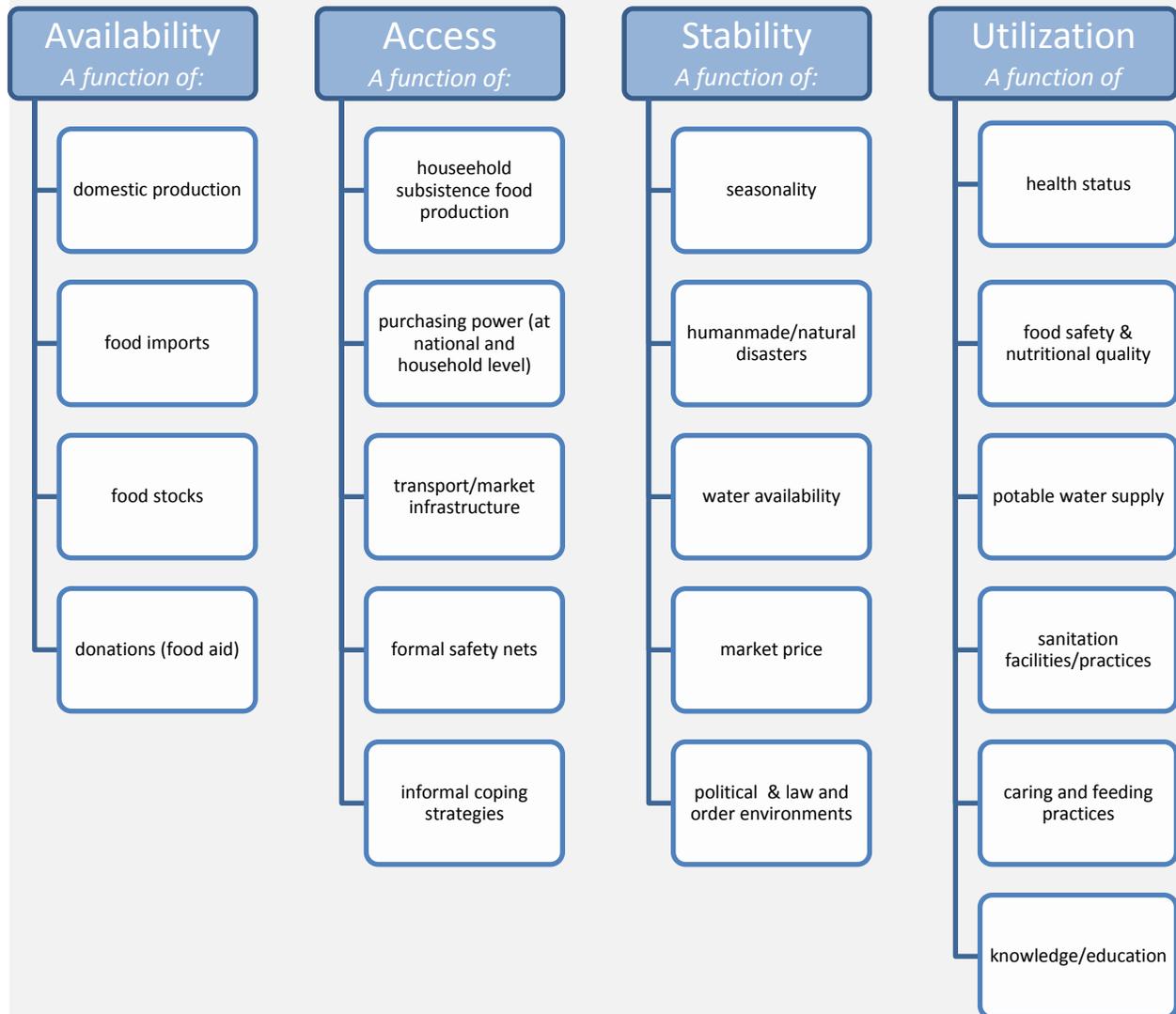
¹ IPCC (2012) Managing the risks of extreme events and disasters to advance climate change adaptation, Special Report of the Intergovernmental Panel on Climate Change (IPCC): Geneva, IPCC Secretariat

² FAO (2009) Glossary on Right to Food, Food and Agriculture Organization of the United Nations, December 2009, Rome

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appropriate foods for a healthy diet); 3) *utilization* (through adequate diet, clean water, sanitation, health care and nutritional awareness to reach a state of nutritional well-being); and 4) *stability* (the ability to maintain the above three factors during sudden shocks or cyclical events). These pillars with their key dimensions detailed are shown in Figure 2 below.

Figure 2: The Four Pillars of Food Security



Gender sensitive approach: The concept of gender-sensitivity has been developed as a way to reduce barriers to personal and economic development created by discrimination against women. It helps to generate respect for the individual regardless of sex or gender roles. It also opens up the widest possible range of life options for both women and man. Applying a gender sensitive approach means going beyond equality in the legal system, by considering the differences in living conditions and interests of

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women and men from the outset, and in a consistent manner, when formulating and implementing a social policy, program or project.³

Sustainable Food Value Chain (VC): refers to the full range of farms and firms and their successive coordinated value-adding activities that produce particular raw agricultural materials and transform them into particular food products that are sold to final consumers and disposed of after use, in a manner that is profitable throughout, has broad-based benefits for society, and does not permanently deplete natural resources.⁴

Four core functions (links) can be distinguished in the value chain: production (e.g. farming or fishing), aggregation, processing and distribution (wholesale and retail). The aggregation step is especially relevant for food VCs in PNG; efficiently aggregating and storing the small volumes of produce from widely dispersed smallholder producers is often a major challenge. The aggregation function can be taken on by producer groups, by intermediaries specialized in aggregation, by food processors or by food distributors (wholesalers or retailers).

³ FAO (2009) Ibid

⁴ FAO (2014) Developing sustainable food value chains – Guiding principles. Rome

3. Policy Context and Directions

Vision

All Papua New Guineans will be food secure principally from domestically produced nutritious food and lead healthy, active and productive lives.



PNG Vision 2050 Targets:

- **Healthy, Empowered, Educated, Happy Population**
- **Top 50 in United Nations Human Development Index (HDI) ranking**

Principles

This policy is framed in the context of:

- ❖ Basic human rights, child rights and women's rights, including the universal 'Right to Food'.
- ❖ Equity, respect and inclusion of the voices of the vulnerable (including women, youth, elderly and those with disabilities).
- ❖ Respecting cultural values and traditional decision making structures.
- ❖ Respecting and promoting biodiversity and environmental sustainability.
- ❖ Building on the nation's strategic assets and comparative advantage.
- ❖ Decentralization, with central authority performing only those tasks which cannot be performed effectively at a more immediate or local level.
- ❖ Private sector-led food sector growth
- ❖ Adopting a gender-sensitive approach
- ❖ Adopting a multi-stakeholder and multi-sector approach to tackling food and nutrition security.
- ❖ Being nutrition sensitive, geared at achieving nutritional impact.
- ❖ Utilizing science-based resources.
- ❖ Strengthening food and nutrition security information in order to better target vulnerable groups.

These principles are considered essential to protect human rights and cultural values, sustain the resource base and promote equitable social and economic development and they underpin the development and orientation of this policy. The implementation of strategic actions under this policy will be guided by these principles which respect the five National Goals and Directive Principles of the Constitution which are: 1. Integral Human Development; 2. Equality and Participation; 3. National Sovereignty and Self Reliance; 4. Natural Resources and Environment; and 5. Papua New Guinean Ways.

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Goal

To enable all Papua New Guineans to access and consume sufficient, safe, affordable, and nutritious food at all times.

Key indicators and targets

By 2025:

- ✓ *In children aged 6-59 months, the prevalence of moderate stunting (HAZ <-2 and >-3) will be reduced to less than 30 percent, moderate underweight (WAZ <-2 and >-3) will be reduced to less than 10 percent, and moderate wasting (WHZ<-2 and >-3) will be reduced to less than 2 percent.*
- ✓ *Prevalence of Anemia in children aged 6-59 months and non-pregnant women aged 15-49 years will be reduced to less than 25 percent and 15 percent respectively.*
- ✓ *Prevalence of overweight in the adult population ≤ 20 percent*
- ✓ *Principally through sustainable increase in smallholder yields, the composite staple food production index will increase from the 2000 level⁵ (=100) by 70 percent (=170).*
- ✓ *The average per capita consumption of rice will be ≤ 30 kg*
- ✓ *The ratio: Food and Beverage Imports/Total Imports ≤11 percent*
- ✓ *The average consumption of food protein principally from domestically produced meat, fish and plant sources will be ≥ 0.8 g/ kg body weight / day*
- ✓ *Household dietary diversity score: ≥5 number of food groups consumed for ≥50 percent of population.*
- ✓ *CPI annual average food price inflation ≤ 3 percent*
- ✓ *Women's share of household income increased*

To achieve these targets coordinated actions will be required to successfully implement this policy together with the national nutrition policy and national food safety policy. Additionally, significant improvement in the transport infrastructure, water, sanitation and hygiene (WaSH) environments must be advanced.

Whilst recognizing the crucial importance of multi-sector interventions to address the food and nutrition security issues the country faces, this policy principally identifies and prioritizes actions in five strategic action areas which will make agriculture work better for good nutrition and health. This focus is chosen because ultimately food insecurity results in malnutrition and health issues. The policy complements other agriculture policies such as the rice policy and the promotion of export crops under the national agriculture plan framework which are also areas vital for livelihoods, employment, economic development and food security.

Five Priority Strategic Action Areas

1. Productivity and farm output growth of the main food staples, horticulture, small livestock and fish farming and increasing efficiencies along the entire food value chain.
2. Building stability and resilience into food production and supply systems.

⁵ The latest national survey and evidence-based data assessment available

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3. Enhanced nutrient content and balance of food products consumed by nutritionally vulnerable households and individuals.
4. Empowerment of women in agriculture.
5. Strengthened governance, coordination, monitoring and communication.

Core Government Legislation and Policies

Policies, Plans and Legislation relevant to national food (and nutrition) security policy:

Policy Area	Policies/plans	Legislation
Macro-overarching Development Fiscal/ Monetary/ Exchange Rate Trade Labour/Wage Population Security	Vision 2050 Development Strategic Plan (DSP) 2010-2030 National Strategy for Responsible Sustainable Development for Papua New Guinea (2014) Alotau Accord 2012 Medium Term Development Plan 2 (2016-2017) Bank of Papua New Guinea Monetary Policy Statements (6 monthly) National Population Policy (NPP3) 2015-2024 PNG National Security Policy PNG Social Protection Policy 2015 (draft)	Constitution of the Independent State of Papua New Guinea Customs Act Customs Tariff Act (Import & Export Customs Tariff) PNG Labor Act 1978 Public Financial Management Act 1995 PNG Public Services Management Act 1995
Decentralization	Provincial Development Plans District Development Plans District Services Improvement Program (DSIP) Local Level Government Services Improvement Program (LLGSIP)	Organic Law on Provincial and Local Level Governments (OLPLLG) 1998 Provincial Authorities Act 2007 District Development Authorities Act 2014
Private Sector	Public Private Partnership (PPP) Policy (2008) Small and Medium Enterprise (SME) Policy 2015 (draft)	
Land	Special Agricultural & Business Leases (SABLs)	Land Act 1996 Land Tenure Conversion Act Revised Land Group Incorporation Act 2009 Land Registration Act
Agriculture	National Agriculture Development Plan (NADP) 2007-2016 National Rice Policy 2015-2030 NARI Strategy and Results Framework 2011-2020	(Bill) National Agriculture Administration Act 2014 (Bill) Agriculture Investment Corporation Act 2014 National Agriculture Research Institute Act 1997 Animal Disease and Control Act 1952 Animals Act 1952
Fisheries	National Tuna Management Plan Bech de mer Management Plan Barramundi Management Plan Gulf of Papua Prawn Fishery (GOPPF) Management Plan	Fisheries Management Regulation 2000 Fisheries Management Act 1998

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	Shark Fishery Management Plan Lobster Fishery Management Plan Fishing Aggregating Device (FAD) Management Policy Trial Fishing Policy National Aquaculture Development. Policy Orangerie Bay Management Plan Live Reef Fish Food Policy	National Fisheries Authority Act 1987
Biosecurity		National Agriculture Quarantine & Inspection Authority Act 1997
Environment – Forestry	National Forest Policy 1991 National Forestry Guidelines 2009 Forestry and Climate Change Framework for Action 2009 – 2015	Environment Act 2000 National Forestry Authority Act 1988 Forestry Act 1991
Biodiversity Conservation Climate change	National Biodiversity Action Plan National Climate Change Policy	
Disaster Management	National Disaster Risk Management Plan	
Health	PNG National Health Plan 2011 – 2020 PNG Child Health Policy (2009) PNG National Early Childhood Care and Development Policy (2007) Infant and Young Child Feeding Policy 2014 School Health Policy 2005– 2015 National Health Partnership Policy (2013) (draft) National Nutrition Policy 2015-2024 (draft) National Food Safety Policy 2014-2024	National Health Administration Act 1997 PNG Public Health Act 1973 PNG Food Sanitation Act 1991 & Regulation 2007
Education	National Plan for Education 2005-2014	
Infrastructure	PNG National Water Sanitation and Hygiene (WaSH) Policy 2015- 2030	National Water and Sewerage Act 1986 NCD Water Supply and Sewerage Act 1996
Gender	National Policy for Women and Gender Equality 2011-2015	

4. Policies and Strategies

Strategic Action Area 1: Productivity and farm output growth of the main food staples, horticulture, small livestock and fish farming and increasing efficiencies along the entire food value chain

Outcome 1: Local food production increased and producers better linked through efficient value chains to profitable markets and consumers

Strategy 1.1: Improve smallholder agricultural production and productivity focusing on maintaining continuity in supply of a range of quality products to improve nutritional health status.

Strategy 1.2: Increase investment in adaptive research and development building on local knowledge and agro-biodiversity to increase overall domestic food production, related value chain development and support for competitive smallholder agricultural enterprises.

Strategy 1.3: Improve the delivery of extension services to smallholder farmers and food value chain participants.

Strategy 1.4: In the crop sector, increase focus on greater productivity and consistent supply of a diverse range of quality nutritious food crops in rain-fed low input systems.

Strategy 1.5: Increase competitiveness of livestock production and productivity of value chains for small animals and their products (pigs, goats and poultry including egg layers).

A thriving agricultural sector is needed to reduce poverty, provide food and nutrition security and promote economic growth in rural areas and our nation as a whole. A growing agriculture sector will also promote rural development. **Adequate public and private investment for agriculture sector development with an appropriate level of investment in smallholder agriculture, food marketing and the food value chain will therefore be essential to achieving the food security goal.**

Enhancing smallholder productivity, production capacity and related value chain competitiveness is critical for protecting and sustaining food security in PNG. Increased agricultural productivity can improve nutrition in several ways—by increasing consumption from one's own production, by generating more income to buy more nutritious food and obtain healthcare, and by reducing food prices.

The necessary sustainable increase in agricultural production and productivity to strengthen food security is ultimately dependent on private sector activity (particularly the current land holders and value chain service providers) and **Government will thus strive to create a stable macroeconomic and transparent coherent policy environment conducive to greater engagement of private-sector, small and medium enterprises (SMEs) and smallholder agricultural investments.** The aim will be to improve food value chain efficiencies and target investments into programs which have the best potential to increase country-wide nutritious food supply, distribution and marketing.

Investment in agricultural research and extension will also be vital to meet the growing food demands and build resilient farming systems. PNG has a strong national agriculture research capacity through its national institute and universities which must be sustained and expanded. Strong coordination between the research agencies and the DAL will be essential together with increased delivery of improved technology outputs of research to farmers' fields, and to value chain service providers. Particularly important will be to improve value addition and reduce value-chain wastage.

Extension services are likely to involve a variety of well-coordinated arrangements of public, NGO and private players including farmer and supply

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Strategy 1.6: Protect and enhance water sources and strengthen water and soil use management and application of appropriate-scale irrigation technologies.

Strategy 1.7: improve the management of coastal and inland fisheries and support the development of sustainable aquaculture and the value chains for their outputs.

Strategy 1.8: Promote and strengthen partnerships for a whole of value chain approach to facilitate the establishment of efficient viable competitive food production, distribution and marketing from input supplies, through farm production, distribution and processing to end markets and consumers.

Strategy 1.9: Encourage and support the formation of small and medium enterprises (SME) in the food sector.

Strategy 1.10: Strengthen value chain/market infrastructure, market information and business support services (including financial inclusion and affordable credit facilities, business skills development and training) to small farmers, fishers and SMEs in the food sector.

Strategy 1.11: Ensure that all intervention programs are gender focused and gender responsive.

chain groups. They will be farmer and supply chain demand-driven, market oriented and use participatory approaches. Although extension services will be directed to all producers and value chain service providers, special attention will be given to women in recognition of their critical role in family household management and food production. Whilst the primary role of the Commodity Boards is to promote export crop development they also can play an important role in facilitating transfer of improved inputs, information and technologies for nutritious food production. If farm households are well-fed and food security is assured greater attention will be paid to productive export crop enterprises. This approach will enhance the vital role that cash earned from the exports crops plays in improving access to food for farm households.

Recognizing that a large proportion of our farmers do not have access to irrigated farmland **increased attention will be focused on improving rain-fed food production systems particularly in upland and hillside locations.** Priority interventions will include promoting conservation agriculture and increased diversification of domestic food production to improve household access to a wider range of nutritionally adequate foods.

