The Development of Insecurity in Vanuatu and Beyond:
Seeking New Ways to Evaluate Land and Livelihood

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September, 2012

A thesis submitted for the degree of Doctor of Philosophy
School of Global, Urban and Social Studies
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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Trevor P. McMahon
17 September, 2012
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Glossary

**asset pentagon**
A visual representation of livelihood assets, grouped into forms of capital — human, natural, physical, financial and social capital. Asset pentagons appear first in Carney's (1998) livelihood framework diagram. The pentagons are formed from axes of relative values and the enclosed volumes can be meaningfully compared as a measure of livelihood assets.

**AusAID**
Australian Agency for International Aid.

**Bislama**
Bislama is the Vanuatu version of Melanesian pidgin — it can be understood by Solomon Islanders 'pidgin' and 'tokpisin' users from Papua New Guinea, and Torres Strait Islanders. Bislama is the declared National Language, but school and tertiary education is conducted in either English or French.

**CBO**
Community-based Organisations are generally seen as providing local counterparts for the international Non-Government Organisations. In Vanuatu there is a peak body for such community-based organisations, the Vanuatu Association of Non-Government Organisations, VANGO.

**grasruts**
Bislama term equivalent to 'grass roots', and having the same meaning — the common people.

**household**
Studies of subsistence and peasant agriculture use household as the primary unit, because there is little differentiation of labour among household members. Where differentiation occurs it is not likely to be in core activities. Chayanov (1986) is the classic household study, but the household forms the basic economic unit in many more studies of rural production.

**kastom**
Bislama term meaning customs, traditions, cultural features, way of life. It is frequently used to distinguish non-colonial, non-western social and cultural practices from western, colonial (and post-colonial) practice.
kava

Kava, (*Piper methysticum*), is a mild narcotic, which has a strong role in custom ceremonies, particularly circumcision rites. It is being sold and used more and more as a social drug, alongside alcohol in both rural and urban areas. In Vanuatu there is almost no betel nut use, except in the Torres Islands group, close to the Solomons.

ni-Vanuatu

The Bislama name taken by the indigenous Melanesians for themselves, taken from the French 'naire', to be born; thus 'born in Vanuatu', in conversation mostly shortened to 'ni-Van'. All non-Melanesians are denoted 'expat', even if born in Vanuatu. People of mixed race present problems for nomenclature. If they are from villages, they may be given 'ni-Van' status, but otherwise they are without category. The former (French) 'metis' is no longer used for mixed-race people.

proletarian, proletariat

For the most part, ni-Vanuatu would not distinguish between urban and rural people — all would be 'grasruts'. The term is used here to signify urban people and follows Haberkorn's (1990) use of the term to denote the urban 'working classes'.

self-sufficiency

Subsistence as a term has pejorative connotations (see Ellis 2000; Cook 1966 for examples). Self-sufficiency is semantically identical to subsistence, but lacks the pejorative sense. However, as a description it does suffer from an association with 1970s 'return-to-nature' romanticism,¹ so has not been generally employed as a substitute for subsistence.

smol nambas

Bislama term meaning 'small penis-sheath'. Used to identify and distinguish two cultural groups on the island of Malekula; the 'big nambas' from the North of the island and the 'smol nambas' from the South.

standard land area

The standard land area is derived from averaging garden land area per household, plus area under coconuts per household, over the two agricultural censuses, 1984 and 2006. The standard land area is utilised in the Pareto year projections, and in the comprehensive valuation of Vanuatu subsistence-plus livelihoods.

subsistence-plus, subsistence-plus livelihood

The core-plus nature of subsistence livelihoods in Vanuatu, but perhaps universally (Brookfield and Parsons 2007; Anderson and Lee 2010) is such that the primary aim is to 'make' subsistence - the core. After this has been core task is assured, other activities may be undertaken — production for exchange, wage and salary earning, small business. Subsistence-plus is the term chosen in this thesis to represent that livelihood strategy.

tabu

Bislama word equivalent to 'taboo' but having wider use, meaning secret, or sacred, or forbidden depending on context.

tokpisin

Papua New Guinea pidgin.

¹Television shows such as BBC series 'The Good Life' (1975 — 1978) share the blame
typologies, livelihood typologies
Grouping of features of livelihood into types. In this study, the typology is a core-plus, with subsistence production being the core activity, and other activities — market-oriented production, wage and salary earning, small business — being undertaken once the core activity is achieved.

UNICEF
Formerly the United Nations International Children's Emergency Fund, now generally referred to as the United Nations Children's Fund, the major international agency for children.

use rights
The right to use land which is not your own for a period of time and to enjoy the fruits of that use. See also usufruct, which is interchangeable.

usufruct
The right to use land which is not your own for a period of time and to enjoy the fruits of that use. See also use rights, which is interchangeable.
Chapter 1

Introduction

1.1 Why this study is important

1.1.1 Livelihoods

In human history, there have been few changes in patterns of livelihood. We humans began as hunters and gatherers and persisted in that manner until ten thousand years ago. Agriculture and pastoralism were then added to subsistence patterns. Shortly after, livelihoods were revolutionised by the development of means of exchange, which led some to give up subsistence production and to specialise in one of the range of skills valued in the growing and diversifying communities. However, subsistence-based production did not disappear. Hunting and gathering societies have persisted down to the present times, as have subsistence agriculture and pastoralism. They coexist with exchange-based livelihood systems.

The people of Vanuatu are representative of societies underpinned by subsistence production systems. They have a three and a half thousand year history of occupation of the Vanuatu archipelago, living with subsistence as their core production. All rural households in Vanuatu continue to engage in subsistence-based agriculture, and rural households make up 75 per cent of the Vanuatu population (Vanuatu National Statistics Office 2010b: 2). Worldwide, three billion people, nearly 50 per cent of all people, may be reliant on subsistence-based livelihoods.1

Despite this, subsistence livelihoods are generally dismissed as anachronisms by development (and other) economists (Cook 1966; Sachs 2005). When subsistence production is evaluated, it is by imputation of values for consumption or production, in market-based cash terms. The World Bank’s ubiquitous International Poverty Line, which underpins most ‘poverty’ policy-making, uses imputed cash values for subsistence-based production (Ravallion,2 pers. comm. 2011).

This study attempts to reverse the bias towards market-based systems in development economics, by evaluating subsistence-based livelihoods in terms appropriate to subsistence,

1World Bank (http://search.worldbank.org/) 2005 numbers show that 50 per cent of the world’s population were living on less than $2 per day. Later in this study such measures are questioned but they do provide a reasonable, if coarse-grained, approximation which may be used to identify subsistence-based producers.

2Martin Ravallion, Director, World Bank Development Research Group.
rather than terms appropriate to market-based exchange. First, Vanuatu livelihoods are examined using three alternative models, then a worldwide sample of 58 countries is tested against another subsistence-appropriate model, which sits in opposition to the dominant development models.

It will be demonstrated that, under certain conditions, normative and contingent ideas of 'development', or 'poverty', may take on radically different meanings, and that for many in the world, subsistence-based production systems may be the most effective means of confronting the perils of gaining a livelihood. Conversely, to follow the dictates of dominant ideas of development may lead to greater insecurity in those countries which rely on subsistence.

The operational logic of three billion livelihoods deserves some consideration and respect, as we confront a world in which food insecurity daily looms larger.

1.1.2 Land

Across the Pacific, in Africa and in parts of Asia and the Americas, traditional patterns of land tenure and the subsistence-based livelihoods on which they depend are under serious and continued threat from neoliberal development policies, which seek to subsume those traditions into the legal framework of modern, market-based economic development.

The international development agencies and the aid donors, along with many of their neoliberal sub-contractors, the international non-government development organisations, are seeking to overturn land tenure systems and livelihoods with several thousand year histories of security and sustainability.

They seek to replace them in the belief that there is no alternative path to the future other than by market-based, export-driven economic expansion.

It is the same belief — the 'one path' view — which dismisses subsistence-based production as an anachronism.

Neither the government of Vanuatu, nor the international agencies seem able to follow the precautionary principle, primum non nocere.4

This study will show that the 'one path' view may lead not only to the wholesale withdrawal of land from traditional use, but also to the diminution and destruction of subsistence livelihoods which depend on traditional continuance. Further, the study will show that on present indications, in Vanuatu and elsewhere, there is little prospect of replacing subsistence-based livelihoods with exchange-based patterns of livelihood on a large scale.

1.1.3 Personal history in Vanuatu

Vanuatu (see Figure A.2) has been chosen for examination in this study for three reasons: it is representative of subsistence-based economies; it is a country which is well known

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3One day in 2006, at the Port Vila Public Library, where I spent two years as a volunteer, the manager, Touman Aka, said to me as she walked out the front door — I'm going to the garden. The library is in the centre of town, so I said 'what garden?' She laughed and said 'the white man's garden!' She meant that she was going to the bank. For the people of Vanuatu, their garden is their bank. That is their operational logic.

4First do no harm! — there is controversy over where the phrase originated, but not of its efficacy.
to the author; and it has two important and connected features for the study. Namely, most of the population continue to follow subsistence-plus livelihoods\(^5\) which rely on the continuance of traditional land tenure, and, at the same time, there have been large-scale withdrawals of land from traditional use.

The author had two periods of living and working in Vanuatu. The first year was from mid-2004 to mid-2005, volunteering at the National Library of Vanuatu, which was then being moved from the old Cultural Centre building in town to the new Cultural Centre on Saralana field, at Nambatu (see Figure A.3).

After some time working at the National Library, I was invited to assist at the Public Library, which was housed in the remains of the former Cultural Centre in the downtown area. The Public Library was, and is, a very different place. The National Library is a place of quiet scholarship where one goes with intent; the Public Library is the place in town where ni-Vanuatu\(^6\) and expatriate alike can sit down and read the newspapers, flip through old copies of *National Geographic* and French quarters. Or they can turn to a the polyglot collection of airport novels, classics, aged discard from the Australian and New Zealand education systems and home-going expatriates’ cooking and parenting books. It is a place where students from primary to tertiary level can go to do their homework, meet their friends, talk and photocopy photos of their cultural heroes. The Public Library is a place for meetings, negotiations, reconciliations, public debate and gossip, romantic trysts and child-minding. Above all, it is free!

In Port Vila town there are no other covered areas where anyone, particularly ni-Vanuatu, can freely sit for as long as they like, except for the markets and the bandstand on the foreshore. The library is always open and available during the day, provided you don’t mind the heat generated by the upwards of 120 people who may be there at any one time. It is free but it is hot!

My second visit, from mid-2006 to mid-2008, was a formalised continuation of my volunteering at the Port Vila Public Library, this time sponsored by Australian Volunteers International Limited, an AusAID\(^7\)-funded sub-contractor organisation, which manages the placement of education and health professionals in countries in the Pacific, Asia and Africa. I had some not very onerous performance targets to meet, and was able to resume observation of the life and times of Port Vila, as seen from the circulation desk, or from behind the photocopier, the cheapest in town. Many legal firms took advantage of the photocopier, as did many individuals and families needing copies of legal documents for land disputes, compensation claims, labour migration documents, religious tracts and get-rich-quick schemes. Teachers came to photocopy textbooks, small boys to photocopy their ‘sponsorship’ forms for use on the cruise ship tourists. As people waited for their photocopies or sought references or waited for someone to finish with the *Vanuatu Daily Post* or the *Independent*, we talked.

This project had its genesis in those conversations and the issue which underlay them; large-scale change and its effect on the social, cultural, ecological and economic life of the people.

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\(^5\)See Glossary.

\(^6\)See Glossary.

\(^7\)See Glossary.
1.2 Research aims

The research aims of the study are twofold:

First, using Vanuatu as a case study, to investigate subsistence-based livelihoods in terms appropriate to subsistence. Subsistence-based production has a more than 3000 year history in the archipelago, yet there has been little analysis of its operational logic, and few attempts to make an evaluation of the economic returns to the livelihood. Rural households make up around 75 per cent of the population, and all continue to practise subsistence-based production. For urban households, it has been assumed that they are following market-based livelihoods of wage and salary earning or small business. This assumption will be tested and urban and rural livelihoods will then be subjected to comparative analysis, to provide a basis for assessing the relative security and sustainability of those livelihoods. The nature of subsistence-based production in Vanuatu will then be generalised to draw some tentative conclusions about similar production systems outside Vanuatu.

The second aim is to examine the impact of development policy on Vanuatu livelihoods, particularly those aspects of policy which aim at transformation of rural production to market-based production and which work for the transition of the Vanuatu economy to a market-based, globally-connected economy. The evidential basis for these policies, particularly the self-styled development indicators, will be critiqued and an alternative measure of 'development', which eschews the normative intent of the Human Development Index and the International Poverty Line will be constructed, and a select group of 58 countries scored and ranked.

The twofold aims will be drawn together to synthesise a picture of livelihood systems in Vanuatu and beyond, which more closely approximates the objective reality of the lives of subsistence-plus households than that provided by the discourse of development.

1.3 Research questions

1.3.1 First research question

The World Bank's Poverty Line indicator uses imputed values for costs of consumption to measure the returns to subsistence-plus production.

Can an evaluation of land withdrawal costs provide a better picture of returns to the subsistence-plus livelihood than the World Bank method?

1.3.2 Second research question

Large areas of land in Vanuatu have been withdrawn into expatriate leasehold.

Can projections of optimal land use provide a measure of the extent of the impact of land withdrawals on rural subsistence-plus livelihoods?

*See Glossary.
1.3.3 Third research question

Can a standard model of livelihood analysis be adapted to assess the security and sustainability of Vanuatu subsistence-plus livelihoods?

1.3.4 Fourth research question

Development indicators, such as the Human Development Index and the International Poverty Line, measure all economies in terms appropriate to market-based economies. However, many economies are not predominantly market-based.

Can a measure be developed which enables all economies — subsistence, exchange and those between — to be assessed and ranked in common terms?

1.4 Methodology

The study presents some methodological challenges, as the tasks undertaken require an innovative and adaptational approach. Underlying the tasks were two major methodological features — the derivation and employment of subsistence-appropriate units of measure; and the iterative nature of the research tasks, each consequent, more or less, on the results of the previous task.

1.4.1 Subsistence-appropriate measures

First and foremost, subsistence-based livelihoods should be examined on their own terms, rather than using the analytical tools of exchange economics, so a non-cash unit of measure is a primary requisite. For the most part, the unit of measure which has been adopted has been percentage participation — what percentage of the given population are involved in an activity? Percentage participation is a good measure of access to resources, which Sen (1984) termed 'capability', or the right and capacity to participate.

Where quantitative data do not exist, or are not available for percentage participation rates to be derived, simple scales have been employed to show cropping capacity of land, levels of technology and the like. Nevertheless, quantitative data are most commonly employed.

The interest for the study is in large-scale phenomena: livelihoods at a national and international scale; land withdrawals at national, provincial and island scale; and world-wide indicators of resilience to food insecurity.

This interest in large-scale phenomena largely determines the type of study this will be — the collection and analysis of large-scale quantitative data sets. Often, with data collections of this type, there are gaps, such as can be seen in World Bank collections, particularly for developing countries. Fortunately, Vanuatu has compiled a regular series of housing and population censuses, from 1967 through to the most recent in 2009. With the exception of the twelve-year gap between 1967 and 1979, the housing and population censuses have been collected at ten-year intervals.
In addition, there has been a less regular series of agricultural censuses and a number of smallholder agricultural surveys which cover the period 1983 to 2006 — three full censuses and three smallholder surveys.

The study also utilises large-scale health studies, including the recent Multiple Indicator Cluster Survey auspiced by UNICEF (Shuaib and Rahman 2008).

There are deficiencies in the data sets. There are a number of areas in Vanuatu where groups are deliberately uncooperative with the state (parts of Tanna (see Figure A.6) and the ‘smol nambas’ areas of Malekula (see Figure A.5) are mostly unwilling to participate), but everywhere there are sensitivities to particular questions, which may trigger deliberate falsehood.

Often, weather and transport difficulties have compromised collection of information. On top of these problems, there is the tendency for the overseas consultants who assist with census preparation and design to be interested in different things at different times. This produces inconsistencies between, and impedes comparison across, data sets.

Nevertheless, the sets have two major advantages. Reports for all censuses are available and complete. The 1993 agricultural census lacked some aggregations, but the smallholder survey series from 1990 to 1992 enables the 1993 gaps to be substantially filled. The second advantage is the time series. There have been five population censuses over a 40-year period and three agricultural censuses over a 20-year period, sufficient to produce trend lines which can be used for verification. The 1999 Population and Housing Census (Vanuatu National Statistics Office 1999), for example, has been shown to be above trend lines across the board.

Additional information sources at country scale are helpful. Paul Quantin, a French soil scientist, surveyed the entirety of Vanuatu in the 1970s and produced maps of grades of potential agricultural land for all islands (Quantin 1982). The alternative figures on agricultural land from the Food and Agriculture Organisation of the United Nations (FAO), show only current use, not potential. Quantin’s studies enabled a method to be devised for interrogating the effects of land withdrawals.

The sets are presented, in the main, in percentage participation values.

Thus, the study has a match. A unit of measure appropriate to subsistence-based production — percentage participation — and sets from which percentage participation values can be derived.

1.4.2 Iterative nature of research tasks

The four research tasks are presented in an order such that each, except the first, is consequent on the preceding tasks. The first task undertaken, the land withdrawal costing valuation, is prime. If the results of that valuation do not show a very different picture to the dominant view of subsistence-based livelihoods, as seen in the Human Development Index and International Poverty Lines and ‘legacy’ studies (Whiteford and Yoshihara 2011 provide a recent Vanuatu example), there may be little or no justification for proceeding to the next step, the optimal land distribution projections and comparison. If the results of the projections do not demonstrate serious adverse consequences of the extent of recent high levels of land withdrawal, then to proceed to a comparative study of urban and rural livelihoods would appear to be superfluous.

\footnote{See Glossary.}
Should the results of the comparative analysis not show declining levels of livelihood security and sustainability across Vanuatu, and the adverse effects of international aid policy on those levels, then it would be difficult to argue that an alternative means of measuring 'development' or resilience may provide a worthwhile contrast to the dominant metaphors of development — the development indicators.

Without pre-empting the results of each task, all were completed.

**Land withdrawal costs valuation**

First, two parameters are set. A standard area for households practising subsistence-plus livelihoods is calculated from agricultural census figures, and population density per standard area is then calculated from housing and population census numbers.

The study will depart from the non-exchange terms constraint for this task, and will present a cash valuation of the costs of land withdrawal from subsistence-plus production.

Costs accruing to the persons representing the population density per standard area from the loss of access to the land and other resources available under traditional land management are then calculated and totalled. These include costs of food and shelter, rental, loss of production for exchange, environmental services and socio-cultural costs. The total represents the costs of land withdrawal. Additionally, and perhaps more importantly, it represents a proxy value of the economic returns to the subsistence-plus livelihood, if environmental services costs are set aside.

A valuation such as this is speculative and must be subject to a number of cautionary considerations. Above all, the parameters used are anecdotal, in the sense that they are not taken from field studies. They are approximations derived from population-level values, and data selected in an *ad hoc* manner, to derive particular values difficult to quantify. There are obvious problems in using this data, however the intention of presenting this valuation is to provide an alternative model of the economic value of subsistence-based livelihoods to that presented in the International Poverty Line calculations, which represent the dominant view. The valuation presented here calls into question the value of estimations of the value of subsistence-based livelihoods derived from National Account values which utilise estimates of consumption based on, in most cases, diaries kept by one family member of food consumption for a set period — a fortnight, in the case of Vanuatu (Vanuatu National Statistics Office 2007b, 2007c).

Thus, while the data presented are quantitative, their importance lies in a qualitative difference. The difference between measuring a livelihood in terms of returns in food and shelter, production for exchange, economic, social and cultural benefits; and a measurement that includes only consumption, and, even for that measurement, employs contentious methods of collection.

**Projections and comparison**

With potential agricultural land known, and numbers on population and agriculture, it is possible to undertake projections to elicit information on the optimal population-carrying capacity of good agricultural land, and on the effects of land withdrawal which reduce that capacity. This will form the basis of the consideration of the effects of land withdrawal on subsistence-plus rural livelihoods.
Carrying capacity of land is a contentious measurement because it generally contains an inherent assumption that the system under review, in this case Vanuatu rural agricultural practice, remains constant.

That assumption has formed the grounds for criticism of the method.

John Street (1969: 104-5) expressed reservations about such calculations. He believed that to assume a static production system 'is to depart so markedly from reality as to seriously diminish the utility of the computed population density values'. He introduced an ecological dimension — the extent to which current practices involve environmental degradation, and questioned whether the carrying capacity idea takes account of that degradation. He notes this potential problem in Brookfield and Brown (1963), along with studies by Allan (1949), Conklin (1957) and Carneiro (1960). He questions the absence in the studies of any estimation of current degrees of environmental degradation, with most assuming that current land resting — fallow — was of an ideal length (1969: 105).

Bayliss-Smith (1980) also expressed concerns with the 'deterministic' nature of carrying capacity calculations. He introduced an alternative method of computing 'standard populations', using two parameters: man hours required to be worked by productive persons to produce calorific minima for population in an area; and labour surplus, measured as leisure. 'Standard populations', so calculated, could then be compared with 'real', enumerated populations to determine whether an area was over-populated or not, and to assess the outcomes of changes in the production system on 'standard populations'. While flexibility is obtained using these methods, numbers of assumptions about production systems (Sahlins (1972) notes the difficulty of disentangling 'work' and 'leisure' in subsistence systems; calorific minima are crop-dependent) have to be made to produce the two parameters.

In the projections undertaken in this thesis, a 'standard land area' per household is employed to attempt to obviate the need to introduce assumptions about production systems required for Bayliss-Smith's 'standard population' calculation. The advantage of 'standard' land areas is that both production and utilisation of natural resources can be quantified. Nonetheless, the assumption of static production systems remains a problem in the projections undertaken.

Marshall Sahlins (1972: 42)) felt that conclusions drawn (from capacity calculations) would 'not be utopian', but he highlighted two further shortcomings of carrying capacity projections. They were both 'partial' and 'derivative'. 'Partial' because only food production, and not resource exploitation, is measured; 'derivative' because capacity is measured by population optimum, not land use optimum. The second objection is effectively a re-statement of the problem already noted, of assuming constant practice.

The first of these two shortcomings is addressed in the projections undertaken in this study by including an allowance in the standard land area per household for forest exploitation and production for exchange, thus nullifying Sahlins's first objection.

The second shortcoming is addressed by a comparison. We acknowledge the difficulty presented by the colonial period in Vanuatu, which largely obscures what went before. Of particular concern is the issue of the extant population at European contact and the extent of depopulation. This deficiency is overcome by the study of a proxy, the island of Tikopia, just to the north of Vanuatu in the Solomon Islands.

10See Glossary.
Tikopia has been chosen as a proxy because of its proximity to the islands of Vanuatu and its similar agricultural base, with root crops and arboriculture dominating produced food resources, and with littoral resources being important food sources. Tikopia has significantly more intensive agricultural practices than Vanuatu, and pigs and dogs have been largely eradicated from the island. Tikopia has been only marginally impacted by European contact, because of its remoteness, yet it has been extensively studied since 1936 — first by Raymond Firth (1957), alone and with others, then by Kirch and Yen (1982). Firth (1959) documented a period of critical food shortage following cyclone damage to crops, which provides more insights into the agricultural regime under intense pressure. Bayliss-Smith and Feachem (1977) commend the advantages of small islands as 'microcosms' for study, because of their isolation.

Hopefully, by mapping the 'worst-case scenario' projections and by comparative analysis with the proxy, a meaningful measure of carrying capacity, and its application to the problem of land withdrawal impacts in Vanuatu, will be obtained.

Livelihood frameworks

Further methodological challenges are presented by the comparative analysis of rural and urban livelihoods, which addresses the third research question.

Here we have chosen to utilise a framework approach, developed by Diana Carney, Ian Seoones, Frank Ellis and others at the U.K. Department for International Development, the Institute of Development Studies and in the Overseas Development Institute at the University of Sussex for the analysis of livelihoods, particularly rural livelihoods. This framework provides a graphic model of how livelihoods are constructed. In the framework, livelihood assets, the basis of livelihood, are modified by contextual elements such as government legislation, social and cultural structures or shocks (natural disasters) and trends (emergence of China as an economic power, for instance). Thus modified, the assets are employed in livelihood strategies which produce livelihood outcomes which may improve or deplete livelihood assets over time.

While framework methodology is followed, it must be noted that some elements of the framework methodology, principally its treatment of subsistence production, are rejected. Subsistence is valued in imputed price terms in Ellis' case studies (Ellis 2000), and many of the variables chosen to be followed are not directly related to livelihood, but are more concerned with wealth measurement. The drawing of a necessary connection between relative wealth and livelihood will be strongly contested in this study.

The framework model approximates a circular or linear flow and is thus a simplification, or abstraction, of the network-like complexities of actual livelihoods — in which the flows and feedback loops are less discernibly linear or circular — but it does make the analysis manageable.

Quantification of livelihood assets does not present difficulties, as the Vanuatu population and agriculture census data sets are comprehensive, and mostly presented as percentage participation rates. This enables us to stay within the 'non-cash terms' constraint and to quantify relative levels of access to resources.

Asset pentagons will be constructed, which will contain relative values for each variable measured, and for each of the five composite variables which make up the five axes of the pentagons. Relativised values permit the calculation of the area of the asset pentagon,
which is meaningful and can be used to compare the livelihood assets of different groups in society, and show trends over time.

Four asset pentagons will be constructed: an earlier and later pentagon for rural households, and the same for urban households.

Values will be aggregated at rural and urban levels. There is considerable variation at provincial aggregations, and between the two urban locations, Port Vila and Luganville (see Figure A.10), but such variations, although shown in the tables, have been set aside, as our study concentrates on the larger-scale rural and urban aggregations.

The effect of contextual agents on the deployment of livelihood assets presents problems of quantification. In the 'standard model' of Sustainable Livelihoods Approach\(^\text{11}\) the method for assessing the framework modifying influences — government, society and culture, and trends and shocks (price trends, natural disasters) — is focus group discussion with the subjects of the study; and the results are qualitatively treated. For this study, quantification will be achieved by the construction of the earlier and later asset pentagons for rural and urban groupings. Quantitative differences in the two sets, the trends over time, will enable us to identify the influence of contextual agents, which will then be examined.

The effectiveness of livelihood strategies can be tested in a number of ways. Ellis (2000) presents income portfolios and indices of diversity as possible methods, but both are constructed on income measures. As such, they are outside our scope, as we are restricted to non-cash measures. Ellis also constructs livelihood typologies, which again use income sources, this time to construct a set of livelihood types. We are able to adapt livelihood typologies to our purposes, by constructing 'core-plus' typologies. Subsistence forms the 'core', and the other activities, various types of production for exchange, wage and salary earning and small business activities are the 'plus'. Using percentage participation rates, we are able to construct a set of subsistence-plus typologies for rural and urban livelihood strategies, which identify differences in the availability of strategies and in the diversity of available assets for the two groups.

**Food Resilience Index**

A selection of countries is included in the ranking. The countries listed as 'least developed countries' — of which there are 48 and in which subsistence production systems are often dominant — and the top scoring ten countries in the Human Development Index, in which subsistence production plays a much less important role. China and India are included as representing transitional economies, and because of their size and significance.

The indicators of resilience measured will be: food self-sufficiency at the national level; evidence of urban subsistence-plus livelihoods; availability of agricultural land per capita; agricultural production and climate features; and, finally, adaptability of population at national levels. These factors were revealed in the Vanuatu case study as providing resilience to food insecurity, but specifically for Vanuatu. The Food Resilience Index tests whether those results can be extrapolated to other economies.

Two data sets will be gathered, an earlier and later set, for each of the indicators.

\(^\text{11}\)Ellis (2000).
There are a variety of units of measure employed — percentage raw food imports of all imports; percentage population in agriculture added to percentage urbanisation; land area per person; percentage urbanisation and percentage of internally displaced persons averaged. It can be seen that only once is the constraint of subsistence-appropriate terms violated, where percentage of raw food imports against all imports determines food self-sufficiency at the national level.

Scores in the variables will be relativised, then added to give the value for the Index.

Tables ranking the 58 countries on the Index will be compiled. A table showing the countries with largest movements in the Index between sets will also be presented.

This methodology will be used to address the fourth research question.

1.5 Thesis structure

The iterative nature of the research tasks undertaken determined the structure of the thesis.

In this present chapter, the context of the research has been set, and the research questions and methodology outlined. Limitations of the study will complete this introductory chapter.

An historical background makes up the second chapter, which is followed by the literature review, Chapter Three.

Chapters Four through Nine describe the research tasks. Chapter Four covers the land withdrawal costing. Chapter Five presents the optimal land use distribution projections and comparative study. Chapter Six begins the livelihood framework analysis with an overview. Chapter Seven presents asset pentagons (Carney 1998; Ellis 2000) and the following chapter presents the other tasks in the livelihood framework analysis.

Chapter Nine presents the final research task, the Food Resilience Index and rankings.

Results and findings for all research tasks are presented in Chapter Ten, and a brief discussion of implications of the research, with conclusions and possible further study, completes the thesis.

A comprehensive set of appendices are provided. In particular, the raw data tables and technical notes (Appendix D) used to compile the asset pentagons in the livelihood framework analysis were too extensive to be included in the body of the thesis.

1.6 Study limitations

There are four major limitations to which attention needs to be drawn.

Data sets

Every effort was made to unearth quantitative data collections to provide the basis for the construction of the models which form the basis of this thesis. Where quantitative data could not be found, parameters and values were derived anecdotally. Often these anecdotal values were calculated from quantitative data, such as the ‘standard area of land’, derived
from agricultural census data, but with only a value found in a much older study of land in Tonga (Maude 1965) to provide some verification for the calculated value. Sometimes, as in the values for agricultural technologies used in the construction of asset pentagons, simple ten-point scales were utilised, based only the author's assumptions, reinforced tangentially by Sahlin (1972).

The reader should not, therefore, assume that the quantitative data presented aspires to a definitive level of accuracy. The intention in the thesis is to present models of the subsistence-based livelihood which provide an alternative measure to that presented by the models which dominate development thinking, which are highly speculative, yet treated as definitive. Where quantitative data are utilised, the best available data are chosen; where such data were not available, or did not exist, anecdotal data — best approximations, scales and calculated values — were pressed into service. Everywhere, however, they were used to assist in presenting models which challenged dominant ideas, which hoped to show that an alternative view may have some merit. It may also go some way towards explaining why the policies derived from dominant ideas often fail to achieve their goals, and sometimes do harm, as the environmental menace of introduced exotic flora and fauna in Vanuatu demonstrates.

The Vanuatu National Statistics Office data sets, particularly the housing and population censuses and agricultural censuses and surveys which have been utilised, contain inconsistencies, discontinuities and errors.

As noted earlier, the design and implementation of each census has been undertaken under the guidance of external consultants, each of whom has seen the need for refinements of methodology, or of differing emphasis.

The second mitigating aspect is that census enumerators are often drawn from tertiary institutions in and around Port Vila, and no effort is made to match language-speakers with their island communities. The significance of this is twofold. First, Bislama is used, which is something of a 'blunt instrument' as a language, often imprecise and unable to shade meaning. Second, people are less likely to answer frankly to outsiders, especially on culturally sensitive topics which may be 'tabu' to non-language speakers. Finally, as discussed earlier, there are the exigencies of transportation and weather and the cultural groups who refuse to participate in the activities of the state (Vanuatu National Statistics Office 1994 gives examples of all the above problems, also Vanuatu National Statistics Office 1989, Vanuatu National Statistics Office 1999).

Finally, the lack of reliable numbers on small business, which is measured only by self-disclosure as there are no taxation records or business registers kept on the 'informal' business sector, means that a significant amount of livelihood capital has not been accounted for. It is unlikely that this deficiency is amenable to improvement.

**Coarse graining**

The study deals with highly aggregated data: populations and livelihoods at international and national levels. This 'coarse graining' inevitably results in high levels of abstraction and imprecision in conceptualisation.

As an example, livelihoods have been classified as subsistence-plus or exchange. Livelihood is a continuum and the selection of two nodes has obscured the very high levels

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12See Glossary.
of differentiation which exist between households, and in the ways in which they conjure livelihood. Likewise, regional and island-level character is invisible at the coarse-grained national and international level, and much detail is lost.

This effect was strongly felt in the construction of a Food Resilience Index and ranking, particularly when climate components were measured. Large countries such as Australia, the United States, China and India have climates which range from sub-arctic to sub-tropical, with production diversities which 'disappeared' at the national level of aggregation. Only the dominant climate type was considered.

Volume of sponsored research and analysis

In undertaking studies in development, the researcher can easily be overwhelmed by the sheer volume of sponsored analysis and research undertaken for the international agencies by consultants. The lack of peer-review in the production of consultant's reports means that much of what can be read has to be taken on trust. As will be noted in this study, sometimes that trust can be naive.

The United Nations agency logo on the cover of a report seems only to ensure that the content analysis and conclusions will support UN initiatives and policies, rather than present something approaching verifiable 'fact'.

This problem is presently intractable. Should some independent verification, or review, be mandated for such productions, then they could be utilised with more certainty, but at the moment they cannot be trusted.

These deficiencies are discussed situationally as they occur through the thesis.

Innovative nature of the research tasks

Each of the four research tasks undertaken represents an innovation and each challenges the dominant understanding in the field.

The costing of land withdrawal from traditional use directly challenges methods of imputation of subsistence production, which are the dominant methodology. An opportunity cost valuation of traditional production systems in Papua New Guinea (Anderson 2006) and a food security analysis (Pollock 2002) provided some guidance, but the bulk of the work undertaken here has no precedent.

Projections, in this case of optimal land use distribution, are controversial, and not universally accepted in the literature. For the study, projections nonetheless provided the most effective way of illustrating the impact of land withdrawal. The use of a comparative study with the island of Tikopia was included to provide a control on the inferences drawn from the projection series. Again, the use of a controversial method, moderated by a comparative control, is not 'mainstream'.

Use of the livelihood framework analysis provided by the U.K. Department For International Development, in this case the version presented by Frank Ellis in his primer on the sustainable livelihood approach (Ellis 2000), is widely used and well-documented, but the use of access to resources as the unit of measure (percentage participation in resource exploitation, in effect) and the disconnection of wealth and livelihood has not been attempted, to the author's knowledge.
Finally, the development of an index to measure resilience to food insecurity, which also utilised access to resources as the unit of measure, has the effect of turning things upside down in a similar way to the Ecological Footprint, where countries which fare badly on the Human Development Index become the 'stars' of sustainability. The index presented in this thesis differs from the Ecological Footprint in that it avoids, as much as possible, normative measures, by grounding the index in a particular contextual background, that of the current crisis in global food security.

Contextualisation has the effect of limiting applicability. If, for example, the world food situation improves rapidly, then resilience to food insecurity will be much less important in assessing the development of nations. Conversely, the Human Development Index, the Ecological Footprint and International Poverty Lines all claim independence of contextual setting — development, poverty and ecological sustainability are the same in all situations, according to their authors at least.

Contextualisation is, it seems, also innovation!
Chapter 2

Vanuatu: Historical Background

2.1 Historical background

2.1.1 Beginnings

Vanuatu is an archipelago of 13 main, and 80 or more smaller, islands which emerged from the Pacific Ocean between one and two million years ago. Enright and Gosden (1996: 166) identify Vanuatu as the geologically youngest archipelago in the Western Pacific. The islands are volcanic, with hilly interiors and coastal coral shelves and platforms. They formed at the boundary of the Australia and Pacific tectonic plates, where the Pacific plate is being subducted. The archipelago still has six active volcanoes. Eruptions have necessitated evacuations on all volcanic islands, from time-to-time. On Ambrym, settlements on the northern part have been abandoned. Some Ambrymese from the village of Maat now live near Port Vila in the village of Mele-Maat on ground transferred to them under custom arrangements, granted to them by the chiefs of Mele.