Water will increasingly be a constraint in agricultural production therefore improved irrigated water management will also be important. **Protecting, maintaining and building water storage and supply capacity for agricultural purposes (including strategically placed dams) will be critical.**

Agricultural practices should promote adequate, healthy food while protecting and contributing to environmental sustainability. Government will promote farming systems and ecosystems perspectives which encourage environmentally friendly production systems, including integrated crop management, integrated pest management, soil fertility management, agroforestry and aquaculture. **Increased attention will be given to land capability assessment in guiding choice of appropriate farming systems and agricultural practices.**

An essential precondition for any successful productive enterprise is that there must be an identified and sustained market for the product that has potential to provide producers consistent and attractive financial benefits, and a viable product distribution and value-management chain linking the producers to the market and to the consumers to give the confidence to make the necessary investments and changes in practice to supply these markets. A demonstrated market demand and facilitated access to markets is necessary to stimulate smallholder commercialization. For this to be realized **improvement in market linkages and product quality are needed.** In times of a strong and sustained market demand farmers will more actively seek and adopt productivity enhancing technology and management methods as well as improved post-harvest handling and value adding technologies.

An effective National Food Marketing System (NFMS) is essential to provide

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reliable and affordable local food produce to the growing PNG population. Therefore **Government will promote a whole of value chain approach** working in partnership with the farming community, traders, transporters wholesalers, retailers and agri-businesses in the food industry to facilitate and support the establishment of efficient viable and cost-effective food value chains from input supplies, through farm production, distribution logistics to end markets and consumers.

In line with the National Aquaculture Policy and fisheries priorities greater focus will be given to ensuring a better supply of fishery products to domestic markets and raising national consumption of fishery products.

Reinforcing market chains for products based on local and traditional nutritious food crops and seafood, where small-farmers and fishers have specialised knowledge will be encouraged. These products strengthen resilience and reduce risk for small farmers because they can flexibly shift between production for home consumption and the market depending on opportunity.

At the present stage of PNG's economic and private sector development, **supporting market linkages for the majority of smallholders/rural population remains a public good**. Also possible use of targeted time bound subsidies to address market failures need to be considered (examples could be for farming inputs/improved planting materials and seeds, transport, cold storage and distribution infrastructure and information). When subsidies are provided these will aim to improve quality food production, supply and distribution, but not distort markets for private sector activity. It is the private sector traders who ultimately will be the most important and sustainable link for farmers' access to markets for outputs, inputs and useful information.

Improved road transport services along with strategically located cool storage facilities and improved market infrastructure (along with essential utilities, including reliable power supply, safe water and telecommunications) are essential requirements for boosting domestic trade in agriculture and fisheries products. When municipal marketplaces offer a good array and quality of produce they make a major contribution to small business enterprise development and food security. **A policy priority therefore is to continue to improve domestic market, storage and distribution infrastructure and post-harvest management for perishable products** (including for livestock and fisheries products) as a means to stimulate local food production, enhance food quality and safety and reduce wastage, thus increasing market opportunities, employment and rural incomes. Domestic marketing is largely the responsibility of women and they should be fully involved and leading initiatives and in decision-making in planning of market developments and market management.

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Strategic Action Area 2: Building stability and resilience into food production and supply systems.

Outcome 2: Enhanced stability and resilience in food production and supply

Strategy 2.1: Enhance capacities in rural communities, landowners and farmers to use natural resources in a sustainable manner to support an adequate and stable supply of domestically produced nutritious food.

Strategy 2.2: Conserve and increase the use of traditional crop biodiversity (and indigenous small livestock breeds), and cautiously introduce new crop varieties which can extend the tolerance range of crop growing conditions (e.g. to drought, excess moisture, saline soil conditions and higher temperatures).

Strategy 2.3: Develop and extend 'climate smart' traditional and science-based agricultural technologies and practices.

Strategy 2.4: Ensure a well-functioning biosecurity service to ensure adequate levels of management and control of spread of endemically occurring pests and diseases and protection of PNG's plant and animal health status from establishment and spread of introduced exotic pests and diseases.

Sustainable management of agriculture, forest and fisheries resources and soil and water resources underpins the achievement of sustainable livelihoods and food and nutrition security for all Papua New Guineans. These resources are a source of food, shelter and economic development, thus managing them sustainably is crucial to ensuring they continue to provide important ecosystem services such as climate change mitigation, watershed protection, biodiversity conservation and food production.

Steep slopes with shallow soils where agriculture is frequently practiced in Papua New Guinea are very susceptible to erosion. Unsustainable land use and forest degradation has already taken a heavy toll on the water cycle, resulting in periodic water shortages, flash floods and landslides. The inevitable consequences are lower crop yields, crop failures and food shortages. Healthy water catchments, rivers, forests and soils are necessary for productive farms and a healthy population. **PNG's land and water resources must be managed to avoid further degradation and to minimize the risk of environmental damage and loss of biodiversity. Forest protection, reforestation and sustainable land, soil and water management remain high priorities.**

Climate studies predict that the climate in Papua New Guinea will become warmer and wetter and the intensity of extreme rainfall events will increase. For most of PNG, an increase in total rainfall and a less seasonal distribution would have a negative impact on agriculture. If ENSO events occur more often as some models predict, more frosts will result at high-altitude locations which will also have negative impact on agriculture. Such potential impacts of climate change pose further challenges for farmers and threats to stability in food production. Increase in rainfall intensity and changing rainfall patterns would exacerbate soil erosion, landslides, local flooding and water availability.

Warmer temperatures are also likely to increase the incidence of some crop and livestock diseases and vector-borne diseases such as malaria and dengue fever. Floods, drought and other natural disasters — made worse by climate change — can transform marginal forms of poverty into chronic vulnerability and food and nutrition insecurity. Bold actions are needed to protect, restore, and manage land, soil, and water sustainably to alleviate rural poverty and hunger and ensure long-term food security. **Increased attention needs to be paid to land capability and land use planning.**

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Strategy 2.5: Explore and promote appropriate approaches to maintaining adequate strategic food reserves.

Strategy 2.6: Build capacity in small scale food processing, preservation and storage at household and community levels.

Strategy 2.7: Streamline and improve coordination of humanitarian food distribution to vulnerable households and communities in times of disasters and extreme need.

PNG is blessed with a wide diversity of plant genetic resources. The broad genetic base of food crops currently available in PNG provides resilience and tolerance against major pest and disease outbreaks and will provide farmers with more options to meet future threats and challenges including the potential impacts of climate change. **Maintaining and utilizing this rich genetic pool for food crop improvement including increased productivity, quality and nutritional value will be vital to ensure sustainable food security in PNG.**

Additionally, ensuring national bio-security is also essential to protecting biodiversity and maintaining productive capacity for food security and to protect plant, animal and human health. Strengthening biosecurity control and interventions targeting endemic emerging pests and diseases, particularly in respect of measures to prevent and manage risks of their spread and adaptation to additional host crops.; strengthening quarantine border controls, harmonization of biosecurity, food safety and customs clearance controls through 'single window' processing integration, and ensuring that import and export activities comply with international quarantine standards are therefore high priorities. As is developing contingency response plans for invasive pest and disease incursions.

Establishing risk management systems and tools, to provide food-based safety nets that offer immediate relief to disadvantaged groups during crises; building adequate emergency food reserves and relief systems (**including seed banks**) as a buffer to natural and human-made disasters; and over the longer-term preserving and extending food crop genetic biodiversity and adopting 'climate smart' agricultural practices to sustain agricultural productivity will all be necessary to protect food and nutrition security.

Systems for improved disaster mitigation and addressing risks are being put in place and disaster preparedness and management plans should indicate how food and agricultural systems will be effectively managed and protected in times of disasters and crisis. The Food Security policy framework will be aligned to national disaster preparedness and mitigation policy.

Maintaining strategic food reserves provide a critical buffer during times of disaster or crisis for vulnerable communities. These buffer stocks need to be well managed to ensure sufficient availability of good quality food in times of need. This policy will promote and support improved strategic food storage from farm household level, through to village, district and national levels. Recognizing the high costs of maintaining physical food stocks and the potential these have to distort market signals, approaches which involve commercial sector food traders holding mandated strategic buffer stocks to mitigate short-term supply shocks will be explored.

In addition, processing, preservation and consumption of food grain and especially pulse crops because of their better storage attributes, compared to traditional root and tuber crops will be promoted. At household level **building capacity in small scale food processing, preservation and safe storage** (e.g.

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cassava flour, dried fruits etc.) to supplement household food supplies during lean periods will be supported. Processing of foods to allow for longer preservation also contributes to diet diversity.

The private sector food (e.g. rice) distribution network appeared to function well following the 1997 drought – relative to the public sector/aid distribution systems - therefore an appropriate approach, under such circumstances where private food markets are operating, may be for government (and aid agencies) to deliver food vouchers (rather than bags of rice) to households in vulnerable communities who have access to purchase rice from the commercial distribution system. This should also better accommodate targeting to the neediest and strengthen rather than compete with private business operations. However, there shall remain a critical need for aid-distributed food supplies for the subsector of PNG society that does not have access to food markets of any kind.

From the perspective of improving targeting of interventions (particularly to disadvantaged and vulnerable groups), as promulgated in this policy, it will be necessary to develop a more disaggregated database at the district and local levels. **The Government also recognizes the need to have in place an effective early warning system** that provides alerts on nutrition and food insecurity which may be precipitated by emergencies such as drought, floods, tsunami, earthquake or unfavorable food market conditions. This information is necessary to improve government's ability to quickly respond to reduce food insecurity and efficiently allocate its material and financial resources to where they are most needed.

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Strategic Action Area 3: Enhanced nutrient content and balance of food products consumed by nutritionally vulnerable households and individuals.

Outcome 3: Vulnerable households and individuals consuming a healthy balanced nutritious diet

Strategy 3.1: Strengthen capacity to map all communities nationally that are particularly vulnerable to lack of food and water security and good nutrition and ensure that appropriate interventions are targeted to reach these groups.

Strategy 3.2: Boost research into nutrient rich crops and improved livestock breeds.

Strategy 3.3: Increase availability of food from animal (including fish) sources at household level.

Strategy 3.4: Use agriculture as a platform for delivery of messaging on nutrition knowledge and practices and work closely with the Vocational Schools in each district.

Strategy 3.5: Promote increased consumption of diverse diets (including protein-rich products especially meat, eggs & fish) particularly among pregnant women, adolescent girls, and young children.

Strategy 3.6: Through partnerships between education, agriculture and health, trial school feeding programs incorporating locally produced nutritious foods.

To address malnutrition in PNG agricultural policies, programs, and investments need to be designed and implemented to achieve clear nutrition goals. Effective strategies to enhance food and nutrition security must also take into account the needs of those who already lack food and nutrition security and those vulnerable to a lack of food and nutrition security. Healthy food, along with healthcare and education, must be available to all regardless of income.

Papua New Guinea displays an enormous diversity in its geography, ecology and human biology; the diversity of the landscape, and agriculture and cultural practices result in wide differences in the nutrition outcomes among the regions. At household level, family wealth and geographic location are significant factors associated with malnutrition of children, with children from poorer families being significantly more likely to be malnourished.

Adequate nutrition of children in PNG is closely associated with the food production systems where they live and by differences in diet. Most of the factors associated with child growth can be related in one form or another to differences in local subsistence agriculture making agriculture one of the main determinants of child growth and nutrition patterns in PNG. Quality of the food consumed is as important as the quantity, for the improvement in nutritional status. The quality of food (for example, intake of protein and fats) results in great variation in the extent of protein-energy malnutrition among children. Therefore increasing **availability and access to nutrient dense/protein rich foods such fish, animal meats, eggs and legume pulses is a strategic priority**. Additionally, people need to be empowered economically to access and consume these nutritious foods and provided with information to enable them to make healthy food choices.

Our national food security strategies have often focused more generally on agriculture and food supply, neglecting the importance of food quality to nutrition. Going forward, **effective programs and projects will need to be location specific, designed to meet the specific needs of particular regions, areas or districts. Moreover, acknowledging resource constraints (both human and financial) means that program responses will need to be nutrition focused and targeted to those areas in greatest need. Therefore, improved**

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food and nutrition security information will be vital for better decision making on program interventions in different locations.

People from all income groups are experiencing health problems and sometimes premature deaths due to a range of factors including poor quality diet, less than optimal nutrition, and exposure to unsafe food and water. Poor dietary practices result from limited access to quality nutrition information and services and the low purchasing power for nutritious food. Consequently, many of our children and adults do not eat a balanced diet with the recommended amount of carbohydrate staples, protein-rich foods (meat and fish), vegetables and fruit. Students with decreased overall diet quality are more likely to perform poorly in school, and have more behavioral and emotional problems. But low awareness on nutrition by mothers, fathers and community leaders remains one of the primary factors undermining nutrition related programs. **Agriculture programs that directly interact with farmers offer a significant opportunity to deliver information about practices and behaviors that improve nutrition alongside information on agriculture.**

Government will therefore **strengthen and expand this integration of nutrition education into our agricultural programs. Particular attention will be focused on locally-adapted crop varieties rich in micronutrients and protein together with increasing availability of food from animal (including fish) source at household level.** Support will be directed to production of small livestock, poultry and egg layers and aquaculture because they offer unique opportunities to improve dietary diversity and nutrition at the household level. Extending the distribution of improved small livestock breeds and aquaculture fingerlings as well as improving local livestock feed sources will be important. In particular, we will work to reach women farmers and to ensure that their increased productivity will translate into improved health and nutrition for their families. School food gardens will also be encouraged.

Whilst under-nutrition remains a critical challenge overweight and obesity is as high as 25 percent among adults in some communities which is a significant risk factor for the increase in lifestyle related non-communicable diseases (NCDs). Improving the availability of lower cost, nutritionally superior and local food products will be a critical strategy to improving diets, health and food security in PNG. **Through partnership with our civil society and NGOs government will facilitate and promote sustained community campaigns that promote healthy food choices.**

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Strategic Action Area 4: Empowerment of women in agriculture.

Outcome 4: Sustainable income generating opportunities for women increased to enhance economic access to nutritious food for children and families

Strategy 4.1: To maximize impact of household income on the family's nutrition, increase women's access to income-generating opportunities, especially via increased attention to crops/livestock produced by women.

Strategy 4.2: Increase focus and resources to sustainable development of the small-scale fisheries sector by developing viable distribution, value addition and marketing chains.

Strategy 4.3: Expand micro-finance access and small enterprise creation, mentoring and support programs for women.

Strategy 4.4: Improve women's access to extension services, technology, inputs, markets and information and support capacity building through strengthened rural resource centres.

Strategy 4.5: Invest in labor and time-saving and productivity enhancing technologies for tasks performed by women (e.g. weeding, food processing, firewood and water collection).

Strategy 4.6: Provide support and work through women's organizations (e.g. PNGWiADF, Women in Business, and the Provincial Council of Women).

In PNG, women make up almost 50 percent of the population with nearly 90 percent of them engaged in agriculture, fisheries and forestry. They produce the bulk of the nation's food but often without their contributions being recognized. Also, they face significant challenges in food production and trade. Law-and-order problems including hold-ups, theft and sexual harassment by men mean they cannot participate freely in marketing which greatly limits women's access to income. Social constraints place barriers around women's access to scientific and technological information. In many PNG sub-culture (but not all), lack of collateral denies women access to agricultural credit, while culture or traditions accord ownership of land and other resources to men. To enhance the contribution of women in food production and supply and to ensure food security at the household level, the empowerment constraints facing women in agriculture need to be adequately dealt with.

Global experience has clearly shown that where women have increased access to income generating opportunities and social decision-making empowerment at community level, household nutrition improves. Among agriculture projects that have improved nutrition, women's active involvement has been a consistent element. Village consultations during the preparation of this policy indicated that women put a very high priority on their children's education and nutrition. **This policy therefore promotes opportunity for increased income earning by women and their empowerment in decision-making processes.**

The small-scale fisheries sector (sea fishers, reef gleaners, shell fish gatherers, and aquaculture) offers the potential for creating significant income generating and employment opportunities for both coastal and inland communities and particularly for women. Developing the fisheries sector will serve the dual purpose of improving nutritional status and household incomes.

Women's access to finance to facilitate development of small-scale rural enterprises will need to be strengthened and expanded along with appropriate small business training and mentoring programs.

Women have a very high workload, which affects their health. The nutritional status of women is dependent on their diet and their workload, and on their nutritional status depends their ability to care for and properly feed their children. Given the significant time constraints on women, interventions that

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Strategy 4.7: Promote a whole of family approach to gender and male advocacy to enhance women's role in decision making relating to agriculture, agribusiness and household nutrition.

Strategy 4.8: Ensure a gender balance in agriculture training and provision of extension services.

affect women's time allocation can help improve their own nutrition as well as that of their children. Improvement of village water and firewood supplies, including bringing them closer to villages, and increased support for labour-saving farm technologies would help to reduce women's workload; also important will be providing healthy and efficient energy sources and cooking facilities.

There are numerous non-government organizations working on gender sensitive food and nutrition security projects. DAL will coordinate its activities and forge partnerships with these established networks to promote best practices that reach families and women farmers at the community/village level.

Women have long been trained as extension officers (*didimeri*) in service provision for agriculture, but the female-to-male ratio of employees as a percentage of total agriculture sector employees actively involved in extension, training and research has fallen. **Restoring the balance of trained women in agriculture extension services will be pursued.**

Strategic Action Area 5: Strengthened governance, coordination, monitoring and communication

Outcome 5: Successful implementation of food security policy and programs at national, provincial, district and local levels

Strategy 5.1: Strengthen public-private sector governance systems and arrangements to enhance private sector role in decision making to enhance development of food value chains and the food economy more broadly.

Strategy 5.2: Strengthen the governance and coordinating structure essential for effective multi-sectoral food security policy oversight, implementation, monitoring and response at national, provincial and district levels).

Policy implementation will require bringing together multiple agencies and groups including the private sector and business organizations (at national, provincial, district and local-level) that are intended to work in concert; therefore effective coordination will be fundamental to success.

The first and perhaps most important step towards encouraging greater investment in improved food and nutrition security by both the public and private sector, is the effective co-ordination of stakeholders, and their clear communication of policy needs and objectives. This is particularly important in the context of linking local level, district and provincial needs and planning processes into the national policy implementation framework.

The Bill for the '*National Agriculture Administration Act 2014*' prescribes the administrative governance structure for implementation and monitoring of national agriculture policy and plans - implementation of the NFSP will be aligned to this legislative framework. Following a review and reformulation of a new National Agriculture Plan (NAP), the food security implementation plan and programs will be subsumed under the NAP. DAL (Food Security Branch) will

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Strategy 5.3: Review institutional/human resource needs to effectively implement the food security policy, and where needed ensure designated food related positions are established and adequately resourced at each level.

Strategy 5.4: Provide training and advocacy on roles and responsibilities of stakeholders in the effective implementation of the food security policy.

Strategy 5.5: Build a critical mass of human capability together with appropriate resources to effectively collect, integrate, analyze and report credible (gender disaggregated) food and nutrition statistics in a timely way.

Strategy 5.6: Continue to improve standardization of approaches and indicators used in the multiple national surveys which collect information relevant to food and nutrition security (e.g. Population Census, HIES, Survey of Living Standards, Demographic Health Surveys, Nutrition Surveys etc.).

Strategy 5.7: Strengthen the food security data management, information and communication systems including appropriate integrated information management systems in public and private sectors.

Strategy 5.8: Support the strengthening and timely distribution of demand-driven food, nutrition and food value chain information products.

have a leadership role in food security policy formulation and coordination of implementing partners, securing finance and monitoring and reporting on progress. The Fresh Produce Development Agency (FPDA) and National Agriculture Research Institute (NARI) will assume an expanded role in implementation of support for food security programs and actions.

Recognizing the importance of good data and analysis for sound policy decision making and the very significant issues that currently exist related to data quality **this Policy promotes a coordinated capacity building effort to improve the flow and quality of information on food and nutrition security intended to guide and support effective evidence-based policymaking and programming.**

The data collected should aim to better link food security and nutrition status and outcomes to macroeconomic, poverty, agriculture, health, education, social protection and other aspects of the underlying causes of food and nutrition insecurity and include climate variability and trends in the monitoring systems. It will also be necessary to build capacity in-country to undertake policy-relevant analysis of food, nutrition and health problems.

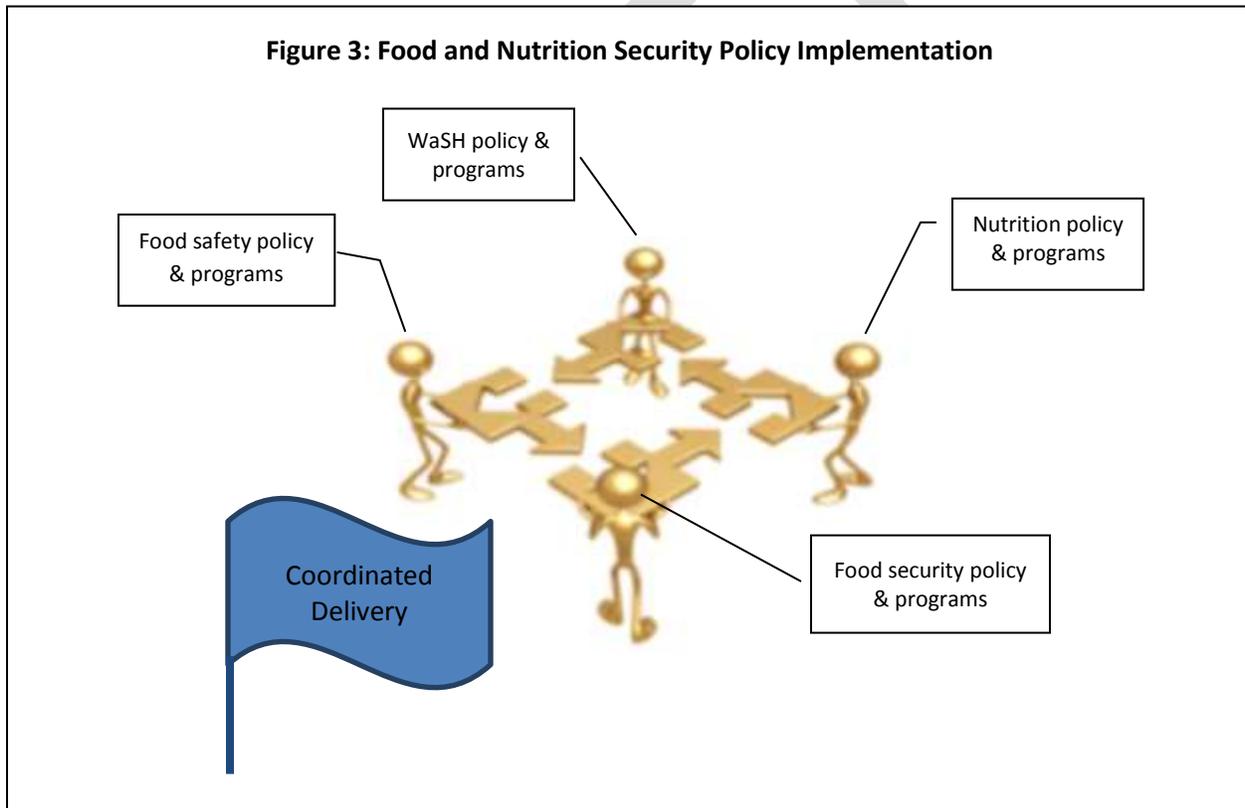
Responsibilities and requirements for agriculture data collection and reporting are laid out in the National Agriculture Administration Bill. Relevant agriculture data for food security planning and monitoring will be collected. This data will inform policy implementation monitoring, an integrated multi-sectoral monitoring system for food and nutrition security and the national statistical system.

Key agriculture minimum data sets will be identified for monitoring food security and will be used to define indicators in a common results monitoring framework for food and nutrition security (refer also to Chapter Five – Monitoring and Evaluation in the National Nutrition Policy 2015-2024).

5. Organizational Responsibilities

Institutional Structure for Food and Nutrition Security Governance and Coordination

Currently the institutional structure of support services for food and nutrition security is fragmented with a range of government departments, NGOs, faith-based organizations and private sector entities all having important roles to play. There is a need to consolidate, focus and coordinate functions across the agencies and the private sector actors who drive the food economy. DAL will work closely with the private sector representative organizations and key government agencies including, departments of Health, National Planning and Monitoring, Education, Community Development and Religion, Commerce and Trade, Transport and Communications, Environment, Office of Climate Change and Disaster Management Centre) together with provincial and district authorities to coordinate the implementation of the nutrition, food safety, WaSH and food security policies (Figure 3).

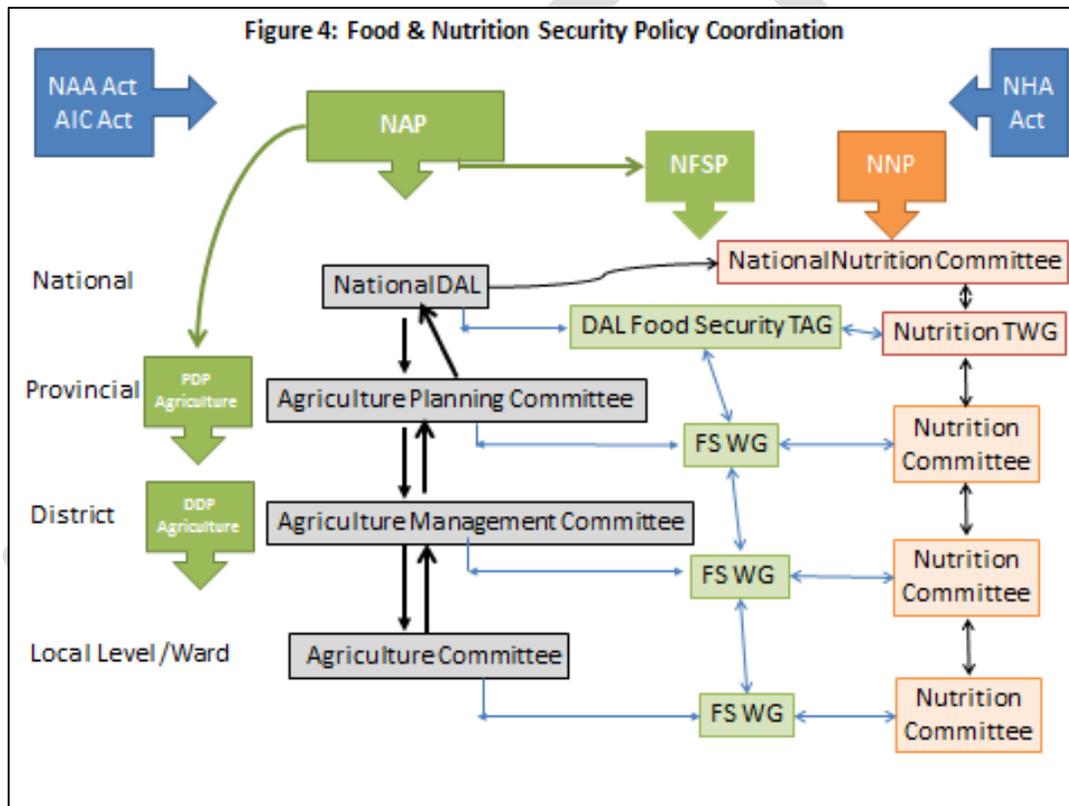


Viable approaches will be sought to leverage integrated actions across the multiple sectors to achieve gains in agriculture, nutrition, and health simultaneously. The aim will be to ensure that minimum (essential) packages are provided in each sector, with gains from each achieved in the communities targeted; hence by exploiting synergies gain compounded food and nutrition security benefits.

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The National Nutrition Committee (NNC)⁶ will be an important body for coordination of the multi-sector interventions to improve food and nutrition security. The NNC is intended as an interim body to operate for an initial period of two years with the intention of transitioning to a National Food and Nutrition Council as the pinnacle coordination body for food and nutrition policy coordination and monitoring.

Along with (horizontal) central coordination it will also be necessary to ensure adequate (vertical) coordination at district and local-levels where support for local demand-driven development, particularly with the private sector will be implemented. Figure 4 below illustrates the structure for coordination through the different political and administrative tiers of government. The structure is in line with the Bill for the National Administration Act, which provides a national policy framework relating to agriculture matters and defines the administrative arrangements, functions and responsibilities of Provincial Governments and Local Level Governments and the relationship between them and the National Department of Agriculture.



Notes: NAA Act = National Agriculture Administration Act; AIC Act = Agriculture Investment Corporation of Papua New Guinea Act; NAP = National Agriculture Plan; NFSP = National Food Security Policy; NHA Act = National Health Administration Act; NNP = National Nutrition Policy; PDP = Provincial Development Plan; DDP = District Development Plan; PA = Provincial Authority; DDA = District Development Authority; DAL = Department of Agriculture & Livestock; FSB = Food Security Branch; FS WG = Food Security Working Group; TAG = Technical Advisory Group; TWG = Technical Working Group.

⁶ The National Nutrition Committee established by the Health Board will be a high level Executive committee, at national level for harmonized delivery, liaison and coordination of nutrition specific and nutrition sensitive activities including food security actions.

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The NFSP will be implemented as part of an approved National Agriculture Plan (NAP)⁷ which will be declared the national agriculture policy for the whole country, and will be coordinated and monitored at provincial, district and local levels by agriculture committees as prescribed in the NAA. The DAL Food Security Branch (FSB) will facilitate the formation of a Food Security Technical Advisory Group (FSTAG) at national level and Food Security Working Groups (FSWG) at provincial, district and local levels to advise the DAL management and the agriculture committees on matters related to implementation and monitoring of the NFSP. The FSTAG and FSWGs will include food security and agriculture expertise from relevant government agencies [e.g. DAL (including a representative on gender issues), National Agriculture Research Institute (NARI), Fresh Produce Development Agency (FPDA); National Quarantine Inspection Authority (NAQIA), National Fisheries Authority (NFA) etc.] and also draw on expertise from the private sector, non-governmental organizations (NGOs) and the food policy research community [e.g. University of Papua New Guinea (UPNG), University of Goroka, National Research Institute (NRI), Institute of National Affairs (INA) etc.]. Where necessary the FSTAG will provide support and mentoring to the provincial, district and local level FSWGs. To ensure multi-sector horizontal coordination of food and nutrition security actions the FSTAG will advise the DAL Deputy Secretary Policy, who will be a member of the National Nutrition Committee. At provincial, district and local levels the relevant FSWG will have a representative in the nutrition committee at that level.

Food security strategies and actions will be included as part of agriculture development plans in provincial development plans and strategic implementation plans. The NFSP will also form the basis for the districts and LLGs to develop food security components in their rolling five-year development plans and other relevant strategies.

Institutional Roles and Responsibilities

Inter-sector collaboration on food security and nutrition will require clarity on roles and responsibilities, including joint planning, joint resource mobilization, joint monitoring and joint implementation. Key government departments and agencies and other stakeholders with important roles for achieving the five development outcomes are listed in the *Summary Food Security Policy Framework* in Annex 1. However, this policy framework does not attempt to stipulate an exhaustive and all-inclusive list of stakeholders and their roles. When operational plans are detailed they should identify and define who is responsible for implementation of specific activities and the costs should be included in the relevant sector/corporate plans and food security budget line. It is also recognized that close working relationships and partnership between the public agencies, private sector and civil society organizations will be essential to achieving the desired development outcomes.

Partnerships

DAL will play a leadership role in policy formulation, coordination, monitoring and reporting implementation, and sourcing financial resources from the national, provincial and district level governments and international development partners to implement activities to achieve the anticipated policy development outcomes. The implementation of the various strategies of the policy will draw strongly upon partnerships with private sector, established NGOs, development agencies, and other

⁷ Currently the National Agriculture Development Plan (NADP)2007-2016 which will be reviewed and revised to a new national agriculture plan going forward

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government departments to utilize their existing networks, technical knowledge and experience on the ground. Leveraging technical support for areas important to food security that are outside of the core business of DAL will require effective communication of the policy and coordination with relevant partners to get their buy in and collaboration in their areas of comparative advantage.

6. Policy Implementation

A detailed and costed implementation plan will be prepared. Implementation of the policy strategic actions will be broken down into a number of mutually supporting priority programs designed to deliver the food security development outcomes. Each program shall be translated into a fully costed operational plan for implementation during the period 2016-2025. Annual work plans at provincial, district, and local levels will come from these, reflecting local capacity, priorities and needs.

The development of the implementation/operational plans will be done in close consultation with implementing and supporting agencies incorporating joint planning and participation (facilitated by the DAL Food Security Branch) to ensure that multiple views, needs and concerns in resolving priority food and nutrition security issues at different levels are taken into account and negotiated. Many actions necessary to achieve the four key development outcomes will already be integral to other sector and agency action programs e.g. fisheries, FPDA, NARI and other research and development institutions, health/nutrition, environment (including disaster risk management and climate change), education, and infrastructure. Care will be taken that all food and nutrition security programs are coordinated and not duplications.

To ensure proper alignment of results down the planning levels, the development of implementation plans shall pick up the planning process from the intervention strategy level under each of the development outcome result areas, as outlined in the Policy Framework Matrix (Annex 1), and unpack each intervention strategy into its necessary broad-based activities. Activity delivery timeframe, responsibility for carrying out each activity and the expected outputs and intended beneficiaries should also be detailed. The cost of implementing the strategy will be shared among relevant sector/agency budgets at national and provincial levels and district support grants, development partners' food and nutrition security support and private sector investments. The Ministry of Finance will work together with DAL, the Provincial Authorities and the District Development Authorities (through the District Development Board) and other stakeholders to ensure coordination of investments in food and nutrition security and subsequently that these investments are delivering the anticipated results.

The implementation of integrated actions through partnerships will be a central focus along with consistency and coherence between food and nutrition security policy, and macroeconomic, trade, agriculture, fisheries, health, education, infrastructure, disaster management and climate change policy. The combined food and nutrition security policy framework should help to align food security and nutrition relevant programs within a common results framework.

7. Monitoring and Evaluation

An effective and affordable monitoring and evaluation (M&E) system will be essential to ensure that policy directions are achieving desired policy outcomes and impact. This will require initially that there is sufficient baseline data in place, and subsequently, systematic data collection on relevant indicators. Good monitoring will allow appropriate adjustments to the policy framework as implementation unfolds. Effectively demonstrating the quality and impact of resources should help facilitate increased commitments to strengthening food and nutrition security.

Currently there are data limitations for monitoring policy outcomes and a first priority will therefore be to establish a minimum set of core indicators that need to be measured. It will then be important to ensure the relevant data is collected in any future agriculture and community surveys, Household Income and Expenditure Surveys, Demographic Health Surveys, Nutrition Surveys, and Population Census.

At the impact and development outcome levels the M&E Matrix in Annex 2 identifies broad indicators that should be tracked. At the strategy output level indicators, data and targets will need to be established at a more disaggregated level to reflect regional context and priorities. Gender, age and geographical disaggregation will help to facilitate monitoring of both positive and negative impacts on vulnerable communities and groups.

The DAL in close cooperation with the National Statistics Office (NSO) and the Department of Health will be responsible for establishing the M&E framework and preparing regular policy implementation reports.