Earthquakes are common, with the most recent destructive earthquake, as reported on by Shorten (2002), occurring near Port Vila in 2002. Earthquakes of Richter scale magnitude seven or higher are not uncommon. Two struck near Port Vila in 2009, but there was no loss of life.¹

The climate ranges from hot tropical, in the north, to temperate tropical in the southern islands. Throughout the archipelago, there are two seasons, the dry winter months from April to November, when the South East Trade Winds are the major weather feature, and the wet summer, from November to March, when tropical cyclones form, with one or two usually affecting some part of the group each season. The most recent destructive cyclone affecting Port Vila occurred in early 2004, stripping trees and destroying many cash crop gardens and leaving the market house almost empty for some months.

The biota of Vanuatu is less diverse and less rich than would be expected under MacArthur and Wilson’s (1967) normal distribution patterns, where closeness to source and physical size are the most reliable predictors for richness. Enright and Gosden (1996: 162) note

that for the Western Pacific islands, the biota originates in the Papuan-Malesian region. The young age of the Vanuatu islands is seen as the main contributing agent to this paucity of biodiversity. To illustrate this, Fiji, which is further to the East from the source region and comparable in island size, has some 1,600 species, while New Caledonia to the West has 3,100 species — Vanuatu has 1,344 species. (Siméoni 2009: 173)

![Image of Oceania and South-Western Pacific](image)

**Figure 2.1: Oceania and South-Western Pacific**

Enright and Gosden (1996) trace the recent history of the Western Pacific islands, which they characterise as having three major events, all connected with the most recent global glaciatic event. At glacial maximum, sea level was 150 metres below current levels, and the island vegetation was typical of temperate regions, which during the period of glacial retreat up till 10,000 years B.P. was replaced by typically tropical vegetation. In the period since 10,000 years B.P. the rise of sea level has caused a large reduction of land area throughout the region, with land area at 6,000 years B.P. being the smallest for 100,000 years (Enright and Gosden 1996: 178). Land area increase since that time has been largely due to coral platform growth. Significantly, it is not until the end of this period, less than 5,000 years B.P., that solid evidence for human habitation to the east of San Cristobel (in the Solomons) is found. Earlier settlement cannot be entirely ruled out, as evidence for any previous inhabitation would have likely been drowned by the rising waters, but the archaeological finds of human inhabitation which have become known as the Lapita cultural complex, are all more recent than 5,000 years B.P.

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2Identified by Enright and Gosden (1996: 162) as 'South east Asia and New Guinea'.

3Before Present. The date regarded as the mark for 'Present' is 1950.
2.1.2 Human settlement

The arrival of the first humans on Vanuatu, the so-called Lapita, was the third of the major events in the time following the most recent glacial maximum. In many of the islands there are two distinct stages of settlement. The first stage is one of coastal settlement, with high levels of exploitation of littoral resources. These settlements were often on offshore islets. Spriggs (1997: 85) noted that this initial period lasted only a few hundred years at most, often much less. The evidence, the pollen remains of the roots and tubers, and the skeletal remains of pig, dog, chicken and rat led investigators to the conclusion that the Lapita people came to the pristine environment not as hunters and gatherers, but as subsistence gardeners, who hunted and collected opportunistically rather than systematically (Kirch and Hunt 1997; Spriggs 1997; Bedford, Spriggs and Regenvanu 2006). If this is so then Vanuatu and the more easterly islands of the Western Pacific are unique in that their history of human habitation lacks a long phase of hunting and gathering before the advent of agriculture.

![Figure 2.2: Melanesia](image)

Further west, in the Solomons, the Bismarck Archipelago and Papua New Guinea, there is evidence for a long period (30,000 B.P. down to 4,500 B.P.) of hunting and gathering. Spriggs (1997) and O'Connell and Allen (2003) note that from about 10,000 B.P. there is evidence — the Eastern Highlands terraces in Papua New Guinea and the occurrence of cuscus on offshore locations — of the beginnings of agriculture. There is ongoing archaeological debate as to whether the Lapita agricultural system represents an innovation in livelihood (Spriggs 1997) or an incremental development (O'Connell and Allen 2003). Be that as it may, the Lapita settlements were primarily the settlements of subsistence
farmers, with their suite of plants: yam; taro; and banana, and their animal domesticates: pigs; chickens; and dogs. The Polynesian rat (*Rattus exulans*), arrived contemporaneously, either as an opportunistic companion traveller, or deliberately transported as a food source (Matisoo-Smith and Robins 2004), which it continues to be to the present day.

Linguistic historians have convincingly shown that the Lapita settlers were speakers of at least one of the many languages which form the Oceanic sub-branch of the Malayo-Polynesian branch of the Austronesian family of languages. These originated in mainland South or South-East Asia, spread through insular South Asia and thence to the Western Pacific (Bellwood, Fox and Tryon 1995; Pawley and Ross 1993: 434-436). Explanations for the development of an amazing multiplicity of languages — 113 in Vanuatu alone (Siméoni 2009: 216-217) — from what seems likely to have been a single language, or a small number of languages in the original settlers; range from insularity — islands as language laboratories — to trade complexity and warfare, with contact as a language-forming and changing mechanism. Whatever the mechanism may have been, in Melanesia there are many languages — as Table 2.1 shows.

**Table 2.1: Languages in Melanesia**

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of documented languages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papua New Guinea</td>
<td>841</td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>74</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>110</td>
</tr>
<tr>
<td>New Caledonia</td>
<td>40</td>
</tr>
<tr>
<td>Fiji</td>
<td>10</td>
</tr>
</tbody>
</table>

(http://www.ethnologue.com/country...index.asp?place=Pacific)

Language and culture are closely bound and linguistic richness is a good indicator of cultural richness and diversity. The growth of a large number of cultural traditions over time seems more likely to have been connected with insularity.\(^4\) Warfare as a driver seems unlikely because there is well-documented evidence for one series of invasions prior to the European contact period, but no others. Linguists again lead in providing the evidence of the Polynesian invasions of between 1000 and 500 years ago. The southern Vanuatu islands of Futuna and Aniwa speak Polynesian languages, as do the villagers of South East Efate, Mele, Pango and Eton in the south. These latter areas also follow a totemic grouping system which is not known elsewhere, generally referred to in Vanuatu as the Roi Mata tradition (Crowley 1987; Lynch and Crowley 2001). Polynesian language is also spoken on the island of Emae, in the Shepherds Group, just north of Efate (Siméoni 2009; Wilson, Ballard and Kalotiti 2007).

There is an absence from archaeology, linguistics or indeed the oral tradition, which played such an influential part in unearthing the Polynesian influence,\(^5\) of any other signs or vestiges of invasion or immigration, either before or after the Polynesian westward expansion. This absence of evidence for other human incursions supports the argument that there was little outside influence on the growth of large numbers of distinct cultural and

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4 In the island sense, not the pejorative form.

5 Garanger (1972), the French archaeologist, was able to find the site of a 400 year old mass burial, which included the presumed remains of Roi Mata, on the small inlet Arotok (Retoke, Eretoka or Hat Island are alternatives) in 1972, relying on the oral tradition of the islanders of the nearby Lelepa island. Their stories had been documented by French anthropologist Jean Guiart, from the 1950s to the early 1970s and passed on to Garanger.
language communities and that they grew from isolation, between, and as often within, islands. Internecine fighting may well have been the order of the day, but there is no evidence of the overwhelming of a number of different cultural groups by one single group or alliance.

It seems reasonable to infer that in Vanuatu there was, with the above exceptions noted, a long uninterrupted period of some 3,000 years of relative isolation of the Melanesian communities, during which time they continued the livelihood which they brought with them — subsistence agriculture — with little development or modification, other than the addition of crops and trees. The root crops, cassava (manioc) and sweet potato, were introduced and added to the group of staples, both native to continental America. The most plausible explanation for their presence is that cassava and sweet potato, along with papaya (pawpaw) arrived in the archipelago as a result of inter-island trade chains beginning in Indonesia or the Philippines and spreading eastward. The Spanish, with their presence in the Americas and in the Philippines are likely to have been the main node in the dispersal network. Other explanations have been offered, but those notwithstanding, ipso facto the plants must have arrived somehow, because they were there when the Europeans 'discovered' the islands of the archipelago. Interestingly, cassava and sweet potato are root crops, cultivated in the same way as yam and taro, vegetatively — from rootlings and not from seed. Their adoption required no new techniques or technology — neither did papaya, which grows like a weed in the islands and needs no skill in propagation. Furthermore, as Sardos (2008) points out, cassava and sweet potato fitted well into the crop rotation, often being planted into the holes left after yam and taro harvesting. The quietly conservative nature of Melanesian subsistence, where incremental changes occurred as minor adaptations of the familiar, was about to be rudely challenged.

The arrival of de Quiros, Cook, Bougainville and other European explorers was to introduce the latest and greatest shock to the archipelago and its indigenous people, one which continues to the present day.

2.1.3 European settlement and colonisation

The 'discovery' and 'naming' of the islands of the archipelago by de Quiros and Torres (1606), Bougainville (1768) and Cook (1774) and the initial contacts, particularly of the latter two, led in a short time to the first commercial contacts between the indigenous Melanesians and Europeans. Two products in particular, beche-de-mer and sandalwood, attracted interest. Both were highly prized in China, at a time when trade between China and Europe was growing strongly. Both goods are 'luxury goods' — sandalwood as the base for incense and sea slug for its aphrodisiac qualities (certainly not for its taste or appearance!) — and thus were attractive enough for the traders to accept the risks inherent in their collection (Campbell 1992; Siméoni 2009).

The next phase of trade was to be that of the Melanesians themselves. Campbell (1992) details labour migration (forced in some cases, but voluntary in others), mainly to the cotton fields and cane-fields of Queensland, but also to Fiji, Samoa and from 1864, to the nickel mines of New Caledonia. The trade continued until 1904, when the Australian Government outlawed it. Total numbers of Melanesians forced into the trade are uncertain, but the trade was, for the most part, in young men. The depopulation of young men by forced and voluntary migration was exacerbated by deaths due to introduced diseases but, as Jolly

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4It is worth trying to place this long period in context. In the same 3,000 years the Egyptian, Greek, Roman, Persian, Mongol, Inca and many other empires, including the British, rose and fell.
(1997) remarks, it is impossible to ascertain the exact levels of depopulation. There was no formal census of the population until 1967. Prior to that population estimates varied, with the British usually reporting higher population than the French. In 1951 the British estimate was 48,000, the French 41,782 (McArthur and Yaxley 1968). The population has grown at nearly 3 per cent since 1967, the first Census, and now nears 250,000, so the 1951 figure does suggest, by inference, that significant depopulation had occurred.

Christian missionaries arrived in 1839 and by 1860 the Presbyterian missionaries had a firm grip on the southern islands. Anglican missionaries worked in the northern islands under an agreement between the Presbyterian and Anglican churches arranged in 1881. Catholic missionaries, the Marists, arrived in the 1880s, as a gesture to French settlers, and gained footholds on the islands of Santo, Malekula and Efate. The Presbyterians were intolerant of indigenous culture, the Anglicans less so and the Marists tended to assimilate practices where possible (Siméoni 2009, MacClancy 2002). The success of the various missions is demonstrated today, as more than 90 per cent of the population declare themselves to be practising Christians (Vanuatu National Statistics Office 1999).

By the time of the Anglo-French Naval Accord of 1887, when the French and British began to formalise their colonisation, the two expatriate communities had divided — the French were the landholders and the British (or more accurately Australians) were in control of commerce. The Condominium agreement of 1906 settled the immediate future of the archipelago, with France and Britain jointly colonising and administrating the colony. For the indigenous Melanesians, few benefits flowed. They were without political or economic freedom, they were unable to obtain either French or British citizenship and much of their land was alienated. By 1930 expatriate land holdings were in the order of 611,028 hectares, about 50 per cent of the total land area of the archipelago. Siméoni (2009: 238) notes that a much lesser area (26,019 hectares) was actually under any cultivation. The worldwide Great Depression brought land acquisition to a halt. For the Melanesians who had lived on the coast, the missions and then the Condominium Government had wrought much change. They often lived on missions rather than their traditional lands, and were more under the influence of western mores and manners. For the indigenous people living on isolated islands, or in the inland areas, life changed little.

The 1939–45 World War has been credited with bringing revolutionary changes in Vanuatu. For the first time since European contact, some indigenous people saw black people (African-Americans), in positions of equality and in rare cases of authority over white people. When they were employed by the military, there was no discrimination on the basis of race in levels of wages — blacks were paid the same as whites. Much has been made of the impetus which the U.S occupation on Efate and Santo, with its high level of material wealth, gave to the various cargo cults. There were many manifestations of cargo cultism prior to the arrival of the more than 100,000 U.S. troops, but the visible and familiar aspects of the U.S. occupation are clearly echoed in the rituals of some adherents of the Jon Frum movement on Tanna, where adherents dress in quasi-U.S. military uniforms and parade with wooden ‘rifles’ in efforts to connect with supernatural beings.7

On 15 December, 1960, the United Nations General Assembly, at its 948th plenary meeting, passed Resolution 1541, which, in many words, contained an obligation on colonial powers to undertake political action to move their colonies towards forms of self-government, either by:

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7 Cargo cults and millenarian movements in Melanesia have had a strange attraction for scholars (see Lindstrom and White (1995), for a discussion of recent developments).
.. emergence as a sovereign independent state... free association with an independent state; or integration with an independent state

(UN General Assembly Resolution 1541, 1960).

In the Condominium of the New Hebrides, the British, in the late evening of their empire, were supportive of the move to decolonisation. Their partners, the French, were not. This lack of accord was to colour the actions and reactions of the colonial powers from this time until independence. In the mid-1960s a charismatic leader on the northern island of Santo (see Figure A.4), in partnership with a traditional land owner, began an agitation to halt the land disposal activities of the Société Française des Nouvelles-Ébrides, which had been assigned land on the Sarakata River close to Luganville (see Figure A.10), the main settlement on Santo, in two Condominium Court rulings in the 1950s (Tabani 2008: 335). The charismatic leader, Jimmy Moli Stevens, went on to lead a movement — the Nagriamel Movement — which played a considerable part in the Evelyn Waugh-esque\(^8\) birth of the republic of Vanuatu, mainly as the force behind the alternative secessionist state, the Republic of Vemera (Shears 1980; Beasant 1984).

While Stevens must take the major share of the blame for the later descent into the farce of the two republics and his eventual imprisonment, he was the first to tap into the deep resentment felt by the indigenous people at their dispossession by their colonial masters. Sadly for himself and for his movement, Stevens soon tied himself to French interests and left the political exploitation of the land rights issue to the emerging New Hebrides National Party, a party whose leaders were educated in the British system, and who were the products of Australian, New Zealand and English universities. In aligning himself with the French anti-independence cause, Stevens condemned himself to be a sidelight of the history of the republic (Shears 1980). Throughout the 1970s the re-named Vanua'aku Pati — the former New Hebrides National Party — led the struggle for land rights. Their success in exploiting the issue was demonstrated in the election of November 1979, where they gained a majority of 26 of the 39 seats, a majority of over 60 per cent, which gave them an additional capability — the power of amending the Constitution. This was the election immediately preceding Independence on 30 July, 1980.\(^9\)

### 2.1.4 Independence and beyond

From the beginning, things did not go as planned. The Republic of Vanuatu began life as one of two declared republics contending for rule of the former Condominium. The other contender was the republic of Vemera, headed by Stevens and based in Santo, but with some adherents on Tanna in the south. Stevens received financial support from the French, but no military assistance.

Father Walter Hadye Lini, an Anglican priest from the island of Pentecost, was Prime Minister of the Republic of Vanuatu and the leader of the Vanua'aku Pati. He was offered support in overcoming the insurrection by the Prime Minister of Papua New Guinea in the form of military troops, who duly landed on Santo and within a short time had arrested Stevens and quelled the rebellion.

Lini led a stable government until early 1990, when schism hit the Vanua'aku Pati. Since that time, a long series of fragile coalitions have more or less governed the country. These

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\(^8\)Waugh's *Black Mischief* (1932) is the basis of this reference.

\(^9\)The two best general history sources for Vanuatu are MacClancy (2002) and Lightner and Naupa (2005), both published by the Vanuatu Cultural Centre.
coalitions are not necessarily party-based. There have been a number of instances where parties have members in both the government and the opposition, and there are regular changes of party membership by sitting members (Hassall 2007; Forsyth 2007). The trend has been for new parties to form and for increasing numbers of independent candidates to contest elections, but overall, the political elite has been remarkably resilient, with most members having long-standing tenure.10

'Grasruts'11 ni-Vanuatu demand very little of their politicians and have little allegiance to the trappings of the 'state'. Parliament, the judiciary and law enforcement have considerable entertainment value but are not regarded as integral to daily life (Miles 1998).

Hassall (2007) calls attention to the inordinate amount of time spent by the Supreme Court adjudicating on purely political matters, and to the interference of law enforcement agencies in the political process, including kidnapping the President (1996) and attempting to arrest the Prime Minister (2004). Larmour (2001) expressed similar concerns, and Hassall (2007: 243), in speaking of constitutional review, suggested that 'any future review could well examine the suitability of a Westminster-style legislature and party systems to micro-states such as Vanuatu'.

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10Barak Sope, Serge Vohor, Maxime Carlot Korman and Donald Kalpokas, all ex-Prime Ministers, have served since Independence.
11See Glossary.
Chapter 3

Literature Review

Little benefit seems to have flowed to the people of the Pacific from the scholarly interest they have received over the past 200 or so years.

Harold Brookfield wrote (1972a: ix), when the Republic of Vanuatu was still the Condominium of the New Hebrides, that unless benefits flowed to the indigenous subjects of research 'the conduct of research is but an academic dimension of colonialism'.

Nearly 30 years later, Linda Tuhiiwai Smith (1999: 1) put the same idea more bluntly:

Research is probably one of the dirtiest words in the indigenous world's vocabulary.

The people of the Republic of Vanuatu continue to refer to expatriate\(^1\) men as 'masta' and women as 'missus'. This deference to expatriates has often been misunderstood as agreement, or accord.

So much of what has been imposed on the people of Vanuatu, and what has gone so badly awry, seems to have had this misunderstanding — lack of objection wrongly interpreted as agreement — at its heart.

If this study is to have some value, the problem of this misunderstanding must be resolved. There is a need to establish a basis for the claim that I, as (or despite being) an 'expatriate researcher',\(^2\) am able to articulate the views of 'grasruts' ni-Vanuatu on land and livelihood.

One thing is certain. In the struggle of ideas, attention is often drawn away from events — phenomena which indisputably occurred — towards how those phenomena may be viewed or explained. The nature of such explanations may affect how events are viewed over time, but do not alter the reality of the precipitating events themselves.

There are real events happening in Vanuatu and they are happening to real people. If the present study fails in its aims to present those real events in a way that makes sense to the people inside those events, it in no way invalidates the events themselves, or their consequences on and for the indigenous people of Vanuatu.

First, a theoretical standpoint must be found as a way of establishing the knowledge claim.

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\(^1\)Expatriate’ includes Europeans and Chinese, but not Vietnamese or Fijian Indians.

\(^2\)Brookfield (1972a).
3.1 Theoretical settings

3.1.1 Colonialism

The subjects of this case-study, land, livelihood and development in Vanuatu, must all be viewed through the prism of a colonial period. It is the colonial period in which the current dilemma for the people of Vanuatu — the extent to which they wish to be a part of the globalised world system — had its roots. It is there we begin.

Unfairness, injustice and oppression exist at all levels of human connections, from the personal through to the international. At the personal level, a uniformity of unfairness and oppression is rare and power oscillates between partners as context changes. One partner may have more physical power, the other more aggression; one may have skills the other lacks. When one moves to consider aggregations of humans — the family, the kinship group, the community, the region and so on up the scale to the ultimate aggregation, humanity — power seems to become concentrated at one end of the pendulum. In world history, the growth in scientific, economic and military power of the nation states of Europe from the Enlightenment onwards, led them to empire-building and domination on a scale which eventually engulfed the globe entirely.

Margaret Kohn (2011) distinguishes colonialism from imperialism, through their linguistic roots. Colonialism, in practice, is the permanent transfer of population to a new territory, where their allegiance remains with their country of origin. Imperialism, on the other hand, is command — the exercise of power, 'whether through settlement, sovereignty, or indirect means' (Kohn, 2011: 1). European colonialism was problematical to contemporary western moral philosophy because of its denial of justice and natural law, and it had to be legitimised for the European nations as a 'civilising mission'. For 'uncivilised' peoples to progress to 'civilisation' they had to undergo a temporary subjection to the will of the coloniser (the civilised).

This 'mission' was underpinned by the stadal theory of development, most associated with Adam Smith and the Scottish Enlightenment, wherein societies were posited to develop in four fixed stages (Reid 1989 acknowledges Montesquieu and Turgot's theoretical contributions, along with Smith). These were subsistence hunting and gathering, through subsistence agriculture and pastoralism, to the labour specialisation and social stratification of cities, until finally the advanced stage, 'commercial society' (Reid 1989: 59) with international trade, is reached.

The world has moved on since the Enlightenment and the stadal theory may be in need of an update, but nevertheless:

It was the changing modes of utilising natural resources for acquiring material sustenance and comfort which constituted the heart of stadal theorising

(Wolloch 2011: 253).

Recent archaeological evidence has demonstrated the error in the stadal approach, with studies indicating that adversity, not increasing sophistication, was the motive force behind livelihood innovation (Simmons 2007). Nevertheless, it represented a sufficiently convincing argument for colonisation for most, and masked other, less worthy and demonstrably more powerful motivations. Kohn notes the conflict between theory and practice in the Americas:
Some of the Spanish missionaries sent to the New World, however, noticed that the brutal exploitation of slave labor was widespread while any serious commitment to religious instruction was absent (Kohn 2011: 5).

In lock step with the 'civilising mission' went the 'religious mission', which also required a moral justification. Thomist rectitude about Church interference with natural law, as expounded by Pope Innocent IV (1243-1254), presented no obstacle to Spanish conquest in the Americas. Nakedness and cannibalism, in Williams (1990) view, were deemed sufficient by the conquistadors to extinguish the protection of natural law.

Over time, the incongruity between development theory and the practice of colonialism should possibly have prompted an adjustment to the theoretical basis of conquest, but nearing the end of the colonial period, the theory, in slightly different guise, remained current.

Norbert Elias, in his 1956 essay, 'Problems of Involvement and Detachment' introduced a doppelganger of the argument, in proposing that only in societies where levels of detachment in examining the processes of nature were practised, could nature be exploited to improve society. He noted the 'involved and emotive thinking about nature' (1956: 229) which characterised less advanced societies:

.. thus in falling ill one may find one's thoughts stray again and again to the question: 'Who is to blame for this?'

(Elias 1956: 230)

Elias contrasted such sentiments with the detached methods of natural science, which gave 'greater control over natural phenomena'(1956: 231).

Colonialism was, at its most basic level, less moral than the 'civilising mission' would suggest (Kohn 2011: 5), and less 'detached' in its assumption of superiority than Elias would have liked (Woloch 2011: 249-50). Nevertheless, it achieved a somewhat bizarre success in matters of religion (where the former colonies now boast more adherents than their former colonial masters), and occasionally, in the establishment of commercially-based ex-colonial societies such as Australia, the United States and Brazil (predicated on the decimation and disenfranchisement of the indigenous population).

Before arriving at a decision as to whether the theoretical basis of colonialism provides any insights into how western scholars may claim to understand 'the other' (Said 1989: 213), Harold Brookfield's meta-model of colonial states deserves examination.

Colonialism was, as he put it:

.. a thorough-going, comprehensive and deliberate penetration of a local or 'residential' system by the agents of an external system who aim to restructure the patterns of organisation, resource use, circulation and outlook so as to bring these into a linked relationship with their own system

(Brookfield 1972a: 2).

On the reaction of the colonised to those agents of the 'external system', he cautions against setting too much store in apparent acquiescence:

\[\text{Thomas Aquinas (1225-1274).}\]
The reaction to colonialism will almost never be equal and may not even be opposite. But it is important to realise that there is a reaction at all times and in all places. It is an error to conceive of the colonised residentary system as simply the passive recipient of external innovation

(Brookfield 1972a: 2).

Brookfield proposed a developmental chronology of colonialism, seen below. His sequence owes some debt to dependency theory, as defined by Cardoso and Faletto in translation in Packenham (1982) and by Halperin-Donghi (1982); and to world system analysis (Wallerstein 1979; Chase-Dunn 1982), neither of which have great relevance when the working people involved are subsistence agriculturalists. Nevertheless, Brookfield's (1972a) model enables us to traverse the colonial period to what has followed.

- **early phase**
  - penetration of the residentary complex
  - establishment of basic structure of the invading system
  - external political control usually achieved

- **high colonial phase**
  - major transformation of the residentary complex under dominance of external agencies
  - dualism emerges strongly
  - empire is seen as semi-permanent condition

- **late colonial phase**
  - weakening expansionist will
  - rising up of the residentary complex (freedom movements)
  - growth of the public sector
  - political independence usually occurs
  - a true post-colonial phase can hardly be recognised

While this model is not Pacific-specific, congruences with the history of Vanuatu[^4] are easy to find in this chronology and Brookfield was in and around the Condominium in the late 1960s and early 1970s (Brookfield and Brown-Glick 1969; Brookfield, Brown-Glick and Hart 1969).

As an independent republic, Vanuatu continues to have high levels of adherence to Christianity, but shows little evidence of a wholesale shift to a commercially-based, internationally connected economy, or to an integrated political democracy. Almost 80 per cent of the population continue to live in rural areas, in traditional societies with livelihoods based on subsistence gardening, and with tenuous links to the political centre. The 'religious mission' of colonialism, here at least, seems to have largely succeeded — people have been convinced. Had the 'civilising mission' been equally successful, it is likely that this study would have no subject. Vanuatu would be an internationally-trading, market-based economy, with commercial agriculture, and fully integrated markets in labour and land. But it is not!

[^4]: See previous chapter.
Clearly, not all the people are convinced.

Had the colonial period not occurred, the islands of Vanuatu would have continued their subsistence gardening livelihoods, their atomised social and cultural groupings and their animistic beliefs. One might imagine that the withdrawal of the colonials would have prompted a return to that state, but that has not been the case either, and nowhere in the post-colonial world is such a wholesale reversion, to the state of things before European contact, evident.5

This presents a puzzle, for while the theoretical justifications for colonialism did not prevail entirely, some former subjects were convinced. What has ensued is a state of limbo, between the old and the new (Bhabha 1994; James 2006; Connell and Waddell 2007). To understand this limbo and demonstrate that we may claim an understanding of other's ways of knowing we need to look beyond the stadial theory of development and the 'civilising mission'.

What might shed light on the nature of this 'betwixt and between' state in the ex-colonial world, and of its persistence?

Postcolonialism

It is the frustration with the 'betwixt and between' which permeates Edward Said's post-Independence trite
tesse.

To have been colonized [sic] was a fate with lasting, indeed grotesquely unfair results, especially after national independence had been achieved. Poverty, dependency, underdevelopment, various pathologies of power and corruption, plus of course notable achievements in war, literacy, economic development: this mix of characteristics designated the colonized people who had freed themselves on one level but who remained victims of their past on another

(Said 1989: 207).

Said finds his answer to the post-Independence state of things in the pre-colonial period, where the basis of the legitimacy claims of the western colonisers lay in a complex set of impressions of superiority. The Orient was despotic, corrupt, morally indigent and incapable of being 'useful in the modern world' without the beneficial aid of 'powerful and up to date empires' (Said 1978: 31-35).

His judgement is that such views have changed little, post-Independence, and he worries that he finds so little to offer in the way of solutions to the dilemma.

Is this book an argument only against something, and not for something positive?

(Said 1978: 325)

In the end, Said is forced to content himself with a Pyrrhonic6 victory over western hegemony, a hope that he has raised awareness of systematic bias.

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5The two instances where such attempts were made, Mao’s 'Great Leap Forward' and Pol Pot's Ludlute de-urbanisation fantasies were not driven by desire for reversion to subsistence, but by ideas of ideological purification.

6Pyrrho was the founder of scepticism, who claimed that happiness lay in suspension of judgement. Pyrrhic victories are named after Pyrrhus, King of Epirus, according to Plutarch.
If the knowledge of Orientalism has any meaning, it is in being a reminder of the seductive degradation of knowledge, of any knowledge, anywhere, at any time

(Said 1978: 328).

Said seems short on remedy for the postcolonial malaise, and while attention should be drawn to the seductive degradation of knowledge, others have been less patient with intellectual postcoloniality. Leela Gandhi notes that:

Anti-postcolonial criticism repeatedly foregrounds the irresolvable dichotomy between the woolly deconstructive predicament of those whose lives are literally and physically on the margins of the metropolis

(Gandhi 1998: 56).

In former colonies, a continuation of political pluralism and economic dualism favoured those who were integrated into the operations of the colonial state. Post-Independence, it is they who operate the legacy elements of the colonial period. These local 'elites' — those who were largely educated in the metropolitan state, and who may have spent some time there — were those who led the struggles for independence, and were those who took advantage of the 'public sector growth' noted by Brookfield. For them, the dualist-pluralist 'hybrid' nature of the post-independence state offered considerable opportunity for obtaining levels of prestige unobtainable before, but only within the confines of a market and exchange-based economy. Such has certainly been the case in Vanuatu, where the political and governmental élite live out a fetishist parody of western political and economic life, largely funded by development aid (Wittersheim 1998; Hassall and Tipu 2008; Hassall 2007).

In Vanuatu and elsewhere, the élite enclave state is often assumed by those who supply the development aid and other outside agents to be the entirety of the state (Larmour 2005). This view effectively excludes not only the rural population, largely dismissed as 'subsistence farmers', but also, as will be argued in this study, urban and peri-urban households who are not fully integrated into the enclave state and are, in their turn, summarily dismissed as 'informal settlers', or 'shanty town' dwellers.

Subaltern Studies scholars claimed to redress that imbalance. Ranjit Guha, the editor of the first volumes of Subaltern Studies, claimed from the outset that subaltern studies aimed to:

.. rectify the elitist bias characteristic of much research and academic work

(Guha 1982: vii).

He further argued that subalterns had acted, in history:

.. on their own, that is, independently of the élite

(Guha 1982: 3-4).

Beasant (1984) outlines a number of 'grassroots' movements in Vanuatu which conform to these 'subaltern' specifications, culminating in the 'Nagriamel' movement, which agitated for the return of alienated lands, under the leadership of Chief Buluk 7 and Jimmy Stevens, a bulldozer driver of mixed Scottish and Tongan blood (see previous p. 23).

7 Bulama = bullock.
As Gyan Prakash and others (Mallon 1994; Spivak 1985) have noted, the bright beginnings of the Subaltern movement were subsequently dimmed, as the initial interest in the subalterns themselves was lost, and:

.. the desire to recover the subaltern subject became increasingly entangled in the analysis of how subalternity was constituted by dominant discourses.

(Prakash 1994: 1480)

Effectively, the subaltern was again silenced, this time by those who claimed the subaltern interests as their own (Spivak 1985).\(^8\)

Whatever the nature of subalternity may be, what I am claiming is — and I believe that it is in accord with the principles outlined by Guha — that three years of conversation with ‘grasuts’ ni-Vanuatu enables me to claim with some confidence that when they told me that subsistence gardening and village life were good and valuable things, the ‘voice’ I heard was theirs; and that I understood what they were telling me.

It is a claim to be able to ‘rectify the elitist bias’ of much scholarship and policy development in Vanuatu, Melanesia and beyond, which is permeated by the misunderstanding of lack of objection and its interpretation as agreement.

Much development policy suffers from the misunderstanding as does much of what tends to be lumped together in the term ‘neo-colonialism’ (see MacLellan 2003). These two, development policy and neo-colonialism, will be discussed within specific contexts, but they bear only a little on the theoretical basis of the study.

### 3.1.2 Standpoint theories

Sandra Harding espoused standpoint theories as a means of bridging the theoretical divide between logical positivism and cultural relativism, the rift between the absolutism of one correct view and the postmodernism of many undifferentiated but equally correct views. She had a number of pertinent things to say about the epistemological contortions of western scientific research:

> The institutionalized [sic], normalized politics of male supremacy, class exploitation, racism, and imperialism... ‘depoliticize’ Western scientific institutions and practices, thereby shaping our images of the natural and social worlds and legitimating past and future exploitative public policies. In contrast to ‘intrusive politics’, this kind of institutional politics does not force itself into a preexisting ‘pure’ social order and its sciences; it already structures both... In this second case (institutional politics), the neutrality ideal provides no resistance to the production of systematically distorted results of research. Even worse, it defends and legitimates the institutions and practices through which the distortions and their exploitative consequences are generated

(Harding 1992: 568).

In this passage, Harding takes issue with the scientific ideal of ‘neutralism’. Here, I take her use of the term ‘depoliticise [sic]’ to mean that certain highly contestable notions — male supremacy, class exploitation, imperialism among them — because they are institutionalised, and thus normalised, structure the nature of scientific thinking. Within such

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\(^8\)My interpretation of Spivak’s conclusion that ‘the subaltern cannot speak’ (1985: 184) is that it is identical in sentiment with Prakash, quoted above.
a societal framework, it becomes difficult for ideas which challenge prevailing knowledge to gain acceptance. Equally, it becomes difficult for those on the inside to recognise the shaping of their own experience and knowledge.

Within such a paradigm, she argues, to defer is tantamount to agreeing, because there is no recognised reality external to the paradigm. To disagree is also futile, because within the paradigm, there is no justifiable, but opposing, view. It is simply rebellion against the status quo.

Harding is particularly concerned with the difficulties presented by the binary opposition of what she names as epistemological absolutism — where there is only one reality; and epistemological relativism — where there are as many realities as may be necessary, but none is more worthy than any other, and they cannot be meaningfully ranked. Relativism, in this sense, condemns the ideas of the alienated and the powerless forever to the underclass of ideas. Harding argues that rejection of epistemological absolutism does not mean that epistemological relativism must be embraced (1992: 579). She offers a third way — the idea of 'strong objectivity', wherein the formulation of ideas for research should come from 'outside the box', so to speak:

Standpoint theories argue that if one wants to detect the values and interests that structure scientific institutions, practices, and conceptual schemes, it is useless to frame one's research questions or to pursue them only within the priorities of these institutions, practices, and conceptual schemes. One must start from outside them to gain a causal, critical view of them. One important way to do so is to start thought from marginal lives.

(Harding 1992: 580-81)

This then is the intent of this study — 'to start thought from marginal lives'.

In particular, the 'marginal lives' where thought commences in this study will be those of rural and proletarian” ni-Vanuatu whose ideas on land use, livelihood and changes in land use in Vanuatu are very different from those views which currently hold sway in development aid circles.

In order to 'start thought', the phenomenon which precipitated this study — large-scale retirements of agricultural land into expatriate leasehold — will not be viewed as a problem which can be solved by strengthening institutional and legal arrangements for the orderly transfer of land. There are already enough supporters of the 'problem' view: AusAID, the World Bank and the United Nations; all are currently supporting projects to bring about 'orderly' land transfer arrangements.10 It is the view from a position of dominance, a view which derives from an 'essentialist' position — one in which those whose view has been 'shaped by their own experience', as Harding puts it — see land as a commodity; a factor of production which can be bought and sold.

On the contrary, the ni-Vanuatu view of land and livelihood will be privileged in this study. Their view is that access to land is vital to the livelihoods of rural people, who continue to practise subsistence gardening and to enjoy the fruits of the forest and the shore. For them, the 'orderly' transfer of land is a problem which may jeopardise their livelihoods and those of their children.

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9 See Glossary.

In this study, the core understanding is that dominant western ways of thinking about development must be challenged, for two reasons. First, because they echo the 'neutrality ideal' with which Harding takes issue, in that development follows one path, and one path only. The destination of that path is industrialised, urbanised and globalised market-economy materialism. Second, outcomes of this way of thinking are so often harmful to the intended beneficiaries, and the 'answers' are so often wrong.