Reporting on policy and program implementation will follow the process for agriculture policy reporting described in the *National Agriculture Administration Bill*. The Food Security Branch will furnish to the Secretary of DAL, on or before the 30 March every year, an Annual Report on progress and performance of food security policy programs implementation for the year ending 31 December preceding. The policy will be subject to a mid-term evaluation no later than five years after its endorsement by the National Executive Council (NEC).

Good reporting on results will provide policy managers and stakeholders the opportunity to reflect on what has and what has not worked and feed these lessons into future planning. The Policy will be updated after the completion of the evaluation or sooner if necessary.

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Annexes

1. Summary Food Security Policy Framework

POLICY GOAL	
<p>➤ Enable all Papua New Guineans to access and consume sufficient, safe, affordable, and nutritious food at all times.</p>	
DEVELOPMENT OUTCOMES	STRATEGIC ACTIONS
<p>Food Security Availability Pillar Action Area: Productivity and farm output growth of the main food staples, horticulture, small livestock and fish farming and increasing efficiencies along the entire food value chain</p> <p><i>Outcome 1. Local food production increased and producers better linked through efficient value chains to profitable markets and consumers.</i></p> <p>Key stakeholders for delivering this outcome: Building and strengthening partnerships with the private sector will be essential in all outcome areas.</p> <p>DAL; Provincial and District Divisions of Primary Industry; NARI, FPDI, NAQIA, UNITECH and University of Goroka. The National Fisheries Authority (NFA) will lead support for fisheries and aquaculture.</p> <p>The Department of Trade, Commerce and Industry will have an important supporting role for improved trade practices and strengthening in the areas of marketing and credit provision. Chamber of Commerce Industry (PNGCCI) Papua New Guinea Women’s Chamber of Commerce and Industry (PNGWCCI), PNG Manufacturers Council National Development Bank (and microfinance intuitions). Centre for Excellence in Financial Inclusion. PNGWiADF; NGOs have been and will continue to be vital players in the delivery of actions to achieve this development outcome. Government will seek to strengthen partnerships with NGOs and community organizations working in the sector and where possible and appropriate encourage and support service provision by them.</p>	<p>Strategy 1.1: Improve smallholder agricultural production and productivity focusing on maintaining continuity in supply of a range of quality products to improve nutritional health status.</p> <p>Strategy 1.2: Increase investment in adaptive research and development building on local knowledge and agro-biodiversity to increase overall domestic food production, related value chain development and support for competitive smallholder agricultural enterprises.</p> <p>Strategy 1.3: Improve the delivery of extension services to smallholder farmers and food value chain participants.</p> <p>Strategy 1.4: In the crop sector, increase focus on greater productivity and consistent supply of a diverse range of quality nutritious food crops in rain-fed low input systems.</p> <p>Strategy 1.5: Increase competitiveness of livestock production and productivity of value chains for small animals and their products (pigs, goats and poultry including egg layers).</p> <p>Strategy 1.6: Protect and enhance water sources and strengthen water and soil use management and application of appropriate-scale irrigation technologies.</p> <p>Strategy 1.7: improve the management of coastal and inland fisheries and support the development of sustainable aquaculture and the value chains for their outputs.</p> <p>Strategy 1.8: Promote and strengthen partnerships for a whole of value chain approach to facilitate the establishment of efficient viable competitive food production, distribution and marketing from input supplies, through farm production, distribution and processing to end markets and consumers.</p> <p>Strategy 1.9: Encourage and support the formation of small and medium enterprises (SME) in the food sector.</p> <p>Strategy 1.10: Strengthen value chain/market</p>

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	<p>infrastructure, market information and business support services (including financial inclusion and affordable credit facilities, business skills development and training) to small farmers, fishers and SMEs in the food sector.</p> <p>Strategy 1.11: Ensure that all intervention programs are gender focused and gender responsive.</p>
<p style="text-align: center;">Food Security Stability Pillar</p> <p>Action Area: Building stability and resilience into food supply and production systems.</p> <p><i>Outcome 2: Enhanced stability and resilience in food production and supply.</i></p> <p>Key stakeholders for delivering this outcome: Office of Climate Change Development (OCCD); Conservation and Environment Protection Authority (CEPA); National Forestry Authority; DAL; NARI; NAQIA; National Disaster Centre; NGOs; Faith-based organizations.</p>	<p>Strategy 2.1: Enhance capacities in rural communities, landowners and farmers to use natural resources in a sustainable manner to support an adequate and stable supply of domestically produced nutritious food.</p> <p>Strategy 2.2: Conserve and increase the use of traditional crop biodiversity (and indigenous small livestock breeds), and cautiously introduce new crop varieties which can extend the tolerance range of crop growing conditions (e.g. to drought, excess moisture, saline soil conditions and higher temperatures).</p> <p>Strategy 2.3: Develop and extend 'climate smart' traditional and science-based agricultural technologies and practices.</p> <p>Strategy 2.4: Ensure a well-functioning biosecurity service to ensure adequate levels of management and control of spread of endemically occurring pests and diseases and protection of PNG's plant and animal health status from establishment and spread of introduced exotic pests and diseases.</p> <p>Strategy 2.5: Explore and promote appropriate approaches to maintaining adequate strategic food reserves.</p> <p>Strategy 2.6: Build capacity in small scale food processing, preservation and storage at household and community levels.</p> <p>Strategy 2.7: Streamline and improve coordination of humanitarian food distribution to vulnerable households and communities in times of disasters and extreme need.</p>
<p style="text-align: center;">Food Security Utilization Pillar</p> <p>Action Area: Enhanced nutrient content and balance of products consumed by nutritionally vulnerable households and individuals.</p> <p><i>Outcome 3: Vulnerable households and individuals consuming a healthy balanced nutritious diet</i></p> <p>Key stakeholders for delivering this outcome: DAL; Department of Health (DOH); NARI; FPDA; NFA; Education Department; NGOs; Faith-based organizations; National Media</p>	<p>Strategy 3.1: Strengthen capacity to map all communities nationally that are particularly vulnerable to lack of food and water security and good nutrition and ensure that appropriate interventions are targeted to reach these groups.</p> <p>Strategy 3.2: Boost research into nutrient rich crops and improved livestock breeds.</p> <p>Strategy 3.3: Increase availability of food from animal (including fish) sources at household level.</p> <p>Strategy 3.4: Use agriculture as a platform for</p>

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	<p>delivery of messaging on nutrition knowledge and practices and work closely with the Vocational Schools in each district.</p> <p>Strategy 3.5: Promote increased consumption of diverse diets (including protein-rich products especially meat, eggs & fish) particularly among pregnant women, adolescent girls, and young children.</p> <p>Strategy 3.6: Through partnerships between education, agriculture and health, trial school feeding programs incorporating locally produced nutritious foods.</p>
<p style="text-align: center;">Food Security Access Pillar</p> <p>Action Area: Empowerment of women in agriculture.</p> <p><i>Outcome 4: Sustainable income generating opportunities for women increased to enhance economic access to nutritious food for children and families.</i></p> <p>Key stakeholders for delivering this outcome: DAL Women in Agriculture Development Unit (WiADU), Women in Agriculture Development Foundation (WiADF), FoWIAD Inc., National Council of Women, Provincial Council of Women, district women’s associations; NARI, FPDA, NFA; Microfinance institutions; National Development Bank; Vocational Schools, Faith-based organizations.</p>	<p>Strategy 4.1: To maximize impact of household income on the family’s nutrition, increase women’s access to income- generating opportunities, especially via increased attention to crops/livestock produced by women.</p> <p>Strategy 4.2: Increase focus and resources to sustainable development of the small-scale fisheries sector by developing viable distribution, value addition and marketing chains.</p> <p>Strategy 4.3: Expand micro-finance access and small enterprise creation, mentoring and support programs for women.</p> <p>Strategy 4.4: Improve women’s access to extension services, technology, inputs, markets and information and support capacity building through strengthened rural resource centres.</p> <p>Strategy 4.5: Invest in labor and time-saving and productivity enhancing technologies for tasks performed by women (e.g. weeding, food processing, firewood and water collection).</p> <p>Strategy 4.6: Provide support and work through women’s organizations (e.g. PNGWiADF, Women in Business, and the Provincial Council of Women).</p> <p>Strategy 4.7: Promote a whole of family approach to gender and male advocacy to enhance women’s role in decision making relating to agriculture, agribusiness and household nutrition.</p> <p>Strategy 4.8: Ensure a gender balance in agriculture training and provision of extension services.</p>
<p style="text-align: center;">Food Security Governance</p> <p>Action Area: Governance, coordination, monitoring and communication.</p> <p><i>Outcome 5: Successful implementation of food security policy and programs at national, provincial, district and local levels</i></p>	<p>Strategy 5.1: Strengthen public-private sector governance systems and arrangements to enhance private sector role in decision making to enhance development of food value chains and the food economy more broadly.</p> <p>Strategy 5.2: Strengthen the governance and coordinating structure essential for effective multi-</p>

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<p>Key stakeholders for delivering this outcome: DAL; MOH; DNPM; National Statistics Office (NSO) Department of Provincial and Local Government Affairs, Ward Development Committees. National Research Institute (NRI); Institute of National Affairs (INA)</p>	<p>sectoral food security policy oversight, implementation, monitoring and response at national, provincial and district levels).</p> <p>Strategy 5.3: Review institutional/human resource needs to effectively implement the food security policy, and where needed ensure designated food related positions are established and adequately resourced at each level.</p> <p>Strategy 5.4: Provide training and advocacy on roles and responsibilities of stakeholders in the effective implementation of the food security policy.</p> <p>Strategy 5.5: Build a critical mass of human capability together with appropriate resources to effectively collect, integrate, analyze and report credible (gender disaggregated) food and nutrition statistics in a timely way.</p> <p>Strategy 5.6: Continue to improve standardization of approaches and indicators used in the multiple national surveys which collect information relevant to food and nutrition security (e.g. Population Census, HIES, Survey of Living Standards, Demographic Health Surveys, Nutrition Surveys etc.).</p> <p>Strategy 5.7: Strengthen the food security data management, information and communication systems including appropriate integrated information management systems in public and private sectors.</p> <p>Strategy 5.8: Support the strengthening and timely distribution of demand-driven food, nutrition and food value chain information products.</p>
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2. Summary M&E Matrix for the Food Security Policy

Results	Indicator	Target 2025	Baseline	Source
Impact: <i>Better nutritional health status for Papua New Guineans, particularly vulnerable groups and individuals</i>	Prevalence of Stunting in children ≤ 5	Moderate ≤30%	48% (2010)	NNS,HIS,HIES
	Prevalence of Underweight in children ≤ 5	Moderate < 10%	27% (2010)	NNS,HIS,HIES
	Prevalence of Wasting in Children ≤ 5	Moderate ≤ 2%	16% (2010)	NNS,HIS,HIES
	Prevalence of overweight in Adults (BMI 25 - 29.9)	≤ 20 %	16.9% (men >18 years), 17.4 % (women 15-49)	NNP indicators
Outcome 1: <i>Local nutritious food production increased and producers better linked through efficient value chains to profitable markets.</i>	Prevalence of Anemia (Hb<11.0g/l) in children ≤ 5	≤ 25%	48% (2005)	NNS
	Prevalence of Anemia (Hb <12.0g/l) in women of reproductive age	≤15%	26% (2005)	NNS
	Composite staple food production index	Increase 70% from (2000 level = 100)	4.5 million Mt (2000)	Agriculture Survey DAL/NSO
	Yield/ha of main staple food crops	increased		DAL/NARI
	Diversification of crops grown on farms	Increased		DAL/NARI
	Aquaculture production	To be determined		NFA
Outcome 2: <i>Enhanced stability and resilience in food production and supply.</i>	Livestock numbers	Increased by 20%		DAL/NARI
	Ratio: food & beverage imports/ total imports	≤ 11%	10.5% (2014)	Trade stats. NSO CPI
	CPI Annual Average Food Inflation	≤ 3%		
	Proportion of total land under forest	72%	71.7% (2014)	MTDP2 (Table 4.2)
	Incidence and geospatial distribution of endemic and foreign pests, diseases and invasive species incursions	Reduced		NAQIA
Outcome 3: <i>Vulnerable households and individuals consuming a healthy balanced nutritious diet</i>	Cereal import dependency ratio	Reduced		
	Disaster-related damages and losses in food and agriculture sectors.	Reduced		
	Share of energy coming from protein, fat and carbohydrate in total dietary energy	Protein 10-15%; fat 15-30%; carbohydrates 55-75%		HIES
	Ave. food protein consumption (g/kg body weight/day)	≥ 0.8 g		HIES
	Amount of protein in diet supplied from domestic animal (including fish) sources	Increased		
	Average per capita consumption of rice	≤ 30 kg	22 kg (2014)	Trade stats, DAL, Population Census STEPS Survey
	Amounts (number of daily servings) of fruit and vegetables in diets	Increased (WHO recommended 6)		
Household dietary diversity score	≥5 for ≥ 50% population		Dietary Survey (24 hour recall)	

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Outcome 4: <i>Sustainable income generating opportunities for women increased to enhance economic access to nutritious food for children and families.</i>	Median per capita rural income	Increased relative to inflation		HIES, CPI
	Women's agricultural assets	increased		HIES
	Women's share of household income	increased		HIES
	Share (%) of rural household expenditure on food	Reduced		HIES
	Child nutrition indicators	Improved		NNS, HIES
Outcome 5: <i>Successful implementation of food security policy and programs.</i>	Food security coordinating structure	Multi-sector coordination mechanisms functional at national and sub-national levels	Dysfunctional	
	Food security medium-term & annual food security implementation plans at national, and provincial levels	Prepared in a timely way	Non prepared	DAL reports and minutes
	Food and nutrition security data collection and management system	In place and well-functioning	Not available and operating	Availability of data
	Regular quality reports on food security policy implementation	Annual Report produced and distributed	Not prepared	DAL reports
	Monitoring targets for outcomes 1-4	≥75% achieved		
	Unintended impacts of gender focused programs +ve & -ve	Recorded - no target		Monitoring & Evaluation Reports

Abbreviations: NNS = National Nutrition Survey; HIS = Health Information System; HIES = Household Income and Expenditure Survey; NNP = National Nutrition Policy; DAL = Department of Agriculture and Livestock; NARI = National Agriculture Research Institute; NAQIA = National Agriculture Quarantine and Inspection Authority; NFA = National Fisheries Authority; NSO = National Statistics Office; CPI = Consumer Price Index; MTDP2 = Medium Term Development Plan 2

Notes: Data for nutritional status indicators of children under 5 reflect World Health Organization Child Growth Standards for classification of stunting, wasting and underweight status. Children are classified as stunted, wasted and underweight if their height-to-age Z-score, weight-to-height Z-score and weight-to-age Z-score are below 2 respectively.⁸

Composite staple food index comprises all main staples (sweet potato, banana, cassava, *Colocasia* taro, Chinese taro, lesser yam (*Dioscorea esculenta*), coconut, greater yam (*D. alata*), sago, Irish potato, taro (*Alocasia*), Queensland arrowroot, taro (*Amorphophallus*), swamp taro, yam (*D. nummularia*), aerial yam (*D. bulbifera*), rice, yam (*D. pentaphylla*).⁹

Household dietary diversity score (HDDS) - the number of different food groups consumed over a given reference period (usually 24hour recall) can be measured at household or individual level. To better reflect a quality diet, the number of different food groups consumed is calculated, rather than the number of different foods consumed. Knowing that households consume, for example, an average of four different food groups implies that their diets offer some diversity in both macro- and

⁸ WHO Multicentre Growth Reference Study Group (2006) WHO Child Growth Standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development, Geneva: World Health Organization.

⁹ Source: Bourke and Vlassak (2004)

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micronutrients. This is a more meaningful indicator than knowing that households consume four different foods, which might all be cereals. The following set of 12 food groups is used to calculate the HDDS: Cereals; Fish and seafood; Root and tubers; Pulses/legumes/nuts; Vegetables; Milk and milk products; Fruits; Oil/fats; Meat, poultry, offal; Sugar/honey; Eggs; Miscellaneous.¹⁰

¹⁰ Swindale A, Bilinsky P (2006) Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide, USAID

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3. Food Security Landscape

Background

Food security remains a crucial yet poorly defined issue on PNG's development agenda. In general, the data necessary to assess the four dimensions of food security – availability, access, utilization and stability – has either not been systematically collected, or where it is available it is not being utilized to provide the evidence base for sound decision making.

Consequently, diametrically conflicting policy perspectives have been articulated over the past years ranging from, *“The long-term sustainability of national food security is precarious, on the present trend of over-dependence on imported food”*¹¹, to *“Food security is generally good in modern PNG. This is because a high proportion of the population is engaged in subsistence agriculture; most people have access to land for food production; there is a diversity of subsistence food sources; and most people have access to cash income with which to buy food when subsistence supplies are inadequate.”*¹²

A further clouded issue in policy discussions is the distinction between food security and national food self-sufficiency – i.e. the extent to which our country can meet its own food needs from home-grown production. But food security and food self-sufficiency are not synonymous – a country can be a substantial importer of food and enjoy a high level of food security provided it has more than sufficient foreign reserves to cover those imports and that the food imported is suitably nutritious, there is an effective food distribution and marketing system in place, and people can afford to buy it.

Nevertheless, the continuing volatility in food commodity prices has called into question the reliability of the global food market and has raised important questions for food security policy, including:

- How much food do we need to produce ourselves?
- What is the optimum level of sustainable food self-sufficiency?
- How resilient is the national food economy and its underpinning systems (including traded food commodities)?

What is clear, however, is that in terms of food security for PNG the agriculture sector has special importance because it continues to be the main source of food, employment and income for over 85 percent of the population, who mainly live in rural areas. Therefore, agricultural growth, including growth in downstream value chains for agricultural products, remains one of the best ways to generate income for the poorest in PNG who need the most help buying nutritious food. Moreover, because of the prominent role women play in food production, agriculture can provide an important entry-point for enhancing women's control over resources, knowledge and status; plus child nutrition outcomes can improve along with women's empowerment in households and society through

¹¹ DAL (2000) The National Food Security Policy 2000 – 2010 page 22, Department of Agriculture and Livestock, May 2000.

¹² Bourke R M (2001) An overview of Food Security in PNG, in: Bourke RM, Allen MG, and Salisbury JG (eds) *Food Security for Papua New Guinea. Proceedings of the Papua New Guinea Food and Nutrition 2000 Conference*, ACIAR Proceedings No. 99 Australian Centre for International Agricultural Research, Canberra. pp. 5–14.

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agriculture. Agriculture also provides a significant amount of food to townspeople and earns an important amount of foreign exchange from cash-crop exports, thus enabling the nation to better access food imports. In sum, agriculture can influence food security, nutrition and health through multiple pathways (direct and indirect), but only one of those pathways relates to the consumption of more food.¹³

In light of the important role agriculture programs can play in improving food security and healthy diets, the Department of Agriculture and Livestock (DAL) formulated the National Food Security Policy 2000-2010. This policy had a strong emphasis on strengthening capacity to increase domestic food production, processing and marketing to reach a higher level of national food self-sufficiency. Additionally, the policy also recognized that food insecurity is a complex multi-faceted issue that must be addressed through coordinated actions across many government departments (at national, provincial and local levels) together with non-government and private sector agents. The policy document specifically mentioned education, nutrition and health, and environment interactions with food security and the need for strengthened road and transport infrastructure. The NFSP 2000-2010 complemented by the 1995 National Nutrition Policy replaced the 1978 National Food and Nutrition Policy. Currently the Health Department has led the drafting of a new National Nutrition Policy 2015-2024 and a National Food Safety Policy. Once adopted these policies together with the new Food Security Policy will provide the framework for strengthened food and nutrition security in PNG going forward.

Development of this new NFSP has benefited from reviews of the earlier food security and nutrition policy frameworks. A key finding is that strategic decision-making and improved policy implementation for food and nutrition security are critically constrained by a lack of co-ordination between public sector agencies and between the public and private sectors. Therefore, **the first and perhaps most important step towards encouraging greater investment in improved food and nutrition security by both the public and private sector, is the effective co-ordination of stakeholders, and their clear communication of policy needs and objectives.** This is particularly important in the context of linking private sector, local level, district and provincial needs and planning processes into the national policy implementation framework.

Additionally, gaining a better understanding of the socio-cultural (including gender) reasons for food security and nutrition issues is also vital to understanding the current situation and developing appropriate policy and institutional settings that will help poor and vulnerable communities strengthen local food systems, manage changing food prices and make improvements in the nutritional value of their diets.

Malnutrition

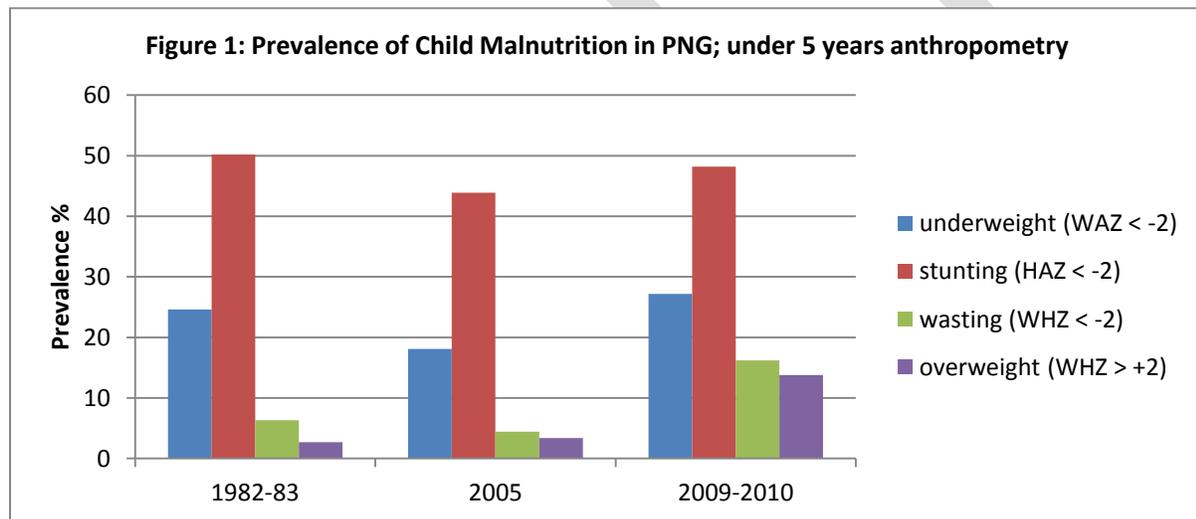
Food security underpins all other development and the Constitution of the Independent State of Papua New Guinea, under National Goals and Directive Principles 1 – Integral Human Development, calls for improvement in the level of nutrition and the standard of public health to enable our people to attain self fulfilment. However, some 40 years since the adoption of the Constitution, the recently drafted

¹³ Webb P (2013) Impact Pathways from Agricultural Research to improved Nutrition and Health: Literature Analysis and Research Priorities, Food and Agriculture Organization (FAO), Rome

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National Nutrition Policy 2015-2024 states that the problem of malnutrition continues to be a significant impediment in the health, social and economic development of Papua New Guinea.¹⁴

Analysis of data pertaining to malnutrition in children aged 5 or younger from the latest national representative survey, the PNG Household Income and Expenditure Survey (HIES) 2009-2010, indicates that malnutrition in PNG remains prevalent and severe, and varies across the regions. The overall stunting, underweight and wasting rates are high, 48.2 percent, 27.2 percent and 16.2 percent, respectively (Figure 1). Not only are the overall rates high; the severe cases among the stunted, underweight and wasted children are also high at around 50 percent in each category. The stunting rate in the Highlands region is very high at 58 percent whilst the Islands Region has the lowest rate at 39.1 percent. In contrast to the distribution of stunting rate, the prevalence of wasting (at 19.3 percent) and underweight (at 31.2 percent) are highest among the Islands Region (Figure 2). The HIES 2009-2010 data indicate similar findings for prevalence of stunting to the National Nutrition Survey 1982-83 and the National Nutrition Survey 2005.^{15 16 17 18} But the national prevalence of underweight, wasting and also overweight appears to be increasing (Figure 1).



Source: NSO 2009-2010 HIES Summary Report; WHO Landscape Information System Country Profile: Papua New Guinea (<http://apps.who.int/nutrition/landscape/report.aspx?iso=png> accessed 6/7/15)

¹⁴ Department of Health (2015) Papua New Guinea National Nutrition Policy: 2015-2014, Final Draft March 2015, National Departments of Health, Agriculture and Livestock, Education, Community Development, National Planning and Monitoring, pg. 7

¹⁵ National Statistics Office, 2009-2010 Papua New Guinea Household Income and Expenditure Survey, Summary Tables (Tables 5.14 & 5.15)

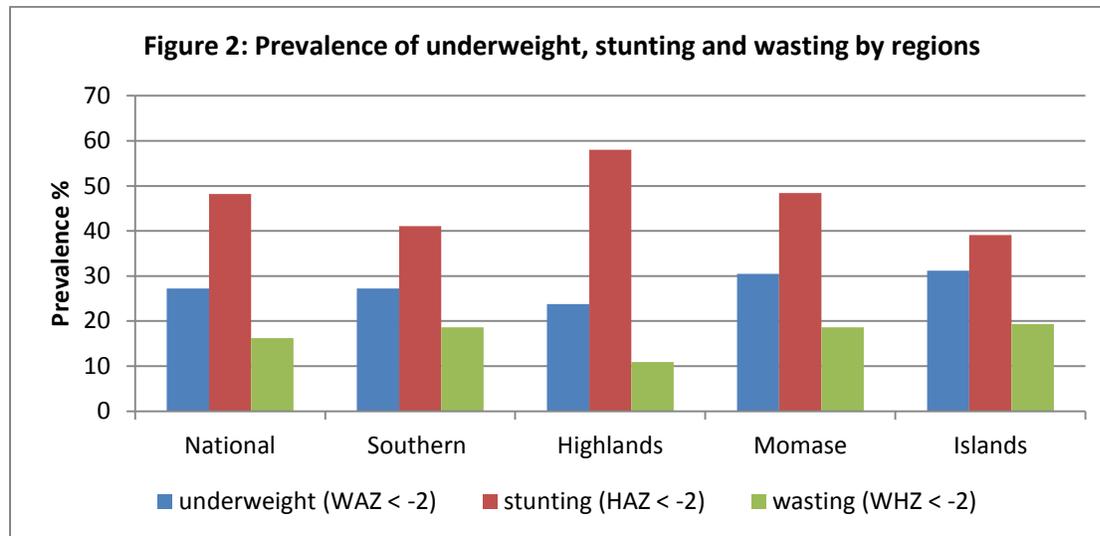
¹⁶ Department of Health of Papua New Guinea (2011) National Nutrition Survey Papua New Guinea, 2005; Pacific Journal Of Medical Sciences: Vol.8, No. 2, Special Issue May 2011

¹⁷ WHO (2014) Global database on child growth and nutrition, data for Papua New Guinea, World Health Organization 16 August 2014

¹⁸ Hou X (2015) Stagnant Stunting Rate Despite Rapid Economic Growth in Papua New Guinea, Factors Correlated with Malnutrition among Children under Five, Policy Research Working Paper 7301, World Bank Health Nutrition and Population Global Practice Group, June 2015

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Note: The data in Figures 1 & 2 reflect the World Health Organization Child Growth Standards for the classification of stunting, wasting and underweight status. Children are classified as stunted, wasted and underweight if their height-to-age Z-score, weight-to-height Z-score and weight-to-age Z-score are below -2 respectively; children are classified as overweight if their weight-to-height Z-score are above +2.¹⁹



Source: NSO 2009-2010 HIES Summary Report, Table 5.14

These findings imply that malnutrition in PNG is not improving despite the country having witnessed strong economic growth over the last decade. Furthermore, whilst higher levels of malnutrition are evident among poorer households (55 percent) even richer households, with anticipated less food access problems, experience relatively high levels of malnutrition with 36 percent of children in households from highest income quintile reported stunted. But despite the seemingly weak linkage between economic growth and child under-nutrition at the macro level, analysis carried out by the World Bank Health Nutrition and Population Global Practice Group shows that at household level family wealth and geographic location are significant factors associated with the stunting rate with children from poorer families being significantly more likely to be stunted. In addition, quality of food (for example, intake of protein) and the history of incidence of malaria are highly correlated with the likelihood of stunting. The evidence also suggests that women lack knowledge of quality feeding for their children even among better-off households and that high fertility rate and close birth gaps also make it difficult to give infants sufficient exclusive breastfeeding in the first six months.²⁰

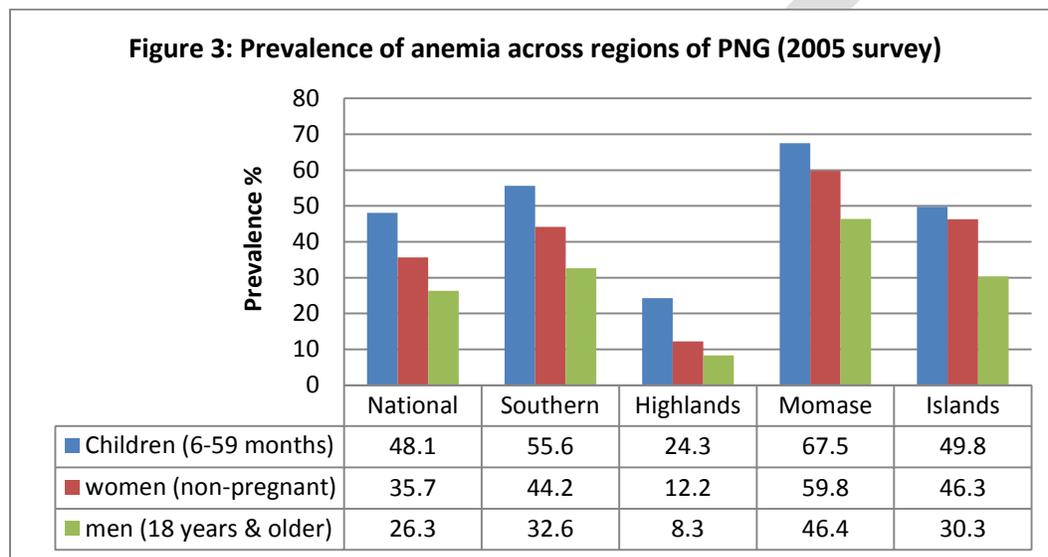
Papua New Guinea displays an enormous diversity in its geography, ecology and human biology; the diversity of the landscape, and agriculture and cultural practices result in wide differences in the nutrition outcomes among the regions. The Papua New Guinea National Nutrition Survey 1982/83 found great variation in the extent of protein-energy malnutrition (PEM) among children under 5 years between different regions.

¹⁹ WHO Multicentre Growth Reference Study Group (2006) WHO Child Growth Standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development, Geneva: World Health Organization

²⁰ Hou X (2015) *Opt Cit.*

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Unfortunately, there is limited population based data on micronutrient deficiency in PNG; neither the 1982/83 nutrition survey nor the 1996 household consumption survey looked at micronutrient deficiencies in PNG. The 2005 National Nutrition Survey (NNS) provides the latest and most comprehensive information which found micronutrient deficiencies to be prevalent in local and selected populations across the country, but that there were considerable differences in the prevalence of micronutrient deficiencies and disease burdens between regions and even between districts. A significant lack of dietary diversity leads to micronutrient deficiencies. The most serious deficiencies relate to the low intake of iron, folic acid, iodine and zinc, which can present significant public health problems among children under five and women of reproductive age.



Source: PNG National Nutrition Survey 2005

Almost half the children included in the 2005 survey were anemic and over one third of non-pregnant women of child bearing age were anemic; rural women were almost twice as likely to be anemic compared to urban women. Among men (18 years and older) 26.3 percent were anemic with rural men having significantly higher prevalence of anemia (Figure 3). Nationally iron deficiency accounts for almost 50 percent of the anemia among children under five, with Momase and the Southern regions having the highest prevalence. Generally, across PNG the survey found vitamin A deficiency to be a moderate problem, but was severe in Momase. The prevalence of both anemia and vitamin A deficiency are significantly associated with malarial infections.

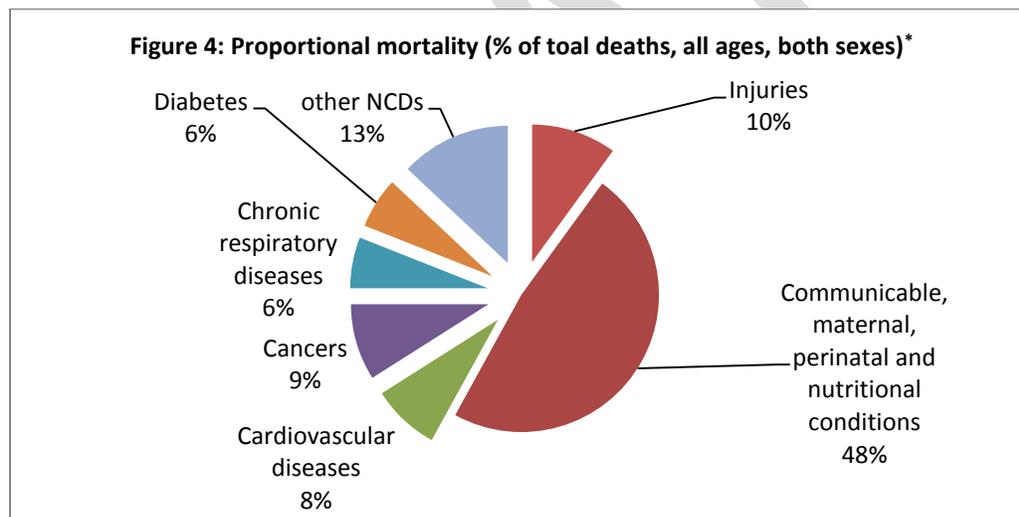
Analysis of nutrition data has led researchers to conclude that adequate nutrition of children in PNG is closely associated with the food production systems where they live and by differences in diet. Most of the factors associated with child growth can be related in one form or another to differences in local subsistence agriculture making agriculture one of the main determinants of child growth and nutrition patterns in PNG.^{21 22}

²¹ Mueller I, Smith, TA (1999). Patterns of child growth in Papua New Guinea and their relation to environmental, dietary and socioeconomic factors – further analyses of the 1982–1983 Papua New Guinea National Nutrition Survey. *Papua New Guinea Medical Journal* 42(3–4):94–113, cited in RM Bourke and T Harwood (2009) pg. 464

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While overall food availability is considered generally good in PNG, food security problems arise through quality and nutritional variety constraints and availability of protein in the diet. Generally low rural incomes mean that there is limited opportunity for imports and high-protein local produce (mainly of animal origin) to contribute to dietary variation.²³ Consequently, protein intake is relatively low compared to the global average which **signals the need to increase availability and access to nutrient dense/protein rich foods such fish, animal meats, eggs and legume pulses. Clearly, enlargement of an affordable nutritious food basket in addition to increasing staple food production is needed to improve the food and nutrition situation in PNG.**

Whilst under-nutrition remains a critical challenge, overweight and obesity is as high as 25 percent among adults in some communities which is a significant risk factor for the increase in lifestyle related non-communicable diseases.²⁴ Data from the 2005 NNS shows that overweight men and women were most prevalent in Southern Region (including Port Moresby) and in urban areas. The WHO estimates that NCDs currently account for about 42 percent of total deaths in PNG (Figure 4). The latest WHO STEPS survey (2007-2008) found a high rate of undiagnosed diabetes with the potential to cause a huge burden of morbidity and mortality. Furthermore, children who were stunted in their early years face an increased risk of becoming overweight later in life.²⁵ **Improving the availability of lower cost, nutritionally superior and local food products will be a critical strategy to improving diets, health and food security in PNG.**



Source: WHO Non-Communicable Diseases (NCD) Country Profiles, 2014 (*NB. PNG mortality rates have a high degree of uncertainty)

²² Allen B (2009) Part 6: Agricultural Development, Policies and Governance, in: Food and agriculture in Papua New Guinea', ed. by R.M. Bourke and T. Harwood. ANU E Press, Australian National University: Canberra.