Harding seems to liken the structure of western hegemonic thinking to a tree. The roots are 'male supremacy, class exploitation, racism and imperialism'. The tree which grows from these roots—branches, leaves, flowers or fruit — cannot escape the consequences of growing from those roots. The tree is bound to the roots, and the genus of the tree cannot be other than the genus of its rootstock.

What this study is attempting, perhaps to extend the tree metaphor past its limitations, is to graft the branches, leaves, flowers and fruit of western thinking onto untainted rootstock — 'grasruts' ni-Vanuatu knowledge.

3.2 Land

Ralph Regenvanu, Vanuatu Member of Parliament and Director of the Vanuatu Cultural Council spelled out the Melanesian view recently in an address to the Lowy Institute Conference 'The Pacific Islands and the World: The Global Economic Crisis', in Brisbane:

There are many important benefits that Vanuatu gains from the strength of its traditional economy. One of the most important is that everyone has access to land on which to make gardens for food, from which to access materials to make homes and from which otherwise to make a living. The traditional concept of the right to use land which is not your own to make food gardens and access resources means that individuals or families who do not have access to their own customary land (or enough of it) to meet their needs can be given the right to use other families’ land, with 'rent' or 'use rights' being paid for using the products of the land

(Regenvanu, 2009: 2).

This is a recent reiteration of the theme that unfettered rights of usufruct are a central social premise in Pacific societies, an idea which has been widely affirmed in anthropological studies and reviews (Jolly 1997; Crocombe 1971; Rodman 1995; Lea 1996). These rights fall into two main categories. Garden land tenure confers exclusive rights to the production of that land. In other words, the household which makes and tends the garden has an exclusive right to the fruits of its production, limited only by reciprocity claims and considerations. This exclusive right extends to planted trees, for which the planter has exclusive rights to the fruits and other products, wherever the tree may be. The second category of usufruct is that of access to the natural resources of the land and the sea. Natural resource economists identify the fruits of land and sea as 'impure public goods', in that they are freely available to all, but each person's enjoyment of the right impinges on other's enjoyment (Sterner 2003; Field 2001). This impingement has two parameters, population levels and land availability. As more people utilise the resource, its utility to each user declines. This reduction in utility also occurs with diminishing land availability.
Where land is held in customary tenure, both categories of rights of usufruct are secure, and limited only by population levels.

When land is withdrawn from customary tenure, in the case of Vanuatu by transfer to expatriate leasehold, but by whatever means, Sterner's (2003) 'impure public good' is diminished in utility, above and beyond that caused by population levels.

It does not necessarily follow that expatriate leasehold must reduce the usufruct utility, but the differing notions of land and ownership of indigenous people on the one hand and expatriates on the other almost guarantee that this will be the case.

**Differing notions of land ownership**

It is not the purpose of this study to extensively explore indigenous cosmological belief systems in land, but those systems cannot be completely ignored, as they have been universally recognised as 'different' from the predominant western view of land as commodity.

Recognition of that difference in the United States (1823), Canada (1888) and New Zealand (1847) took a legal form, with the judgements of Chief Justice John Marshall in the U.S. Supreme Court recognising that there were traditional rights to land, and that those rights 'survived the act of colonisation' (Keon-Cohen 2000). Somewhat belatedly, the International Court of Justice followed the same precedent for a number of African states in 1975, and much later again, the High Court of Australia followed suit in 1992, the so-called Mabo decision, in which the High Court found in favour of the Meriam people of Murray Island.\(^{11}\)

Critically, the High Court of Australia judged that:

> The Meriam people are entitled as against the whole world to possession, occupation, use and enjoyment of the lands of the Murray Islands


The Court could have found for individual land claimants, but chose to vest the traditional ownership in the community as a whole.

Shanahan (1995) notes the comments of Justice Brennan of the High Court:

> The fact that individual members of the community, like the individual plaintiff, Aboriginals in Milirrpum, enjoy only usufructuary rights that are not proprietary in nature is no impediment to the recognition of a proprietary community title


Shanahan found that the difficulties presented in translating the reality of a common law community entitlement into statutory law in the Commonwealth of Australia and the States were resolved to the detriment of the community entitlement and in favour of individual entitlements in land.

Lea (1996:1-2) presents a similar picture of Melanesian societies, but from a social perspective, where ideas of 'individual' rights so familiar to western individualism are not found, and communal interests are paramount. Land forms part of these communal interests, and there is no separation of the people and their land — no subject-object duality.

\(^{11}\)The people of the Torres Strait Islands, and particularly the Meriam people of Murray Island (Mer), claim Melanesian heritage and follow Melanesian subsistence gardening practices.
Raymond Firth (1957) first detailed this interconnectedness of land and people. The word 'tikopia' referred equally to the land and the people of Tikopia — the land was Tikopia, the people were Tikopia.

Nari (2000) explores this interconnectedness for ni-Vanuatu generally and Jolly notes that for the Sa people of Pentecost (Vanuatu):

Land is thought to be the pre-condition of human culture, indeed the human inhabitants merge with the earth in some sense. Thus like children, land is not so much owned as part of ones human substance

(Jolly 1997: 59).

In other words, there is no separation into subject and object, no commodity relation between people and things. She further notes how these ideas were changed, or modified in some way at least, by colonial contact:

.. such articulations of persons and things are not only basic to an understanding of customary relations between men and women but to the novel relations constituted by colonialism and the increased import of the capitalist logic of object and subject

(Jolly 1997: 54).

These 'novel relations' are treated more expansively by Rodman (1987) in a study of the impact of copra production on customary land arrangements. Rodman notes the tendency for powerful people to manipulate notions of custom — to change custom to suit their own purposes. This is a particular case of the concept of 'invented tradition' (see Hobshamn's introduction in Hobshamn and Ranger 1992; Ward and Kingdon 1995:13-15), which has some anthropological weight, but is misleading. It presupposes that people in non-literate societies who invoke tradition, envisage a past 'golden age', where custom was immutable. Such is unlikely to be the case. Any set of rules, taboos and entitlements in non-literate society can be legitimated only by a consensus of the people who claim and share the traditions. Such 'tradition' is, and has always been, ephemeral, and contingent on community consensus. The 'Mabo' decision of the High Court of Australia in its 1992 judgement, by vesting title in the community and not individuals, recognised the fluidity of community consensus and the need for the particularities of any community member's claim to be settled under the guidance of that community consensus. This is a de facto recognition of the nature of a system of social regulation where rules are not written down, but are carried by the collective consciousness of the community.

Nevertheless, the ephemeral nature of tradition is vulnerable in the face of written law and regulation, and that is precisely what the colonisers of the Vanuatu archipelago brought with them.

During the colonial period, land alienation, duly documented and recorded, if not always surveyed, took place on a massive scale, as it did elsewhere in the Pacific.

At Independence, in an attempt to recapture the past, the Constitution of the Republic of Vanuatu defined the land tenure system in such a way as to reflect its non-literate origins.

Articles 73, 74 and 75 state:

73. Land belongs to custom owners
All land in the Republic of Vanuatu belongs to the indigenous custom owners and their descendants.
74. Basis of ownership and use
The rules of custom shall form the basis of ownership and use of land in the Republic of Vanuatu.

75. Perpetual ownership
Only indigenous citizens of the Republic of Vanuatu who have acquired their land in accordance with a recognised system of land tenure shall have perpetual ownership of their land.

(Constitution of the Republic of Vanuatu, 1980)

Since Independence, there has been no further alienation of land, and all formerly alienated lands are now nominally held in leasehold, under arrangements made for the orderly return of those alienated lands to customary land tenure (Regenvanu, Sethy (2004) outlines the transitional nature of the arrangements). One might be led to think that the Constitution has been an effective means of restoring the pre-existing land tenure system by extinguishing colonial land alienation, but such is not the reality. Farran (2002); Forsyth (2007); Regenvanu (2008); Jowitt (2004) and Hardy-Pickering (1997) all point to the impossibility of determining 'ownership' within the written legal framework. Of the plethora of land dispute determinations between 1983 and 2001 by local Island Courts,12 which operated at the community level, but under rules of legalistic determination and not of community consensus, 100 per cent were appealed to the Supreme Court of Vanuatu.

Once written law and the tiered legal system is in place, and community consensus is no longer the determinant of rights in land, the regulation of traditional land tenure becomes unworkable. Forum-shopping leads inevitably to the highest court, the Supreme Court of Vanuatu, which itself is incapable of determining to a reasonable standard of legal proof who may have rights in land, relying as it does on oral histories, sometimes backed by missionary accounts, all of which are 'hearsay'.

Patrick Ellum, a ni-Vanuatu lawyer, summed up the problem:

... custom ownership is an impossible concept for ... any Court to adjudicate with certainty

(Crocombe 1995: 31).

To add to the difficulties, oral traditions are vernacular language traditions. There are more than 100 language communities in Vanuatu, and many refuse to translate vernacular traditional stories, for fear of weakening their power, or of unwittingly giving others power over them (elsewhere noted, at p. 254). The Supreme Court records judgements and hears evidence in Bislama primarily, or sometimes French or English, but never in vernacular languages (Forsyth 2007).

Small wonder then that there has been a constant stream of legislation emanating from the Vanuatu Parliament, all aimed at introducing some certainty into land tenure arrangements:

• Alienated Land Act 1982
• Land Leases Act 1983
• Land Leases (Amendment) Act of 2003
• Land Leases (Amendment) Act of 2004

12 Article 78(2) of the Constitution charged the Government with arranging for institutions to resolve land disputes. Island courts were the means chosen (Evans, Goddard and Patterson 2011).
• Land Acquisition Act 1992
• Land Reform (Amendment) Acts 1992 and 2000
• Urban Lands Act 1993
• Freehold Titles Act 1994
• Strata Titles Act 2000

Ostensibly, these pieces of legislation were designed to benefit ni-Vanuatu traditional land owners, but where they have been of any benefit, that 'benefit' has most often accrued to expatriates seeking to lease land.

Land leasing, which was originally a device for transition of formerly alienated land back to customary tenure, but which has become standard practice for transferring rights in land, is viewed by those same expatriates as de facto ownership, a view encouraged by local real estate agents (Slatter 2006: 8). This view of leasehold as ownership assumes a right to 'exclude' others.\(^{13}\) Barbed wire fencing surrounds many leases, sometimes supplemented by dogs and occasionally by signage invoking some bastardised form of 'tabu'.\(^{14}\)

As a consequence of this practice of exclusion, ill will has grown on both sides. Ni-Vanuatu seek to continue to enjoy the fruits of the forest and shore, and expatriates seek to apply the laws of trespass.

The Vanuatu Constitution (79: 2(c)) notes that government consent to any lease cannot be given if it is prejudicial to the interests of 'the community in whose locality the land is situated', and at the 2006 National Land Summit, it was resolved that 'there must be public access to the sea, and to inland waters' (Lunay et al. 2007: attachment 1: 4).

To sum up, there is a written encoding (the Constitution) of a non-literate, consensually upheld land tenure system (custom ownership), which has led to the situation where customary ownership can only be determined by a legal proof. That legal proof rests on a decision between conflicting oral traditions and genealogies, or on third-party accounts of what community consensus may have been at European contact ('hearsay'). Expatriate leaseholders, who acquire rights in land by an instrument which was initially intended as a transitional measure for returning alienated land to customary ownership, now consider that they exercise a form of ownership, carrying with it the right to exclude others from the land.

To this complexity, another dimension can be added — the 'development' notion of transitional economies, wherein economies which were formerly subsistence-based, are assumed to now be in transition to commercial modernity. The price which must be paid, according to many if not all development aid donors, is that uncertain community-based land tenure systems must be converted to systems where tenure is more certain, so that development can occur (Larmour 2005 provides a Melanesian overview).

This idea can best be illustrated by the following examples, taken from 'Making Land Work', AusAID’s current position document on Pacific land issues:

> The central thesis of this report is that making land work means developing


\(^{14}\)‘Tabu’ signs, which generally warn of the dire consequences of trespass are written in Bislama. Ni-Vanuatu are educated in either English or French, but not Bislama. If someone can read, they can read either French or English. If they can’t read, the sign may as well be written in Esperanto!
mechanisms to link customary land systems to the formal legal and economic systems of the modern nation state

(AusAID 2008: 2).

In such a discourse, the complexities of traditional systems of land tenure become an impediment to the transition process:

For customary landowners and for countries as a whole, the potential social and economic benefits of making more land available for development are enormous

(AusAID 2008: 1).

It is not spelled out in the AusAID document, but the inference can hardly be avoided, that if land is to be available for development, then households currently using that land will be required to vacate that land and subsequently seek a different means of livelihood, because subsistence-based livelihoods cannot be followed without access to land and natural resources.

For this study, land assumes importance because of its nexus with livelihood, and the socio-cultural or legal aspects of land tenure systems are of minor concern. The connection of land and livelihood will be explored to test statements such as 'the potential social and economic benefits of making more land available for development are enormous', against the reality of the effects of land withdrawal, and of the potential for loss of livelihood.

3.3 Livelihoods

The study of subsistence-based livelihood systems is generally seen as forming part of the field of economic anthropology, because subsistence-based livelihoods were seen to be practised mostly by indigenous cultural groups, and generally regarded as exotic, anachronistic and archaic, at least until post-structuralist scholars pointed out that such a view could be construed as racist and epistemologically inadequate.

3.3.1 Economic anthropology — Exchange and Production

Melville Herskovits is given credit with naming the field of economic anthropology, in his 1940 re-release of a work first entitled 'The Economic Life of Primitive Peoples', and renamed 'Economic Anthropology' for the re-release.

Raymond Firth subsequently mapped the boundaries in his 1951 lecture, 'The Social Framework of Economic Organization'. Firth noted that interest in economic structures arose from the recognition by anthropologists that many social relations had economic aspects. Firth was particularly concerned that the application of economic principles needed to be undertaken with care:

The principles of economics which are truly general or universal in their application are few. Most of those which purport to be general have been constructed within the framework of ideas of an industrial, capitalist system

(Firth 1961: 122).

He then moves to a definition of the field of economic anthropology itself:
If, then, economics deals with the principles of the use of resources in general, economic anthropology deals with the concomitant social relations, the specific ways in which the principles are exemplified in a range of given social situations

(Firth 1961: 131).

He concludes by reiterating the difference between economics and anthropology:

The economist is apt to think of the social framework as consisting mainly of the controls exercised by law — e.g., in regard to the holding of property, in minimization [sic] of force or fraud. The anthropologist thinks of this framework as essentially one of values giving meaning to the economic system

(Firth 1961: 154).

Firth's unease at the marriage of economics and anthropology goes to the heart of the intellectual conflict which has bedevilled the field — the substantivist-formalist debate.

This debate was triggered by the writings of Karl Polanyi. Polanyi developed a considerable set of ideas, drawn from his major formulation — that industrialised market economies are an historically recent phenomenon — and that the principles developed from a study of those systems, generalised as 'classical' economics, cannot be applied to other economic systems. Polanyi described three major systems of exchange — reciprocity, redistribution and market-based exchange — one of which would be dominant in any economy; which would 'integrate' the economy. Reciprocity is most often linked to subsistence-based societies, redistribution most often seen historically in entrenched monarchy, and presently in social-democratic 'welfare state' systems, or alternatively in centralised economics, where power structures determine entitlements, rather than market-based exchange (Polanyi 2001, 1977; Dalton 1971).

Polanyi's attacks drew a spirited response. Scott Cook (1966) is credited by Manning Nash (1967) with providing the definitive rebuttal from the classical school. Nash, however, went on to remark that:

Social science being the sort of enterprise it is, however, it is virtually impossible to down a poor, useless, or obfuscating hypothesis, and I expect that the next generation of creators of high-level confusion will resurrect, in one guise or another, the substantive view of the economy

(Nash 1967: 250)

This point has been borne out, as Polanyi is again in vogue. The failings of neoliberalism in the global financial crisis of 2008-9, and the warning signs which preceded it, have triggered a re-examination of Polanyi's rich mine of theorising.

Susana Narotzky, writing in 2008, returns to the familiar theme (see also Dowsley 2010):

Alternative ways of thinking about the economy and about the making of "value" are increasingly central in the debates of social anthropology but also of other social sciences

(Narotzky 2008: 11).

Despite their polar opposition, the substantivists and formalists were both interested in systems of exchange. This study is more concerned with the economics of production, and less so with exchange. This enables us to put the substantivist-formalist debate to one side and concentrate on production.
3.3.2 Theories of subsistence-based livelihoods

While the term 'peasant' has been largely avoided until now, almost all the works discussed in this section identify their subject as 'the peasant'. Chayanov (1986) and Scott (1976) use it overtly, Guðmundsson (1978) in a qualified manner while Sahlins (1972) avoids the term entirely. Ellis (1988), in his study of peasant economics, offers a micro-economic analysis of five theoretical conceptions of peasantry, including Chayanov's classical study and an adaptation of the model.

Rather than undertake a long discussion of how best to identify and describe the term 'peasant', the view is taken here that the Vanuatu system under study is a production system, and the production systems identified by the above writers have many common elements with the Vanuatu system, a major one being that the 'core' of production is production for consumption or production for use.

Another major similarity is the unit of production, the household.

Chayanov's studies of the 'operational logic' of the Russian peasant household came first and he is cited by all of the writers discussed here.

Long before Polanyi, he formed a set of ideas about non-capitalist economic systems, including an exploration of the difficulties involved in applying capitalist economic entities and operating principles to the interrogation of non-capitalist systems (Chayanov 1986, 1-29). He claimed that if one capitalist economic category, wages for example, was absent, then it was not possible to calculate others — rent, interest, profit and so on. Such ideas informed his theory of peasant economy, in which he demonstrated that the operations of the peasant farm violated many rules of capitalist economic logic. His particular interest was the concept of 'the drudgery of labour', which operated as a determining agent in labour inputs and replaced the capitalist category of wages. He argued, at some length, that on the peasant farm, labour inputs could be increased due to demand, up to the point where the drudgery of the work required outweighed the desire for the goods produced (1986, 70-73). The uneasy equilibrium around the tipping point of demand satisfaction and dislike of onerous labour relies on an intimate knowledge of the conditions of production.

He also theorised on the observed 'problem' of labour under-utilisation in peasant production. He demonstrated the correlation between household size and effective manpower, calculated as a ratio (1986: 77-78, particularly Table 2.8 on p. 78). As the ratio increases — that is more mouths to feed, or less workers — labour intensity increases. Conversely, as more family members become productive, and the ratio decreases towards unity, labour intensity decreases. This may seem trivial, or obvious, but when the phenomenon is aggregated to the village level or beyond, the tendency is for production to be much less than optimal.

Chayanov's theories assumed a condition that the peasant farm operated within an heterogeneous economy, alongside capitalist farms and other market-sensitive economic elements. He argued that there are situations where the peasant farm is able to compete successfully with capitalist enterprises, simply because the peasant household has the capacity to apply more labour power without additional cost.\(^\text{17}\)

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\(^{15}\)Shanin, in his introduction in Chayanov 1986.

\(^{16}\)Chayanov used a mathematical formulation to show this, which I have accepted at face value — see (1986: 3) (non-capitalist systems).

\(^{17}\)He provides an example (1986: 88) where a reduction in product price means a capitalist enterprise makes a loss, because wages and outlays exceed income. For the peasant farm, the return to labour is reduced over the year, but because it is operating on the equilibrium principle, the return remains acceptable.
Systems of exchange can be measured in terms of units of exchange, most commonly currency. Such measures are difficult to promulgate in production systems, where no exchange has occurred. Chayanov, to overcome this lack of a unit of value to measure the production system, utilises labour value, or labour surplus as his unit of value. Both features, labour drudgery and less than optimal production, imply that there is surplus labour value inherent in the system (Chayanov 1986: 88).

This approach to determining a unit of value in subsistence systems is followed by Gude- man, whose study of a Panamanian village undergoing a transition to market exchange, led him to adopt labour surplus as a unit of value for the subsistence system, in the absence of market measures.

Gudem an specifically declined to introduce theories of exchange to an analysis of subsis- tence:

> When we talk about subsistence we should cease using the term only to designate standards of living or a form of agriculture... and realise that production for consumption is radically different from production for exchange

(Gude man 1978: 3).

He utilises 'Ricardian' economics — the economics of production. He reduces Ricardo’s three classes — proprietors, capitalists and labourers — to two in his analysis, combining proprietors and labourers (1978: 4). Gudeman’s critical concern is to discover:

> What determines the distribution between the subsistence level and the surplus in an economy lacking markets, in an economy where market principles cannot apply?

(1978: 5)

His answer, which accords with Chayanov, is that labour value, measured as labour surplus, is the crucial measure of value in a subsistence system, with that labour surplus being available and utilised for social and cultural purposes within the community.

Scott (1976) approaches the problem of a unit of measure in a different way in his study of peasant 'moral economy', based on a review of a number of South-East Asian studies.

Scott (1976: 2, 22-3) emphasises the primacy of obtaining subsistence not only in the technical arrangements of production, such as the use of a wide variety of seed varieties or the staggering of planting times to produce the most stable and reliable yields, but also in the social arrangements; the patterns of reciprocity, forced generosity, communal land and work sharing (1976: 3).

This primacy of subsistence is the basis for Scott's view that livelihood security determines value for peasants. Thus what may seem counter-intuitive to an economist — for example, preference for low production returns over wage labour returns, preference for smallholder production over tenancy — makes good sense if livelihood security is the priority. So, in livelihood security terms, smallholding is more valuable than tenancy or wage labour, and tenancy has more value than wage labour; all this in the face of situations where wage labour may give higher income, and tenancy greater production than smallholding.

18He quotes from Volume I of 'The Works and Correspondence of David Ricardo', the 1951 CUP edition, edited by P. Staffa — this work has not been consulted.
Livelihood security is harder to measure than labour surplus, but can be seen to form the basis of choice, of judgements of value; in the same way that labour value is the basis of choice for Chayanov and Gudeman.

Marshall Sahlins had wider concerns than peasant production systems in his 1972 work, 'Stone Age Economics'. His analysis of the economic systems of hunting and gathering societies and subsistence agriculture drew on a number of anthropological studies. Sahlins chose to call subsistence agriculture 'the domestic mode of production'.

He begins with a discussion of hunting and gathering and illustrates, several times, the inability of those Europeans who made early contact with hunting and gathering societies to see beyond what seemed to them to be material squalor and deprivation. He demonstrates how pervasive and persistent this initial error was, and how influential the myth of squalor and malnourishment became in shaping the views of those who came later (1972: 4-7). Sahlins then contrasts these early 'mythical' accounts with three studies, two from Australia and one from southern Africa (1972: 14-28) which challenge two major myths — that subsistence was physically harder and a more risky livelihood than agriculture and that the hunter-gatherers were severely undernourished. The studies showed that hunter-gatherers worked, on average, less than five hours per day, and they were well nourished, with caloric intakes above 2100 calories per day, in both the Australian and African groups.19

Recent archaeological evidence drawn from the Fertile Crescent suggests that those who practised hunting and gathering had a more varied diet, better teeth, higher bone density and longer life expectancy than their neolithic farmer successors (Cohen and Armelagos 1984; Steckel and Rose 2002). This evidence confirms the relative good health of ancient hunter-gatherers, and underlines the danger of equating succession with 'progress'. The neolithic farmers certainly succeeded the hunter-gatherers, but on the present evidence, the only 'progress' made was in detriment to health.

Sahlins' two main propositions are that subsistence societies have low levels of needs, and thus require fewer means to satisfy those needs, unlike the uncapped needs of exchange-based societies, and that poverty is not necessarily a lack of material goods.

At a recent conference (ANU Asia Pacific Conference 2010), a speaker from Papua New Guinea responded to a question about poverty by defining a poor person as 'a man with no relatives, no kin, no village'. Sahlins notes:

The world's most primitive people have few possessions, but they are not poor. 
Poverty is not a certain small amount of goods, nor is it just a relation between means and ends, above all it is a relation between people.

(Sahlins 1972: 37).

When he moves to the 'domestic mode of production', Sahlins notes the tendency for less than optimal production in household subsistence systems. Labour power is under-utilised. The studies cited20 show that only small and irregular amounts of time are devoted

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19It is virtually impossible to get comparable figures for today, because the government agencies concentrate on healthy diet rather than specific intakes — the U.K. Department of Health averages of 2440 (calories per day) for adult males and 1990 for adult females are quoted on many weight-loss sites, but I have been unable to confirm them. I am prepared to say that 2100 calories for someone working less than five hours a day, and sleeping a lot would be more than adequate.

20For brevity's sake I have not attempted to cite all the relevant studies, as Sahlin's conclusions are here more important than the evidence he leads to support them.

44
to gardening, clearing, weeding and other agricultural and pastoral activities; and that gathering activities are also desultorily handled, with play and rest often consuming more time than ‘work’. He reasons that the under-utilisation of labour power represents an inherent economic surplus, which brings him into line with Gudeman and Chayanov’s view of production for use. Unused labour power represents an equivalent surplus to that of surplus production in an exchange-based economic mode.

Sahlins proposes three principal elements in the domestic mode of production. First, he notes that the division of labour in households reflects the division of labour in the society generally. Gender-specific tasks predominate, without necessarily precluding shared activities. He argues that marriage establishes the minimal economic grouping — the household — which pools its resources and operates as a unit to produce its livelihood. Second, he explores the ‘primitive’ relation between human and tool, where the tool extends the capacity of the human, unlike in industrialised production, where the role of human and tool are reversed, as people are employed to extend the capacity of the tool. Third, and most importantly in connection with the present study, he outlines the distinctive features of production for livelihood. He notes that exchange occurs in all societies; that rural households are not generally self-sufficient and must meet some of their needs by trade or exchange. The differentiation from production for exchange exists in the ‘producer’s relation to the productive process’ (1972: 83).

Subsistence producers produce for ‘use’ value, not exchange value, and production levels are aimed at satisfying ‘use’ needs, not ‘exchange’ needs. In passing, Sahlins provides a convincing explanation of the logic behind what appears to be a counter-intuitive production regime. When subsistence gardeners turn to cash cropping, they aim to return a specific amount of cash, in order to make a specific purchase. Again, the ‘use’ value of the production is the driving force. When they achieve that result, they discontinue production. Thus, when prices are high, production is low; but when prices are low production is high. In a market economy this behaviour violates the rules of supply and demand, which insist that when prices are low supply be withheld. When prices are high production increases, because the aim is to achieve the greatest profit, not a specific amount. So, even when it seems that subsistence gardeners are participating in the market, they are competing in their own way, using logic derived from subsistence (1972: 86).

Sahlins is difficult to pin down on the question of whether or not he proposes a unit of measure for subsistence production systems. He speaks of the under-utilisation of labour power, but not of labour ‘surplus’, as do Chayanov and Gudeman. He notes the primacy of ‘use’ value, but does not connect this with livelihood security, as does Scott. He also addresses questions of access to resources, in terms of ‘carrying capacity’ and ‘optimal population levels’, but does not use access levels as a unit of measure.

For this study, access to livelihood resources will be used as the unit of measure. Subsistence-based livelihoods in Vanuatu are constrained by the availability of land, and of the natural resources of the land and the sea. High levels of participation in a specific element of livelihood, such as gardening, are an indicator of high levels of availability. Low levels of participation, say in wage and salary earning, are an indicator of limited availability.

Despite this divergence on the question of unit of measure, the study relies on the exposition of the above writers for detailing the ‘operational logic’ of subsistence-plus livelihoods which forms, in part, the basis of the research.

Percentage participation as a measure of access, will be employed in the livelihood analysis as the unit of measure, and it is to livelihood analysis that we now turn.
3.3.3 Livelihood analysis

The Brundtland Commission

This study will employ some methods of what has come to be known as the Sustainable Livelihoods Approach, which traces its history back to the report of the Advisory Panel on Food Security, Agriculture, Forestry and the Environment to the World Commission on Environment and Development (World Commission on Environment and Development 1987a), to the Brundtland Commission. This report outlined two major policy failures facing the world and its people. The first failure identified was the lack of success in reducing the numbers of people living in poverty. Despite the 'green revolution', the structural adjustment programmes and substantial increases in agricultural production, a fifth of the world's peoples continued to go hungry. Many of them were in rural areas (World Commission on Environment and Development 1987a: 2-5).

The second failure noted was the inability to curb over-production (including agricultural over-production) in the industrialised market economies, which was both unsustainable — production based on high inputs of fertiliser and insecticides and high inputs of non-renewable energy was not sustainable — and predatory. 'Dumping' of food products into developing countries threatened the livelihoods of the rural poor, which often resulted in increased environmental degradation in the developing world — deforestation, desertification, waterways pollution — consequences of the rural poor drawing down their resources to meet present exigencies. In 'development' thinking an increased availability of food should have been of benefit to the poor, but the poor lacked entitlement, or the resources to take advantage of more available food. They (the poor) were often seen by environmentalists as a 'problem' to be managed in the conservation of resources.

The Advisory Panel argued that the two development aims of sustainability and rural livelihood security, could be tackled as one, sustainable livelihood security. Sustainable livelihood security for the rural poor in the developing countries would not address the over-production in the industrialised world, but if policies for the developing world were based on the promotion or facilitation of sustainable rural livelihoods, more successful outcomes should result.

This paradigm shift took the rural poor from the margins to centre stage, and the 'pro-poor' sustainable rural livelihoods paradigm continues to be a significant driver of development theory (see Devereux et al. 2004; Clark and Carney 2008; World Bank Development Research Group 2008; Solesbury 2003; FAO Livelihood Support Programme 2007; Carney 2003; Davies et al. 2008; Hanstad, Neilson and Brown 2004).

One of the members of the Advisory Panel to the World Commission on Environment and Development was Robert Chambers. In 1991, he and Gordon Conway produced 'Sustainable Rural Livelihoods: Practical concepts for the 21st. century' — a paper for the Institute of Development Studies at the University of Sussex, which elaborated on the concepts of sustainable livelihood security. This paper built on the outline sketch of sustainable rural livelihoods from the Brundtland Report, adding a theoretical structure whereby fundamental concepts of capability, equity and sustainability, (both environmental and social sustainability) were proposed, and means of practical analysis of rural livelihoods were canvassed, including a notional calculation of net costs and benefits from livelihood enhancement or intensification.
For the first time, an anatomy of household livelihoods was sketched, and the notion of a portfolio of assets — both tangible (resources and stores) and intangible (claims and access) assets was suggested. A flow diagram illustrated the flows between people's livelihood capabilities, their activities and their assets and their livelihood (their living).

Chambers and Conway (1991) identified two types of sustainability — environmental sustainability, which was concerned with external impacts of livelihoods, both local (desertification) and global (ocean temperature rise) — and social sustainability, the internal capacity to withstand shocks or stress, and to assure continuity. Strategies for dealing with shock and stress were drawn from a number of writers.²¹

The continuing and continuous adaptation to incremental change of rural populations was also noted, with examples such as crop diversification and seeking off-farm income through small scale rural enterprise (traditional handicrafts, roadside markets). The role of external actors (government, non-government organisations, donor countries and agencies) in facilitating (or hampering) rural resilience to shock and incremental change is noted, but not included in the flow diagram.

Chambers and Conway spent some time outlining the benefits of their theoretical structure of sustainable rural livelihoods for practical analysis, as their ultimate aim was to improve policy-making, not rural livelihoods per se, and improved policy-making, they argue, comes from a better model for livelihood analysis. The remainder of their paper outlines shortcomings in contemporaneous policy-making and analysis, and of the tendency for expert (top-down) analysis to misconstrue rural innovation. One final thread that runs through the paper, which has some relevance to the present study, is the bemoaning of the lack of an analysis of the environmental costs of the industrialised, rich economies of the North, and the rich among those of the South:

A do-it-yourself manual for the rich to assess their own net demands would

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...seem overdue

(Chambers and Conway 1991: 19).

The Ecological Footprint model, developed initially by Mathis Wackernagel and William Rees in 1996 (Wackernagel and Rees 1996, World Wildlife Fund International 2008), is just such a 'manual' and will be discussed later in this review.

In summary, Chambers and Conway (1991) introduced a model of rural livelihoods which introduced the key concepts of assets and activities sets, closely defined fundamental notions of capability, equity and sustainability and offered some policy parameters for the achievement of improvements in capability, equity and sustainability.

Chambers and Conway’s paper had an immediate impact and the Sustainable Livelihood Approach was, by 1998, the most favoured approach to poverty reduction in the international development community. Solesbury’s (2003: 3-4) timeline below shows some early milestones.

Table 3.1: Timeline of Developments: Sustainable Livelihoods Approach

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>World Commission on Environment and Development releases 'Our Common Future', with sustainable livelihoods outlined</td>
</tr>
<tr>
<td>1993</td>
<td>Oxfam begins to employ Sustainable Livelihood Approaches in improving project strategies and staff training</td>
</tr>
<tr>
<td>1994</td>
<td>CARE adopts household livelihood security as a programming framework</td>
</tr>
<tr>
<td>1995</td>
<td>UNDP adopts Employment and Sustainable Livelihoods as one of five priorities in its human development mandate</td>
</tr>
<tr>
<td>1996</td>
<td>U.K. Department for International Development launches major research programme on Sustainable Livelihoods</td>
</tr>
<tr>
<td>1998</td>
<td>FAO/UNDP group on Participatory Approaches and Methods to Support Sustainable Livelihoods and Food Security first meets</td>
</tr>
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Frameworks for Analysis — Scoones, Carney and Ellis

The development of methodologies for the sustainable livelihoods approach was, not surprisingly, centred in the United Kingdom where Chambers taught. Livelihood framework analysis, the approach which will be followed in this study, appeared first in 1998. Ian Scoones, at the Institute of Development Studies at the University of Sussex published Working Paper 72, 'Sustainable Rural Livelihoods: A Framework for Analysis' (Scoones 1998). In the same year the U.K. Department for International Development released "Sustainable Rural Livelihoods: What contributions can we make?" edited by Diana Carney. In her introduction, Carney (1998: 5) includes a framework analysis model. In 2000, 'Rural Livelihoods and Diversity in Developing Countries' by Frank Ellis was published. Ellis examined the nature of rural livelihoods with particular emphasis on the role played by livelihood diversification in spreading risk and in enhancing livelihood assets. He also included his version of the framework (Ellis 2000: 30).
Scoones and Carney added a major enhancement to the flow model of Chambers and Conway, in which a number of deficiencies are addressed. Especially important is the recognition of how the interplay between people's assets and their activities and the outcomes of those activities is mediated by external and internal influences. Ellis added to their enhancements and provided a fuller exposition of the various elements of the frameworks.

A much more detailed treatment of the frameworks for analysis of Scoones, Carney and Ellis is offered in chapter 6, along with diagrams of their respective frameworks (Figure 6.1; Figure 6.2 and Figure 6.3 respectively).

Critics of the models put forward by Scoones, Carney and Ellis — and they have been few and far between — have focussed mainly on the micro-level, with minor additions or subtractions to various aspects under treatment. Cultural, political and symbolic capital have variously been proposed as other classes of livelihood assets, drawing on the works of Pierre Bourdieu (see Scoones 1998: 17). There has also been much agonising over what should and should not be included in what has become known as the 'PIP box' (Policies, Institutions and Processes). Hobley (2001) summarises a number of studies concerned with the composition of the PIP box. Much of the debate has been conducted among the coterie in the United Kingdom, centred on the Department for International Development, the Institute for Development Studies and the Overseas Development Institute.  

Stringent critics are hard to find.

Dorward et al. (2003) argued for a more dramatic overhaul of the structure of the model, claiming that not enough emphasis is given to the role of markets in the model — markets in practice that is — not simply 'a preoccupation with neo-classical competitive markets' (2003: 325). The diagramatic representation of Dorward et al's proposed framework is difficult to follow (see 2003: 327) and is less useful to a study of subsistence-based livelihoods, in which the market in any form plays a peripheral role. Carney (2003: Annex 1, 2) shows a variety of alternative diagrammatic representations of the framework, all more or less conceptually similar; all with difficulties in representing flows. Dorward et al's objections could conceivably be met by including markets in practice in what Scoones boxes as institutions and organisations (see Figure 6.1). This is what Ellis has efficaciously done.

Castro (2005) examines key issues in natural resource management in Africa, where resolution of intractable sustainability and livelihood security conflicts have proved near impossible, in the light of the USAid NWP (Nature, Wealth, Power) framework. The NWP framework (see Anderson 2002) emphasises the links between sustainable natural resource management, the rights of indigenous populations and their need for livelihood security. However, aside from statements of intent (or good intentions) it offers no practical means of analysis. Castro notes an ahistorical bent in the framework:

History conditions contemporary social action, and failure to take it into account results in disappointing policies, programs, and projects.

(Castro 2005: 3)

The NWP framework is a natural resource management framework which focusses firmly on the connection between nature and people, and people still seem to be the 'problem'.

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22 Scoones, Carney, Moser, Ellis, Clark, Hobley among others.
The sustainable livelihoods approach has been tested in a variety of situations over the years since Oxfam, CARE and UNDP adopted it, with some refinements over time and with FAO also adopting the approach. Many studies have adopted and adapted livelihood framework analysis.


Of course, the sustainable livelihoods approach has not been universally adopted. The UN Millennium project and the World Bank appear not to have noticed it, despite recognising the role of rural agriculture in food security. Sachs (2005) regards anything other than commercial agriculture as dysfunctional, the World Bank Research Group (2008) seem to regard the problem of rural agriculture analysis as being one of poor data collection, rather than poorly understood livelihoods.

This study will utilise the livelihood framework analysis methods of the sustainable livelihoods approach, as it offers more hope of coming to terms with subsistence and subsistence-plus livelihoods, especially when the unit of measure adopted, that of percentage participation, is not amenable to a neoliberal economic analysis.

### 3.4 Metaphors of development

The final research task to be undertaken is to build a development indicator which will challenge the dominant view of development expressed through the development indicators discussed hereunder.

A thoroughgoing survey of the history of development indicators will not be attempted here, other than to note in passing that the trend has been towards ever more elaboration, sophistication and proliferation, from single economic variable indicators such as Gross Domestic Product per capita (see Chambers 1997; Baster 1972; Seers 1972 for overviews), through grouped economic, social and political indicators (Hicks and Streeten 1979; Dasgupta and Weale 1992) to the composite variable indices (see Morris 1979; McGillivray 1991; ul Haq 1995 for discussion) which will be discussed here.

Development indicators are abstract models, and like all models they represent an attempt to capture the essential aspects of a perceived reality, by selecting and deploying a limited set of features of that reality. The Human Development Index is an abstract model of a perceived reality. As the name suggests, its authors claim to model human development, by selecting and combining three purported features into an index variable. The
features selected to represent human development are: levels of school education across the population; life expectancy at birth; and per capita share of Gross National Income. The authors, it can be presumed, do not claim that any of the three variables are, in and of themselves, models of human development. It is in combining the three variables into one composite variable that the essential features of human development are claimed to have been encapsulated.

The acid test for acceptance of any model, including the Human Development Index, would seem to be in how closely it accords with the perceived reality of the audience it is intended to address. If the abstracted features of the model capture none of the perceived reality of its audience, then it fails. If it captures some, or approaches closely to the audience view, then it can be said to succeed.

In addition, if the contextual background of what is being modelled is ignored, or set to zero, then another layer of abstraction is added to the model.

We live in a dynamic world. Human population levels are rising; cereal food stocks are falling and the nature of food and financial crises is no longer local, but global. Human-produced carbon pollution has reached levels such that climate-wide effects are being observed and it appears that the focus of economic power may be shifting towards Asia. If models are produced which do not take account of such contextual background effects — or take them to be of no consequence — they are further removed from perceived, indeed objective reality, almost to the point where they cease being models and become metaphors.

The dominant metaphors of development give scant regard to contextual contingency. That is, the development supposedly being modelled is beneficial everywhere, at any time and in any context. In a similar way, although supposedly descriptive in intent, they are also normative in effect. They adopt a set of features peculiar to globalised, industrialised economies as the path out of poverty to development and discount anything else, or in the case of the Ecological Footprint, do the opposite!

This review of development metaphors limits itself to three indicators, for two reasons. First, despite their seeming simplicity, indicators tend to be complex creations with large numbers of inherent assumptions, which makes them difficult to explain and to critique. Second, there has been an exponential proliferation of index variable indicators in recent times, none of which have stood the test of time and use sufficiently to yet warrant a closer look.23

Of the three indicators chosen, one declares itself an index, the Human Development Index. The other two are also composite variable measures, but are generally not spoken of as indices. They are the World Bank’s International Poverty Line, and the World Wildlife Federation’s Ecological Footprint.

Considered for discussion, but excluded, were the Happy Planet Index, Gross National Happiness and the Human Assets Index of the United Nations Conference on Trade and Development (UNCTAD), along with numerous others, on grounds of lack of general acceptance and use. None of these measures has achieved the penetration into public consciousness of the International Poverty Line and the Ecological Footprint, which have been extraordinarily successful in encapsulating a range of complex ideas and measurements in

23Maplecroft, a firm of development consultants — see http://maplecroft.com/ — claims to provide over 500 separate indices of global social, environmental and security risks.
a simple, easily recalled image. None have the history of the Human Development Index, presented first in 1990 (United Nations Development Programme 2010: iv).

The development indicator which will be presented in this study as a challenge to the dominant view, examines resilience to food insecurity among nations. The term 'food insecurity' has been carefully chosen, in the light of the way in which 'food security' has become a putative aim and catch-all justification for all sorts of development policies and projects. In addition, food security has developed a specialised meaning in the intellectual property debate. Adverse impacts on 'food security' are led as evidence in attacks by critics on the practices of globalised agricultural conglomerates, whose patenting of seed varieties prevents agricultural smallholders from storing seed for sowing, thus binding them to the conglomerates as unwilling clients.

AusAID justifies funding of the Australian Centre for International Agricultural Research and the (transnational) Consultative Group on International Agricultural Research (formed in 2006) on 'food security' grounds.

Without the CGIAR's work, it is estimated that developing countries would produce 7-8 per cent less food, world food and feed grain prices would be 18-21 per cent higher, and 13-15 million more children would be malnourished.

(AusAID 2009: 1)

Similar arguments support the Food and Agriculture Organisation's 'Pacific Food Security Toolkit', a five paper series (Food and Agriculture Organisation of the United Nations 2010-1,2,3,4,5) which, while advocating change in agricultural practices for better outcomes, does acknowledge that current practices may promote 'food security'.

On the other hand, Pollock (2002), Welegate (2001), Smithson and Lenne (1996), Lebot (2008) and Sardos (2008) argue that current Pacific practices such as vegeculture (Pollock’s term for vegetative agriculture), varietal diversity and plantings of 'disaster-resistant food crops' (Welegate 2001: 25) — the continuance of tried and true practice — will continue to ensure 'food security'.

Even the World Intellectual Property Organisation lays claim to 'food security'!

Realizing [sic] our potential to produce enough food for the world’s expanding population will remain a major challenge in the future and one in which intellectual property (IP) rights will play a key role.

(WIPO 2011: 1)

'Food security' can be conscripted to any cause, it seems.

3.4.1 Ecological Footprint

On the face of it, the Ecological Footprint, first introduced by Wackernagel and Rees in 1996 (World Wildlife Fund International 2008), seems a little outside the compass of this study, as it is concerned primarily with promoting an understanding of the nexus between human activity and the Earth’s biological capacity.

Biological matter is produced by the planet and consumed by humans. If humans consume more in a time frame than the planet can reproduce, we have biological debt. This problem is encapsulated by the metaphor 'footprint'. The bigger the footprint, the bigger the
problem. The size of the footprint is measured in global hectares — these are 'world-average hectares', which represent the average bio-productivity of all land types, and of the sea (Ewing et al. 2010: 5).

The advantage of using a representational land unit is that international trade flows can be quantified, because they are not simply a physical area, they are the bio-productivity of that area, thus when coal flows to China from Australia, the 'footprint' of that flow can be quantified in global hectares.

The reason that the Ecological Footprint appears in this review is that it is, essentially, an economic analysis and ranking of countries, which, unlike the other indicators discussed, favours those countries with low production and consumption levels and presents an unfavourable picture of high consumption, high production regimes, such as globalised, industrialised economies.

There is a normative aim in this metaphoric measure — excessive consumption is revealed, and implicit in that revelation is that reduction in consumption is required to restore the biological deficit to balance or better. Here the metaphor is extended from the personal to the universal — the biological debt is measured in 'Earths'. Current rates of human consumption and waste absorption require more than one Earth.24 At current consumption and waste absorption levels, by 2030, two Earths will be needed to satisfy human demands.25

The world average global hectares per person is 2.3 gHa. Of the 50 countries ranked above this world average, only Namibia and Botswana have significant subsistence-based production sectors. They are ranked 38 and 39 respectively. Of the 73 countries listed as being at or above the 'sustainability tipping point' of consumption and waste absorption — 2.1 gHa per person (World Wildlife Fund International 2008: 14, 34–42) — only Sudan, in addition, has significant subsistence-based production. Sudan is the only country to appear in the top 73 'footprints' and to be concurrently included in the United Nations 'Least Developed Countries' list.

For Africa, all countries, except Mauritius and South Africa are below that point. Most Pacific countries are now excluded from the 'footprint' listings because the population cut-off is one million. By inference from the Papua New Guinea footprint, 1.7 gHa/person, they — the Pacific nations — would also be below the tipping point. Vanuatu’s footprint was 1.1 gHa/person in 2006, Samoa’s 1.4 gHa/person (New Economics Foundation/Friends of the Earth 2006).

Clearly, the message from the Ecological Footprint is that countries which are elsewhere labelled ‘underdeveloped’ are here characterised as highly developed, in that they are already living sustainably, whereas those countries elsewhere denoted ‘highly developed’ are struggling to live sustainably — they are ‘overdeveloped’!

All is not sweetness and light however.

While the Ecological Footprint is eloquent, perhaps even loquacious, on the unsustainable practices of high-consumption societies, it is silent on the suffering which may accompany a low footprint. If a country has a low footprint, but most of the population are hungry, or homeless, or living under conditions of war or civil anarchy, then that low footprint comes

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24 One plus 30 per cent of another.
25 World Wildlife Fund International (2008: 24) — projected population increases are included in the calculations.
at an unacceptable cost. The idea of 'sustainability' promoted by the Ecological Footprint does not include social and cultural sustainability among its concerns.

As a development indicator, the Ecological Footprint is normative — there is only one right way — and it is not bound by contextual contingency. Improved sustainability is viewed positively, no matter what the social or human costs may be. In a time of increasing global food insecurity, it could well be that a balance may need to be struck between the goal of carbon pollution reduction and the impact of such reduction on food production.

3.4.2 International Poverty Line

The International Poverty Line purports to be a measure for calculating global and national poverty. Many households worldwide following subsistence-based livelihoods are likely to be labelled 'poor'. Subsistence-based livelihoods have large levels of consumption from their own production and it is of critical interest to this study how this consumption is measured in the compilation of the International Poverty Line.

The International Poverty Line is a World Bank project, and measures poverty, in terms of individual consumption, where possible, or income, using purchasing power parity (PPP) to standardise money values between countries. Set from 1990 to 2003 at '$1 a day', it was raised in the 2005 revision to $1.25. This development indicator aims to encapsulate the many dimensions of poverty

In the world as a whole by the standards of what poverty means in the poorest countries

(Chen and Ravallion 2009: 1).

The 2005 revision of the International Poverty Line used 'almost 700 household surveys for 115 developing countries' (2009: 2).26

Accounting for subsistence in the International Poverty Line

Household consumption, which forms the basis of the International Poverty Line, includes consumption of own production — subsistence-based production. The subsistence element of consumption is measured by imputation, an indirect method of measurement.

Chen and Ravallion (2010) advise that the most frequently applied method of imputation is that of self-disclosed estimates of consumption in household surveys undertaken as part of national surveys of household income and expenditure. The producer-consumer records household consumption in a diary and provides an estimate of the price and quantity of goods and services consumed. This method has the potential to be very unreliable, even if an adequate level of literacy and numeracy is assumed. Subsistence producers may not know the market price for their produce, or they may simply guess a price. It is also unrealistic to expect that people know how much they consume, in volume or units, or that they remember all they consume. In addition, 'free' foods from the forest and shore may be missed, or price equivalents not known. Ravallion acknowledges that much of the data for imputed values are 'problematical', but adds that where such problems are known, attempts have been made to address them (Ravallion, pers. comm. 2011). Chen

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26 It is not stated whether the 700 surveys represented an average of less than seven surveys per country. If that is the case, then representativeness becomes an issue.
and Ravallion (1996) discuss shortcomings in China, and how improvements in imputation were attempted.

Gibson (2007: 9) suggests that self-disclosed cost replacement methods may return widely varying values in one village, or one region. He notes that if there is a discrepancy between market prices, with some being higher, then estimates of those in poverty could be inflated. Where subsistence production is highly significant, this is a major deficiency. He adds that an alternative could be to value self-produced foods at the average market price at the market closest to the respondents, with adjustments made for differing markets — opportunity cost in economic terms. This method was applied by Anderson (2006) in a customary land valuation in Papua New Guinea.

In Vanuatu, the northern market town, Luganville, has prices half those of Port Vila. These are the only two collections of sellers and buyers which could be said to represent a 'market' and many goods which are major items in the diet are not sold.

In this study, it will be argued that loss of access to land and resources for livelihood shifts households to market-based livelihood alternatives. As these alternatives are far more readily available in the commercial centres, then market prices in those commercial centres are more realistic substitutive values. As the study is concerned with aggregations of population at the national level, the values at the biggest market, Port Vila, better reflect values at that level of aggregation. It could well be argued that even this is an under-representation of value of subsistence production, as root crops and other traditional foods are sold at supermarkets and stores throughout the commercial centres at much higher prices than the market, and it is these values which are used in the compilation of the Vanuatu Consumer Price Index (Vanuatu National Statistics Office 2011).

Another major difficulty for imputation is a lack of accuracy in quantity measurement. It cannot be assumed that households are able to weigh, or count, produce they consume. Market measures, in so much as they are likely to be based on specific quantities of a good (a kilo of rice, a plastic bag of peanuts, two taro) will not necessarily be the same as household measures, nor are measures likely to be consistent between markets in different locations. This difficulty is compounded when goods are not uniform, not even roughly so. There are yams sold which weigh 20 kilograms, and yams which are sold in bags which would weigh no more than a kilogram holding many, so what is the price of a yam? Without scales it is a guess, no more.

This problem is widely acknowledged (Chen and Ravallion 1996, 2004, 2009; Ravallion, Chen and Sangraula 2008; Gibson 2007; Deaton and Dupriez 2009). Statistical methods have been suggested as a means of producing standardised quantities, thus making prices obtained more readily applicable across regions, but Capeau and Derecon (2005), who examined that method, concluded that collection of prices in local markets remains the most cost-effective method of imputation.

Despite these difficulties, imputed values for subsistence production are widely used in National Accounts in countries with a significant subsistence sector, and these values tend to be accepted without question in legacy studies which derive data from National Household Income and Expenditure Surveys. An example from Vanuatu is the recent study undertaken by the Social Policy Research Centre at the University of New South Wales; a study of child poverty and disparities in Vanuatu undertaken as part of a UNICEF global study (Whiteford et al. 2010, Whiteford and Yoshihara 2011). This study utilised data from the

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27 Personal observation in 2008 verified anecdotal estimates.
28 See Glossary.

Imputation as a methodology will be challenged in chapter 4, where an alternative valuation of subsistence production will be provided. That alternative methodology not only accounts for consumption of own production, but also includes an evaluation of other ‘economic’ goods supplied by the livelihood in Vanuatu: housing; forest and shoreline resource access and use; the capability to engage in diverse financial capital ventures; and the social and cultural benefits of community membership. This valuation will be offered as a more accurate rendering of the value of production for consumption.

The International Poverty Line is, as a metaphor, context-insensitive — it uses only exchange values (cash terms) to measure what in many parts of the world has no cash value; and it is normative, in that it defines poverty solely in terms of western consumption practices, which, as Sahlins noted (see p. 44), is simply one of a number of ways ‘poverty’ can be characterised.

### 3.4.3 Human Development Index

The Human Development Index, the third of the measures chosen, lacks the visual imagery of footprints or dividing lines, but it is definitely an abstract model and otherwise fulfils the conditions of insensitivity to context and normative intent laid out earlier.

The Human Development Index is a composite measure of three variables, first proposed by Sen and ul Haq: life expectancy at birth; education; and per capita share of Gross National Income. It was introduced, and continues to appear, in the Human Development Reports of the United Nations Development Programme (UNDP), first published in 1990 (United Nations Development Programme 2010). Over time there have been a number of add-ons and methodological adjustments, but there has been no weakening of the bias inherent in the three variables, they are all grounded in the values of the market.

Life expectancy at birth as a measure has lost much of its original purpose — to gauge reduction in infant mortality through medical intervention, principally vaccination programmes — and become something of a contest or yardstick of medical efficacy, where more and more medical resources are being deployed to keep people alive for longer and longer, without consideration of the consequences of such profligacy, or of its value. There is no rational basis for assuming that longer life is intrinsically better than shorter, yet it is often assumed that such is the case. Morris (1979: 3) includes it in his Physical Quality of Life Index, with the comment, ‘under almost all circumstances people prefer to live longer rather than shorter lives’.

The belief that longer life is better seems rooted in the market economy logic that more is always better.

A contrasting view is presented in the New Economic Foundation and Friends of the Earth (New Economics Foundation/Friends of the Earth 2006) Happy Planet Index, which includes a variable of ‘self-assessed life satisfaction’, an attempt to introduce qualitative elements into longevity — is a short, happy life better than a long miserable one? Vanuatu, rather controversially,29 headed the first Happy Planet Index in 2006 (New Economics

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29Famously, one US blogger could not believe that people could be happy without broadband — see http://www.skyscrapercity.com/archive/index.php/t-372885.html for example.
Foundation/Friends of the Earth 2006), in no small measure due to people's high levels of self-assessed life satisfaction.

Education, by which is meant the universal education of the modern market economy state is, within that system, the major means of gaining social and cultural entitlements, through attaining proficiency in the major symbolic systems — literacy and numeracy — and some additional specialisations. This is not the case in most traditional and many hybrid modern societies, where birthplace and parentage accord entitlements to land, society and culture. In societies where no such rights exist, education, or wealth is substituted.

Morris alludes to this, while including literacy in his 1979 Physical Quality of Life Index:

.. even if the desire of literacy per se is not as widely shared — literacy could serve as a surrogate for (although it does not guarantee) individual capacity for effective social participation

(Morris 1979: 3).

If long life and school education can be seen as normative and contextually contingent, then the final variable, Gross National Income per capita is certainly so, since it takes no account of subsistence production, yet includes all the subsistence producers in the population by which Gross National Income is divided to reach the per capita figure.

All three metaphors of development examined here — the Ecological Footprint, International Poverty Lines and the Human Development Index — suffer from the same deficiencies, and this study will attempt to address those deficiencies by producing a contextually sensitive, and non-normative, ranking of nations in terms of their resilience to food insecurity.

To conclude this review of literature on land, livelihood and development, the reader is reminded that the inhabitants of the archipelago now known as Vanuatu have lived and developed their societies and cultures for more than three thousand years in a volatile and sometimes dangerous natural environment.

We of the (now global) West cannot claim likewise, and yet it is our ideas on sustainable living and development which prevail.
Chapter 4

Land use: valuation of land withdrawal costs

4.1 Valuation of costs of land withdrawal

When land is withdrawn from traditional tenure arrangements, households relying on that land experience a loss of livelihood and they are forced to seek alternative livelihoods. In this valuation, it is assumed that those alternatives are exchange-based, and urban.

Sternes's (2003) work on policy instruments for natural resource management highlights market failures in incorporating 'free' and public goods — the so-called 'tragedy of the commons' (Sternes 2003: 27-33).

Land used for subsistence-plus livelihoods in Vanuatu (and all areas where traditional, non-written land ownership systems continue to be recognised) is essentially a 'free good'.

Sternes (2003: 28) would call it an 'impure public good' in that 'the utility of one user typically is reduced by an increase in the number of other users'.

Whether it is a free or impure public good, it is not incorporated in the market and can be freely used (under usufruct entitlements), but for a limited period.

When the land is transferred to leasehold, that right to use disappears.

When households lose their entitlements to usufruct their subsistence-plus livelihood is lost, and costs must be met in cash or kind.

It is these costs which have been assessed, and which serve, with minor modification, as a proxy for the 'value' of subsistence-plus livelihoods.

4.1.1 Parameters for the valuation

In order to evaluate the costs, in money terms, of land withdrawn from traditional tenure arrangements, three parameters must first be set: the amount of agricultural land in Vanuatu; the population density on that agricultural land; and a standard area of land per household to meet livelihood requirements.
How much agricultural land is there in Vanuatu?

The Food and Agriculture Organisation of the United Nations (FAO) provides these definitions:

Agricultural land is:

the share of land area that is arable, under permanent crops, and under permanent pastures.

Arable land is:

land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.

Permanent crops are:

land cultivated with crops that occupy the land for long periods and need not be replanted after each harvest, such as cocoa, coffee, and rubber.

Lastly, permanent pasture is:

land used for five or more years for forage, including natural and cultivated crops.

Using this set of definitions, the World Bank provides the following percentages of agricultural land for Vanuatu.

From 2005 to 2007, agricultural land represented 12.1 per cent of the total land area of Vanuatu, made up of arable land (1.64 per cent), permanent crops (6.37 per cent) and permanent pasture (3.49 per cent).

This gives a picture of current land use, but does not provide indications of total available (currently in use and potential) agricultural land. For the purposes of this study, the question of potential agricultural land is as important as current agricultural land usage. Potential agricultural land is not identified in the World Bank estimates.

To find an estimate of total agricultural land in Vanuatu we need to look elsewhere.

Between 1972 and 1978, Paul Quantin, a French soil scientist conducted a pedological study of the entire archipelago, for ORSTOM, now IRD, a French agency. His results were published initially in a Soil Atlas (Quantin 1979), using a system for soil classification developed in France, which did not correspond well with the agricultural potential of the soils.

In a follow-up work, Quantin (1982) simplified his classification system to five soil types and related it more closely to agricultural potential. An example of this is shown (Figure 4.1) for Efate island, where Class 1 soils (grey) are of low potential, Class 2 and 3 soils (yellow) were combined into 'moderate potential' and Class 4 and 5 soils (green) were grouped as 'high potential'.

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1The definitions are taken from http://data.worldbank.org/indicator/AG.LND.AGRL.ZS, derived from FAO sources.
2Office de la Recherche Scientifique et Technique Outre-Mer.
3Institut de Recherche pour le Developpement.
Quantin’s estimates for Vanuatu are reproduced in Table 4.1. Estimates for Efate are included and World Bank estimates have also been provided, combining their categories of *arable land* and *permanent crops* as high potential land, and their category *permanent pasture* as moderate potential land.

### Table 4.1: Quantin Soil types by area (km²) [percentage]: Vanuatu

<table>
<thead>
<tr>
<th>Island</th>
<th>low potential</th>
<th>moderate potential</th>
<th>high potential</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(World Bank)</td>
<td>n/a</td>
<td>425[3.5]</td>
<td>1,049[8.6]</td>
<td>12,189</td>
</tr>
</tbody>
</table>

(VNSO 1984: 5.10; Table 5a, from Quantin 1982; World Bank datasets)

Quantin’s study remains the definitive soils study of Vanuatu but it would be best not to forget that his view of high, moderate and low potential agricultural land, or indeed the World Bank and FAO’s view, may not be shared by the rural ni-Vanuatu households who actually decide where to make gardens and who rely on their produce to feed themselves. Their views are not documented, but it will be their views which will in the end determine
what land is used for what purpose, and what land is not used. Nevertheless, Quantin's estimates will be used here.

As Table 4.1 shows, there are an estimated 5,403 km$^2$ of good agricultural land in Vanuatu.

**How much agricultural land is needed per household?**

Rural subsistence-plus households require land for gardens, for tree crops and for cash crops. They also utilise the natural resources of the forest, the shoreline and the sea. The agricultural censuses provide numbers for garden and tree and cash crop requirements, but there are inconsistencies between data sets. The censuses aside, there has been no study of extant populations in Vanuatu which attempts to quantify the exploitation of arboreal resources or arboriculture. Latinis (2000) has undertaken comprehensive studies of arboreal exploitation and argues that it is a vital resource, but his results are for archaeological populations. Dye's (1979) dietary study of the Walarano area on Malekula (Figure A.5) did not measure consumption of fruits and other tree resources. Galipaud and Walter (1997) acknowledge difficulties in quantifying food sources outside the garden. The lack of supporting information has necessitated taking a risk and excluding arboreal resources. Littoral resources have not been measured for extant populations and do not easily convert to equivalent land areas.

These shortcomings need to be kept in mind.

There have been three agricultural censuses conducted in Vanuatu: in 1983; in 1993; and in 2006. Table 4.2 shows land area per household used in gardens and in coconut plantings, in 1983, in 1993 and in 2006; total numbers of households involved in subsistence agriculture; and area of land utilised for agriculture in square kilometres. Coconut planted areas and subsistence garden areas will form the basis of the standard area per household estimate because coconuts are extensively used in food preparation. While coconuts are also used for copra production, this is opportunistic and fluctuates widely whereas food consumption of coconuts is stable and vital to the subsistence diet.

Coconut planted areas also provide a catch-all, or proxy, for other production, cash cropping and livestock production. There is no consistency of measurement between censuses for this production. Cattle are often grazed under coconuts, and cocoa is often planted as under-storey to coconuts, so there is some justification for taking this step.

**Table 4.2: Agricultural land requirements per household: Vanuatu 1983, 1993 and 2006 (ha.)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Garden</th>
<th>Coconut</th>
<th>Combined</th>
<th>Total H/holds</th>
<th>km$^2$ utilised</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>0.25</td>
<td>3.4</td>
<td>3.65</td>
<td>21,401</td>
<td>78.1</td>
</tr>
<tr>
<td>1993</td>
<td>0.13</td>
<td>n/a</td>
<td>n/a</td>
<td>20,447</td>
<td>n/a</td>
</tr>
<tr>
<td>2006</td>
<td>0.77</td>
<td>3.1</td>
<td>3.87</td>
<td>34,887</td>
<td>150.5</td>
</tr>
</tbody>
</table>


Averaged over the two censuses, 1983 and 2006 and excluding 1993, which lacks estimates of areas under coconuts, the land area requirement for garden and coconuts per household is 3.76 hectares.
This value will be adopted as the *standard land area* requirement for subsistence-plus households.\(^4\)

**What is the population density per standard area of land?**

We have Quantin's estimate of agricultural land — 5,403km\(^2\).

To calculate an average population density on agricultural land, we take the 2009 Population and Housing Census (Vatuatu National Statistics Office 2010b:Table 3) count, which gives the rural population total as 176,816 persons.

To obtain average population density per square kilometre, we divide:

\[
176816 \div 5403 = 32.72
\]

Average population density of rural population on good agricultural land is 32.7 persons/km\(^2\).

If we recall that the standard area land requirement for households is 3.76 hectares (0.0376km\(^2\)), the average population density per standard area can be calculated.

To obtain population density per standard area we multiply:

\[
32.7 \times 0.0376 = 1.23
\]

The average population density for the standard area of good agricultural land is 1.2 persons/standard area.

This figure, the number of people using the standard area for livelihood, will form the basis of the calculation of costs of land withdrawal. The most realistic assumption is that this represents one adult and one child.

An anomaly must be dealt with before going further.

We have determined a current average population density of 1.2 persons per standard area. The standard area was calculated on a per household basis. The average persons per household across the censuses is five persons. Should we then divide the standard area, so that it represents the area needs of the current population density (this would be 3.76 \times 1.2/5 = 0.9 hectares)?

That course has not been followed. Average population density does not correspond to a specific population density at a particular location. If the average household figure of five were used, the resulting valuation would be four times greater, but to do so would misrepresent the current population spread across all agricultural land.

#### 4.1.2 Land withdrawal costs: the valuation

The costs are taken to be:

(a) costs of replacement of food (and shelter) obtained by production for use

\(^4\)Maude (1965) details the size of areas of land granted in Tonga to young people on reaching maturity, which are quite close to the standard land area calculated here.
(b) rental costs
(c) costs of loss of production — in addition to food and shelter replacement costs, production for exchange on the standard area is lost, so must be included
(d) environmental service costs — costs of loss of biomass, biodiversity and of land degradation
(e) socio-cultural costs — costs of loss of social entitlements, cultural identity and practice

Typically, when development economists measure subsistence or production for use, they estimate only food and shelter costs — by imputation, or opportunity cost. Other costs listed are treated as externalities, and are not measured. By estimating the costs of land withdrawal, rather than simply production, we are able to account for those externalities in our valuation.

There are other externalities which will not be incorporated, as they cannot be attributed to the standard land area. They are:

(i) the environmental costs of development — building materials such as beach sands, land shaping costs and importation of materials and urban environmental degradation due to overcrowding and over-exploitation of natural resources
(ii) costs of land use intensification — fertiliser, herbicides, insecticides, high-yield seeds and plants
(iii) asymmetric information (except in (d) above) — the costs of lack of knowledge or information

Throughout the valuation, cash values are given in VUV (Vanuatu Vatu), the national currency.\(^6\)

**Food and shelter cost replacement**

How much food do 1.2 persons, an adult and a child, consume? How much material for shelter do they need?

The 1979 study by Elizabeth Dye of the villagers of Walarano, an area on Malekula island, is the most authoritative source on food and nutrient intakes (see also Galipaud and Walter 1997). However, although her methodology included observations, weighing of food and weighing of consumers, the results published in the report present only nutrient intakes, rather than food intakes. This makes it difficult to estimate food intakes.

She observed (1979: 12-13) that three meals were eaten each day, but that there were no differences in food prepared for any meal. From her observations, the morning meal was likely to be re-heated portions of cooked food from the previous day — either roasted root crops or laplap\(^7\), with ripe banana or pawpaw, sometimes finished with tea or coffee. The other meals, lunch and dinner were either freshly roasted root crops, banana, breadfruit or laplap of one kind or another. Protein, either fish, other seafood, tinned meat or chicken, was served with the laplap or roasted vegetables, cooked over coals. Green vegetables were most likely to be ‘island cabbage’ (*Abelmoschus manihot*), but Chinese and European cabbage were also grown.

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\(^3\)Prices at nearest markets are commonly used (Capec and Dercon 2005)

\(^4\)As at 12 January 2012, exchange rates for VUV100 were — AUD1.05, USD1.08, CAD1.10, GBP0.71, JPY83.4.

\(^5\)Pudding of grated yam, taro, manioc or banana, wrapped in leaves and cooked under hot stones.
She also noted that fruit was consumed outside mealtimes, as were cucumbers, tomatoes and other 'western' salad vegetables, including lettuce. Other snack foods were leftovers and:

Papaya, sugarcane and the meat of the coconut. Forest fruits and nuts and banana are eaten around the gardens or while gathering firewood

(Dye 1979: 13).

The residual difficulty in obtaining estimates of consumption is that food is prepared in groups, and individual shares are difficult to quantify. That difficulty cannot be overcome, so is acknowledged en passant.

Likewise, in markets, Port Vila and Luganville and the less formal markets of other islands, root staples are sold by the basket.\(^8\) Weight can vary between different roots. Dry coconuts are sold in tied bunches of around ten nuts, green coconuts as single fruit, ‘navar’\(^9\) as tied bundles of three nuts. Other fruit can be sold individually or in plastic bagfuls.

The following estimates for one week’s supplies for one adult and one child are based on a sample 2200 calorie menu produced by Massachusetts Institute of Technology (2006) with food items (carbohydrates, protein, vegetables etc.) converted using Dye’s reports for Walarano, geared to a daily intake of between 2100 and 2300 calories. These estimates are also informed by the calorific assumptions in the World Bank poverty line imputations (Chen and Ravallion 2010 is the most recent review), Sahlins (1972: 14-28) reports on hunter-gatherer studies, and personal experience shopping for two at the Port Vila, Luganville and Lenakel (Tanna, see map A.6) markets. Finally, the observed food intake of colleagues at the Port Vila Public Library has informed the selection.

Food items required to achieve that calorific intake are listed, with price ranges in the table below:

<table>
<thead>
<tr>
<th>Item</th>
<th>range</th>
<th>average</th>
<th>cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>roots two baskets</td>
<td>400-600</td>
<td>500</td>
<td>1000</td>
</tr>
<tr>
<td>dry coconut two bundles</td>
<td>100</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>green coconut*15</td>
<td>30</td>
<td>30</td>
<td>450</td>
</tr>
<tr>
<td>island cabbage two bundles</td>
<td>200</td>
<td>200</td>
<td>400</td>
</tr>
<tr>
<td>cucumber*10</td>
<td>100-200</td>
<td>150</td>
<td>1500</td>
</tr>
<tr>
<td>pumpkin tips bundle</td>
<td>100-200</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>large fruit*10</td>
<td>100-500</td>
<td>300</td>
<td>3000</td>
</tr>
<tr>
<td>small fruit*15</td>
<td>20-200</td>
<td>110</td>
<td>1650</td>
</tr>
<tr>
<td>seafood</td>
<td>200-300</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>laplap leaf bundle</td>
<td>150-200</td>
<td>175</td>
<td>175</td>
</tr>
<tr>
<td>firewood two bundles</td>
<td>250-300</td>
<td>275</td>
<td>550</td>
</tr>
<tr>
<td><strong>weekly food costs</strong></td>
<td></td>
<td></td>
<td><strong>9,325</strong></td>
</tr>
</tbody>
</table>

(The author's observations)

The market prices in Table 4.3 are derived from personal observations at Port Vila market on 6 November, 2009. This was a Friday, the second busiest day after Saturday. Green

\(^8\) A basket is made of a coconut palm leaf, split and woven.

\(^9\) Sprouted coconuts.
vegetables and other perishables are delivered throughout the day, but prices rarely change during the day.

Although rice, tinned meat and fish and bread are staple items for rural and urban households, only items available at the market have been included and rice, tinned goods and bread are not sold there.

A full market report, with price ranges and quantities is included in Appendix E.

Traditional housing is 'free goods' — resources collected from the forest.

Dye's description of house construction in Walarano holds for most traditional housing:

Wooden poles are cut, peeled and lashed together with strong leaves, vines or strips of bark to make a frame for the house. The frame sits directly on the ground, although some families are beginning to use cement for the floor or foundation. Large poles of bamboo are slit while green and woven to make the walls. Four plaited bamboo walls are made in this manner and left in the sun to dry. After several days they are mounted onto the wooden frame.

The roof is made of leaves which are stacked very methodically, one on top of the other, to produce a layered effect

(Dye 1979: 4).

She notes that most houses deteriorate in three years or so and need replacement. She also notes the relative safety of the house in earthquakes and their ease of reconstruction — 'almost within a day' (1979: 3).

In an urban setting and in some rural settings, it is likely that non-traditional materials would be used for shelter construction.

Non-traditional housing is less easy to classify than traditional materials and not much easier to cost, as the materials are mostly 'found' materials, or combinations of forest resources and found materials. It would be unrealistic to cost non-traditional housing at new prices for materials. Roofing iron is the most common purchased material, but it is mostly second-hand and often 'removed' from derelict buildings at no cost, as are timber and other construction materials.

In view of these difficulties, a very conservative estimate of shelter costs is made.

Second-hand roofing iron to cover an area of nine square metres would cost approximately VUV1,500, and this would last three years at least, so an annual cost of VUV500 breaks down to weekly cost of less than VUV20.