²³ Omot N (2012) Food Security in Papua New Guinea, in: Templeton D. (ed.) Food security in East Timor, Papua New Guinea and Pacific island countries and territories. ACIAR Technical Reports No. 80. Australian Centre for International Agricultural Research: Canberra. 53 pp.

²⁴ Papua New Guinea National Nutrition Policy 2015-2024, Final Draft March 2015

²⁵ Gillespie S, Haddad L (2001) Attacking the double burden of malnutrition in Asia and the Pacific, Asian Development Bank, Manila, Philippines and the International Food Policy Research Institute, Washington DC, United States

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While food preferences are important in dietary choices, price and food availability are the driving factors in food consumption patterns. Therefore, poor diet is not simply a health issue but an economic one. Households make economically rational, but sometimes nutritionally detrimental decisions to consume certain foods, because of the relative price difference between nutritious food and less healthy alternatives.

To address malnutrition in PNG agricultural policies, projects, and investments need to be designed and implemented to achieve clear nutrition goals. Policies that affect the price of food by facilitating investment in improving agricultural production efficiencies and public investments in roads and ports that support improved logistics and lower unit costs for food distribution should be prioritized.

However, international experience has shown that agricultural interventions that aim to improve productivity and income tend to be more successful in improving nutrition status of children when they also include a nutrition education component.²⁶ **Additionally, policies that incentivize healthier food choices should also be considered.** A clear aim of this new food security policy shall be to make agriculture work for better nutrition and a more productive and functional food economy.

Furthermore, recognizing that the extent of malnutrition varies enormously across different locations and that it cannot be assumed that the problems causing malnutrition in one community are the same as those causing it in nearby areas - farming systems differ, access to cash differs, infrastructure and health and education services differ, and customs relating to food and health differ. Consequently, **effective programs and projects will need to be location specific, designed to meet the specific needs of particular regions, areas or districts.**²⁷ **Moreover, acknowledging resource constraints (both human and financial) means that program responses will need to be nutrition focused and targeted to those areas in greatest need.**

Access to nutritious food is essential to good health, but national food security policy must also recognize the distinction between food insecurity and malnutrition. While food insecurity is one of the underlying causes of malnutrition other factors, such as diseases, poor health and child care, lack of safe water and improved sanitation, hygiene and housing, are also critical causal factors (Figure 5). Infrastructure is particularly lacking: only 40 percent of population have access to an improved drinking water source and 19 percent are using an improved sanitation facility. Eighty percent of urban households lack access to latrines, 94 percent of all cities and towns are unsewered, and 80 percent of all sewerage generated is discharged untreated. Furthermore, a large part of the country's rural roads network is in a poor condition impacting adversely on access to health centres and schools.²⁸ The food and nutrition security situation is also compounded by a general lack of knowledge at household level on good nutrition and feeding practices which is complicated also by cultural beliefs and taboos.

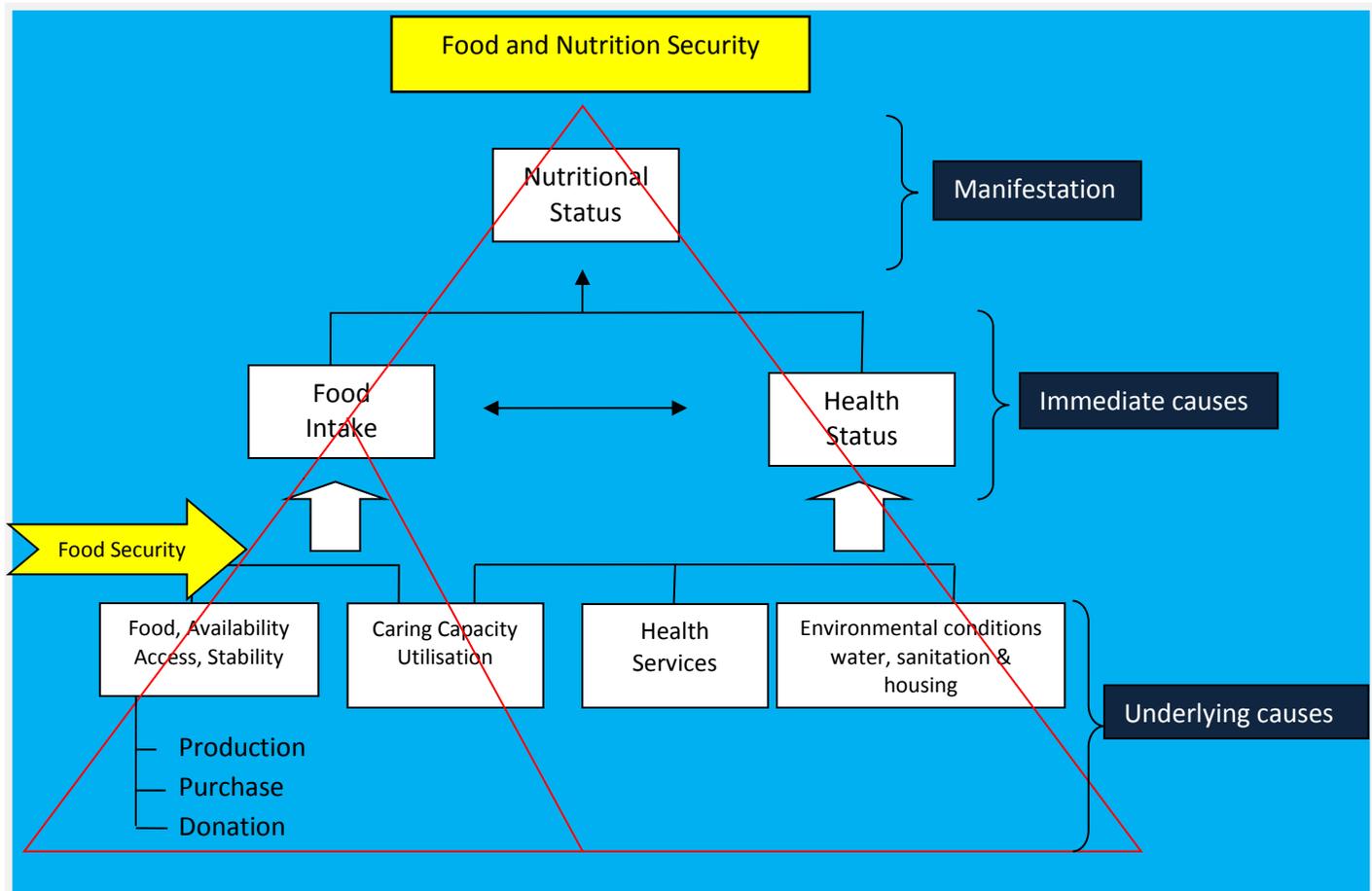
²⁶ Hou X (2015) *Opt Cit.*

²⁷ Marks G, Fereday NS (1992) Summary of Proceedings Papua New Guinea National Nutrition Policy Workshop, Papua New Guinea National Nutrition Policy Workshop, Institute of National Affairs, Discussion Paper No. 54

²⁸ Data sources: WHO Landscape Information System Country Profile: Papua New Guinea (<http://apps.who.int/nutrition/landscape/report.aspx?iso=png> accessed 6/7/15); ADB (2015) *Country Strategy Paper PNG*, Asian Development Bank, March 2015

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Figure 5: Conceptual Framework of Food and Nutrition Security



Adapted from: Academy of Nutrition & Dietetics, 2013

PNG women are at the nexus of agriculture, nutrition, and health. As smallholder farmers and caretakers of children they make daily food production and consumption decisions for their families. They are also much more likely than men to spend additional income on food and healthcare, so increasing women's income is likely to have a proportionally greater impact on children's health and nutrition than comparable increases in men's income. Given the significant time constraints on women, interventions that affect women's time allocation can help improve their own nutrition as well as that of their children.

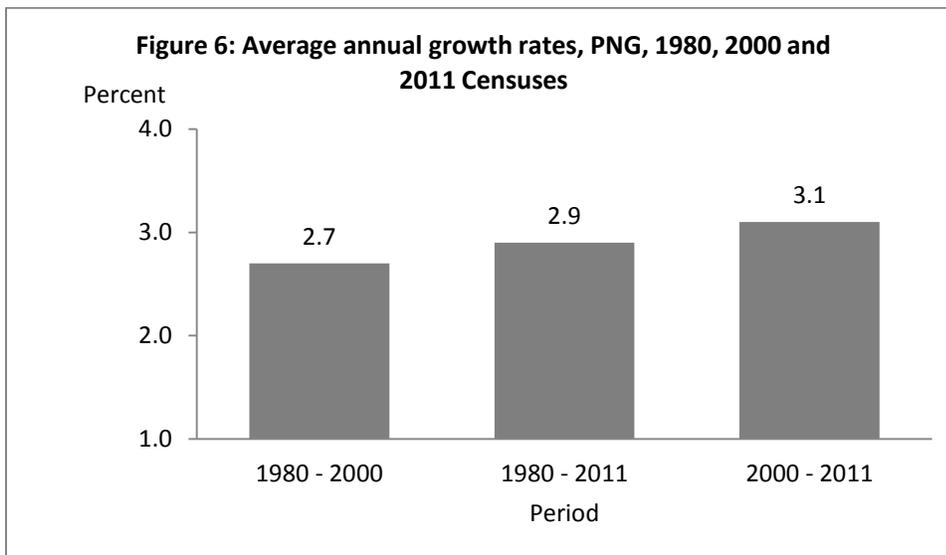
The National Health Department is introducing evidence-based nutrition interventions through national nutrition policy including strategic actions aimed at nutrition behavior change, improved breastfeeding, and infant and young child feeding practices and scaling up of community management of acute malnutrition through supplementary and therapeutic feeding programs nationwide and training of family health promoters on nutrition.

Global experience indicates that other **key factors for improving nutrition through agricultural investments include working with women farmers (to ensure they gain access to technologies and inputs), nutrition education, tailoring projects to the specific needs of each community, and rigorous monitoring and evaluation.**

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Food Availability

At the time of the 2011 census there were almost 7.3 million mouths to feed in PNG. Population growth rate is high and average annual growth rates have been increasing (Figure 6). At an average annual growth rate of around 3 percent the population will double in just over 30 years' time implying at least a doubling in the demand for food. The estimated arable land area in PNG is 44,438 km² giving a 'physiological' density of 164 persons per square kilometer, an increase of 78 persons from 86 persons in 2000.²⁹ Land degradation is becoming a major risk factor as population density increases.



Source: NSO, National Population & Housing Census 2011 Report Figure 1.1

In terms of land potential some districts in the provinces of Madang, Sandaun (W Sepik), Enga, E New Britain, Morobe and the Southern Highlands are particularly distressed.³⁰ Locally high and growing population densities are placing some agricultural systems under stress through reduced fallow periods and extended intensified cropping periods. Agricultural stress is likely to be a primary cause of malnutrition which influences secondary causes such as disease and poverty.³¹

Increasing population also means increasing demand for imported food. However, a major challenge in analyzing trends in food production and food imports to meet the rising demand is accessing reliable data. Data is either absent or weak and frequently there are conflicting data sets recorded by different sources. A particularly chronic problem is the limited availability of subsistence production data which means that a very important part of the country's food supply is poorly accounted for. Absence of a recent agriculture census³² and lack of a regular supply of domestic market data also makes it difficult to

²⁹ NSO National Population and Housing Census 2011 Report Table 1.2, pg. 18

³⁰ Allen B, Bourke RM, Gibson J (2005) 'Poor rural places in Papua New Guinea, Asia Pacific Viewpoint, 24, 2, Aug 2005

³¹ Hide RL, Allen BJ, Bourke (1992) Agriculture and Nutrition in Papua New Guinea: Some Issues, Papua New Guinea National Nutrition Policy Workshop, Institute of National Affairs Discussion Paper No. 54

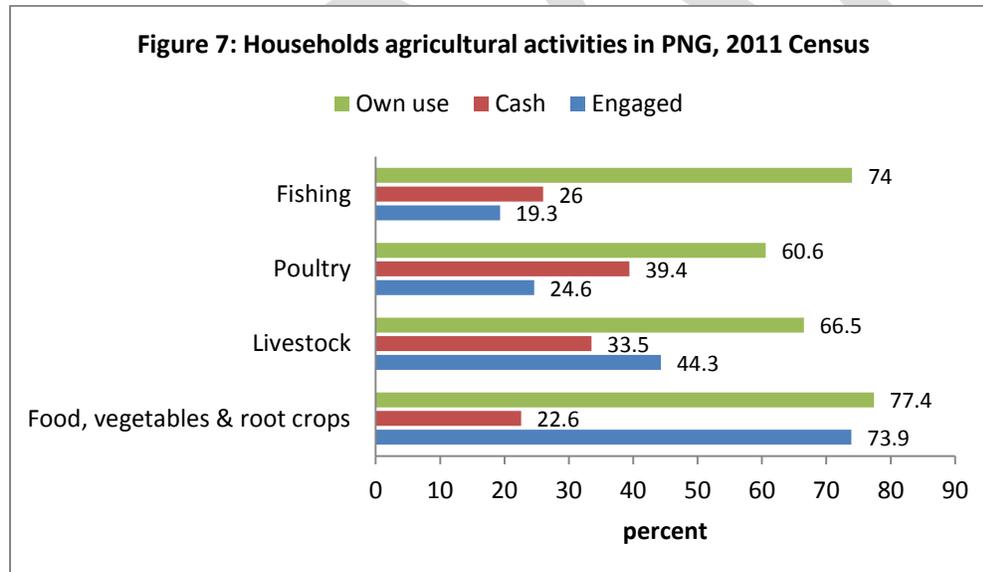
³² The last national agriculture survey was undertaken in the 1961-62; most recent credible estimates for national food crop production are for the year 2000.

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estimate accurately the size of the commercial domestic food production sector. Consequently, the nation has no credible food balance sheet. **To strengthen food policy analysis and formulation improving agriculture data collection and systematization is therefore a high priority need.**

Recognizing that many aspects of agriculture are inherently difficult and expensive to measure, including valuation of smallholder agricultural output and field measurements of crop yields and production, **regular monitoring of food-related domestic market activity would provide a useful proxy to measure the ‘pulse’ of food production and commercialization and the impact of both domestic and external factors on this.**

Subsistence food production in traditional food gardens together with subsistence and artisanal fishing³³, hunting and food gathering continues to be the fundamental basis of food security in Papua New Guinea; providing resilience against external shocks, either economic (price spikes, global recession) or natural (cyclones, floods, droughts, pests and diseases etc.). For the large majority of the population subsistence food production is by far the most important source of food and a growing portion of domestically grown food surplus is being marketed (Figure 7). Indeed, cash earned from selling fresh food is exceeded only by cash earned from coffee sales. The most commonly marketed fresh foods are sweet potato, other root crops, corn, peanuts, green vegetables such as *aibika*, cabbage, beans and amaranthus, fruit including pawpaw, pineapple, mango and watermelon, and nuts such as *karuka* and *galip*.³⁴ Additionally, increasing amounts of domestically-grown introduced vegetables are now being sold.



Source: NSO, National Population & Housing Census 2011 Report Table 6.1

³³ Traditional fisheries involving fishing households (as opposed to commercial companies), using relatively small amount of capital and energy, relatively small fishing vessels (if any), making short fishing trips, close to shore, mainly for local consumption (FAO definition).

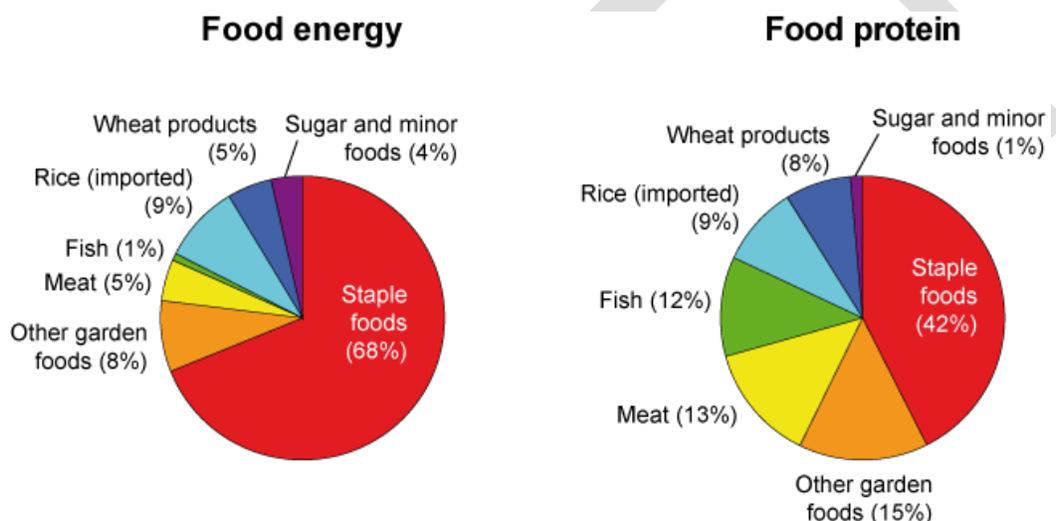
³⁴ Allen M, Bourke RM, McGregor A (2009) Part 5 Cash Income from Agriculture, in: Food and agriculture in Papua New Guinea', ed. by R.M. Bourke and T. Harwood. ANU E Press, Australian National University: Canberra.