The other cost which can be assessed is the cost of pandanus mats which are used for floor covering and sleeping. Mats in the market start at around VUV600, and six mats at least would be needed to cover nine square metres. Mats have a life of two years at least, so the costing is:

six mats x 600 = 3,600/2 = 1,800 annual cost, thus about VUV70 weekly cost.

Total weekly shelter costs (mats and roofing iron) are VUV90.

Combined total weekly food and shelter costs for our adult and child are:
Table 4.4: **Weekly food and shelter costs (VUV)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>food</td>
<td>9,325</td>
</tr>
<tr>
<td>shelter</td>
<td>90</td>
</tr>
<tr>
<td>total</td>
<td>9,415</td>
</tr>
</tbody>
</table>

**Rental costs — the cost of loss of shelter**

Traditional land tenure arrangements include 'free' housing. Once that entitlement is lost households must find an alternative means of housing. Rental is charged everywhere in the informal settlements around Port Vila and Luganville, in the peri-urban and hinterland villages. Rent is charged down to bed level — if you can't afford a house, or a room, you can rent a bed (Mecartney 2001).

Cox et al. (2007: 17) reported that families often paid half their weekly income in rent, which at a daily wage of VUV1,200 (or a weekly wage of VUV6,000, assuming rates at the Vanuatu minimum wage rate) is VUV3,000.

Mecartney (2001: 92) gives ranges of annual rent in Blacksands, an informal settlement in Port Vila (Figure A.1) for dwellings as VUV96,000 to VUV144,000, which on a weekly basis is between VUV1,846 and VUV2,770. These were for 1999-2000, so an adjustment will be made for inflation to Mecartney’s minimum figure.

On that evidence, rental costs for a family, would be estimated at VUV2,000 weekly. As the representative family is one adult and a child, rental costs are less, so VUV1,000 is estimated:

Table 4.5: **Weekly progress total (VUV)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>food and shelter costs</td>
<td>9,415</td>
</tr>
<tr>
<td>rental costs</td>
<td>1,000</td>
</tr>
<tr>
<td>total</td>
<td>10,415</td>
</tr>
</tbody>
</table>

**Loss of production costs — the cost of loss of production for exchange on the standard area**

At first sight, this would seem to be double-counting, as food and shelter costs have already been included. The cost is confined to an estimate of loss of production for exchange. There is no double counting in including foregone production if that production is for exchange, in addition to the cost of buying other households' production.

From the agriculture censuses (Vanuatu National Statistics Office 1984, Vanuatu National Statistics Office 1994 and Vanuatu National Statistics Office 2007a), we note that more than 50 per cent of rural households were involved in coconut, kava or beef production. 10

To simplify this calculation an estimate of beef production, at 500 grams per week, will be used, as meat is sold in supermarkets, and prices can be verified. That 500 grams per

---

10See chapter 8, 8.2.1 for details.
week is 26 kilograms per year, or 260 kilograms over ten years. If cattle production is assumed to be one unit (say a bullock), held over ten years, 260 kilograms of meat is an underestimate. Many dealers — young cattle — are over 300 kilograms dressed weight when slaughtered.11

Beef prices are cheap in Vanuatu, around VUV800 per kilogram for stewing meat, so 500 grams of lost meat production is valued at VUV400.

To account for other production for exchange, we add VUV200 for coconut production and VUV200 for kava production.12

This gives a weekly total of VUV800 for costs of loss of production. This is conservative, but as there is less than 100 per cent participation in production for exchange, conservative values are required.

Table 4.6: **Weekly progress total (VUV)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>food and shelter costs</td>
<td>9,415</td>
</tr>
<tr>
<td>rental costs</td>
<td>1,000</td>
</tr>
<tr>
<td>loss of production costs</td>
<td>800</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>11,215</strong></td>
</tr>
</tbody>
</table>

**Environmental services costs — costs of loss of biomass, biodiversity, land degradation**

Here we are attempting to quantify the provision of environmental services by traditional land tenure arrangements and households following subsistence-plus livelihoods.

Benefit-cost analysis is a standard economic tool for assessment of public and private sector project proposals, but when the subjects under consideration are natural environments and natural environment features, most fall under the category of public or 'free' goods, in that they have no set price, and there are uncertainties about property or exclusion rights (Bennett and Flatley 1996, Sterner 2003). Alternative methodologies must be found and employed to estimate their value as they currently exist.

Tacconi and Bennett (1995) at the Australian National University, explored alternative evaluation methods when they were examining processes involved in the setting up of a Protected Area in Kauri forest on Erromango (Figure A.8), the island south of Efate in the archipelago. Later Bennett and Flatley (1996) used Contingent Valuation Methodology to try and discover Australian tourists’ valuation for forest conservation on Erromango13 and Malekula, to the north of Efate. The areas in question were 32.5km² on Erromango and 25km² on Malekula. Contingent Valuation tests willingness to pay in its subject group, to preserve an area of wilderness, or of environmental significance.

Briefly, the methodology prompts subjects to name an amount they would be prepared to

---


12One bundle of dry coconuts at the market is VUV100, based on the November 2009 market prices. A large kava root (estimate around 30 kilograms) was offered at VUV5,000 (see Appendix E).

13Erromango is not a tourist island so would be rarely visited and not well known, but has a long history of logging.
pay (in this case into a Forest Preservation Trust) to ensure that the biomass and biodiversity of the areas was left pristine and not lost to logging or other development.\footnote{The method was by questionnaire, to departing visitors at the Bauerfield Airport at Port Vila.}

Their results, in summary, were that Australian visitors were prepared to pay AUD403,000 per annum to retain the two forest areas:

Australian visitors are, on average, willing to make a once-off payment of $20.22 to the PA [Protection Area] Trust fund. Furthermore, if it is assumed that a total value estimate can be determined from the summation of values held by members of the relevant population (19,945 in 1992), then it can be concluded that Australian resident visitors are willing to pay around $403,000 per annum to preserve the two rainforest areas

(Bennett and Flatley 1996: 121).

This equates to an annual payment per hectare of AUD70.00 for conservation or, for the standard area of 3.76 hectares, AUD263.20.

To put that into perspective, we need to examine 'real' prices paid by expatriate lessees. Porter and Nixon (2010: 82) report a 2008 lease valuation by the Vanuatu Valuer General on Epi, for an area of 539 hectares at AUD1,495,000, an annual payment\footnote{Assuming a 75 year lease, the calculation is:}
of AUD37.00, or roughly half the value obtained by the Contingent Valuation method.

Given the disparity between the Contingent Valuation Methodology result and the commercial leasehold valuation, which figure should be used?

Leases in Vanuatu have often been hugely undervalued or underpriced. Porter and Nixon (2010: Appendix B) show that for many leases on Epi no premium was paid, and annual rent was as low as AUD1.00 per hectare.\footnote{The rationale behind this acceptance of low prices seems to be that if someone has been declared a traditional owner, their aim is to get their hands on the money put aside, before other claimants can challenge the judgement. Such challenges result in the payments being held in trust by the Minister of Lands, until such time as the traditional ownership dispute is settled. Over time this procedure amounted to a guarantee that no traditional owner would ever see any money from the leasehold transaction — thus the unsavoury haste, and the decision of the 2006 National Land Summit that the Minister of Lands be prohibited from dealings in land (Lunnay et al. 2007: attachment 1: 7).}

In view of the consistent and large-scale underpayment on commercial leases, the Contingent Valuation Methodology value of AUD70 per hectare, has been adopted. To convert to VUV at AUD1.00 = VUV90\footnote{Currently (mid 2012) the rate is VUV96 to the AUD, in early 2010 is was VUV85, so this is a midpoint compromise conversion.} the value becomes VUV6,300. Remembering our standard area is 3.76 hectares, VUV23,688 per annum is the valuation of the biomass and biodiversity value of the standard area, or VUV455 per week.

The 2006 Agricultural census showed that use of fertiliser and pesticides was minimal. For this exercise, land degradation will be not be quantified. Likewise, the environmental degradation caused by sand-mining to make building blocks will not be included, nor will environmental pollution from the abattoirs and other industries along the Tagabe river, or the reef death caused by yacht moorings in Vila Bay and the two large resorts on Erakor Lagoon, all in Port Vila and environs.
Table 4.7: **Weekly progress total (VUV)**

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>food and shelter costs</td>
<td>9,415</td>
</tr>
<tr>
<td>rental costs</td>
<td>1,000</td>
</tr>
<tr>
<td>loss of production costs</td>
<td>800</td>
</tr>
<tr>
<td>environmental services costs</td>
<td>455</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>11,670</strong></td>
</tr>
</tbody>
</table>

**Socio-cultural costs — the costs of loss of social entitlements, cultural identity and practices**

This is the most intractable externality to attempt to measure as it is entirely composed of 'free' goods. One cannot pay a price and be given social entitlements, a cultural identity, a language and other means of access to cultural practices. The closest to which the literate world comes is through a combination of education and inheritance. Academic success opens possibilities of social entitlements and cultural identity as well as employment prospects, through learning the major symbolic systems, literacy and numeracy, and additional specialisations. Inheritance enables land and possessions to be passed on to family members or chosen inheritors.

In Vanuatu, since 2009, school fees are being progressively abolished, at the primary level, as the result of a 'deal' with AusAID.\(^{18}\) Nevertheless, school fees are still charged and represent the cost of educational entitlement.

School fees for primary children are around VUV1,500 each term, VUV4,500 for a three term school year or VUV90 per week.\(^{19}\)

For our sample household, the child is of primary school age, so that is the cost of educational entitlement. It should be borne in mind that the real costs of entitlement would include secondary education, which is much more expensive, at VUV20,000 per term, or VUV60,000 per year.\(^{20}\) If secondary costs were included the weekly entitlement cost would be VUV1,240.

Inheritance cannot be accounted for, so the educational costs are the sole costs counted.

As our sample child is a primary age child, the entitlement cost is VUV90 per week.

Table 4.8: **Weekly final total (VUV)**

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>food and shelter costs</td>
<td>9,415</td>
</tr>
<tr>
<td>rental costs</td>
<td>1,000</td>
</tr>
<tr>
<td>loss of production costs</td>
<td>800</td>
</tr>
<tr>
<td>environmental services costs</td>
<td>455</td>
</tr>
<tr>
<td>socio-cultural costs</td>
<td>90</td>
</tr>
<tr>
<td><strong>final total</strong></td>
<td><strong>11,760</strong></td>
</tr>
</tbody>
</table>

---

\(^{18}\) AusAID 2010: 3-4.  
\(^{20}\) Based on the fees charged by Malapoa College in Port Vila, the most prestigious anglophone school — see [http://malapoa.edu.vu/administration/12-bursar/20-information-about-our-fees.html](http://malapoa.edu.vu/administration/12-bursar/20-information-about-our-fees.html).
4.1.3 Findings

There are two major valuations which address the issue of livelihood in Vanuatu and provide an alternative quantification to the one presented here. The Vanuatu minimum wage is one. Cox et. al. (2007: 18), in their study of young people living and working in informal settlements, inform us that the young people they interviewed often reported receiving less than half the minimum wage. Nonetheless, minimum wage values are expected to provide a guide as to how much income may be required to subsist.

Another valuation of livelihood is that presented in Poverty Line calculations derived from National Accounts. The value of own-account production provided in the 2006 Vanuatu Household Income and Expenditure Survey, an estimate of the subsistence-based livelihood, was VUV16,840 monthly (Vanuatu National Statistics Office 2007b: 41). This value was used as the basis for calculations of poverty lines in, for example, Whiteford et. al. (2010) for UNICEF, and Robertson (2010) for the Millennium Challenge Account, Vanuatu.

Neither valuation, the minimum wage, or the National Household Income and Expenditure Survey, includes a quantification of the externalities such as has been presented here. Neither can claim methodological superiority to the model here presented. The minimum wage is adjusted on rises in the Consumer Price Index, calculated using supermarket prices, and other charges laid in Port Vila (Vanuatu National Statistics Office 2007c). These costs and charges have no impact for the population outside Port Vila, and, as will be argued later in this thesis, little for many living in Port Vila and Luganville, the two urban areas themselves. The estimate of own-account production is derived from diaries kept by one family member over a two-week period. All food consumed by the family is supposedly logged, despite the lack of standard quantities, scales to measure weight and the sheer impossibility of accounting for food consumed outside meals. Meals themselves are difficult to attribute to one family or another, as they are often prepared and shared communally (Galipaud and Walter 1997, Dye 1979).

Opposing these estimates, the values derived in the present valuation show that, even if only the cost of food and shelter are considered, the figure obtained exceeds the minimum wage by 60 per cent, and more than double the estimate of own-account production. If other externalities are considered, the disparity is heightened.

This mismatch, of itself, gives pause to those who would rely on estimates of own-account production, or minimum wage figures as being reasonable approximations of what constitutes a livelihood. If the dominant view of livelihood can be called into question in Vanuatu, then it may well be that it needs to be called into question more broadly.

If these findings can be extrapolated to the many countries which have high percentages of population involved in subsistence-based livelihoods, then these livelihoods may have been serially and seriously undervalued by development economists in the international aid agencies, the donor countries and the world financial institutions.

Furthermore, if this apparent undervaluation of subsistence-plus livelihoods permeates measures of poverty (International Poverty Lines), measures of development (Human Development Index) and measures of hunger (World Food Programme21), all of whom

21 see http://www.wfp.org/hunger/map for the WFP hunger map.
employ some imputed measure of subsistence, then their value as measures is called into question, not only because of the normative nature of what they purport to measure, already noted, but because they could well be wrong.

Further discussion of the results is undertaken in the final chapter.
Chapter 5

Land use: projections and comparison

5.1 Optimal land distribution projections

5.1.1 Projection parameters

From the previous chapter, we already have two required parameters for the projection series. The amount of agricultural land in Vanuatu — 5,403km², and the standard land area required by rural subsistence-plus households — 3.76 hectares. To prepare for the projections, more parameters need to be set:

(i) What is the rate of population growth in Vanuatu?
(ii) How much land is currently used?
(iii) How much land has been withdrawn into leasehold?

Once these parameters are obtained, the projection series will identify the point at which all agricultural land will be optimally utilised:

(a) if land withdrawals are ignored (the default case)
(b) if land withdrawals are included, in low, mid and high levels of withdrawal scenarios

What is the rate of population growth in Vanuatu?

The summary report of the 2009 Population and Housing Census gives the following population growth rates for intercensal periods (Table 5.1).

These growth rates are for total population (indigenous and expatriate) and give an average population growth rate of 2.6 per cent over the period 1967-2009. Growth rates for the indigenous population were higher (3.2 for 1967-1979; 2.8 for 1979-1989; with no separation in 1999 or 2009).
Table 5.1: Population growth rates: intercensal periods

<table>
<thead>
<tr>
<th>period</th>
<th>percentage growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967-1979</td>
<td>3.1</td>
</tr>
<tr>
<td>1979-1989</td>
<td>2.4</td>
</tr>
<tr>
<td>1989-1999</td>
<td>2.6</td>
</tr>
<tr>
<td>1999-2009</td>
<td>2.3</td>
</tr>
<tr>
<td>average</td>
<td>2.6</td>
</tr>
</tbody>
</table>

(VNSO 2010c: 15)

As it is indigenous households under study, we use a slightly higher estimate than that given by adding the indigenous rates of the two early intercensal periods to the whole population rates of the latter two periods, which would have been 2.725 per cent. The rate chosen is 2.8 per cent per annum.

The study will use 2.8 per cent as the average population growth rate for the whole of Vanuatu.

In the projections, aggregations at province and island level are given. There are variations in annual population growth rates between provinces and islands which could have been utilised. For simplicity’s sake, it was decided to use one average rate, as the aim is to model growth rather than to accurately predict it.

How much land is currently used?

Table 5.2 shows current agricultural land use, as presented in the 2006 Agricultural Census for Vanuatu, for the provinces of Sanma (The islands of Santo and Malo) and Shefa (Efate, Epi and the Shepherd Islands) and for Efate island.

Table 5.2: Current land use: Vanuatu, selected Provinces and Efate

<table>
<thead>
<tr>
<th>current use (km²)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Efate</td>
<td>36.9</td>
</tr>
<tr>
<td>Shefa</td>
<td>53.7</td>
</tr>
<tr>
<td>Sanma</td>
<td>51</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>250</td>
</tr>
</tbody>
</table>

(VNSO 2007a)

The value for Efate is an estimated proportion of the Shefa value. Efate agricultural land area is 543km², or 68 per cent of Shefa agricultural land (791km²), so the value provided, represents 68 per cent of Shefa land in current use.¹

¹Current agricultural land needs for Vanuatu is not in accord with the FAO figure, which would be 1049km² (8.61 per cent of total land area of 12189km²). In this study, we have chosen to accept the census numbers, which are locally collected, and based on counts. The FAO numbers seem to be based on assumptions about population growth rates and rates of increase in agricultural production, which may not be reliable.
How much land has been withdrawn from agricultural use?

There has been a real problem with separating fact from opinion on the question of land withdrawals. Few documented studies have been made of land transfers in Vanuatu (see Farran (2002) below), and none for Vanuatu as a whole, until the studies undertaken as part of the World Bank's Jastis Blong Evriwan Project by Porter and Nixon (2010), and Porter, Nixon and Otto (2011). Milena Stefanova (pers. comm. 2010), coordinator of the project, confirmed by email that many difficulties were encountered and needed to be overcome in order to arrive at a reasonably accurate estimate for Efate land dealings. Since the introduction of the Strata Titles Act in 2000, most of the land transactions in Vanuatu have been on the islands of Efate and Santo, with more activity recently on Epi.

In her 2002 study of leasehold on Efate island, Farran (2002) estimated that 25 per cent of agricultural land2 had been transferred to leasehold and thus lost to traditional patterns of land use. This estimate included the leases arranged at Independence with alienators. Farran's interest was in questions of legality and propriety, but she examined the original documents in all cases, and her estimate can be trusted. Since that study, others have revised upward the quantity of lost agricultural land.

By 2006, the year of the National Land Summit, a percentage between 66 per cent and 85 per cent had currency, with opinion strongly favouring the idea that the coastline of Efate was 95 per cent in expatriate leasehold (Slatter 2006). Russell Nari, the then Director-General of the Department of Lands who supported Slatter's figure, is quoted (Sydney Morning Herald, 2 September, 2006) as giving estimates of leasing of agricultural land on Santo being in the order of 25 per cent of agricultural land.

In October, 2010, the Department of Lands released two maps of land leasing on Efate to the Jastis Blong Evriwan Project and these were forwarded to the author by Milena Stefanova, by email on 8 October, 2010. One map shows registered leases on Efate with darker green being lease areas (Figure 5.1), the other leased land as at May, 2010 with red showing leased areas (Figure 5.2). There are some discrepancies between the two. The green area of the second map, which shows the Efate Land Management Area, is an area supposedly free of leases. In the first map, some of that green area is marked as held in a registered lease.

The two maps do not support Russell Nari's estimate of 95 per cent of Efate coastline being in leasehold, but do show that the majority of coastal land has been lost to traditional land use.

The release of the two maps was accompanied by calculations on percentages of land in leases on Efate, reproduced here (in facsimile):

(a) Total area of Efate = 897,706,796.1 square metres
(b) Area of Rural Efate leased = 415,260,411 square metres
(c) Total area % Leased out = 46.26%
(d) Also note that Efate Land Management Area (ELMA), a Conservation Area around Mount McDonald, is an area without any Registered Leases in it = 170,210,772.8 sq. metres. And it makes up = 18.96% of Efate

2Agricultural land is land which is not in urban leases. Urban leases exist in Port Vila and Luganville and form what is essentially a system which seems to work effectively. Surprisingly, the urban lease system is often ignored in discussions of land reform, despite its provenance and functionality.
(e) Note that the dataset is 98% complete and updated.

Figure 5.1: Registered Leases

On face value, this would seem to alleviate concerns raised about the levels of land withdrawal.

Closer inspection reveals a less optimistic picture!

Although the total land area of Efate is 898 km$^2$, the area of good agricultural land identified by Quantin (see map, Figure 4.1 or Simeoni 2007: 117), is 543 km$^2$.

If the Quantin map is compared with either map, it can be seen that the land classed as poor agricultural land closely approximates the area of the Efate Land Management Area, referred to above.

More importantly, almost all leased land falls within Quantin’s good agricultural land.

In the light of this information, the calculation above needs to be modified.

(i) To calculate percentage of good agricultural land leased we have:

$$\frac{415km^2}{543km^2} \times 100 = 76.2\%$$

(ii) If we then subtract the land already in use, taken from the 2006 Agricultural Census, from the good agricultural land:

$$543km^2 - 37km^2 = 506km^2$$
(iii) Then re-calculate percentage:

\[
415 \div 506 \times 100 = 82.0\%
\]

While it may well be that the re-calculated percentage of land withdrawn — 82 per cent — can be treated with some degree of confidence, it would be imprudent to be too bold with data that are preliminary; even at 98 per cent complete!

**Three scenario approach**

Accordingly, the most prudent course seems to be to adopt a scenario approach to the land withdrawal issue which enables us to identify a range of possible values. Three scenarios of land withdrawal: best case; moderate; and worst case are examined.

For Efate; a lower level of land withdrawal into leasehold, at 60 per cent, a moderate level, at 75 per cent and a high level, at 90 per cent will represent the best, moderate and worst case scenarios.

For Sanma (Santo and its offshore islets, including Malo), the 25 per cent put forward by Nari is nowhere substantiated but is indicative at least of elevated numbers of land dealings. The best, moderate and worst case scenario withdrawal intervals will be set at 10 per cent, 20 per cent and 30 per cent.
The tables (Tables 5.3 and 5.4) show the results of the application of the scenarios, using Quantin (1982) as the basis for potential agricultural land. It is assumed that land transferred to leasehold has in all cases been land with good potential for agriculture. In both cases, Efate and Sanma, the littoral zone is the most highly prized by expatriate investors for obvious reasons. This zone generally falls within the areas of good potential, shown previously (Figure 4.1, p. 61).

In each case, the available land is the net available land after land in current use has been subtracted.

Table 5.3: Agricultural land withdrawal and available land at 10%, 20% and 30%: Sanma Province

<table>
<thead>
<tr>
<th>land (km²)</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>withdrawn</td>
<td>176</td>
<td>352</td>
<td>528</td>
</tr>
<tr>
<td>remaining (less current use)</td>
<td>1583</td>
<td>1407</td>
<td>1231</td>
</tr>
</tbody>
</table>

(VNOSO 1984, VNOSO 2007a)

Table 5.4: Agricultural land withdrawal and available land at 60%, 75% and 90%: Efate

<table>
<thead>
<tr>
<th>land (km²)</th>
<th>60%</th>
<th>75%</th>
<th>90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>withdrawn</td>
<td>304</td>
<td>380</td>
<td>456</td>
</tr>
<tr>
<td>remaining (less current use)</td>
<td>202</td>
<td>126</td>
<td>50</td>
</tr>
</tbody>
</table>

(VNOSO 1984, VNOSO 2007a)

5.1.2 Optimal land use projections series

The series of tables presented below summarise calculations which can be found in Appendix B, which presents the full set of workings.

Default projections

First, the default projections are presented, where land withdrawals are ignored. In this projection the Pareto³ years — the year of optimal land distribution — are shown for Efate, Shefa and Sanma provinces and rural Vanuatu, using the standard area of 3.76 hectares per household, and assuming an annual population growth rate of 2.8 per cent. The actual rates recorded in the 2009 Population and Housing Census are given in parenthesis, for comparison. Table 5.5 shows the results.

In the default projections, Pareto years — the year of optimal land distribution — would not be reached until the second half of the century. The least distant year, 2048 for Shefa province, represents the worst case. While this does not yet present as a cause for alarm, it is certainly on the horizon of concern, in land use planning terms.

Table 5.5: Default projection: Rural Vanuatu, Shefa and Sanma Provinces and Efate

<table>
<thead>
<tr>
<th>Area</th>
<th>currently in use (km²)</th>
<th>land available (km²)</th>
<th>pop. increase p.a.</th>
<th>Pareto year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efate</td>
<td>36.9</td>
<td>506</td>
<td>2.8(4.4)</td>
<td>2058</td>
</tr>
<tr>
<td>Shefa</td>
<td>53.7</td>
<td>737</td>
<td>2.8(3.7)</td>
<td>2048</td>
</tr>
<tr>
<td>Sanma</td>
<td>51</td>
<td>1,759</td>
<td>2.8(2.4)</td>
<td>2080</td>
</tr>
<tr>
<td>Rural Vanuatu</td>
<td>250</td>
<td>5,153</td>
<td>2.8(1.9)</td>
<td>2060</td>
</tr>
</tbody>
</table>

Projections: land withdrawals best case scenario: Sanma, Shefa and rural Vanuatu

With the default projections completed, we are now in a position to examine the impact of land withdrawals on subsistence-plus livelihood potential.

As noted above in Table 5.5, on current rates of population growth, rural Vanuatu has until the year 2060 to reach the tipping point of optimal land distribution — the Pareto year. If we modify the available land (5,276 km²) by subtracting the land withdrawn, we can get a measure of the impact.

Table 5.5 is revised below by subtracting 10 per cent of Sanma land and 60 per cent of Efate land and by adding a column showing the Pareto year under this 'best case' scenario. These withdrawals are aggregated for rural Vanuatu. The values for Sanma and Shefa provinces include only Santo and Efate withdrawals and ignore those on other islands, so the Pareto year value is better than it should be.

Table 5.6: Pareto year 'best case': Sanma, Shefa and Rural Vanuatu

<table>
<thead>
<tr>
<th>Area</th>
<th>avail. (km²)</th>
<th>pop. increase p.a.</th>
<th>Pareto one default</th>
<th>Pareto two best case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanma</td>
<td>1583</td>
<td>2.8</td>
<td>2080</td>
<td>2077</td>
</tr>
<tr>
<td>Shefa</td>
<td>737</td>
<td>2.8</td>
<td>2058</td>
<td>2029</td>
</tr>
<tr>
<td>Rural Vanuatu</td>
<td>4673</td>
<td>2.8</td>
<td>2060</td>
<td>2056</td>
</tr>
</tbody>
</table>

In the best case scenario the situation for Sanma province and for rural Vanuatu is almost unchanged, with land withdrawals having very little effect on the projected Pareto year. However, in Shefa province the reduction in time to optimal distribution represents a decline of more than 50 per cent. The lead time until Pareto year is less than 20 years.

Projections: land withdrawals worst case scenario: Sanma, Shefa and rural Vanuatu

The worst case scenario is represented by land withdrawals of 30 per cent in Sanma province and 90 per cent on Efate. These are above the highest estimates of land withdrawals, that of the former Director-General of Lands, Russell Nari, by about five per cent in both the Santo and Efate cases. However, the discussion of the best estimate for Efate (see p. 76)
showed that it is likely that 82 per cent of agricultural land has been withdrawn, taken from an incomplete data set.

Table 5.7: Pareto year 'worst case': Sanma, Shefa and Rural Vanuatu

<table>
<thead>
<tr>
<th>Area</th>
<th>avail. (km²)</th>
<th>increase p.a.</th>
<th>Pareto one default</th>
<th>Pareto two worst case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanma</td>
<td>1231</td>
<td>2.8</td>
<td>2080</td>
<td>2067</td>
</tr>
<tr>
<td>Shefa</td>
<td>335</td>
<td>2.8</td>
<td>2058</td>
<td>2013</td>
</tr>
<tr>
<td>Rural Vanuatu</td>
<td>4169</td>
<td>2.8</td>
<td>2060</td>
<td>2052</td>
</tr>
</tbody>
</table>

For both Sanma province and rural Vanuatu there is a less than 20 per cent reduction in time to Pareto year, which does not present an immediate threat. However the Sanma scenarios show only the impact of land withdrawals on Santo and Malo, and there are known leases on other islands in Sanma province, Aore and Toutouba in particular, so the picture is likely to be worse than shown here.

The more than 90 per cent reduction for Shefa province is cause for concern. Land withdrawals on Epi, the second largest island in the province have not been considered, and there are 63.5km² in leasehold (Porter and Nixon 2010: 25-28), of an area of 195km² of good agricultural land (Vanuatu National Statistics Office 1984: 5.10), or 33 per cent.

Of even greater concern is that the percentage reduction effectively reduces Pareto year to 2013, the present.

If the situation for Shefa province is of concern, and the land withdrawals which have produced the adverse effect are only those on Efate, what might the effects be for Efate itself?

Projections: land withdrawals best, worst and medium case scenarios:

Efate

As mentioned, the problems in Shefa province are not confined to Efate, however the problematic level of leasehold on Epi lacks the extra dimension of an extensive urban population (the population of Port Vila) also reliant, more or less, on the agricultural production of Efate for food.

Sectors of the urban population are heavily reliant on the market, having no gardens. Others are marginally reliant. Into the future, there is unlikely to be more land available for the urban and peri-urban households to access for gardens, thus land intensification seems inevitable, as there is little possibility of the urban population stagnating or declining. This land use intensification will take place on land to which the gardeners have no entitlement or tenure, as the traditional owners are reluctant to enter into either formal or informal agreements, owing to the perilous nature of tenure.

Under the best case scenario Pareto year arrives in 2025, 12 years from now.

In the moderate scenario, Pareto year was passed in 2006. The reverse projection has certain logical problems associated with it — you cannot project into the past! It can still be reasonably argued that we are past optimal land distribution and in a worsening situation.
Table 5.8: Pareto year under three scenarios: Efate

<table>
<thead>
<tr>
<th>Area</th>
<th>avail. (km²)</th>
<th>default</th>
<th>best</th>
<th>mod</th>
<th>worst</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efate</td>
<td>50 (worst)</td>
<td>2058</td>
<td>2025</td>
<td>2006</td>
<td>1975</td>
</tr>
</tbody>
</table>

In the worst case scenario, the Pareto year passed in 1975.

The level of land withdrawal under the worst case scenario indicates a situation where the carrying capacity of the available land is less than half that of the number of households presently using it. There are 3,525 households using land which has the carrying capacity of 1,346 households using the standard area of 3.76 hectares.\(^4\)

**Indicators from Pareto year projections**

In the following section, the value of the projections will be put more into perspective and limitations will be dealt with. However, before proceeding we need to extract the main indicators from the projections:

(a) The most apparent indicator in the projections is that the level of land withdrawals on Efate in particular, but also the whole of Shefa province, has produced a situation where the carrying capacity of the available agricultural land has been exceeded on Efate, and is about to be for Shefa as a whole. The projections are an indicator that rural households on Efate and in Shefa may be drawing down their resources — living unsustainably — in effect.

If the urban population is added to the mix, the situation worsens. There are more than 9000 households in Port Vila and 13,000 households on Efate (Vanuatu National Statistics Office 2010b: 6). If they are all dependent on the food resources provided from land which has a carrying capacity of 1,346 households, then food security is in peril.

(b) We note that although there is not much leeway for other parts of Vanuatu, the situation is not as dire.

**5.1.3 Limitations of the projections**

It must first be acknowledged that the projections do not directly measure land use. The measure of land use is derived from the projections of population increase, by means of allocating a standard area of land per household. The projections thus have the inherent limitation of being derivative.

Second, because it is impossible to predict the future course of land withdrawals, the projection series used current levels of land withdrawal. This introduces an implication that no further land withdrawal will occur, and this is unlikely to be the case.

These are relatively minor limitations, but those below are major.

\(^4\)A reminder that the actual calculations and assumptions for the projections above can be found in Appendix B.
We have held one value to be constant — the farming system. This is unrealistic. It has been assumed that our standard area — 3.76 hectares — provides a sustainable livelihood. Such may not be the case. All these are self-imposed limitations but there are others which stem from the effects of the colonial period, particularly on population. The limitations are dealt with as responses to the questions below:

(a) Is subsistence agriculture in Vanuatu a static system?
(b) Is subsistence agriculture in Vanuatu a sustainable system?
(c) What was the population before European contact?
(d) Did the colonial period change subsistence gardening?

Is subsistence agriculture in Vanuatu a static system?  

Clearly, the evidence shows that such is not the case. There are many obvious precedents for adaptive change in agriculture in Vanuatu, most obviously in the adoption of introduced crops — manioc, sweet potato and papaya — are prime examples. Trees and fruits have also been widely and successfully adopted: mango; avocado; and a wide range of citrus fruits. These adaptations and adaptations are indicative of an agricultural community which is adaptable, flexible and responsive to change. Similar examples of adaptive incorporation of introduced species are common throughout Melanesia. The best-documented example is the adoption of the sweet potato in the Eastern Highlands of Papua New Guinea (Yen 1993; Brookfield with Hart 1971). Sweet potato has supplanted other root crops as the staple, because of its ability to withstand a wider range of climatic conditions and its usefulness as pig feed. This usefulness as feed is a big advantage in societies where pigs are vitally important in social construction, for prestige-gaining feasts.

Thus it seems entirely reasonable to suggest that subsistence gardeners would be likely to make changes when faced with developing problems and issues. Within the last five years new garden areas have been developed on Efate. A leader and land owner of the Eretap community allowed land to be used in the Teouma river area, 15 kilometres south of Port Vila, by 'town' communities, under a 'kastom' grant, wherein he was promised customary gifts in exchange for use of the land. This area now provides a significant contribution to the food resources of Port Vila as many of the gardeners grow 'European vegetables' for the market, along with traditional subsistence garden foods. This gesture, a response to the perceived shortage of land for gardens in the urban and peri-urban areas, is entirely in keeping with the custom of making land available for people to make a garden as Regenvanu (2009) noted.

The 2006 Agricultural Census examines the growth of agricultural practices which are responses to soil degradation. Little use had been made of passive measures, such as covering of gardens with plastic sheets to protect soils and crops from rain damage (1.9 per cent of all respondents), or of the more characteristic measures of intensity, use of fertiliser (1.3 per cent) or pesticides (0.4 per cent). However almost 10 per cent of respondents claimed

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1Bourke (1999: 10), Street (1976), Baylis-Smith (1980) and Sahlin (1972) all warn of the dangers of calculations of land use intensity or land needs which assume static farming systems.

2In an early tropical agriculture guide (MacMillan 1915: 130-131) there is a plate with 51 selected tropical fruits, all of which — with one exception, the durian — the author has seen either in the market or growing around Port Vila.

3See Glossary.
to use improved (commercially produced and purchased) seeds. Such indicators as these reinforce the notion that despite its seeming conservatism, subsistence gardening does show an adaptive nature, Levi-Strauss' contrary notions of 'cold societies' notwithstanding (Levi-Strauss 1968: 233-235).

Is subsistence agriculture in Vanuatu a sustainable system?

Sustainability has become a word which engenders confusion, not least because it seems to be most often used in a restorative or remediative sense by people involved in practices which have clearly passed beyond the point of sustainability, in countries where 'sustainability' is historical. It is widely used in studies of Australian agriculture (Nelson et al. 2009a; 2009b, for example), which, few would argue, has long ago tipped over into unsustainability. All this has somehow led to the conflation of the term sustainability with the process of remediation of unsustainable practices.

In Vanuatu, while there are warning signs from the Pareto projections, and planet-wide issues which are impacting, there is no need to undertake a long and tortuous exploration of what sustainability means in the present case. In this case it means just that — a process which does not deplete resources over time. The projections showed that only on Efate is there the suggestion that resource depletion may be evident. Elsewhere, there is leeway.

With some misgivings in the light of the Efate projections, the study will use the now-standard definition, provided by the World Commission on Environment and Development in its 1987 report — *Our Common Future*.

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs

(World Commission on Environment and Development 1987b: 51).

If a sustainable process is a process which does not deplete resources over time, is subsistence gardening in Vanuatu sustainable?8

In Vanuatu, as far as the evidence shows, human habitation began 3,500 years ago. It began with the people and culture known to archaeology as Lapita. Recent finds of an extensive burial site at Teouma, just outside Port Vila represent a breakthrough in the body of knowledge of the Lapita cultural complex, as skeletal remains were rare beforehand (Bedford, Spriggs and Regenvanu 2006; Bentley, Buckley and Spriggs 2007).

While it is of great moment to archaeologists from whence the Lapita came, for this discussion the origin site is of little concern. What is of greater significance is that they did not come empty-handed. They brought with them their means of subsistence — their root crops, their banana and plantain plants and their commensal animals — pigs, dogs, chickens and two rat species at least (Matison-Smith and Robins 2004).

The arrival of the Lapita, and their flora and fauna, introduced a period of rapid ecological adjustment, at the end of which a number of indigenous species were regionally extinct. In particular, megapodes9 and other birds suffered drastic reductions. Steadman (1999: 7) noted that 'human-caused extinctions have obliterated most populations and species of megapodes in Oceania'.

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8This material expands on the earlier treatment in the history chapter (see 2.1.2).
9Flightless birds, some very large such as the New Zealand Moa, but also many smaller species.
Birds, along with fruit bats and other bats, are the main endothermic (warm-blooded) species throughout Oceania, with exothermic fauna\(^\text{10}\) being more common. These exothermic species also suffered at the hands of the Lapita and their commensal species, with fossil records showing extinctions of terrestrial lizards, some crocodilian species and several species of turtle (Spriggs 1997).

The Teouma site, in common with all Lapita sites, shows heavy exploitation of molluscs and other littoral-dwelling fauna. Spriggs (1997: 85-87) notes that most Lapita occupation sites are initially littoral sites, which show signs of serious erosion. Many sites show signs of abandonment for sometimes hundreds of years with later occupation moving inland.

Lapita environmental impacts were not confined to fauna. Pollen records from a number of sites show discontinuities, with evidence of tree species disappearing and being replaced by grasses and carbon deposits, an artefact of Lapita swidden practices (Kirch and Hunt 1997, Enright and Gosden 1996). This deforestation may have been accidental, but is more likely to have been deliberate. The practice has been observed in many Pacific islands, where the ground cover is removed on slopes to promote the transport of soils to replenish the soils on lower, more easily worked land (Kirch and Yen 1982, Spriggs 1997).

The picture that emerges across the islands of the Lapita migration and settlement is one of irreversible environmental change in the fragile island environments, with large scale extinctions of bird and reptile life and over-exploitation of littoral resources. When we observe Pacific islands today, we are looking at island environments which are 'man-made' (Kirch’s introduction in Kirch and Hunt 1997: 1-4).

That said, we can turn to the question of current concern. Given that we cannot undo the impact of the initial settlement, how sustainable has the biodiversity regime which replaced the original biota been?

For any history of Pacific subsistence, the initial difficulty which presents itself is that we still have a very incomplete picture of Pacific prehistory before the arrival of literate man and the beginnings of written history.

As noted, the people known to linguistic historians as Austronesians and to archaeologists as Lapita were presumed, initially, to have arisen somewhere in South Asia around 10,000 years B.P. and moved over time to be present in Near Oceania by 6,000 years B.P. Subsequently they island-hopped into Remote Oceania through the Solomons and Vanuatu archipelagos to New Caledonia, Fiji and thence to Polynesia — beginning around 3,500 years B.P. and concluding with the settlement of Aotearoa, less than 1,000 years B.P.

This interpretation is currently undergoing considerable modification as the technological advantages of genetic marker history are applied to the Lapita/Austronesian expansion into Remote Oceania. Driven by the anomalous instances of Polynesian outliers\(^\text{11}\) researchers have begun to question the notion of a single point of departure. Matisoo-Smith (2002),\(^\text{12}\) whose studies of the mitochondrial DNA of Lapita commensal animals (rats and pigs) pioneered this field, proposes a model of contemporaneous Lapita/Austronesian expansion from two points, the New Britain area being one, the other being insular South East Asia (Philippines), through Micronesia and on to Polynesia (Matisoo-Smith 2002, Matisoo-Smith and Robins 2004).

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\(^{10}\)Reptiles and other cold-blooded animals.

\(^{11}\)Islands which are inhabited by Polynesian-speaking, racially Polynesian people in the Melanesian archipelagos, such as Rotuma (Fiji), Futuna and Aniwa (Vanuatu), Tikopia and Anuta (Solomons).

\(^{12}\)see also Matisoo-Smith and Robins (2004); and Denny and Matisoo-Smith (2010).
Common to both interpretations is the idea that over time, an equilibrium was reached in most places of settlement throughout the Pacific. Diamond (2005) documents some notable exceptions, including the collapse of populations on Rapanui and Pitcairn, but these are comparatively rare occurrences. This state of ecological equilibrium included the biodiversity which survived the initial impacts of human settlement, the commensal flora and fauna of the human settlers and the introductions from other places — sweet potato and others. Alongside these were the human settlers themselves — the Micronesians, the Melanesians and the Polynesians — spread across the Pacific from insular Asia to the Americas. During the period, as equilibrium was reached, there were considerable human movements, with evidence of Samoan and Tongan expeditions throughout the Western Pacific, including to islands in Vanuatu.

Aside from the literature, the other primary source of information for Pacific history are the oral traditions of the people themselves. While issues such as sustainability may not appear often in the oral histories, major events are well remembered.

In the Shepherd Islands (see Figure A.2), there is oral history of a huge volcanic eruption of the Kuvae volcano, which created the island of Tongoa, formerly part of Epi Island (Hoffman 2006). This oral tradition is in accord with a number of scientific studies which indicate that the Kuvae eruption, in terms of sulphate deposition — ash, in other words — was the largest volcanic event of the last 700 years, and that it was, before the eruption, an uninterrupted caldera, a circular landmass which became the islands of Epi and Tongoa. Gao (2005) used ice-core analysis of Arctic and Antarctic samples to date the eruption to 1452 or 1453. Hoffman (2006) notes 40-60 cm of tephra covering most of Epi. Such an event would have presented the populations of the surrounding islands with significant livelihood challenges. Hoffman (2006: 66-67) describes a song which tells of water shortages, ash-covered people and women searching for famine foods. Despite this, the islands of Tongoa, Buninga and Epi were re-settled.

If cataclysmic natural disasters were able to be withstood, what of human-induced events?

Our second example is less dramatic, but of more historical significance to the human history of central Vanuatu (see also p. 22). Oral history in central Vanuatu tells of the conquest of Efate and its offshore islands by a Polynesian chief, perhaps known as Roi Mata, around 1,000 years B.P. (1000 A.D.), and of his institution of a 'natlak\(^{13}\) totemic system which was unknown before the conquest, and is not documented anywhere else in the archipelago.\(^{14}\) There is a current application to have the Roi Mata domain proclaimed a World Heritage Area, as an outstanding and living example of Polynesian chiefly systems. In the 1960s, the French archaeologist Jose Garanger, with the help of anthropologist Jean Guirat, used local accounts to locate and excavate sites associated with the Roi Mata oral history. On Artok island (Eretoka or Hat Island), an island which has been ‘vanua tabu’,\(^{15}\) unoccupied and largely unvisited for 400 years, Garanger excavated a mass burial site which contained a high status grave surrounded by more than 40 burials of males and females together. This burial site was as the local oral tradition suggested, although the oral tradition indicated 300 were buried at the site.

The 600 year gap between the arrival and conquest and the mass burial is explained as a confusion of a title (Roi Mata) with an individual — thus the chiefly title was passed through the generations until some 400 years ago when the then holder of the title died.

\(^{13}\)There are many translations, but clan seems the most likely.

\(^{14}\)For more information on this totemic clan system, see the World Heritage Centre — http://whc.unesco.org/en/list/1280.

\(^{15}\)Forbidden land.
and no appropriate successor came forward (Wilson, Ballard and Kalotiti 2007: 4; Vanuatu Kaljoral Senta 2006).

Although some of the cultural aspects of the invasion persist, the subsistence gardening regime on Efate has no noticeable Polynesian influence — there is no tradition of pit fermentation of root crops, nor is there cultural cultivation of turmeric, both markers of Polynesian agriculture and culture (Firth 1959; Borrie, Firth and Spillius 1957).

As major events, such as the invasion and volcanic eruption described above, have persisted for many centuries in the oral tradition, we may advance an 'argument from silence' that if neither the Polynesian invasion nor the Kuwae eruption had long-term effects on the agricultural systems of Vanuatu, then there is no reason to suspect that there may have been other disruptions, or they would have left markers in stories and songs.

One small enigma remains.

Spriggs (1997: 85) argued for a model of settlement with:

(i) initial littoral settlement with high environmental impact
(ii) abandonment, sometimes for hundreds of years
(iii) settlement, moving inland, with much less environmental impact

There are, in a number of oral traditions, stories of displacement of previous inhabitants by the current incumbents. Suas (1917: 201-206), for example, outlines the 'Talu Tuel' tradition of displacement on Ambae island (see Figure A.7). There is a possibility here that the oral tradition accords with the observed archaeology, and that it describes two separate phases of settlement. We await further evidence.

To summarise, inhabitation in Vanuatu began with considerable environmental impact, but over time reached an equilibrium — a sustainable interplay of human and environment — with no additional species extinctions and no catastrophic erosion and soil depletion. This equilibrium seemed resilient to both natural disasters and to human-induced change.

**What was the population before European contact?**

If a sustainable equilibrium had been reached in Vanuatu before European contact, then we could assume that the indigenous population levels were at sustainable levels. If we knew those population levels, we would be able to use those levels to make predictions about sustainable population levels into the future.

Unfortunately, we have little or no idea of the population at contact, and, from that point, things got worse. Depopulation, through introduced diseases, altered settlement patterns and abductions for overseas labour happened at some level, but that level is also unknown and contentious. Estimates of populations of Pacific islands before European contact and settlement have become an historiographic battleground. Early population estimates for the Vanuatu archipelago ranged from 25,000 to more than a million (Caldwell, Missingham and Marck 2001). The extent of depopulation was from the first a politico-intellectual issue, with early catastrophic depopulation estimates giving way to later revisions, with those revisions often put forward as a challenge to the dominant colonial discourse of a 'displaced and disappeared' people. Diamond (1997; 2005) is the foremost current representative of the discourse of 'disappearance and displacement', Jolly (1997) and perhaps Brookfield (1972b) the revisionist view that depopulation was often overstated to enable
the original culture to be subsumed into the dominant colonial culture, with concomitant land alienation and cultural destruction.

In the previous section (see p. 73), Table 5.5 showed that the Pareto year for rural Vanuatu, projected to be 2060, was based on the time it would take for population to total 137,048 households, which at five persons per household would be a population of slightly under 700,000, compared with the current 250,000.

The most wildly optimistic estimate of pre-contact population was six million, one among a number of early estimates, but by 1910, just following the formation of the Condominium, estimates were much lower, at around 65,000 (McArthur and Yaxley 1968: 1-22). We are left with a conundrum. If the pre-contact population exceeded 700,000 then sustainability, on the basis of our projections, may have been threatened. That seems unlikely, given that there were no major population centres prior to contact and that most of the estimates are much lower than the current population (Caldwell, Missingham and Marck 2001: 3-7).

It can be surmised, with some trepidation, that the risk of population pressure on the subsistence livelihood prior to European contact would have been slight.

Did the colonial period change subsistence gardening practices?

While the degree of depopulation remains at issue, there is no dissent from the view that some depopulation did occur. Brookfield (1972b) argued that depopulation would likely have led to a disintensification of agriculture; Spriggs (1982; 1983) also documents higher levels of agricultural intensity in the archaeological record. Causal effects in such agricultural disintensification are difficult to prove, one way or the other, because of the interference of the colonial period. From the beginning of census-taking in 1967, the population has almost quadrupled, from 77,000 to near 250,000. With that growth in population has come an increase in land under cultivation — an extensification of agriculture which appears mostly sustainable at the present time, according to the projections.

The colonial period and the preceding period of European contact has effectively pulled a veil over what went before. It is an impenetrable barrier to a view of how life went on, both for researchers and for the indigenous Melanesians. A way of life — the Melanesian way — where all aspects of livelihood, culture, a language and social organisation were integrated by a sense of place into a large number of homogenous societies, met and was swept aside by another. This new way of life had long abandoned an integrated and geographically bound way of life for a set of decoupled systems, unbound by time or place. The colonial God was a god without place, the colonial livelihood was a livelihood based on symbolic exchange (cash). Colonial education was based on instruction in two symbolic systems — reading, writing (literacy) and arithmetic (numeracy). Colonial social organisation was based, not on kinship and reciprocity, but on social class and stratification. Social control came not from rights of acquired prestige through gift-giving, but by military might. Belonging was constructed by arbitrary lines drawn on maps — this is the New Hebrides, this is the Solomons, this is Australia! (Brookfield 1972a).

Around 100 years later, the military might was withdrawn and the colonial confection known as the Condominium of the New Hebrides became the post-colonial confection known as the Republic of Vanuatu, peopled by a population trying to reconcile two ways of life; the tribal and the modern (James 2006). Doubtless there were many areas of the country, and many islands, where the colonial influence was felt only a little, but more than
90 per cent of the present-day population claim the colonial religion, Christianity, as their religion. The most obvious and confronting reminder that this was a colonial society is the continuing tendency, noted earlier, for ni-Vanuatu to address expatriates as 'Masta' or 'Missus'.

The two problems noted, agricultural practices and population densities are both obscured. How then can this problem of masking be overcome? In the laboratory of Vanuatu there is no escaping the taint of the colonial past, even on the more remote islands.

Is there another place which can provide us with a less tainted view of subsistence sustained over time? With some reservations, there is!

5.2 Tikopia — a comparison

Figure 5.3: Tikopia: www.janesoceania.com, 3 June 2010

The island of Tikopia is part of the Republic of the Solomon Islands, but is remote and roughly equidistant to the East South-East from the Solomons island of Vanikoro, and North-East from Vanua Lava in the Banks group of Vanuatu. In the map, Tikopia appears in the red circle at the bottom right.

The island itself is a high island, some 3.6 kilometres from East to West, and 2.2 kilometres North to South at its widest point. There is an almost circular lagoon, inside the slopes of a cylindrical crater, and a plain or raised coral shelf which extends to the West about a kilometre.

The lagoon has been cut off from the ocean for most of the past 100 years, although the Tikopia (people and place are Tikopia) have from time to time opened the channel at the eastern end of the enclosing spit.
Following a cyclone in 2002, the lagoon opening remained open for some time, threatening the sago palms, until with assistance from outside, a gabion barrier was used to close the opening in 2006.16

Tikopia’s value as a laboratory comes firstly from its remoteness and inaccessibility. It does not have a natural harbour or shelter for visiting vessels, so visitors are a rarity. Because of its isolation, the colonisation of the Solomons and later of the New Hebrides meant little to the people of Tikopia. Firth (1959: 31) noted that since the first appearance of Europeans with de Quiros in 1606, contacts with the West were characterised by their ‘rarity and irregularity, despite the long period since they first began’. There has never been land alienation, or permanent colonial residence on the island. Christianity has certainly had a significant impact on the Tikopia, and in 1955, the last group still practising traditional religious beliefs and practices abandoned them as a result of an epidemic which caused many deaths, and which followed two cyclones and a period of near-famine in 1952 and 1953 (Firth 1959; 1967).17 Nevertheless, in comparison with other locations in Melanesia, Tikopia has been lightly touched by the colonial past and by the Republican18 present.

Secondly, Tikopia is a valuable source for the sustainability of subsistence practices and population densities. It has a well-documented history, thanks to the extensive anthropological and ethnographic work undertaken by Raymond Firth, from 1928 through to 1966

16 For an account see www.tallshipstales.de/Restoring_Tikopia-lagoon.php.
17 Kirch and Yen (1982: 122) indicate that certain rituals were still being performed 22 years after Firth sounded their death knell.
18 The Republic of the Solomon Islands.
and beyond, and to the coterie of researchers who followed in his footsteps, including Kirch and Yen (1982), whose study provided much supporting archaeological and agricultural embellishment to Firth’s ethnography. More recently, it has gained favour among welfare economists seeking to move the sustainability debate on from discount rates and ‘the true degree of substitutability of different forms of economic capital’ (Gowdy 2006: 348-349) by examining past and present societies and how they achieved sustainability (or didn’t!).

Kirch and Yen (1982: 54-55) identified the two residual and major problems subsistence systems were required to manage: population; and natural disasters.

**Tikopia and population management**

Tikopia is heavily populated — the 1976 Solomon Islands Census counted 1,115 persons, a population density of 242/km², next only to its nearest neighbour Anuta and the capital Honiara in density of population. The number counted on Tikopia at the 1999 Census was 1,346.²⁰ There were more Tikopia (1,203 persons) living off the island in emigre communities on Makira, Vanikoro and the Russell Islands than on it. Firth reported that on his visit in 1952 the population was 1,753 which he and his co-worker Spillius felt was close to the ‘Malthusian limit of its population carrying capacity’ (Borrie, Firth and Spillius 1957: 250), but the 1952 famine and 1955 epidemic referred to above lessened population pressures considerably. Kirch and Yen (1982) felt that in 1977 there was evidence of significant under-utilisation of agricultural land, with opportunistic regrowth of taro and manioc on slope gardens among weeds, and fallow areas in an area of intensive cultivation.²¹ The Tikopia they spoke to appeared uninterested in increasing production, citing difficulties with land owners or land disputes. Sahlin (1972), offer an alternative explanation for lack of interest. It appears that a population around 1300-1400 can achieve a subsistence livelihood with current levels of land utilisation on Tikopia.

More to the point, it appears that evidence for the coupling of disintensification and de-population (Brookfield 1972b) has been observed on Tikopia.

The list (from Kirch and Yen 1982) below indicates the population control ‘policy measures’ undertaken by the Tikopia, some of which have been discontinued, for obvious reasons:

- emigration
- abortion
- infanticide
- warfare
- contraception
- limiting of marriages

It seems that the problem of population is currently well-managed, and that there are sufficient measures remaining available for deployment to continue the success of the management regime for the foreseeable future.

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²⁰ An even more remote Polynesian outlier to the east of Tikopia which recently gained some degree of fame, being featured in an episode of the TV production 'Tribe'.
²² Rikuru, on the western shelf.
Tikopia and natural disaster risk management

Throughout Tikopian oral history stories tell of proactive measures taken to manage the resource base. Pigs disappear in the fossil record from the island around 400 years ago, when oral tradition records not only the extermination of pigs but also the extermination of the autochthonous Nga Ravenga and the driving off to exile of the Nga Fa'a by the Nga Ariki, the current inhabitants (Firth 1959). Both events coincide with the closure of the lake by the Ravenga tombolo, an indication of a severe change in the natural environment. Kirch and Yen also found evidence of deliberate in-filling behind the tombolo to stabilise it; of tree planting to stabilise the coastal dunes and of deliberate encouragement of colluvial flows to enrich lowland garden areas. In addition, soil enrichment measures (charcoal and human faecal deposition among others) were undertaken on the western shelf. The Tikopia have covered much of the slope of the caldera with mixed orchards, with breadfruit, nut, coconut and fruit trees intermingled (see Latinis 2000 for more on arboriculture). They discontinued swidden because of the presence of the orchards and utilised fertilisation and mulching as alternative soil enhancement measures for their gardens. They grow manioc in preference to sweet potato, although sweet potato has a shorter gestation period, because manioc tolerates poorer soils and also can be stored in fermentation pits which sweet potato cannot.

All these measures can be seen best in the light of the risk posed by disaster, as risk amelioration ‘policies’.

Natural disaster risk management policy measures (from Kirch and Yen 1982 again) are:

- warfare and exile
- abandonment of swidden
- multi-species orchards on slopes
- eradication of dogs and pigs
- mulching of gardens
- managed erosion of slopes to enrich garden areas
- preference for root crops able to be pit fermented
- dune stabilisation by tree-planting
- tombolo reinforcement with landfill and stone walling
- active management of the lagoon/lake by ingress and egress measures

With the exception of the first item on the list, these measures are ongoing, not emergency responses. Natural disasters such as cyclones, tsunamis, earthquakes, volcanic eruptions are unpredictable but commonly experienced on Tikopia, and emergency response ‘policies’ are also in place. Firth’s (1959) account of the near-famine brought on by cyclones in 1952 and 1953 shows these measures, where all food which could be stored was processed and placed in fermentation pits. Fast maturing plants — sweet potato, pumpkin — were planted first, before the slower maturing staples. Hunger-time foods such as cordyline roots, sago pith and bark were eaten. Food was carefully managed and so was work, with chiefs taking an active role in prioritising and managing structural repairs. Plans were also

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22 A tombolo is a narrow spit of sandy land.
23 'Masi' piti on Tikopia, 'po' in Hawai‘i, 'ma' in Tonga, where root crops and banana are grated then placed in pits, covered and left to ferment. Storage in this manner can last three to four years.
canvassed for some of the male population to emigrate temporarily to provide the means for food remittances to the island.

These measures, these population and natural disaster risk-management and emergency response policies, are indicative of the nearness of the Tikopia to the horizon of unsustainability. These features make it possible to view Tikopia as a proxy for seeing behind the colonial mask in Vanuatu.

**Tikopia and Vanuatu: a comparison of the major issues**

First and foremost, population densities in Vanuatu come nowhere near that on Tikopia. Among the provinces, Shefa province has the highest population density, 52/km², while Vanuatu as a whole has a population density of 19/km² (Vanuatu National Statistics Office 2010a: 8). In 1999 the population density on Tikopia was 292/km². On Tikopia, the population is near 'Malthusian' limits and population 'growth' can only occur off the island. In Vanuatu, the population has experienced strong growth, which the most recent census showed may be slowing, at 2.3 per cent per annum (Vanuatu National Statistics Office 2010b).

In Vanuatu, particularly on the islands where land has been transferred to expatriate leasehold, population pressure is created by land loss as much as by population growth, but there are islands where population pressure of itself has provoked active measures, such as the islands of Paama and Tongoa, where emigration to the capital has long been a means of population reduction (Haberkorn, 1990).

Population control measures on Vanuatu, in terms of the measures outlined on Tikopia, are non-existent. Small numbers of ni-Vanuatu, mostly professionals or students undertaking tertiary studies, do emigrate, but the diaspora is miniscule.

In Vanuatu, the needs of increased population have been met by agricultural extensification — more land has been put under cultivation. On Tikopia this is not possible, so intensification is the only way to increase the carrying capacity of land. This difference in approach suggests that population pressure is not present in Vanuatu to anywhere near the degree that it exists on Tikopia.

The measures undertaken on Tikopia to manage the risk of natural disasters involved changes in agricultural practices, eradication of pigs and dogs, and measures to stabilise protective barriers — dunes and the tombolo. The evidence for agricultural change in Vanuatu will be discussed in more detail later. At this stage we can say that the most obvious change is the decline in fallow periods and the intensification of crop rotations, to the point where swidden is in many areas replaced by virtually permanent cultivation. Other agriculture measures are not found and there is no eradication of commensal animals. There are few fences to control pigs and no islands without them.

Mixed arboriculture is practised throughout Vanuatu as it is on Tikopia. There is a tendency in urban areas for cassava to predominate as the root crop staple, but not because it is suitable for pit fermentation, simply because of its capacity to thrive in poor conditions. Soil enrichment by any means is rare (Vanuatu National Statistics Office 2007a).

If Tikopia is on the horizon of unsustainability and the changes in agricultural and other natural disaster risk management measures stem from that position, then the comparable evidence is that for Vanuatu such is not the case.
The Tikopia are Polynesian, not Melanesian. Their culture, language and way of life are markedly different. Polynesians have more structured and stratified societies, usually with hereditary chiefs, as is the case on Tikopia. Polynesians also practice pit fermentation of root crops as a means of storage, which is rarely documented for Melanesians. Recent genetic marker studies have challenged assumptions that Polynesians derived from populations in island Melanesia, and proposed a separate origin in mainland and insular South East Asia (Scheinfeldt et al. 2006; Friedlaender, J. et al. 2007), an hypothesis supported by the pig and rat studies of Matisoo-Smith and Robins (2004) and Denny and Matisoo-Smith (2010). These studies provide something of a counterpoint to the linguistic histories, which throw light on the language characteristics of populations, but none on the physical makeup of the speakers.

The most fundamental difference between the Tikopia and the people of Vanuatu is that the Tikopia are isolated and homogeneous and subject to little outside influence, whereas the ni-Vanuatu are an heterogeneous population (of many homogeneous societies) whose island-level contact with Europeans cannot really be generalised to the whole of the country. Some parts of inland Santo, the ‘smol nambas’ 24 areas of Malekula and the isolated islands of the Torres groups have been minimally touched by contact. For the ‘smol nambas’ this has been a matter of conscious choice. For the people of the Torres choice has no part. They are rarely visited, have no radio contact with the capital and are not yet serviced by the Digicel mobile network; in fact they do not appear on the coverage map. 25 David Stein (pers. comm. 2008), of the Vanuatu Renewable Energy and Power Association (VANREPA), a community-based organisation promoting alternative energy exploitation remarked, after a 2008 visit, that the people of the Torres have more allegiance to the Chinese trader who runs a semi-regular shipping service from Luganville, Santo, than to the Republic of Vanuatu, simply because they see him much more often.

This being the case, there is more likelihood of the Tikopia being able to act in a concerted manner to deal with issues and changes. In Vanuatu, not so.

There are differences between Polynesians and Melanesians, but there are many similarities. They belong to the family of Austronesian language speakers. Their subsistence practices and the floral and faunal basis of that subsistence practice were identical during the period of settlement of the Pacific islands. In both populations, opportunistic gathering of litoral resources formed a major source of protein. In both populations, initial impacts of settlement on the island environment were major, with bird and reptilian extinctions being characteristic.

The differences which have developed can be seen as adaptations to a range of changing long-term circumstances (erosion of slopes, in-filling of lagoons, population pressures), and to major catastrophic natural events, such as the Kuwae eruption in Vanuatu.

In other words, the similarities derive, as do the differences, from responses to the residual issues of risk for island subsistence populations — population pressure and natural catastrophes. That said the degree of risk is less easy to generalise in the polyglot island grouping of Vanuatu, where each island would need to be taken on a case by case basis for comparison with Tikopia.

The value of Tikopia as a proxy for Vanuatu is that it is an environment finely balanced. Slight increases in population, slight losses in available land, or natural catastrophes can quickly produce a tipping over into a period of unsustainability. The 1952-53 years of

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24 Small penis-sheath in English.
cyclone damage leading to near-famine and the 2002 cyclone which breached the lake, altered the salinity of the lagoon, and threatened an important source of hunger-food, the sago palms which grew on the shore, are recent evidence.

In Vanuatu, the problems seem much less immediate.

Natural disasters can be cataclysmic, such as the Kuvae eruption, or transitory, such as the cyclone which struck Port Vila in 2004, leaving the trees leafless and the Port Vila market empty of all but root vegetables and a few cabbage for three or four months, until the pawpaw and breadfruit began to fruit again. Whether large or small, the range of natural disasters which can befall Vanuatu are the same as those which afflict Tikopia from time to time.

The population of Vanuatu continues to grow, and as the Pareto projections indicated, there seems to be little impetus for population control.

We can safely conclude that although the problems faced by the ni-Vanuatu and the Tikopia are the same in nature, they are not of the same dimension or degree.

We must also conclude that for the people of Efate, the dimension of land and population pressure is much closer to that of Tikopia than elsewhere in Vanuatu, and some of the more extreme policies of the Tikopia may need to be considered, sooner rather than later.

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26 A lake has no direct connection with the sea, a lagoon does, so one can begin a sentence with a lake and end it with a lagoon!
Chapter 6

Frameworks and methodologies for livelihood analysis

This is the third major research task — livelihood framework analysis — which attempts to shed some light on the third research question:

Can a standard model of livelihood analysis be adapted to assess the security and sustainability of Vanuatu subsistence-plus livelihoods?

In Chapter 3, the genesis of the Sustainable Livelihoods Approach was traced. It was noted that the approach marked a change of direction in development policy towards the micro-level, that of the individual household and their livelihood. Such an approach refocuses attention on the capacity of the household, rather than that of the village, the region or the nation.

In the analysis which follows, attempts are made to capture the flows of resources, strategies and outcomes which make up a livelihood.

The tool chosen for this analysis is what has become known as a livelihood framework, which is a representation of the flows and which enables quantification of aspects of those flows. The framework diagrams of various protagonists in the Sustainable Livelihoods Approach are considered, and one is chosen for the research task.

In addition to the use of the framework, methodologies are considered for the analysis in the study and discussed at some length. Some of the methodologies are employed, some are adapted and some are discarded, on the basis of their fit with the study-specific issues of interpretation of large-scale, percentage participation data.

The livelihood framework attempts to capture the nature of livelihoods, by:

(a) identifying the resources of the household;
(b) considering the contextual background which constrains the employment of those resources;
(c) identifying livelihood strategies which utilise the constrained resources; and
(d) examining the livelihood security and sustainability outcomes of the strategies.
The frameworks proposed by the major protagonists — Scoones (1998), Carney (1998) and Ellis (2000) — are explored.

The following examination will concentrate on the diagrammatic representations of the frameworks discussed, as others have done (Hamilton-Peach and Townsley 2003, for example). This is primarily for ease of comparison, but also is a recognition of the collaborative and corroborative nature of the development of the ideas and concepts among the three investigators. In the diagrams the differences in emphasis are more easily seen. Chronologically, the framework appears first in Scoones, or possibly Carney. Ellis’ presentation follows, and he credits both Scoones and Carney in his framework diagram (Ellis 2000: 30).

6.1 Frameworks

A discussion of alternative models, evaluations and criticism of the Sustainable Livelihoods Approach, which informs and guides these frameworks, can be found earlier, in Chapter 3 (p. 50). Three different diagrammatic approaches to livelihood framework analysis are examined, and reasons for the choice of the Ellis model are given.

All three models are linear (left-to-right) in design, but all indicate the circular nature of livelihood, where feedback into the system alters the next iteration.

6.1.1 Scoones’ framework

Scoones’ framework (Figure 6.1) begins with the context of rural livelihoods, that of present conditions and emerging trends. In this context, livelihood assets, called by Scoones ‘Livelihood Resources’, are identified and grouped as types of capital — natural, economic/financial, social and human capital. Scoones (1998: 17) adds another group, ‘and others’, which he identifies as either symbolic capital (the embedded historical or cultural setting of the livelihood) or political capital (the nature of relation of state with society and its livelihoods).\(^1\)

Scoones interposes the next component of the framework, institutional processes and organisational structures between livelihood resources and livelihood strategies, because it is these structures and processes which mediate the process of applying livelihood resources to livelihood strategies.

Livelihood strategies themselves can then be studied and analysed, by reference to the final element — sustainable livelihood outcomes.

\(^1\)From the ideas of Bourdieu — see Bourdieu and Wacquant (1992), for example.
The outcomes, for livelihood and sustainability, are derived from a discussion (1998: 6-7) of accepted measurements of livelihood and sustainability. For livelihood: working days created, poverty reduced, enhanced wellbeing and capability, and the vulnerability and resilience of the livelihood. For sustainability: the amount of depletion of the resource base, and the vulnerability of the natural resource base to shock or major catastrophe. There are good reasons for thinking Scoones errs in separating livelihood and sustainability at this level. Either they are linked, which he asserts is the thesis of his paper, or they are

2Capability here refers to the ideas of Sen (1984) on capability and entitlement, lack of which, he argued, formed the basis of poverty, particularly when hunger and famine were present, rather than not enough food production.
not, in which case they can be discussed separately, as sustainability and/or rural livelihoods.

As the somewhat confusing arrows then indicate, this final analysis of outcomes then feeds into policy-making, which resets the contextual background, and in taking us back to the left hand side of the diagram forms the loop of the livelihood cycle.

In summary, there appear to be two areas of weakness in Scoones' model.

The first is that there is a major difficulty in sorting out what constitutes a contextual event or setting and what constitutes institutional processes and organisational structures. When is an institutional process, for example a tax change, not also a contextual event? Given that better policy-making for rural livelihoods is the aim of the analysis, Scoones seems to have been faced with a dilemma. In order to obtain the loop of the livelihood cycle, he had to have context before livelihood resources, but in reality, it is the way in which context mediates the application of livelihood resources to the formation of livelihood strategies which should dictate its position on the framework. Having it both ways has not helped understanding.

The second weakness, already mentioned, is the separation of livelihood and sustainability in the treatment of livelihood outcomes, which is at odds with his declared purpose.

6.1.2 Carney framework

The frameworks of Scoones and Carney (1998) have much structure in common. Context, in Carney's (1998) case particularly vulnerability, is placed at the beginning of the cycle. Then follow livelihood assets, which are mediated by transforming structures and processes (synonymous with Scoones' institutions and organisations) in the implementation of livelihood strategies, which then produce livelihood outcomes.

Carney (1998) introduces four additional features to the framework (Figure 6.2). She notes that the interaction between rural people and institutions and organisations is facilitated by the extent of influence and access which people have or are able to call upon — notions similar to Sen's (1984) 'entitlement' and 'capabilities' and to the ideas of Bourdie, cited above. This feature is bi-directional; influence and access can flow both ways. It becomes of prime importance when implementation of central government laws and regulations is weakened by distance or absence, a notable feature of archipelagic nations, where inter-island transport and communication is often unreliable. Nonetheless, a doubt persists that she may, with this feature, be merely making explicit what is implicit in Scoones.

The second feature introduced is the addition of physical capital to the group of livelihood assets. Physical capital includes roads, irrigation or other infrastructure, machinery, storage facilities and the like. As with most aggregations, arguments can be raised about the need to separate items into groups and which item goes into what group. This of itself tends to cloak an awareness that livelihood resources or assets are applied in an integrated manner.

What is useful in grouping the assets is that when they are displayed graphically, the diversity of the asset base is revealed.

In terms of flow, or cycles, Carney proposes two feedback loops — the first resolves the difficulty noted in the Scoones framework — the confusion between what is context and

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Footnote:
1 The figure is adapted from that which appears in Carney (1998: 5). Boxes have been re-arranged to fit the page.

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what are structures and processes, and where their effect is felt. She has rather neatly sidestepped this problem by installing a feedback loop, so that the structures and processes feed back into the context, as well as mediating (forward) between livelihood assets and strategies. The second feedback loop is that between livelihood outcomes and livelihood
assets, thus invoking circular flow. It is a useful addition in that it directly addresses the question of sustainability of the livelihood strategies employed. If a strategy employed — say increased cattle ownership for argument's sake — produces positive effects on coconut tree yields because cattle grazing keeps the tree surrounds clean, then it adds to livelihood assets and livelihood sustainability is enhanced. Conversely, if the cattle become infected with disease due to higher population (cattle) densities and die, then assets are reduced and sustainability is threatened.

Lastly — and this appears to be a cosmetic difference at most, but definitely is not — Carney introduces a pentagon to represent livelihood assets. The pentagon itself is simply an outcome of the number of variables (five) being measured, a square or triangle would have done just as well. The important element is the volume of the geometric shape. This volume underlines the idea that despite the grouping of livelihood assets into five separate types of 'capital', they comprise an integrated whole — one livelihood. The volume enclosed by the pentagon is a visual representation of livelihood. This pentagon model of livelihood assets has become a widely used feature of the sustainable livelihoods approach and framework analysis and will be used in the analysis which follows. This pentagon methodology, as explained by Ellis, is presented in more detail in the following section.

Carney's model has some advantages over that of Scoones. She has been able to better reconcile the flows in livelihood, particularly the circular flows between context and the transforming structures and processes of institutions and organisations, and that between livelihood outcomes and livelihood assets, much better than Scoones. He, it must be said, provides much more detail in his representation.

We turn now to the framework model of Frank Ellis (2000), chosen for use in this study.

6.1.3 Ellis framework

Ellis (2000) entitles his framework 'A Framework for Micro-policy Analysis'. It will be examined first in relation to the points of difference between Ellis and his contemporaries, Carney and Scoones. Later, the question of whether or not it is suitable only for analysing micro-policy, or if it is adaptable to a wider range of applications, will be addressed.

The framework model (fig 6.3) appears below. Within the boxes, items which are specific to the Vanuatu context have been added below the dotted lines.