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At the time of the 2011 Census growing food crops, vegetables and root crops and rearing livestock were the main activities that 74 percent and 44 percent of households were engaged in, respectively. For the households engaged in growing food crops, vegetables and root crops, 77 percent did so for their own consumption. Clearly, PNG's food security remains reliant on the ability of the rural community to grow subsistence crops and to market produce that provide the cash to purchase food.

Researchers have estimated that 83 percent of food energy and 76 percent of protein consumed in PNG in 2006 was produced in PNG. The balance was imported (Figure 8). In general, crop-based energy foods are consumed in larger quantities than animal and/or plant protein-based food. However, people's diets vary across the country, particularly between rural and urban areas. The broad pattern is that most food energy in rural areas comes from root crops, banana and sago, with coconut, other nuts and green vegetables making a small but significant contribution to energy and a greater contribution to the intake of other nutrients, particularly protein.³⁵

Figure 8: Sources of dietary energy and protein by major food groups in PNG, 2006



Source: Bourke and Harwood (2009) Table 2.1.2 pg.133

Urban people consume more rice, wheat-based foods, soft drink and beer, and less root crops and banana. But sweet potato remains by far the most important staple food in PNG. It provides around two-thirds of the food energy from locally grown food crops and is an important food for 65% of rural villagers. Annual production of sweet potato was estimated at about 2.9 million tonnes in 2000³⁶ Regarding staple food of plant origin alone, it was estimated that 15 years ago PNG produced annually

³⁵ Many green vegetables used traditionally do not constitute staple crops, but they are very important supplementary foods, providing additional protein, vitamins and minerals in the diet. Studies of dietary intake suggest that green vegetables contribute at least 20-30% of the daily protein intake and sometimes much more as well as 4 to 6% of the daily energy intake in the highlands.

³⁶ Bourke RM et al (2009) Food in Papua New Guinea: Part 1 An Overview, in: Food and agriculture in Papua New Guinea', ed. by R.M. Bourke and T. Harwood. ANU E Press, Australian National University: Canberra.

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about 4.5 million tonnes and imports annually an average of 0.3 million tonnes.^{37 38} Unfortunately, up-to-date reliable estimates of food production are not available.

An overall proxy indicator of a country's self-sufficiency in food is the level of food imports as a proportion of total imports. A country where food imports made up only a small proportion of total imports would be deemed to be more food self-sufficient. Food imports into PNG account for only about 10.5% of total imports – which is very low by developing country standards and the lowest in the Pacific islands region (see Table 1).

Table 1: PNG Food and Live Animal as a proportion of total imports

	2010	2011	2012	2013	Average
Total merchandize imports FOB PNGK millions	9,576.2	10,033.5	9,911.8	12,141.8	10,415.8
Food & live animals FOB PNGK millions	1,111.3	1,119.1	970.5	1,146.6	1,086.9
F&LA as % of Total Imports	11.6%	11.1%	9.8%	9.4%	10.5%

Source of data: Bank of PNG Quarterly Economic Bulletin, December Quarter, 2014

Rice is the largest value food commodity import; in 2012 rice imports had a CIF value of US\$218 m (approx. PGK 440 m³⁹) and represented 2.6 percent of total imports.⁴⁰ But in terms of volume wheat imports have now overtaken rice. The long-term trend in national rice and wheat imports is shown in Figure 9.

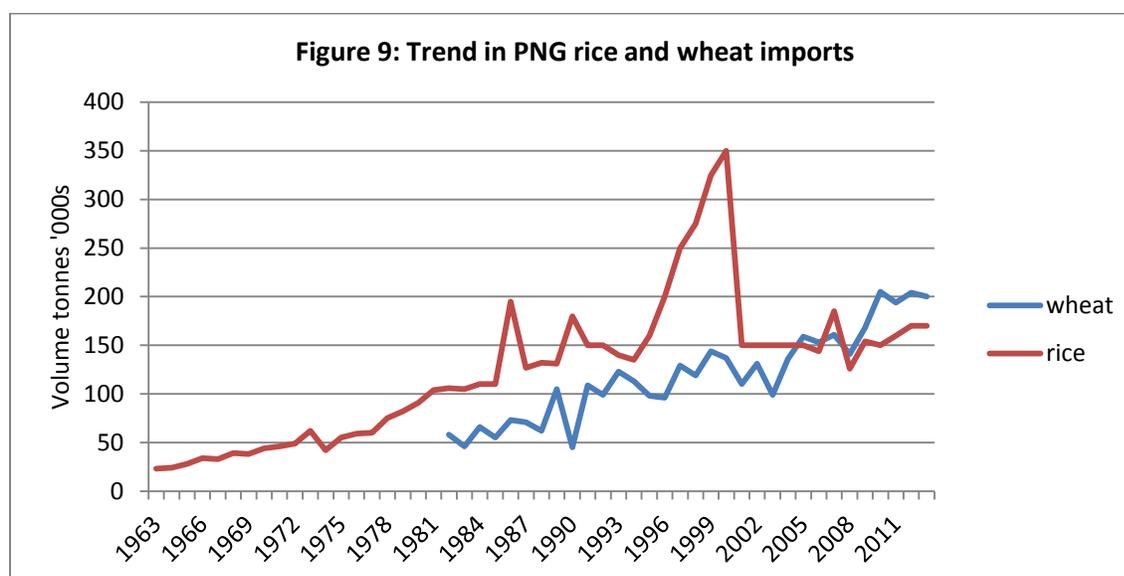
³⁷ Bourke RM, Vlassak V (2004). Estimates of food crop production in Papua New Guinea. Land Management Group, Research School of Pacific and Asian Studies, the Australian National University, Canberra

³⁸ Omot (2012) *Opt Cit.*

³⁹ 2012 inter-bank mid-year rate

⁴⁰ UN Comtrade Papua New Guinea 2013 Trade Profile

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Source: [indexmundi](http://indexmundi.com) ; United States Department of Agriculture

Whilst there has been a steadily increasing trend in rice imports, taking into account population growth the per capita consumption seems to have plateaued. Since 1990 the imports of rice have averaged about 180,000 tonnes per year, in 2013, 170,000 tonnes of rice were imported. The large peak in rice imports shown in Figure 5 is a consequence of the severe drought experienced in the country in 1997.

Table 2: Trend in per capita consumption of imported rice

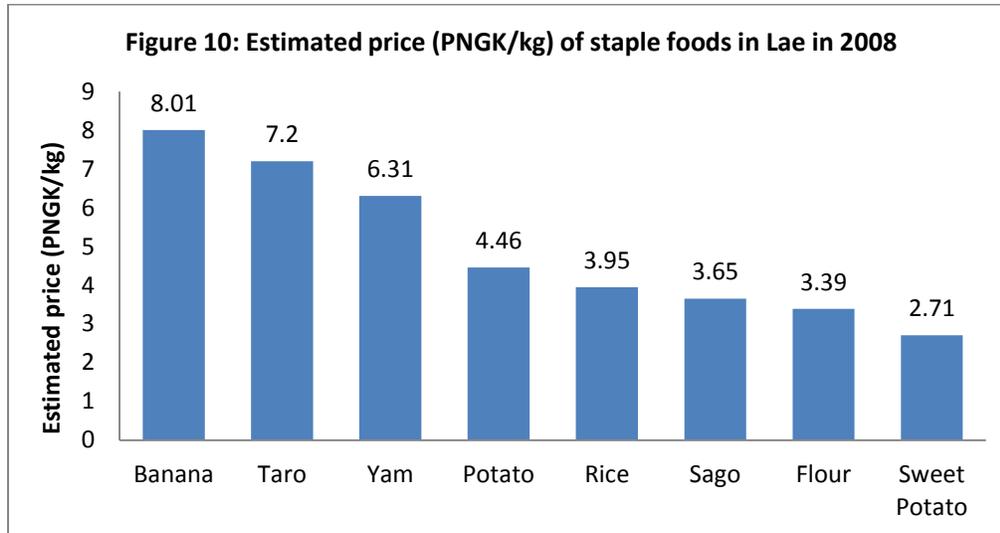
Year	Estimated Population (million)	Rice imports (Kg millions)	Estimated per capita consumption (kg imported rice)
1981	3.0	104	35
1991	3.6	150	42
2001	5.2	150	29
2011	7.3	160	22

The slowing in rice demand has been described as a ‘maturation’ of the rice market in PNG.^{41 42} Nevertheless, rice remains important for food security, particularly in urban areas and at times of national disasters such as the 1997 drought. The favorable price comparison of rice with other staples (on an energy per kg basis – Figure 10), together with its good transportability and storage qualities and convenience in preparation will continue to make it a popular choice in PNG household’s food basket.

⁴¹ Gibson J (2001) Rice demand in Papua New Guinea, Pacific Economic Bulletin 16 (2): 27-35

⁴² Bourke RM et al (2009) Part 2 Food Production, Consumption and Imports, in: Food and agriculture in Papua New Guinea’, ed. by R.M. Bourke and T. Harwood. ANU E Press, Australian National University: Canberra.

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Source: Omot (2010), cited in Omot (2012)

Note: the price is based on food energy content. The price for each food was converted to the rice equivalent using the energy content of each food, because foods such as banana, taro, yam, sweet potato and cassava have high moisture content, while rice, flour and sago have low moisture content and prices may not be directly comparable if using the given market prices.

Local staples in urban areas are generally considerably more expensive than in rural areas. So when rural dwellers move to urban areas there is reduction in the consumption of local staples and an increase in rice consumption. However, Gibson (1995) asserts that low consumption of local staples in urban areas is due more to high prices than consumer preferences.⁴³ Therefore **a key policy imperative is to get local staple products into domestic urban markets at competitive prices.**

Recent reliable estimates for domestic rice production are hard to come by. Domestic rice production was estimated to have been in the range 60–2,200 tonnes over the period 1962 to 2000.⁴⁴ Current industry estimates⁴⁵ are that local annual production is about 30,000 tonnes, whilst DAL estimates of 15,000 tonnes⁴⁶ are a little higher than NARI researcher's estimate of about 10,000 tonnes.⁴⁷ If an optimistic current local production of 30,000 tonnes is added to the imports of 170,000 tonnes in 2013, the current per capita consumption would be about 26 kg which is a little lower than the consumption of 29 kg per capita estimated for 2001 (Table 2). However, consumption levels are not even across the country with significantly more rice consumed by urban dwellers, being possibly 30kg higher than the national average (i.e. 50 – 60 kg/capita/annum).⁴⁸

Rice production is important for the nation's food security, but expansion in production must be producer driven based on household consumption needs (e.g. the mountain communities inland of

⁴³ Gibson J (1995) Food Consumption and Food Policy in Papua New Guinea, Institute of National Affairs Discussion Paper No. 65

⁴⁴ Bourke RM et al (2009) *Opt Cit.*

⁴⁵ [Business Advantage PNG](#) 3 June 2015, Trukai's CEO estimates current local rice production of 30,000 tonnes

⁴⁶ DAL (2015) Papua New Guinea National Rice Policy 2015-2013, pg. 47

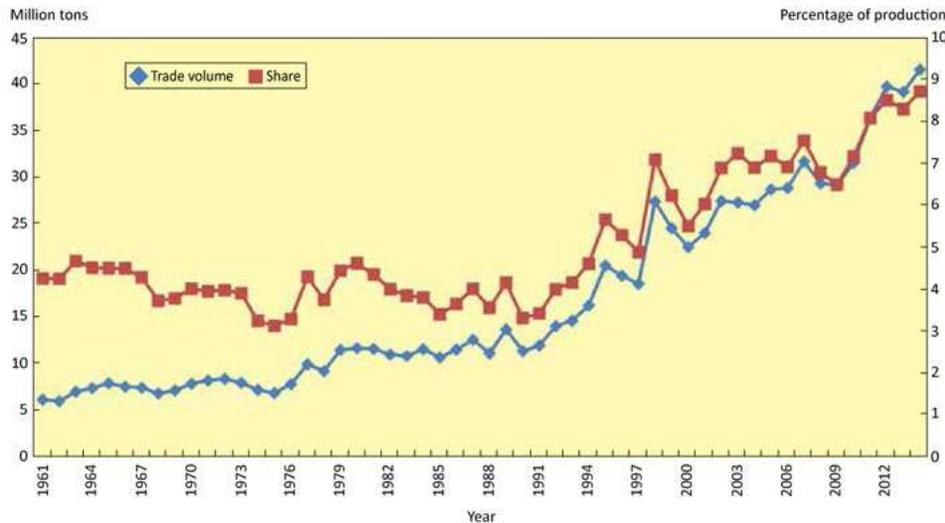
⁴⁷ Laraki J () Rice Research and Development, NARI

⁴⁸ Gibson J (2001) *Opt Cit.*

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Finschhafen in Morobe Province, where access is difficult, imported rice is expensive and coffee is costly to market),⁴⁹ or on full commercial viability of the rice production system.

Figure 11: Trends in Global Rice Trade (source: [International Rice Research Institute](#))



In the international arena most rice is consumed where it is produced with less than 10 percent of world production being traded on the global market (Figure 11). This can give rise to “thinness” in the world rice markets that may contribute to price surges. Government restrictions on rice exports practiced in some countries also exacerbates scarcity and pushes up prices. This situation decreases confidence in the global market supply of rice and invigorates national import substitution policies. Since the 2007-08 rice crisis, many rice-consuming countries have been reluctant to depend on imported rice and have rolled out measures to improve self-sufficiency through programs to expand their rice production and reduce their dependence on foreign rice.⁵⁰ Consequently, the PNG Government’s long-term policy for rice remains to strengthen national self-sufficiency.⁵¹ As the biggest per capita rice consumption is in urban areas, and the poorest household spend the highest proportion of their budget on food, keeping the price of rice as low as possible is a critical factor for their food security.

However, in terms of nutrition security, there is a more pressing need for support to enhance productivity and sustainability of smallholder farming systems for the traditional staples and nutrient rich (particularly protein) foods - including, legumes, small livestock and aquaculture fish. Enhancing competitiveness and function of value chains for domestically produced protein rich foods will also be critical for livelihoods and food security.

Livestock makes a significant contribution to the livelihoods and health of more than 600,000 smallholder farmers in PNG mainly through subsistence and small scale commercial production of pigs and poultry. Small ruminants (goats & sheep), cattle and inland aquaculture can also play an increasing role in this sector. However, the food security and economic benefits from these livestock enterprises

⁴⁹ Bourke RM et al (2009) *Opt Cit.*

⁵⁰ Mohanty S (2015) Trends in Global Rice Trade, [International Rice Research Institute](#)

⁵¹ DAL (2015) *Opt Cit.*

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are constrained by a lack of livestock health services and poor management practices. Inadequate housing and nutrition, poor reproduction, high mortality of young stock and poor access to emerging urban markets are consistent issues restricting productivity. Compounding the situation are the effects of HIV/AIDS on the labour market and an increased susceptibility to common zoonotic conditions, thus adding to the disease burden of tuberculosis and malaria within smallholder farming communities.⁵²

Set against a backdrop of high cost of fuel and imported food and coupled with the growing threat of disease introduction there is considerable potential for livestock to make a greater contribution to food security and sustainable livelihoods in PNG. **Key challenges for livestock development are building local capacity in animal health and production, developing cost effective local feed sources, and improving hygiene and slaughtering facilities. Other localized challenges to developing commercial livestock ventures are water and power supply, investment for fencing and theft of stock.**

With the many kilometers of shoreline and largely unpolluted coastal waters as well as high elevation lakes and streams, PNG has good potential for development of aquaculture enterprises. There is also good potential for small scale fish pond culture under appropriate extension approaches. Consequently aquaculture is slowly being developed and is currently at the subsistence to semi-commercial level, particularly where small ponds are dug to farm GIFT tilapia, carp or trout. Estimated number of small aquaculture farms stands at around 100,000 with more than 80 percent of these located in the Highlands. Barramundi cage culture is also gaining momentum in the Fly River area and cage culture of prawns in the Sepik River. There is scope for expanding cage culture and inland fish production, which offers a good opportunity for small-business involvement. The major constraint to the expansion of aquaculture remains the high cost and availability of imported feed formulations and the availability of fingerlings. **Aquaculture remains an important component in sustainable coastal fisheries management providing an important source of protein for the local diet whilst relieving the pressure on local fishery resources.**

While sustainable food production to meet the needs of PNG's rapidly increasing population will require greater productivity of existing staple foods and better management of land resources, the key stimulus to increase food production and productivity will be an increased market demand. For this to be realized improvement in domestic and overseas market linkages are needed. Over the past much focus on agriculture development has been on the production component of supply side issues without sufficient attention paid to how the downstream components of the value chain will assist the farmer to access viable markets for the new surplus. Basically, if a farmer cannot generate worthwhile value from sale of surplus to his subsistence requirements why grow it? Often in PNG, the incentive to grow more hasn't been there because the value chain opportunities haven't been available to farmers. In times of a strong and sustained value chain demand farmers will more actively seek and adopt productivity enhancing technology and management methods. Functioning value chains support better livelihoods so poor households can grow food and generate income to buy affordable food, especially during seasonal food shortages.