Ellis begins his framework not with context, but with the livelihood platform, the assets, which he groups in accord with Carney and Scoones into human, natural, physical, financial and social capital. The other livelihood assets advanced by Scoones (symbolic and political capital), and represented by Carney as bi-directional flows (influence and access) are subsumed into the next step in the process, access modification and contextual background.

Ellis notes his departure here from the representations of the process by Scoones and Carney, preferring to conflate the two elements of the mediation process, with access modifiers working against a background of trends or shocks. He groups these access modifiers into three areas — social relations, institutions and organisations. The listed items are general — gender, class, age and ethnicity. In Vanuatu, family and kinship play a much bigger role in the cast of social relations than, for example, class or ethnicity.
Institutions are 'the formal rules, conventions and informal codes of behaviour that impose restraints on human interaction' (Ellis 2000: 38). He lists rules and customs, land tenure and markets in practice — the market as a working model. While on face value markets have little import in the lives of rural subsistence farmers, the analysis of the subsistence-plus livelihood which follows shows that production for exchange is integrated into the livelihoods of many households.

In Vanuatu the Church (in its most general sense, including non-Christian faiths) is important as an organisation, much more so than local administration and state agencies and NGOs.

In very recent times, some schism has split villages and communities — particularly the involvement of evangelical churches, such as the so-called NTM4 churches — but generally, villages and communities are homogenous in matters of religion. Douglas (2005) shows how the Church forms another layer in the cultural and social interconnectedness of small community life, a layer which outside the archipelago would be more likely to be filled by local or regional government.

NGOs, both international and local, play a significant role in Vanuatu.

In the following analysis, state agencies and local government or administration will not feature prominently. Under the Constitution, decentralisation is mandated (13: 82-3, Constitution of Vanuatu). In 1994, the Decentralisation and Local Government Regions Act No.1 of 1994 was passed by Parliament, confirming a decentralised structure of six provinces with provincial councils, and two municipalities, with municipal councils. Each year Parliament issues grants to the provincial and municipal councils.5 The provincial and municipal councils are able to strike rates and taxes to provide revenue, however the experience has been that taxes and rates are not systematically collected, if at all.

Primarily, the municipal and provincial councils appear to function as 'cash cows' to distribute parliamentary grants to political party members. The Vanuatu Ombudsman, over the years 1995 to 2009, conducted no less than nine investigations into improper and illegal dealings of provincial and municipal councils. The two municipal councils, Port Vila and Luganville, have been suspended three times since 2005 (Hassall and Tipu 2008). Councils have had very high populations of councillors, with the Shefa Provincial Council in 1995 having 24 elected members and 11 nominated members, to service a constituency of 50,000.6

State-owned agencies operate in a similar way, as vehicles for patronage and graft. In 2005, Air Vanuatu, the national airline, with five planes, had a 29 member Board of Directors — all political appointees, all drawing meeting and sitting allowances and enjoying free travel.7 This example is emulated, to a greater or lesser degree, in all state-owned enterprises.

For the purposes of this study and in reality, state agencies and local government are peripheral players in peoples' lives.

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5AUD 2.5mll. in the 2010 Budget, according to the budget papers (Ministry of Finance 2010).
7Personal knowledge, but see jovitt 2006: 436.
Figure 6.3: Ellis 2000: Framework for Micro-policy Analysis

Source: adapted from Scoones (1998:4) and D. Carney (1998:5)

Ellis, Frank (2000), Rural Livelihoods and Diversity in developing Countries, Oxford University Press, Oxford, U.K., p. 30 (additions below dotted lines by the author)
Ellis separates contextual background into trends and shocks, unlike Scoones, who seems to have under-emphasised the major role played by natural disaster in changing peoples' lives. Carney is even less forthcoming. Ellis nominates a number of trends: demographic; technological; economic (national and world) and includes macro-policy. The last-named is questionable as a trend in itself, but it is here taken to mean the trend in government policy (and in this case, donor country and multilateral organisation policy; such as the World Bank structural adjustment programmes of the 1990s). Ellis does not include environmental trends, but for this analysis they have been included, as trends in the environment such as man-made climate change and sea level rise are of critical importance to Pacific island nations.

Shocks are natural disasters — droughts and floods, wars internal and external, disease and pestilence — all of which have occurred in Vanuatu, although the risk of flood is more a risk of tsunami, than river flooding. Cyclones, earthquakes and volcanic eruptions have been added to the range of shocks which need to be considered in any analysis of livelihood in Vanuatu, with its six currently active volcanoes, frequent strong earthquakes and an average of two cyclones each wet season.

The activities and strategies of livelihood itself come next in the Ellis model. He divides the activities of livelihood into two categories, natural resource-based activities and non-natural resource-based activities. Littoral and ocean natural resources have been added to the first category to separate it from forest and land-based hunting and collecting and to give it emphasis. Littoral resource-gathering is, and has always been, important, sometimes critical, to the Vanuatu subsistence-plus livelihood.

To the second category, non-natural resource-based activities, reciprocity has been added, as the commodities traded or gifted may be food, labour or specialised assistance in construction or other activities and because it is an important element in Melanesian society. The reason reciprocity appears separately is that, unlike the other activities in this category, it does not involve markets. It cannot be separated from the social setting into a neatly 'economic' activity.\(^8\)

Finally, we come to the outcomes of livelihood activities, and consider the security and sustainability of livelihood strategies.

Ellis here repeats the Scoones' schema and separates livelihood security from livelihood sustainability. For the subsistence-plus livelihoods of Vanuatu livelihood security and livelihood sustainability would be better viewed as aspects of a livelihood whole. In the analysis undertaken later in this study, they will be treated as such. Cultural sustainability has been added, because of uncertainty as to whether or not cultural continuity is vital to sustainable livelihood security. For instance, it may be that people stop following cultural practices, lose their local language and forget their animistic and cannibalistic traditions, yet continue to practise subsistence-based agriculture with no ill effects. Firth (1959) provides a good example, where he notes the abandonment of 'the work of the gods' by the Tikopia in favour of Christianity, with no noticeable change in livelihood practices.

It was mentioned in the introduction to the Ellis framework that we would return to the question of whether a framework constructed to facilitate micro-policy analysis and formulation could be adapted to other uses. He himself provides a worked example, a study of three Tanzanian villages and an analysis using the framework, which seeks to identify those characteristics of farmers which lead to more prosperity and thus, to greater livelihood security. This could be seen as the standard micro-policy application.

\(^8\)This is, of course, the substantivist line of Polanyi (1977; 2001).
Other studies, already noted (see p. 50), have explored alternative uses, with some success. Those studies give confidence that the livelihood framework model is robust and adaptable to wider uses than micro-policy.

Some of the methodologies and the case-study design presented by Ellis (2000) will now be explored, which, with some modifications and additions, will form the basis of the analysis in this study.

6.2 Methodologies

6.2.1 Data selection and collection

In Rural Livelihoods and Diversity in Developing Countries, Ellis includes a substantial discussion of methodologies which may be applied within the framework approach to sustainable livelihood analysis.9 His remarks, on the relative merits of large-scale surveys and local focus groups, small-scale surveys and ranking exercises are made in the context of his interest in micro-policy making.

He begins by warning of the dangers of relying on figures from large-scale surveys for decision-making or for policy-making, particularly at the micro-level — the village or the region.

He also finds the following defects in aggregate level surveys — international, national and region-wide collections:

- poor quality enumeration
- unreliability of information collected — from memory or unwillingness to divulge to strangers
- lack of specificity of design
- difficulties with quantifying some information
- have not been found useful for policy making at the local level

In addition to the above, he notes that large-scale surveys are commonly one-off and mostly supervised by overseas consultants. These consultants may have slight local knowledge, often cannot speak the local languages and may have little awareness of logistical and other limitations they face in-country.

Ellis’ warning is pertinent to the present study, because most of the figures analysed have been collected in large-scale surveys under the supervision of contracted overseas consultants. These surveys have some of the shortcomings to which he alludes.

Earlier in this study, similar shortcomings have been noted in the construction of, for example, the International Poverty Line (see p. 54).

Ellis contrasts the limitations of large-scale data collection with a discussion of the benefits of small scale surveys and other localised approaches. He outlines the RRA10 and PRA11 approaches, where there is greater engagement with communities, and where a variety of

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9 Ellis 2000: 200-228 covers the case study and the methods and methodologies discussed in this section.
10 Rapid Rural Appraisal
11 Participatory Rural Appraisal
collection methods can be utilised. Among these he includes focus groups, ranking exercises and semi-structured discussions. Alongside these he combines small-scale surveys to collect quantitative values: income sources and amounts; household sizes; education levels land tenure and use and assets, which provide information at the local level.

While the interest of the present study is in large-scale structures and trends, it will facilitate discussion of the methods and methodology employed by Ellis to summarise the case study he presents. This will enable commentary on the methods and methodologies he utilises to be explored in concrete terms.

In passing, it must be noted that the standard postcolonial and post-structural objections which apply to large-scale surveys must also be raised in relation to focus groups, ranking exercises and small-scale surveys undertaken with indigenous groups in ex-colonies.

How reliable is what is collected, given the underlying power imbalances between the researcher and the researched? How limited an understanding of the sensitivities of the subject group to particular questions does the non-indigenous researcher bring to the village situation? Whose agenda is being followed? In whose interests is the research taking place?

These questions need to be kept in mind as we analyse the case study.

The case study involved three rural villages in Tanzania. The villages of N’Guni, Wari and Kashashi are in the North of Tanzania, on the slopes of Kilimanjaro. Traditionally, the area is a coffee-growing area, although subsistence production is an important element in the livelihoods of the villagers. The study involved three information-gathering elements:

- semi-structured focus group discussions, summarised on one spreadsheet for each village, to elicit topical local information on three aspects of the framework — assets, access and activities
- a participatory wealth-ranking exercise
- a survey with four one page forms — demographics, land assets and income, non-farm income sources and household assets (production as well as consumption)

Ten households were selected from each village as samples. These 30 households were then ranked into three income groups — high, middle and low. It appears that the division into three tiers was actually made in terms of assets rather than income, but nevertheless, there were three groups, aggregated on relative wealth. Thus he was able to analyse results and make comparisons across two dimensions, the geographic dimension — the village, and the wealth dimension — across villages. Table 6.1 provides some basic numbers on the three villages and shows that Kashashi has the highest percentage of low income households, N’Guni is the most remote and that Wari has the highest percentage of rich households. Although it is slightly more remote than Kashashi, it has an all-weather road connection to the nearest urban area.

6.2.2 Data analysis — income and strategies

Ellis examines three methods of analysis of incomes and livelihood strategies — income portfolios, indices of diversity and typologies of livelihood strategy.
Table 6.1: Data for Three Tanzanian Villages (Ellis 2000: 202-223)

<table>
<thead>
<tr>
<th></th>
<th>Wari</th>
<th>Kashashi</th>
<th>N’guni</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. H/holds</td>
<td>1007</td>
<td>456</td>
<td>502</td>
</tr>
<tr>
<td>Total Pop.</td>
<td>6888</td>
<td>3600</td>
<td>2850</td>
</tr>
<tr>
<td>Distance to urban area</td>
<td>25</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>High income %</td>
<td>29</td>
<td>20</td>
<td>26</td>
</tr>
<tr>
<td>Middle income %</td>
<td>34</td>
<td>31</td>
<td>40</td>
</tr>
<tr>
<td>Low income %</td>
<td>37</td>
<td>49</td>
<td>34</td>
</tr>
<tr>
<td>Farm income % (mean)</td>
<td>53</td>
<td>69</td>
<td>73</td>
</tr>
<tr>
<td>Non-farm income % (mean)</td>
<td>47</td>
<td>31</td>
<td>27</td>
</tr>
<tr>
<td>Village mean subsistence prod. (%)</td>
<td>26</td>
<td>32</td>
<td>31</td>
</tr>
<tr>
<td>Diversity Index (mean)</td>
<td>2.23</td>
<td>2.82</td>
<td>2.54</td>
</tr>
</tbody>
</table>

Income portfolios

Income portfolios in this case simply means the division of total income into percentage contributions from each source. It is a particularly suitable method for displaying in pie charts. He found for the case study that income portfolios varied between villages (Table 6.1), with Wari depending on non-farm income sources for almost 50 per cent of income. Ellis attributes this to Wari’s proximity to urban opportunities and markets.

When income groups were examined, there was a much smaller range of difference, with the middle income group gaining 35 per cent of income off-farm, while the high income group’s off-farm earnings represented 45 per cent of total income.

He concluded that income portfolios provided useful results for the role of the split between farm and non-farm income in geographic terms (across villages) in enhancing livelihood diversity, but was inconclusive in finding differences between wealth groups. He noted high levels of standard deviations around means, an indicator of highly variable results and a further indicator of the need for caution in interpretation.

Ellis does not separate what he terms ‘subsistence’ production in the income sources; it is subsumed into crop and livestock production, presumably at replacement cost. He deals with subsistence as a separate issue, whereas we will treat it as integrated into the livelihood. The information gathered on subsistence is included in Table 6.1 above, and shows little variation between villages. Of passing interest is that there is a significant difference between high, middle and low income groups in the percentage livelihood derived from subsistence, which could be interpreted to mean either that richer people do not need to practise subsistence, or that valuing subsistence at replacement cost may underestimate its value. Other interpretations cannot be ruled out.

Indices of diversity

There is an understandable attractiveness about indices. The idea that an untidy bundle of variables can be successfully combined into one summary or composite variable, an

\[\text{Index} = \frac{\sum \text{Variables}}{\text{Number of Variables}}\]

12Ellis (2009) confirms this.
index, by a bit of statistical sleight-of-hand is pervasive; particularly when applied to prices (consumer prices, share prices) and human development. Such indices are particularly sought after for GIS\textsuperscript{13} as they are easy to plot, visually obvious and highly accessible. However, there are a number of dangers in their use.

Figure 6.4: Vulnerability Index: Australian Broadacre Agriculture 2005

![Vulnerability Index map](image1)

(Nelson et al. 2005:175)

The most insiduous danger is the masking of the component variables by the composite variable. Figures 6.4 and 6.5 are examples from Nelson et al. (2005), the Australian study of broadacre farm livelihood vulnerability referred to earlier. Figure 6.4 is the Vulnerability Index plotted on the map of Australia, an index variable composed of twelve component variables. Figure 6.5 shows income diversity, one of the twelve component variables which make up the index.

Figure 6.5: Income Diversity: Australian Broadacre Agriculture 2005

![Income Diversity map](image2)

(Nelson et al. 2005: 177)

\textsuperscript{13}Geographic Information Systems.
The conclusion is hard to escape. In the construction of the index, the value of the component variable, income diversity, has been lost. In attempting an analysis of broadacre agriculture, a lack of diversity in income sources may be of overriding importance in determining vulnerability to livelihood risk in comparison to the other variables, but it is barely visible on the vulnerability index map.

Ellis had noted that the income portfolio approach fell short because of high variability around the mean, and because participation rates in any activity are not revealed as only the mean is examined. That is to say, you have a pie chart which tells you what share of total income each activity earns, but you do not know how many of your sample group actually participated in each activity. His stated reason for testing an index of diversity was to try and capture both income and participation share.

Thus income share and participation share — how much and how many — were tabulated and indexed using an inverse of the Herfindahl-Hirschman Index. He could, perhaps, have tried examining median or modal values for income portfolios, but chose not to.

Ellis employed a method to obtain the index variable which does not entail Principal Component Analysis, a means of 'weighting' variables so that their impact on the index is more closely proportionate to their significance. Nelson et al. did so on a revised version of their index (Nelson et al. 2009a; 2009b). In a development studies context, Moser and Felton (2007) provide a highly technical discussion of weighting and other matters, in their construction of an asset accumulation index for an urban poor community in Ecuador. The principle objection to the various methods of 'weighting' is that of redundancy, an objection outlined by McGillivray (1991) in relation to the Human Development Index. The problem comes down to this. If a component variable in an index is of more importance than others, it may well be better studied in isolation rather than disguised, or hidden away, in a composite variable.

His index results are given in table 6.1. He notes that there was least diversity in Wari, which had the highest proportion of high-income households, but also had the highest non-farm income. Between income groups there was no discernible trend.

In conclusion, it must be recalled that the major useful feature of indices is their movement over time — that is in showing trends — rising and falling. It is the change in value which provides the information, rather than the value itself.

**Typologies of livelihood strategy**

Ellis devotes some time to this method of analysis, and there are a considerable number of studies which utilise this approach in analysis. Tittonell et al. (2010), for example, have undertaken an analysis of smallholder farms across six districts of Kenya, and developed a typology of farm types to analyse the impact of soil fertility and spatial variability on livelihood strategies.

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14Ellis (2000: 213) gives the formula as 1/sum of squares of proportional contributions to total income
15High 2.37, middle 2.56, low 2.39
16Stock Market Index figures of themselves are meaningless, but a ten per cent drop in the past week acquires a good deal of meaning for ageing superannuants, among others.
17Using "typology of livelihood" for Google search on 26 march 2011 returned 468 results — the first 20 results were journal articles or theses of various levels.
Table 6.2: Typologies of livelihood strategy (Ellis 2000: 215)

<table>
<thead>
<tr>
<th>Type</th>
<th>Category</th>
<th>low income</th>
<th>mid income</th>
<th>high income</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>&gt;50% total h/hold income from single source</td>
<td>69</td>
<td>64</td>
<td>68</td>
</tr>
<tr>
<td>II</td>
<td>&gt;66%</td>
<td>25</td>
<td>33</td>
<td>43</td>
</tr>
<tr>
<td>III</td>
<td>&gt;75%</td>
<td>15</td>
<td>17</td>
<td>32</td>
</tr>
</tbody>
</table>

The method consists of a reduction of the breadth of practices involved in constructing livelihoods into a set of types, based on major activities in the livelihood.

He begins with a simple illustration, where he calculates percentages of subjects of the study (by income group), who earn more than 50 per cent of their income from a single source. He then recalculates the percentages where 66 per cent of income was from a single source, then again where 75 per cent of income was derived in the same way. The results are shown in Table 6.2.

He then constructs six types of livelihood strategies for the Tanzanian villages — principally crops, principally livestock, principally non-farm, crop/livestock, livestock/non-farm and crop/non-farm and tests these by village, and by income group.

Table 6.3: 'Type 66' livelihood strategy categories (Ellis 2000: 217)

<table>
<thead>
<tr>
<th>Type</th>
<th>Category shares</th>
<th>Strategy type</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>crop income &gt;= 66%</td>
<td>principally crops</td>
</tr>
<tr>
<td>II</td>
<td>livestock income &gt;= 66%</td>
<td>principally livestock</td>
</tr>
<tr>
<td>III</td>
<td>non-farm income &gt;= 66%</td>
<td>principally non-farm</td>
</tr>
<tr>
<td>IV</td>
<td>crop plus livestock &gt;= 66%</td>
<td>crop/livestock</td>
</tr>
<tr>
<td></td>
<td>crop &lt; 66% but &gt; non-farm: &gt;= 66%</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>livestock &lt; 66% but &gt; non-farm</td>
<td>livestock/non-farm</td>
</tr>
<tr>
<td></td>
<td>livestock plus non-farm: 66%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>livestock &lt; 66% but &gt; crop</td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td>non-farm: &lt; 66% but &gt; crop</td>
<td></td>
</tr>
<tr>
<td></td>
<td>crop plus non-farm: 66%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>crop &lt; 66% but &gt; livestock</td>
<td></td>
</tr>
<tr>
<td></td>
<td>non-farm: &lt; 66% but &gt; livestock</td>
<td></td>
</tr>
</tbody>
</table>

Ellis also speaks of 'Type 75' livelihoods but does not provide a breakdown for this grouping. It seems safe to assume the six previous types were used. However, when 75 per cent of income derived was chosen as the break point, another category emerged, called 'mixed'. Presumably (this is not explained) this 'mixed' type would be one where no pairing of crop, livestock or non-farm income reached 75 per cent of income — equivalent to Bertrand Russell's 'set of no sets' perhaps.18

Ellis found the usefulness of livelihood typologies lay in revealing that both low and high

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18Russell (1903)
income groups rely heavily on non-farm income. Critically, he felt this supported the proposition that the poor diversify in less lucrative labour markets, reflecting human capital constraints, particularly in education (Ellis 2000: 221).

For the present study, typologies of livelihood strategy will be utilised in a modified form, but there are limitations to consider.

Typologies represent a snapshot in time. There is no guarantee that the livelihood type being followed by a particular group is not an opportunistic response to circumstance, which could change markedly, even in the short term. A second limitation is the possible confusion of production strategies with livelihood strategies. Certainly the various 'types' show how differing production strategies produce differing wealth outcomes. Livelihood, however, is not necessarily wealth outcomes. It is much more about food, shelter and security outcomes.

As Scott (1976) and Guaman (1978) have demonstrated, where there is production for use present, the nexus between wealth and livelihood collapses.

The extent of 'subsistence' production in the three villages and among the income groups is quantified in the case study. For the villages, 'subsistence' forms approximately 30 per cent of livelihood. Among income groups, it was said that 25 per cent of the low income group relied on subsistence for more than 50 per cent of their livelihood. Such a discussion of livelihood strategy is missing the point.

To 'subsist' is to achieve livelihood. Subsistence is not a 'share' of production, it is the livelihood itself. Certainly, production for use can be a share of production, and the shares allocated in the case study can then be meaningfully compared. The comparison is not, however, a livelihood comparison, it is a wealth comparison.

There are really only three fundamental types of rural livelihood strategy operating here in rural Tanzania and in the wider rural world — subsistence, cash farming and off-farm cash or in-kind returns. Whether subsistence is achieved by cropping or livestock raising is immaterial, but it must be achieved. What matters to the farming household is whether or not they have adequate food and shelter and that their social and cultural needs are met, without having to draw down their resources (Sahlins 1972a, Scott 1976, Chayanov 1986).

In the analysis of livelihoods in Vanuatu which follows in the next chapter, subsistence will be measured by participation rates, rather than by wealth.

The final limitation which needs to be considered is a consequence of the previous one; the selection of variables for the case study. No amount of statistical dexterity will make up for irrelevant or poorly-chosen variables. If livelihood is being measured then the variables measured must be those of livelihood. Some chosen for the case study do not comply with that requirement. Those which do measure livelihood may also be misunderstood. For example, these measures of natural capital were used and the results were presented thus.

For each of these measures, the high income group scores highest. A cursory reading would suggest that the high income group was richest in assets, the middle income group next, with the low income group way behind. Such a reading could well be wrong for each measure, particularly in the light of the allocations of subsistence share to each income

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Mean subsistence share — Nguni 31 per cent, Kashashi 32 per cent, Wari 26 per cent — Table 10.14, p.222.
Table 6.4: Three Income groups: Natural capital (Ellis 2000: 224)

<table>
<thead>
<tr>
<th>natural capital</th>
<th>Measure</th>
<th>Low</th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>total area cultivated</td>
<td>&gt; mean area in hectares</td>
<td>2.90</td>
<td>4.58</td>
<td>5.74</td>
</tr>
<tr>
<td>total area owned</td>
<td>&gt; mean area in hectares</td>
<td>2.66</td>
<td>3.83</td>
<td>6.62</td>
</tr>
<tr>
<td>milk cattle owned</td>
<td>&gt; mean number</td>
<td>0.78</td>
<td>1.37</td>
<td>1.51</td>
</tr>
</tbody>
</table>

...group — low 35 per cent, middle 29 per cent and high 17 per cent. Cost-replacement (opportunity cost) is the method used to calculate the subsistence share. It has been argued elsewhere (and will continue to be so argued) in this study that cost-replacement excludes many externalities and undervalues subsistence greatly (see Chapter 4, p. 63), but for this illustration that method will go unchallenged.

To take the measures in turn:

(a) The low income group has the smallest average area under cultivation. Subsistence gardening requires smaller areas because the crops grown (roots and tubers) have higher yields than cash cropping. To infer that larger areas under cultivation are an indicator of livelihood security is to misunderstand the nature of subsistence production. The larger the area under cultivation, more likely the higher the outlay and the risk, particularly if the area under cultivation is mainly commercial monoculture — that is to say, not underpinned by a subsistence strategy (Scott 1976).

(b) In terms of area owned, again the low-income group has the least, on average. However, the difference between area owned and area under cultivation is slight, so rental costs, either in-kind or cash, are less a burden than for the middle income group. The high income group own more land than they are utilising. The remainder may be fallow, or rented out, or it may be beyond the capacity of the human capital of the household to utilise (Sahlins 1972, Guinem 1978).

(c) The ownership of dairy cattle is a for-cash activity and is not a traditional occupation in the district. If the low income group is practising subsistence production, then they are unlikely to invest in dairy production, with its high level of risk (husbandry skills, exotic animals, no local market as examples). To depict dairying as beneficial diversification is to ignore its exotic nature, and its incompatibility with other components of the livelihood. Ellis himself notes the difficulties with dairying and its recent decline — rising costs, lack of availability of veterinary services and of dietary concentrates (Ellis 2000: 204-6).

Other measures selected bear no relation to livelihood — for example, education, used as a measure of human capital, is school education. For subsistence farmers, access to community knowledge through common language and traditions is as meaningful a measure of knowledge acquisition as school education.

Household access to electricity as a measure of physical capital may be useful for an investigation of lighting and cooking, but lack of electricity is no barrier to subsistence, except in an indirect way. Such might be the situation if alternative sources of fuel and lighting are being run down — where wood for fuel is being harvested without adequate replacement is an example.

There are other instances where issue could be taken with the selections made by the
researchers, but the point has been made sufficiently. There is a need to carefully select
the measures of livelihood assets, so that they reflect real contributions to livelihood and
livelihood security, and are not simply measures more fitted to an analysis of wealth and
livelihood in industrialised societies.

6.2.3 Data analysis — assets

Asset Pentagons

Ellis spends much of his explication of the framework on examining methods of quantifying
livelihood strategies through income analysis, and is content to utilise Carney's method
for asset analysis.

He uses asset pentagons to plot his evidence on livelihood assets. First seen in Carney
(1998, 1999), they represent a visualisation of a livelihood, which is constructed from the
relative values of component variables of the composite values for each 'capital'. These
pentagons allow comparison between groups, and are a valuable aid in analysis. The
example which follows is a simplified set and does not represent results from the case
study.

Because the five composite variables are relative values (percentages of the highest raw
value for the variable) the volume of the pentagon is meaningful as a measure of livelihood
assets.

Figure 6.6: Asset Pentagon Example: Step one

Scores for particular sets of the asset groups — human (h axis), natural (n axis), physical
(p axis), financial (f axis) and social capital (s axis) are plotted on the five linear axes which
radiate from the centre point of the pentagon, one for each asset group. The points on the
axes are then joined to form the pentagon. A five point scale is shown here, but provided
each axis has the same point scale any can be used.
These value points are then joined to form the pentagon of assets of, in the example, Group A.

Values for group B are then plotted.

Figure 6.7: Asset Pentagon Example: Step two

The two sets of values, for Group B and Group A can then be displayed together for comparison.

Figure 6.8: Asset Pentagon Example: Step three
Comparison is made easier by the graphic representations — it can be seen that there are fundamental differences in the assets base for the two groups, and that despite this, the area of each pentagon, that is the livelihood asset base itself, is roughly the same, an indication that neither group is advantaged overall in terms of their assets base.

It is when there is an obvious disparity in terms of the volume of the assets base that we are looking at the likelihood of inequities in livelihood outcomes. An example is given below.

**Figure 6.9: Asset Pentagon Example: Step four**

Group B is obviously less endowed with livelihood assets, making their livelihoods more vulnerable to shocks and stresses and putting them at higher levels of risk of livelihood failure.

In the next chapter we begin applying the Ellis framework to the subject under study — Vanuatu livelihoods.
Chapter 7

Vanuatu Livelihoods: Assets

7.1 Nature of rural and urban livelihoods

This is the starting point of the livelihood framework analysis. The aim is to construct earlier and later livelihood asset pentagons for rural and urban livelihoods.

To begin, there is a need to verify the nature of rural and urban livelihoods.

If one assumes that there are two separate patterns of livelihood for 'rural' and 'urban' households, one can examine each separately and quantify the assets which contribute to the livelihood platform for each.

Alternatively, the assumption that there are two separate patterns of livelihood for 'rural' and 'urban' households could first be tested. This is the course that has been chosen.

In the review of the livelihoods literature, it was noted that 'pure' subsistence livelihoods, in which all products of activities are consumed by the productive unit, may never have existed in practice. Furthermore, it was noted that 'pure' exchange livelihoods, where all products of activities are exchanged by market mechanisms, are also abstractions. Many unpriced elements, particularly within households — cleaning, washing, ironing, gardening and the like — are often unaccounted for.

In Vanuatu, around 80 per cent of the population live in rural areas, and are assumed to practise livelihoods which revolve around a core of subsistence. Their primary aim is to produce or access sufficient food and shelter for household wellbeing (Scott 1976; Sahlins 1972). Once this aim is accomplished, other productive activities are undertaken. Some of these activities will be undertaken for exchange, whether that be market-type exchange, reciprocity, or redistribution (Polanyi 2001). Some will be undertaken for other purposes, such as social cohesion and cultural enhancement. This is the livelihood for which the term 'subsistence-plus'\(^1\) has been coined.

The remaining 20 per cent of the population reside in urban areas, living what have been

\(^1\)See Glossary.
presumed to be exchange livelihoods (see Vanuatu National Statistics Office 2007a; 2007b as examples of that presumption), where their primary aim is to produce, either by trade or by wage and salary earning, sufficient cash to ensure household wellbeing.

These assumptions must be tested.

In LeClair and Schneider's 'Economic Anthropology: Readings in Theory and Analysis' (1968), Robbins Burling (pp.172-175) lists some features of exchange livelihoods.

(i) income is derived from exchange

(ii) needs are met by exchange

(iii) there are many activities which are undertaken for one's own consumption — cooking, washing and cleaning for example

(iv) there are many activities which are not given an exchange value — meals at friends are not priced, but meals at restaurants are

To which are added two features emphasised by Polanyi:

(v) there is at least one symbolic means of exchange (usually currency) (Dalton 1971: 166-7)

(vi) everything can be exchanged — including land and labour (Polanyi 2001: 71-79)

These features will be use to test for the nature of both rural and urban livelihoods.

7.1.1 Rural livelihoods and exchange

Can the features of exchange livelihoods be found in rural settings?

Within most villages, there is someone who has a 'truck' (car, utility truck or minibus), and provides transport, either to markets, to ports or to the urban centres for a fee. The same applies with powerboats — transport for fees. The operators are often people who have been away working, either in Port Vila or overseas, and have returned with enough capital to buy a boat or truck. In other cases, the boat (or truck) may have been provided to the village under some grant scheme as a 'fishing' boat or community truck. In this case the boat or truck may be run cooperatively by the village, with lower fees for locals.

The second major rural exchange activity is undertaken mostly by women — selling produce and crafts through markets and stalls. Village women have rosters drawn up. Those rostered on travel to nearby markets to sell the village's surplus food crops and fruits and craft items (Allen 2000, 2001). The profits are directed towards village-wide needs for cash — school fees are the most common. In Port Vila and Luganville, women often spend three days or more at the market, sleeping under the stalls at night (Leipakoa, market stallholder, Nguna, pers. comm. 2008).

This situation contrasts strongly with that which applied at the market house in Port Vila in colonial times, where Vietnamese and Chinese middlemen controlled the market (Brookfield, Brown-Glick and Hart 1969).

Wage and salary earning is reported in the census data, but at low levels of participation — less than 10 per cent. Recently, this has been augmented by Seasonal Worker schemes

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2Rural Economic Development Initiative, an AusAID project which provides seed funding in Vanuatu, for example (John Oke, REDI Project Officer, pers. comm. 2004)
in New Zealand, which have provided wage-earning opportunities and remittance income for rural people, as detailed by Hammond and Connell (2007).

In peri-urban villages, women may prepare market foods, or participate in craft markets set up when cruise ships are visiting.\(^3\)

While these activities are all exchange activities, none represent a departure from subsistence-plus. Boat operators, fishermen, market stall holders and hot food sellers all base their livelihood on the garden and resource gathering. Nowhere is Scott’s (1976: 23) ‘primary aim’ ignored — subsistence remains the core activity.

Health and education professionals, who may be locals but are more likely to be from other islands, are the only people living rurally who work full time for a salary and can be said to be integrated into the exchange economy, yet for them too, housing is provided, as is land for making a garden. At times, rural teachers are not paid for months on end.\(^4\)

Health workers seem to fare somewhat better, but are not a big enough cohort to be significant contributors to a rural exchange economy. With both teachers and health workers, absenteeism is endemic, driven in large part by the uncertainty of payment (see footnote, p. 234).

In many villages, there is likely to be a co-operative ‘store’, where rice, biscuits and western goods are sold, sometimes with petrol. These are vestiges of what was in the 1960s and 1970s an extensive co-operative movement.\(^5\) The villagers form the co-operative, so there are no entrepreneurs at the village level.

For rural households, some income is provided and some needs met by exchange. There is production for own consumption and there are many unpriced activities and there is more than one symbolic means of exchange, including cash. There is a labour market of sorts, but there is no developed market in land, which is freely available to all, under social constraints. Despite having many of the features of exchange livelihoods, rural livelihoods retain their subsistence core, and the basis of that activity is the ready availability of land.

On this evidence, for the 80 per cent of ni-Vanuatu who live in rural areas, the rural subsistence-plus livelihood is the sole livelihood followed.

### 7.1.2 Urban livelihoods and exchange

Turning to urban households, an entry point can be found by posing a simple question about land.

‘Who does not have a garden?’

Those households which do not have a garden are those most likely to be integrated into the exchange economy, as they cannot grow their own food. Expatriates can obviously be ruled in. None rely on a garden, although they may have coconut, papaya, banana and other edible trees and plants growing. These are more likely to feed domestic staff.

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\(^3\)In Port Vila, ‘tulul’ (tinned meat in a manioce pudding) from Mele, prepared by women in the village each morning, is duly hawked from door to door and at service stations

\(^4\)Anecdotal, but verified by many conversations with teachers

\(^5\)There is currently a government department which aims to restore the co-operative movement to its former status:


&Itemid=67&lang=en
There is one notable ni-Vanuatu community who have had to give up gardening. The traditional owners of the lands around, and including, Port Vila, the people of the small islet in Vila Bay\(^5\) known as Ifira\(^7\) (see Figure A.3), who formerly had gardens on the main island (Brookfield, Brown-Glick and Hart 1969), which have since been converted to urban leasehold, now buy all their food at the market or elsewhere in town. Population density on the island is such that there is no room for gardens.

The same Ifirans have two enterprises in town, which are run as cooperative ventures. They operate the port facilities in Port Vila and they have an inter-island shipping company. They are also over-represented, according to local opinion, in the civil service.

Aside from the people of Ifira, who are strongly integrated into the exchange economy, there are those who people the enclave economy of Port Vila itself, an economy driven by three main engines — tourism, offshore banking and government. Luganville has some features of an enclave economy, with a strong tourism sector, but a far smaller government sector and no international representation. Within these two enclaves, the ni-Vanuatu elite\(^8\) lives essentially without a base of subsistence gardening, although there are few ministerial residences where there are no bananas, pawpaws and coconut palms growing and no vegetable garden, usually tended by extended family. Teachers and members of the police are, as a rule, provided with housing and gardening land, which gives them the capacity to practise a subsistence-plus livelihood. While the business of government is firmly in the hands of the indigenous population, tourism has become less so. There has been a steady watering down of prohibitions on expatriate participation in the industry and tourist resort accommodation is almost exclusively in the hands of expatriates (Slatter 2006). The airport transfer buses may be driven by ni-Vanuatu, but they are owned by New Zealanders and Australians.

If the urban elite are practising a livelihood which, to a greater or lesser extent, includes some production for use but is primarily exchange-based and could best be identified as an 'exchange-plus' livelihood — what of the urban proletariat?