⁵² Enabling Smallholder Livestock Services in PNG <http://www.nari.org.pg/node/266>

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But the current critical lack of effective extension and outreach services means that smallholder farmers and value chain participants generally have little access to information, new technologies and improved planting materials resulting in low farm and value chain productivity. Because of information asymmetries, few farmers and value chain participants have knowledge about the quality and standards requirements of higher value markets. These obstacles coupled with general farm remoteness and lack of access roads continues to impede market access and farm commercialization. Furthermore, facilities in urban open markets are often of poor quality, with lack of shade and poor water and sanitation facilities. Consequently, losses in food chains are expected to be high and there are potential public health risks from food contamination and transmission of food borne disease.⁵³ **Addressing the principal constraints in food produce value chains including the lack of sector coordination, lack of value chain standards and the lack of food safety standards are therefore policy priorities. Building the capacity for robust domestic value chains will require coordinated investments in improved quality production together with enhanced capacity in value chain infrastructure, processing and marketing. Upgrading physical marketplaces and facilities will also be necessary.**

Plant genetic diversity is crucial to improving productivity by providing farmers with a variety of crop production options to choose to suit their particular circumstances. PNG is blessed with a rich diversity of plant genetic resources. It is the center of origin for 'noble cane' (sugar cane) and winged bean and the secondary center of diversity for sweet potato, taro, banana, yam, cassava and aibika. The diversity of these crops includes more than 1000 sweet potato varieties, 800 taro, 200 banana, 300 yam, 100 cassava and 50 aibika (island cabbage) varieties.⁵⁴ The broad genetic base of food crops currently available in PNG provides resilience and tolerance against major pest and disease outbreaks and will provide farmers with more options to meet future threats and challenges including the potential impacts of climate change. **Maintaining and utilizing this rich genetic pool for food crop improvement including increase productivity, quality and nutritional value will be vital to ensure sustainable food security in PNG.**

Additionally, ensuring national bio-security is also essential to protecting biodiversity and maintaining productive capacity for food security and to protect plant, animal and human health. Strengthening and improving the cost-effectiveness of internal controls and regimes to limit spread and control endemically occurring pests and diseases, and quarantine border risk management and compliance management controls, including harmonization of biosecurity and customs clearance through 'single window' processing integration, ensuring that import and export activities comply with international quarantine standards and domesticating into PNG legislation international trade obligations, rules and processes are therefore high priorities. As is developing contingency response plans for invasive pest and disease incursions.

⁵³ PNG has suffered from several high-impact outbreaks which can at least partially be attributed to foodborne transmission, such as cholera in 2009-2011, which led to 1500+ recorded cases and 500+ deaths, and frequent shigellosis (bacillary dysentery) outbreaks, which led to 1000+ cases and at least 13 deaths in 2013 (Draft National Food Safety Policy 2014-2024, pg. 10)

⁵⁴ FAO (2009) State of Plant Genetic Resources for Food and Agriculture, Papua New Guinea Country Report

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Under an appropriate implemented policy framework PNG's substantial land and marine resources and strong agricultural base retain a solid foundation for food availability, both in terms of self-sufficiency in production of staple foods and also in the capacity to develop and generate export earnings from the primary sector (agriculture, forestry and fisheries). Additionally, Papua New Guinea mineral resources (mining and petroleum/gas products) considerably strengthen the country's potential export earning capacity and thus the country food import capability. However, whilst availability of sufficient food is clearly a necessary condition for food security, as the Nobel prizewinner Amartya Sen eloquently states in his classic essay *Poverty and Famines*⁵⁵, availability of enough food in the aggregate is not sufficient for food security. Therefore there is also a need for a policy focus on access, which refers to the ability of people to physically obtain and economically procure the balanced nutritious diet they need.

Access to Nutritious Food

Poverty and food security are inextricably interlinked. Even in rural settings, the poorest farming households tend to produce less food than they consume and spend the largest proportion of their income on food, leaving them vulnerable to high food prices and declines in agricultural output. The 2009-10 HIES data indicate that nearly one-quarter of the population suffer food poverty (households consuming less than the value of 2200 calories of moderate nutritional quality) and 40 percent of the population consumed less than a minimum basket of food and other goods and services.⁵⁶ Furthermore, poverty rate varies considerable across regions and is significantly more prevalent in rural areas. With their greater populations, the Highlands and rural Momase account for 37.5 percent and 29.2 percent of PNG's poor households, respectively. Only 8.5 percent of the poor population lives in urban areas, and these households appear to be only just below the poverty line, unlike rural Momase in particular where poor households report very low consumption levels.^{57 58} Essentially, the worst social indicators are associated with environmental conditions in which the practice of subsistence agriculture is least productive.⁵⁹ Low rural incomes mean that there is limited opportunity for imports and high-protein local produce (mainly of animal origin) to contribute to dietary variation exacerbating protein energy malnutrition (PEM). **For a truly food secure society, PNG needs to ensure that the poorest and most vulnerable have access to sufficient nutritious food to meet their dietary needs.**

⁵⁵ Sen A (1982) *Poverty and Famines: An Essay on Entitlement and Deprivation*, Oxford New York: Clarendon Press

⁵⁶ In recognition of the widespread informal social safety nets provided by access to productive land assets, assessments of poverty in PNG have typically not been solely based on cash incomes but have also taken account of the economic value of subsistence production. For the 2009–2010 HIES, a “cost of basic needs” poverty line was determined, calculating the cost of an individual consuming 2,200 calories per adult equivalent per day plus the cost of essential nonfood items such as clothing.

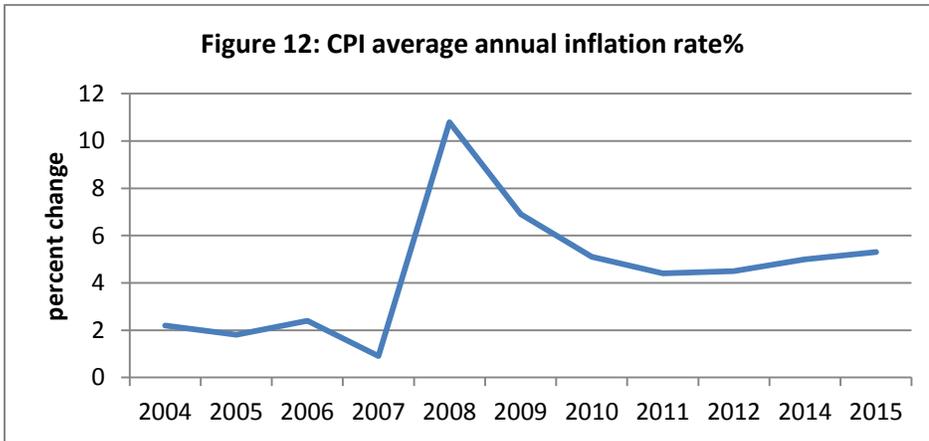
⁵⁷ Gibson J (2012) *Two Decades of Poverty in Papua New Guinea*, presentation at PNG Update, UPNG, June 12, 2014

⁵⁸ IMF (2013) *Papua New Guinea Staff Report for the 2013 Article IV Consultation*, IMF Country Report No. 13/339, Box 1 pg. 5

⁵⁹ Hanson L.W et al (2001) *Papua New Guinea Rural Development Handbook*. Land Management Group, Department of Human Geography, Research School of Pacific and Asian Studies, The Australian National University, Canberra

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PNG has an open trade policy regime and food price volatility therefore becomes a particularly important variable in assessing the nation's food security. Inflation spiked following the rise in global commodity prices in 2008, imported food and fuel being major drivers of inflation (Figure 12). In rural



areas food transported from the capital and other regions is subject to higher prices largely due to transport costs and excessively high wastage rates within the value chains which contribute directly to end prices. High inflation adds further pressure to the already weak purchasing power of vulnerable households.

Source: *indexmundi: Bank of Papua New Guinea*

The quality of food that people can access is important, particularly for the poorest people, but also for people with limited information about nutrition. When food prices rise, or the real incomes of poor people fall for other reasons, there is a risk of hidden hunger, where people switch to lower-priced foods that fail to adequately meet their nutritional needs. Policies for this problem need to ensure that the real incomes of the poor are protected, and to provide information to help poor people make better choices about the food they eat. **With a large proportion of PNG's poor population dependent on semi-subsistence farming supporting small farms to be a major source of nutritious food and of income for women and families is a food and nutrition security policy priority.**

To buy enough food, the poor rural households need higher cash incomes and efficient value chains and local markets, to augment the variable supply from subsistence production. Investment is needed in food value chains and other markets, as well as in social protection systems, to help disadvantaged people cope with chronic poverty as well as household-level and macro price shocks.

Currently in PNG there are no formal systems in place to support the social protection of communities vulnerable to food insecurity and malnutrition. The *wantok* system of reciprocity continues to be the major informal social safety net operating in PNG. However, whilst transfers (cash or kind) remain a very important means of assisting households, the proportion of all households recorded that received transfers in the 2009-2010 HIES was about 49 percent, down from over 90 percent recorded as receiving transfers in the 1996 Household Survey. The importance of *wantoks* notwithstanding, the possibilities for inter-household income transfers remains limited by low household incomes in poorer communities. Furthermore, in times of shock, particularly those brought about by natural disasters, community support arrangements often fail, unless the community includes a substantial number of *wantok* members outside the affected area (such as urban dwellers). There is thus a need to supplement these informal safety net arrangements with targeted formal interventions.

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Stability of PNG's Food Supply

Stability of food supply at the national level is dependent on the resilience of the national food economy and supply system (comprising value chains for domestic production and imports) to shocks – such as food price spikes, natural disasters (floods, droughts, frosts, cyclones, tsunami and volcanic eruptions etc.), outbreaks of pest/ diseases, and also to longer-term trends – including downturns in the global economy, changing climatic conditions and labor migration from rural areas.

The largest proportions of the population are smallholder farmers who live in the densely settled valleys of the central highlands or within 10 kilometers of the coastline, regions which are vulnerable to natural disasters. Almost two-thirds (63 percent) of land used for agriculture is on mountains and hills. The provinces with the greatest proportion of land used for agriculture on mountains and hills are Eastern Highlands (91 percent), Enga (90 percent), Simbu (86 percent), Madang (76 percent), Sandaun (76 percent), Morobe (76 percent) and Gulf (75 percent).⁶⁰ Intensification of land use in these farming environments exacerbates soil erosion and land degradation and lowers the resilience of the agricultural systems. Loss of soil organic material reduces soils moisture holding capacity and increases the risk of drought damage. With increasing population pressure and reduced fallow periods, under existing cultural systems and practices there is low rate of soil fertility replenishment and thus land degradation is becoming a major risk factor for the stability of food supply. The literature indicates that it is no longer possible that most people of PNG are able to eat well from their gardens or labor. Vulnerability is increasing, though how susceptible to shocks a person is depends on the quality of their land.⁶¹ **There is therefore a critical need for well researched low input technology to enhance the resource base and sustain smallholder farm productivity and to strengthen availability and accessibility of rural households to food value chains that are able to deliver alternative foods to them as well as take their food production and deliver it to markets and consumers with minimal wastage.**

Heavy rain or earthquakes frequently cause landslides that may occur over a wide area. Each year, between May and October, the highlands experience frosts at altitudes above 2,100 meters. Where these frosts remain infrequent, crops can recover from the temporary damage they cause. If the frequency or duration of the frosts increases, crops can be destroyed. As the staple root crops have a long growth period in cooler areas, this can lead to food shortages lasting many months; as was the case during the 1997 drought and frosts.

With the looming threat of climate change there is a critical and urgent need to address the impact of changing weather patterns on food production and stability of food supply. There are already indications that rising sea levels are having a negative impact on very small islands and other coastal locations because of coastal erosion and sea water inundation. Many of these areas depend on taro, cassava, sago and bananas as staples, and yields from these crops have been on a decline.⁶² ⁶³ There are

⁶⁰ Allen B, Bourke RM (2009) Part 1 People, Land and Environment, in: Food and agriculture in Papua New Guinea', ed. by R.M. Bourke and T. Harwood. ANU E Press, Australian National University: Canberra.

⁶¹ Cammack D (2008) Chronic Poverty in Papua New Guinea, Background Paper for the Chronic Poverty Report 2008-2009, Chronic Poverty Research Centre

⁶² Government of Papua New Guinea and World Bank (2010) Climate Change in Papua New Guinea: Framework for the National Climate Change Strategy and Action Plan

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about 140 islands smaller than 100 km² in size and with population densities greater than 100 persons /km². It is these people who are likely to suffer the most severe consequences of rising sea levels.⁶⁴ The possible increasing threats of floods and excessive soil moisture, droughts (often associated with El Niño conditions) and frosts are also becoming important concerns.

The devastating impact of the 1997 and 2015 droughts on domestic food supply have highlighted that food security strategies, including drought contingency plans, must include the use of imported foods to feed a significant proportion of the population for a short time from time-to-time.⁶⁵ At times of such natural disasters rice is a very important food because of its transportability and storability, but disasters like the 1997 drought would likely also disrupt any local rice production - so what is crucial for the rice sector is to maintain and strengthen the national distribution and marketing system and keep the price of rice at a low market level. The private sector distribution network appeared to function well following the 1997 drought – relative to the public sector/aid distribution systems⁶⁶ - therefore an appropriate approach, under such circumstances, may be for government (and aid agencies) to deliver food vouchers (rather than bags of rice) to enable vulnerable communities who have access to purchase rice from the commercial distribution system. This should also better accommodate targeting to the neediest. There will, however, remain a need for public sector aid distribution during periods of supply-side food security crisis to support the substantial proportion of the population that lacks access to markets of any kind.

The Framework for the National Climate Change Strategy and Action Plan identifies the agriculture and water sectors as particularly vulnerable to climate change. Across all sectors, the main concerns raised related to changes in rainfall and temperature patterns and their effects on drought, flooding and landslides. **Sustainable management of the environment and building resilience in the face of climate change and natural disasters are fundamental for achieving lasting food and nutrition security.** Resilience will be the ultimate measure by which PNG's farming and food security will be judged. Not just resilience to short-term shocks, but a more enduring resilience in the face of the new fundamentals associated with globalized trade, high energy costs, labour migration and climate change.

Key Lessons from review of the 2000-2010 Food Security Policy

The National Food Security Policy (NFSP) 2000-2010 was overly ambitious with 14 sub-programs and an estimated budget for delivery of PGK 500 million over 10 years. Lack of detailed implementation plans with allocated responsibilities and a monitoring framework, particularly related to the involvement and actions required at provincial and district level, and in relation to engagement of private sector and the value chains that it operates, resulted in low and erratic allocation of budget resources. Furthermore

⁶³ DAL (2014) Towards Agriculture Transformation and a New Direction for Enhancing Productivity in Agriculture, Functional and Expenditure Review of Agricultural Commodity Boards and Agencies, Department of Agriculture and Livestock, April 2014

⁶⁴ Allen B, Bourke RM (2009) *Opt Cit.*

⁶⁵ *Ibid*

⁶⁶ Whitecross N, Franklin P (2000) The role of rice in the 1997 PNG drought, in: Bourke RM, Allen MG, and Salisbury JG (eds) *Food Security for Papua New Guinea. Proceedings of the Papua New Guinea Food and Nutrition 2000 Conference*, ACIAR Proceedings No. 99 Australian Centre for International Agricultural Research, Canberra. pp. 255–259

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the policy failed to capture the widely varying food security needs across the different provinces and regions or the pressing food security issues related to climate change. At the household level food security is only possible when constraints of local food sources and their distribution are fully addressed. Consequently, there was very limited policy buy-in at the provincial and district levels where program priorities often varied from those articulated at the national level. As a result only four provinces (Manus, Madang, East Highlands and Simbu) adopted provincial food security programs linked to the NFSP.⁶⁷

The poor implementation of the 2000-2010 Food Security Policy indicates that there is need for greatly improved coordination of multi-sector service provision especially in linking agriculture and nutrition interventions and between national, provincial and district levels and especially linking the public sector at all levels with the private sector and the value chains that are private sector driven and managed. It is also essential to design programs to meet the specific needs of particular regions, areas or districts. Moreover, acknowledging resource constraints (both human and financial) means that program responses going forward will need to be nutrition focused and targeted to those areas in greatest need.

Ensuring coherence in the policy enabling environment is also essential - if policies are conflicting they need to be reconciled. Furthermore, food and nutrition security policies must be aligned with the country's natural resource endowments, macroeconomic environment, infrastructure development and be in tune with the socio-economic and cultural context. Additionally, information systems need to be strengthened with improved data quality and timeliness to enable policy monitoring and investment decision making.

Women are at the forefront of smallholder food production and marketing in PNG, women also play the key role in child and family nutrition; therefore national food security policy needs to fully empower women in agriculture development to maximize nutrition gains.

A review of international experience identifies that limited communication between the agriculture and nutrition sectors and inadequate joint planning at the national level has reduced the impact of interventions in both areas. The creation of an enabling environment, encompassing effective national institutions, for the development and implementation of nutrition-sensitive agricultural policies and programs is critical. Key contributors to success in improving nutrition through agricultural investments include working with women farmers, nutrition education, tailoring projects to the specific needs of each community, and rigorous monitoring and evaluation.

⁶⁷ DAL (2014) *Opt Cit.*

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