Those of the urban proletariat actually in employment are chiefly employed in the construction, transport, tourism, commerce and food industries, or in domestic service positions — housework and gardening (Vanuatu National Statistics Office 2007b). There are many self-employed transport operators, either taxi drivers, 'bus' drivers or 'public transport' drivers;\(^9\) some employment in manufacturing and automotive industries; and — a comparatively recent phenomenon — employment as security guards.

Because Port Vila is an enclave economy controlled by expatriate investors (Hassall 2007), wage and salary levels are of particular concern in the context of livelihood, because if wages are not sufficient for the livelihood, other supplementary measures must be in place. The Gini Coefficient, an international measure of income inequality, is, for Vanuatu, the highest in the world at 0.58 by the World Bank estimate, according to Bazeley and Mullen (2006: 4-5). They give another estimate (0.56), from Deutsch and Silber (2005). In Gini Coefficient terms, zero represents perfect income equality and 1.0 infinite income inequality. Values above 0.5 are regarded as strong impediments to sustainable growth.

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\(^5\)although the town is Port Vila, the bay is simply 'Vila Bay'.

\(^7\)In the past it has been Fila, Vila, Vira island — spelling is notional at best

\(^8\)Members of Parliament, Town and Provincial councillors, public servants, NGO local appointees and health and education professionals all of whom may also be acting as entrepreneurs

\(^9\)Bus services in Port Vila and environs are provided by minibuses — which can seat between 8 and 14 passengers. There are no regular routes and no timetables and the fare is a set price, except for outer peri-urban destinations which are twice the price.
This income inequality was recently illustrated in a briefing paper prepared for AusAID:

A survey of 1,026 young people between the ages of 13 to 25 years carried out in the urban shanty towns and squatter settlements of Port Vila in 1997 found an unemployment rate of 64.1%. For those who do find employment, wages are reportedly often less than half of the minimum wage (Vt 20,000 or A$250 per month). The hotel industry, where many young people from the shanty towns find work, is notorious for poor wages and conditions

(Cox et al. 2007: 18).

In 2008, the Vanuatu minimum wage was lifted to VUV26,000 per month. To give some perspective on the real value of the minimum wage of VUV26,000 per month, which equates to around VUV1200 per day worked (8-10 days for weekends each month),

a table of everyday costs in Port Vila is shown below:

Table 7.1: Costs of everyday items: Port Vila 2009 (VUV)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>bus round trip</td>
<td>300</td>
</tr>
<tr>
<td>laplap (market)</td>
<td>150-200</td>
</tr>
<tr>
<td>small water</td>
<td>80</td>
</tr>
<tr>
<td>orange</td>
<td>40</td>
</tr>
<tr>
<td>cigarette</td>
<td>30</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>650</strong></td>
</tr>
</tbody>
</table>

All of these costs are optional — one can walk to work, bring something to eat and drink from home and give up smoking — but if one’s livelihood is based mainly on wages, then food must be bought at some time, and rent must be paid. There is a tendency for outsiders to think that someone living in an informal settlement does not have rent costs, because they are ‘squatters’. This is not true. Rent is charged, by the room (see earlier discussion in chapter 4, p. 67)

Some families are living up to 8 people to a room, yet still required to pay more than half of their household income on rent

(Cox et al. 2007: 17).

It does not require much imagination, nor does it need much mathematical acuity to suggest that someone trying to live on VUV1200 per day and paying half of that in rent, is unlikely to survive the daily grind, let alone cope with difficulties like ill health, accident or needing to top up their mobile phone. In addition, there is a strong likelihood that more than one person will be trying to survive on that income. It simply does not add up to a viable livelihood. If Cox et al.’s comment that respondents were paid less than half that amount, is added to the mix, some idea of the magnitude of the problem becomes apparent.

In summary:

(a) The Vanuatu minimum wage is VUV1200 per day worked, or VUV866 per day in a month;  

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10At the Port Vila Public Library assistants were paid at casual rates of VUV1000 per day worked. The library manager had a permanent position and was paid VUV33,000 per month, with a VUV4,500 housing allowance. The housing allowance was paid in lieu of accommodation being provided, which it is in most government positions — teaching included.
(b) Many people receive less than half the minimum wage, that is less than VUV600 per day worked, or VUV433 per day in a month, when in employment;

(c) Often rent is half family income, that is, per working person, VUV216 per day, leaving VUV216 per day for food, clothing and essentials.

That is VUV216 per day for subsistence.

Cox et al. found that unemployment rates among young people from informal settlements is around 64 per cent, thus one in three young people are working. If the VUV216 is shared among them, they each receive about VUV70 per day. That is equivalent to a small bottle of water, or an orange and a cigarette.

Recalling the features of exchange economies, for urban households there is income derived from, and some needs met from exchange. There is production for self-consumption and there are unpriced activities. There are markets in labour and in land and there is currency — but there is also strong evidence that most of the urban proletariat are very poorly integrated into the exchange economy, while the local elite and the Ifira islanders seem to be more so.

The idea that there is an urban proletariat exchange livelihood based on wages and salary seems likely to be a fiction.

There are three sets of observations which suggest that the 'real' livelihoods of the urban proletariat are subsistence-plus. The 1999 census provides one set of clues. Another is provided by a study undertaken by Ormerod (2005) in Ohlen-Freswind,11, an informal settlement in the north-east of Port Vila (see Figure A.3) which abuts the urban lease area of Freswota.12 A third source of clues is the Pacific urbanisation study by Connell and Lea (2002).

In the 1999 census, urban populations were questioned about household food sources and food gathering practices. Surprisingly, many were found to be practising subsistence gardening with 62 per cent of Port Vila residents claiming that they had access to land for gardens. In Luganville it was much higher at 77.1 per cent (Vanuatu National Statistics Office 1999: 168-9). In response to a question on land ownership, only 20.5 per cent of Port Vila residents said they had no land, and 22.9 per cent of Luganville residents. Given that most people gardening in and around Port Vila are almost certainly gardening without right or agreement, the 62 per cent who said they were is likely to be an under-estimate. The true number is probably a good deal higher.

The clue offered by the 1999 census is that the major feature of rural subsistence-plus livelihoods, the garden, is not only present in urban areas, but substantially present. For most households in the urban areas, their livelihood is the same subsistence-plus livelihood as that practised by those in the rural areas, with one major difference — they have a single source of what is identified as financial capital (see p. 245), wages and salary. Rural households have a more diverse portfolio of financial capital.

Ormerod (2005) surveyed 15 households in Ohlen. She researched the settlement with an interpreter (Bislama speaker) and asked families at random if they would like to participate in her study. Despite the high risk of sampling errors, and the alteration of the survey questions 'on the fly', the picture which emerged confirms the findings of the 1999 census.

11 Fresh wind = cool breeze
12 Fresh water, from the water supply tanks for Port Vila
She found (2005: 13-15) that 75 per cent of her 15 household sample had gardens. Some had gardens nearby, others were utilising land further away, along the Tagabie River (perhaps two or three kilometres distance). She found that the majority were using land without permission. Garden produce was mainly root crops, island cabbage, banana and pawpaw. Her respondents said that theft from gardens was an endemic problem, and many had stopped growing 'European' vegetables, which were cultivated for their cash crop potential, because of this.

The same problem, theft, occurred with domestic chickens, which are free-range (2005: 52-55).

The strategy of reducing production of crops and stock vulnerable to theft meant that there was a reduction in the variety of food available to families. More seriously, it meant a reduction in cash-earning for school fees and medical expenses.

In addition to own-account gardening, Ormerod identified the role played by kinship and church networks in food security (2005: 32-33).

Kinship networks are a vestige of the time when circular migration was a significant aspect of urbanisation. When a family member was in town working for wages, they would have their food needs met by their rural relatives, with the expectation that they would share in the cash earnings in time (Bonnemaison 1977). Now that migration is more likely to be permanent, these *quid pro quo* arrangements are often a cause of friction within kinship groups, a situation which is exacerbated when the rural family decide to visit town for extended periods (land dispute court cases are a common reason, along with custom ceremonies and rites), with the expectation that they will be fed and housed by their urban kin (Ormerod 2005: 55, see also Welegrabit 2001: 26).

Church networks are most often created in the non-mainstream churches. The Seventh Day Adventist church has a number of primary schools and two secondary schools in Port Vila. The NTM church has a school, shop and kindergarten complex in Agathis, an area in the northern suburbs. Churches regularly perform roadside clean-ups, and above all they provide the welfare services more often undertaken by government, or by family and kinship networks.14

Connell and Lea, in their 2002 study of urbanisation in the Pacific, noted:

> Agriculture is practised in every urban area, from labour-intensive cultivation of root crops and flowers in 44-gallon drums in Funafuti, to extensive and diverse production and marketing in Suva, where about 15 per cent of the urban area is under cultivation. There food gardens occupy land next to homes, distant idle land supports less intensive use and there is adventitious cultivation of roadside verges and parkland. A significant amount of food comes from such gardens, invaluable in a situation where urban poverty is worsening and nutrition deteriorating ... as one woman said.

> 'If my family didn’t have a garden, we would not be able to live in Vila. It is very hard to get a job ... most of the time we have to depend on the garden and on the sea for food'

(Connell and Lea, 2002: 95).

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13Neil Thomas Ministries
14Douglas (2005) finds that this phenomenon is more likely to be seen in rural areas, but in the author's experience it is equally likely in urban settings
These findings permit generalisation of subsistence-plus production from Port Vila, where Ormerod found it, and the 1999 census, where it was found in the two urban centres, to Pacific island nations generally.

It has been demonstrated that rural livelihoods are almost entirely subsistence-plus livelihoods. Urban livelihoods, on the other hand, appear divided between the integrated exchange livelihoods of the local elite and the Ifira islanders and the subsistence-plus livelihoods of the proletarian urban households.

While it is relatively easy to make the case for the separation of what now seem to be two distinct urban livelihoods — the exchange economy of the urban elite and the subsistence-plus livelihood of the urban proletariat — in practice there is no way to differentiate numbers available for urban households into two separate livelihood sets. An economic study which separates the two livelihoods, or groups the urban elite with the expatriate community, would be of great benefit.

In the absence of such a study, the present thesis divides livelihood patterns in Vanuatu along the urban and rural axis.

Given the strong likelihood that subsistence-plus livelihoods exist in both rural and urban settings, features common to both rural and urban households can now be combined in the data sets.

7.1.3 Variables for asset pentagons

In the Ellis version of the framework (see Figure 6.3) livelihood assets are grouped into the five 'capitals' — five composite variables which together make up the livelihood platform.

The variables chosen to form those capitals are, in the main, ones which can be measured by percentage participation, in keeping with avoiding cash terms and wealth differences, and concentrating on access to resources. Simple ten-point scales are employed where appropriate. In one case, household size, the group average is utilised.

The criteria for inclusion are straightforward. Variables will only be considered if they can be seen to contribute to livelihood.

The author has been critical of Ellis and others for selecting variables which have no necessary connection to livelihood. Variables such as type of house construction, electricity to the home, television or vehicle ownership may be good indicators of wealth, or desire for prestige, but they shed no light on the matters of livelihood.

The following sets pass the livelihood test, and are mostly measures of access to resources, by percentage participation rates.

Human Capital

Human capital is the availability and quality of labour in the household — levels of education, skills, and health determine the extent of human capital (Carney, 1998).

Household size is also a determinant, in that smaller households are likely to have less available labour.

In societies in which education and skills may be of two forms — modern or traditional — recognition that traditional knowledge has equivalence with modern school education
is needed. In addition, knowledge can be obtained through radio and telecommunications access. These have been included.

Health issues and access to health services also contribute to the availability and scope of human capital.

The variables for human capital for both rural and urban households are:

- household size
- knowledge and information, measured by access to:
  - school education
  - traditional knowledge
  - radio and telecommunications
- health issues and health access
  - issues chosen are obesity, under five undernourishment, infant and child mortality
  - access is measured by percentage population access to health professionals

**Physical Capital**

Ellis provides this definition:

In economic terms, physical capital is defined as a producer good as contrasted to a consumer good

(Ellis 2000: 33).

If producer goods are goods which 'create a flow of outputs into the future' (Ellis 2000: 33), then for subsistence-plus livelihoods, benefits which facilitate production, such as proximity to gardens and low levels of technological inputs are physical capital. Likewise, cropping diversity and the capacity to grow crops year-round also facilitate subsistence-plus production.

Less obviously, cash cropping capacity, the capacity to grow crops which are not consumed or otherwise used, represents physical capital in the sense that land availability and climatic suitability are needed to participate.

The variables chosen for physical capital are:

- cropping capacity — scaled so that low seasonal constraints, good soils and nutrients (year-round cropping is possible) are highest, high seasonality, poor soils and high levels of nutrient replacement are lowest
- cropping diversity — scaled so that highly diverse cropping is highest, monoculture lowest
- proximity — gardens close to home are more valuable they take no time to get to, and transport is not required. Access to proximate gardens was measured in percentage terms, with walking preferred to transport, either by water or by road
- agricultural technologies — scaled so that the digging stick scores highest, the combine harvester lowest
• cash cropping capacity — measured by percentage with access to land to grow crops not intended for household consumption

Urban households do not have any capacity for cash cropping, because of land restrictions and the high likelihood of crop theft. Urban physical capital assets will not include cash cropping capacity.

**Natural Capital**

Natural capital is 'the land, water and biological resources that are utilised by people to generate means of survival' (Ellis 2000: 32).

In keeping with the use of subsistence-appropriate measures *access to* resources is measured, rather than *quantity* of resources per household.

The variables chosen are access to:

- garden land
- littoral areas
- forest areas
- fallow — scaled so that longest fallow is highest value, shortest is least.

Fallow length is taken as a proxy for land use intensification. Other elements of intensification are longer cropping cycles, soil improvement and permanent cultivation. Fallow length values are available but that is not the case for the other elements.

**Financial Capital**

Financial capital is available to the subsistence-plus livelihood, but this availability stems from the capacity to engage in production for exchange, or to engage in wage and salary earning or small business activities, which convert to cash or barter capital reserves.

Urban households have little or no capacity to engage in production for exchange, thus their financial capital livelihood assets are less diverse than those of rural households. Urban households have greater access to opportunities for wage and salary earning, and arguably for small business. In the absence of numbers for small business activities, financial capital assets for urban households have to be restricted to their access to wage and salary earning.

Again, the measure is percentage participation in production, not quantitative differences in the variables chosen:

- cattle — (rural only)
- kava — (rural only)
- coconut — (rural only)
- other livestock — (rural only)
- wages and salary — (rural and urban)
Social Capital

A number of difficulties present themselves in the selection of variables to measure social capital.

While village social structures and systems have been well documented, urban social systems have been less well researched.

In villages, there is always a local language, there are elements of custom to a greater or lesser degree, there is church religion and there are social settings which exhibit hybrid mixes of church and custom. The majority of inhabitants are living in their birthplace.

In urban and peri-urban areas, local languages are not used outside the household, with exceptions in homogenous settlements where adults may converse freely in their local language. Many children and young people are not fluent in their local language, and when parents are from different language groups that tendency is heightened. Nevertheless, local language fluency does confer social and cultural entitlements, whether the setting is urban or rural.

Church affiliation is high in urban and peri-urban areas, and custom, while less obvious, retains a strong following.

There is a strong tendency for 'indigenizing' [sic] modernity (Sahlins 2000) in the urban setting. There are 'chiefs' in most suburbs and informal settlements, who derive their legitimacy from community consensus. Despite the lack of culturally significant places, and village social systems, there are few challenges to the legitimacy of the informal chiefly structures, and those elected, or selected, take their place in the National Council of Chiefs like any other.

Provenance is here used to identify people living in their place of birth. For rural people, provenance guarantees social and cultural entitlements. In urban areas, the connection between place of birth and place of residence is by no means a guarantee of social and cultural entitlements. Nevertheless, it cannot be entirely discounted.

The variables chosen are:

- local language fluency — (rural only)
- provenance
- church/custom adherence

Limitations

In the selection of variables, it was noted that for a number, urban households have been excluded. The modifications made by excision are not controversial, however possible replacements for the excised variables need to be canvassed, particularly in those which make up financial capital.

In the urban setting, wages and salaries are one source of income but there are a number of others, which are more part of the informal economy. Included among these are road markets, which are of two varieties — the unmanned 'honesty' markets in villages or outside urban gates, or the ad hoc markets at intersections or close to settlements where groups of women gather to sell root crops or other garden products. The women in these ad hoc markets avoid paying the municipal fees which those in the market house must pay. One
favourite item at these markets is small plastic packets of roasted peanuts, the production of which Ormerod (2005: 14) noted in Ohlen.

Another source of income are ephemeral small businesses — kava bars, cake and cooked food stalls and car washing — which materialise and disappear with equal speed, requiring little expense in establishment and none in dismantling when the kava or food or water run out.

A popular income source is stall-holding. Stalls are set up during the many festivals and holidays and are enjoyed by ni-Vanuatu and expatriate alike. The French and British holidays (principally Bastille Day and Queens Birthday) are celebrated with equal enthusiasm, but the main celebratory week begins with Children's Day and culminates in Independence Day, on 30 July. Stalls are constructed on football grounds and cleared spaces, often lining the perimeter. Everything and anything is sold — food, kava, drinks, arts and crafts, hardware (coconut graters, laplap graters). Football and netball competitions run through the week and string band competitions (ukulele, guitars and a tea-chest bass, with falsetto vocals) are a popular feature.

Sub-contract arrangements are used by taxi and bus owners, where the driver gets a percentage of the takings, rather than a wage. Anecdotally, this seems to be the ‘normal’ arrangement when the driver is related to the owner\(^\text{15}\) but no studies have been undertaken to verify this.

Rental income, land-lording, is another important source of capital, but information on rental income is not collected by the National Statistics Office. As all arrangements are informal, no value added tax is charged or collected, so the extent of the practice, and the volume of rent collected, are unknown.

The Household Expenditure and Income Surveys do not provide numbers for the percentage of households involved in cash-earning activities outside wage and salary earning. A number of other sources are included in the surveys — other cash income, income from agriculture, fishing and handicrafts, gifts received — but no percentage breakdown. The only available numbers are those in the 1999 Population and Housing Census, which provided percentage population involved in family businesses or other work, but stipulated that these were 'not for cash' activities.

Regrettably, in the absence of data in a useable form, it will be necessary to use the single indicator, wages and salary, for financial capital in the urban subsistence-plus livelihood asset pentagon.

Likewise, no additional component measures are available to add to social or physical capital.

### 7.1.4 Principal sources


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\(^{15}\) The same answer was given in many conversations with bus and taxi drivers conducted by the author over three years.

\(^{16}\) The 1990, 1991 and 1992 censuses were actually 'agricultural smallholder surveys' but collected similar information to the 1993 census.
Vanuatu National Statistics Office numbers, particularly the Household Income and Expenditure Survey of 2006. These will be supported by material drawn from health surveys and studies conducted by United Nations agencies, the World Health Organisation, the World Bank and other sources, mainly donor aid-funded studies.

There are inaccuracies and deficiencies throughout the data set, but there are, for most part, either alternative sources for cross checking or sufficiently long and regular time series to provide for verification against trends.

Warnings are given when figures are suspect.

Figures for Torba Province (see Figure A.2) have not been included. This province has a small population and percentage participation numbers derived from small populations can exert an undue influence on aggregated values. Aggregations below the provincial level have not been considered for rural livelihoods. Sanma and Shefa provinces are the two provinces with urban settlements, Luganville and Port Vila respectively.

### 7.2 Livelihood asset pentagons

The following figures show the component variables which will be used to construct the composite variables — the five capitals, for rural livelihoods first.

**Figure 7.1: Rural livelihood asset pentagon**

The urban asset pentagon, which follows, shows the narrow asset-base in financial capital and the less diverse physical and social capital assets.
7.2.1 Raw data sets

The long series of raw data tables, the accompanying technical notes and sometimes extensive discussion, have been placed in Appendix C. The relativised sets, where the raw values for variables have been made relative to the highest value in each set, are presented below. A reference is provided with each table to the relevant tables and discussion in Appendix C; to which the reader is commended, for a more detailed picture.

7.2.2 Relativised data sets

The tables in this section show two datasets, earlier and later. The earlier datasets are mostly figures collected before 1990. While this generally applies, there are a number of exceptions where no figures are available before 1990. The later sets are, in the main, figures collected since 1990. Weighting of the variables is given for each capital set of assets.

Human capital data set

• household size
• access to information/knowledge (composite variable)
  – school education (25 per cent)
  – provenance (local knowledge) (25 per cent)
– radio (25 per cent)
– telecommunications (25 per cent)

• health (composite variable)
  – western diet/Body Mass Index (20 per cent)
  – <5 undernourishment (20 per cent)
  – infant mortality (20 per cent)
  – <5 mortality (20 per cent)
  – access to health professionals (20 per cent)

Each of the three component variables, household size, access to information/knowledge and health, was given equal weight (33 per cent).

Table 7.2: Human Capital relative data sets: Rural and urban

<table>
<thead>
<tr>
<th>set</th>
<th>household size</th>
<th>knowledge/information</th>
<th>health</th>
<th>human capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earlier</td>
<td>8.6</td>
<td>7.6</td>
<td>9.6</td>
<td>8.6</td>
</tr>
<tr>
<td>later</td>
<td>8.7</td>
<td>8.2</td>
<td>9.6</td>
<td>8.9</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earlier</td>
<td>8.5</td>
<td>7.2</td>
<td>8.8</td>
<td>8.2</td>
</tr>
<tr>
<td>later</td>
<td>8.7</td>
<td>9.4</td>
<td>8.9</td>
<td>9.0</td>
</tr>
</tbody>
</table>

(see Appendix, Section C.1)

As noted in Appendix C.1 (see p. 230), health information is hard to come by — earlier and later rural values are the same.

Earlier and later values for telecommunications access are 1999 compared with 2009. Nothing older was found, although the telephone system almost certainly dates from colonial times, as there are 1978 telephone directories for Port Vila offered for sale online.17

Physical capital data set

• cash crops (25 per cent — rural only)
  • cropping capacity and diversity (25 per cent rural — 33 per cent urban)
    – capacity (50 per cent)
    – diversity (50 per cent)
  • agricultural technologies (25 per cent rural — 33 per cent urban)
  • proximity (25 per cent rural — 33 per cent urban)

For the physical capital data set each variable was given equal weight (rural 25 per cent; urban 33 per cent). Cropping capacity and diversity were equally weighted. Cash crops, a component of the rural assets, do not form part of the urban asset-base.

These sets came from the 1983 (earlier) and 2007 (later) agricultural censuses, except rural cash crops (later) which was drawn from the 1999 Population and Housing Census.

The numbers in brackets are those which would have applied, had 1999 Population and Housing Census numbers for urban cash cropping been included.

Table 7.3: Physical Capital relative data sets: Rural and urban

<table>
<thead>
<tr>
<th>set</th>
<th>cash crop</th>
<th>capacity/diversity</th>
<th>agricultural technologies</th>
<th>proximity</th>
<th>physical capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>rural</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earlier</td>
<td>8.1</td>
<td>10</td>
<td>8</td>
<td>9.6</td>
<td>8.9</td>
</tr>
<tr>
<td>later</td>
<td>5.1</td>
<td>10</td>
<td>8</td>
<td>9.6</td>
<td>8.2</td>
</tr>
<tr>
<td>urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earlier</td>
<td>n/a</td>
<td>8.3</td>
<td>8.0</td>
<td>9.6(^{18})</td>
<td>8.6(6.5)</td>
</tr>
<tr>
<td>later</td>
<td>n/a</td>
<td>8.3</td>
<td>8.0</td>
<td>9.6</td>
<td>8.6(6.9)</td>
</tr>
</tbody>
</table>

(see Appendix, Section C.2)

Natural capital data set

Access to:

- garden land (25 per cent)
- littoral areas (25 per cent)
- forest areas (25 per cent)
- fallow practices (25 per cent)

Each variable was equally weighted in forming the composite variable. It is of some concern that the key variable, land access, is not given more weight, but once weighting is considered it is difficult to know where to stop.

Table 7.4: Natural Capital relative data sets: Rural and urban

<table>
<thead>
<tr>
<th>set</th>
<th>garden access</th>
<th>littoral access</th>
<th>forest access</th>
<th>fallow access</th>
<th>natural capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>rural</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earlier</td>
<td>9.9</td>
<td>7.5</td>
<td>10</td>
<td>10</td>
<td>9.4</td>
</tr>
<tr>
<td>later</td>
<td>9.8</td>
<td>8.0</td>
<td>9.7</td>
<td>2</td>
<td>7.1</td>
</tr>
<tr>
<td>urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earlier</td>
<td>6.8</td>
<td>5.0</td>
<td>3.0</td>
<td>2.0</td>
<td>4.2(^{19})</td>
</tr>
<tr>
<td>later</td>
<td>6.8</td>
<td>5.0</td>
<td>5.3</td>
<td>2.0</td>
<td>4.8</td>
</tr>
</tbody>
</table>

(see Appendix, Section C.3)

The earlier rural value for fallow seems suspiciously high, as some provinces had lower relative scores indicating shorter fallow periods. Caution is urged, but a number of alternative

\(^{18}\)There is no available figure, so a default value, that for rural Vanuatu, is given

\(^{19}\)Earlier and later garden and littoral resources values are both 1999
sources — Bourke (1999), Allen (2001) and Vanuatu National Statistics Office (2007a) — all indicate that fallow periods have been falling over time (see discussion, p. 244).

**Financial capital data set**

- cattle production (20 per cent — rural only)
- kava production (20 per cent — rural only)
- coconut production (20 per cent — rural only)
- other livestock (20 per cent — rural only)
- wages and salary (20 per cent rural — 100 per cent for urban)

The figures in brackets in Table 7.5 show the values, had 1999 Population and Housing Census values for urban production been included.

<table>
<thead>
<tr>
<th>set</th>
<th>cattle</th>
<th>kava</th>
<th>coconuts</th>
<th>other livestock</th>
<th>wages</th>
<th>financial capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>rural</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earlier</td>
<td>7.2</td>
<td>8.1</td>
<td>8.5</td>
<td>7.7</td>
<td>0.4</td>
<td>6.4</td>
</tr>
<tr>
<td>later</td>
<td>8.4</td>
<td>6.6</td>
<td>7.8</td>
<td>7.3</td>
<td>1.6</td>
<td>6.5</td>
</tr>
<tr>
<td>urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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(see Appendix, Section C.4)

The earlier and later rural financial capital value is almost identical despite significant shifts in the component variables over time.

**Social capital data set**

- local language speakers (33.3 per cent — rural only)
- provenance (33.3 per cent — 50 per cent for urban)
- church/custom adherence (33.3 per cent — 50 per cent for urban)

<table>
<thead>
<tr>
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</table>

(see Appendix, Section C.5)
7.3 Comparison of urban and rural livelihood asset pentagons

7.3.1 Earlier pentagons

Figure 7.3: Vanuatu Livelihood Asset Pentagons: Earlier dataset

In the earlier pentagons (Figure 7.3), the relative advantage to rural households in terms of their livelihood asset-base is clear.

There is a substantial inequality in assets, 124 units for the urban livelihood compared with 175.4 for the rural livelihood.

There are wide disparities in favour of rural areas in social capital, where provenance was relatively much higher, and natural capital, where fallow periods in rural areas were again relatively much longer.

In financial capital the narrow base of wages and salary is not showing as a disadvantage for the urban livelihood.

Physical and human capital are virtually equivalent.

\[26\text{The earlier value for adherence, 9.7 is an assigned value, equal to the lowest value for provinces in the 1967 population census} \]
7.3.2 Later pentagons

In the later pentagons (Figure 7.4), the livelihood asset-bases for rural and urban cohorts have become similar in volume, indicating positive change for urban households and negative change for rural households. The similarity in the volumes of the asset pentagons, that is the overall livelihood asset-base for each livelihood — 152.5 for rural and 157.5 for the urban livelihood — indicates that no overall advantage exists for either rural or urban groups.

Figure 7.4: Vanuatu Livelihood Asset Pentagons: Later dataset

There are two main points of difference — natural capital and social capital.

Natural capital assets have declined in rural settings. Social capital assets for urban households have apparently increased.

As with the earlier pentagon, there is no apparent disadvantage to urban households in the lack of diversity of the financial capital asset-base, where wages and salary, in relative terms, are overwhelmingly important.

7.4 Provisional observations

Some provisional observations from the comparative analysis of the asset pentagons for rural and urban livelihoods must now be highlighted, in order to proceed to the next step in the analysis.
The urban livelihood asset-base has apparently grown in relative terms, while that of the rural livelihood has decreased relatively over time, from 1970 to the present.

The most contentious issue in the relative rise in the urban asset-base is the growth in social capital. Primarily this has been due to a rise in provenance in urban areas. As previously noted, the most likely explanation for this trend is that in-migration to the urban areas has declined in significance as an agent in urban population growth, and been replaced by a growth in the urban birth rate. As families have moved into the urban and peri-urban areas over the previous 30 years and have become settled, children of those families are, in fact, 'natives' of Port Vila or Luganville.

Two elements arise from this:

First, as more urban 'natives' mature and seek marriage partners, the likelihood is that those partners will come from islands and cultures other than those of the seekers.

Connell and Lea (2002: 195) note:

In Blacksands (Port Vila) as many as 45 per cent of all households were in inter-island partnerships and for them town was a 'neutral place' of residence, even if few regarded Vila as their 'place'. Their children, born in town, are the first to lose their island affiliations ... over time creolisation becomes the norm for urban residents.

While the loss of identification with an island and culture is certainly diminished, if not lost, it cannot be said categorically that this loss has not been replaced by elements of culture and belonging which are derived otherwise — from the urban place of residence, from church membership or from membership of friendship groups, in which the connection is often the island identified as being the island of origin, but not always. Blacksands (see Figure A.3) is a thoroughly mixed community with people from many islands living side by side. Seaside (see Figure A.3, another large informal settlement has, by contrast, separate settlements of 'Tannese, Paamese and Tongan island communities.

Second, urban lease-holding has come to be identified in many ways as like traditional ownership and the landlord (the leaseholder) often acquires the status of patron from his tenants, in addition to receiving lucrative rents.

These elements show how difficult it is to reach a safe conclusion about whether one can dismiss the improvement in social capital in the urban livelihood as an aberration. Without further information no conclusion can be safely made. The best that can be said is that it seems that the urban livelihood has experienced a rise in social capital, despite decreases in church/custom adherence and despite the language of the urban areas, Bislama, being a creole language, which confers no cultural or social benefits on its speakers. This increase

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21 While there are no 'raskol' gangs in Vanuatu, there are groups who aspire to that status, and they function as intermediaries in such sectors of the informal economy as the trade in marijuana, which is unmeasured, but anecdotally quite large.

22 Urban leases have not been treated extensively in this study, because they are outside the scope of the study. When the Government settled the boundaries of the urban area and reached an agreement with the Itiran traditional owners for that land, it was decided that urban settlement would be achieved by instituting urban leases, which are equivalent to house allotments in area, and can be transferred or sold in much the same manner as land held in free simple. Urban dwellers regard these urban leases as 'secure', and the dwellings constructed on them reflect that. They are far more substantial than the dwellings erected in the peri-urban areas, outside the urban boundaries.

23 Although Bislama has the status of 'national language' and is widely used in the community, in parliament, in legal documents and in some parts of newspapers, there are virtually no other published works to its credit. The education system is either anglophone or francophone.
in social capital may also be a de facto recognition that the informal settlers are there to stay and that the social upheaval involved in trying to unseat them renders any assertion of custom rights by bulldozer\textsuperscript{24} and police action less likely as time goes by.

The decline in natural capital in rural livelihoods is due exclusively to the change in fallow practices over the period covered by the agricultural censuses — 1984 to 2006. It has been noted elsewhere (see Appendix C, p. 244) that it is difficult to make definitive judgements on fallow practices, and that shorter fallow periods may be appropriate. Nevertheless, the evidence presented by Albers and Goldbach (2000), backed by the Bourke studies (Bourke 1999; Bourke et al. 2006), seems compelling. This evidence will be tested in more detail in the following chapter. Seemingly, the decline in fallow periods does represent a reduction in the rural livelihood asset-base.

Bourke (1999: 2) argues —

Three factors have driven the change in agricultural systems: population growth; desire for cash income through cash cropping; and changing social values.

He notes that there have been yield improvements from the introduction of more productive root crop cultivars, which may also have influenced the shortening of fallows.

The latter two suggested reasons for declining fallow periods are not beyond challenge, but the real danger is that the change in the nature of regrowth from woody, high regrowth, to vines and short grasses may be irreversible, without deliberate intervention.

During the cropping period, weeding leads to a relative decline in pioneer woody species compared to invading grasses. While grasses are also removed during weeding, they are able to set seed between weedicings, thereby augmenting their presence as cropping continues ...

If the relative presence of woody pioneers is sufficiently small, succession during the fallow may be deflected to a stable grass regime, resulting in an irreversible loss of forest cover and a permanent loss of agricultural income (Albers and Goldbach 2000: 262).

A further dimension can be added to these concerns.

At the Asia-Pacific Forest Invasive Species Conference in Kunming (17-23 August, 2003), Bakeo and Qarani (2003) reported major concerns with invasive species. Ecuador Laurel (Cordia alliodora) was introduced to Vanuatu in the 1970s as a possible timber resource. The market for the timber collapsed and the trees are now invading native forests on the eight islands where they were trialled.

Mile-a-minute weed (Mikania micrantha) and Elephant grass (Pennisetum purpureum) have had major adverse impacts on Efate, as has the 'conflict tree' (Lenaena leucephale), which was introduced as a 'nitrogen-fixing' tree and as cattle feed, but is now primarily gathered for firewood.

Bakeo and Qarani (2003: 3) note that Lenaena 'can form dense monospecific thickets and is very difficult to eradicate once established, rendering extensive areas unusable and inaccessible'

If the regrowth problem includes introduced pest species, the difficulties involved in eradication of the vines and grasses and re-establishment of native forest regrowth are com-

\textsuperscript{24}Connell (2003: 248) notes that such actions as 'bulldozing' informal dwellings is regarded as 'purification'.

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pounded. This problem of ill-conceived introductions of exotic species to Vanuatu will be dealt with more fully in the next chapter.

This discussion of environmental degradation has been confined to attenuated fallow and its possible consequences. There is a need to keep in mind the more general problems associated with a decline in natural capital assets. Reef and shore damage and deforestation are outside the control of rural populations, but there are instances where they have contributed to the degradation of natural resources. Shark-finning and beche-de-mer harvesting practised by villagers have contributed to a decline in these species. Riverine, stream and lagoon pollution from over-settlement and latrine contamination present further threats.

To summarise the observations thus far —

(i) The characterisation of rural and urban livelihoods as 'subsistence' or 'exchange' is seen to be misleading, because urban households were shown as having livelihood assets more characteristic of subsistence-plus livelihoods. Wages and salaries earnings were shown to be insufficient for a sustainable exchange livelihood.

(ii) Separate consideration of the livelihoods of the two urban cohorts, the élite and the proletariat, proved impossible because of a lack of disaggregated information.

(iii) The asset pentagons showed that rural and urban populations have similar stores of livelihood assets, but that the asset-base for urban populations is less diverse, which may mean that it is more risk-prone.

(iv) When the earlier and later asset pentagons are compared, a decline in assets for rural populations is indicated, and the decline in fallow practices in rural areas is implicated in this decline in natural capital, the most significant feature. Apparent growth in the urban asset-base is contentious, and likely to be a reflection of a shortcoming in method. The selection of variables measured to make up social capital included provenance, people living where they were born. However, any proposed advantage to being born in urban areas, particularly in the informal settlements, is at odds with observed reality.

7.4.1 Working model

Beyond this point, the study moves from the framework's livelihood platform to an examination of the effects of the access-modifiers and contextual events (shocks and trends) which mediate the process by which a livelihood platform is converted to a livelihood, via a range of strategies. Use will be made of earlier and later asset pentagons to identify effects of those mediating processes. In preparation, a working model is proposed, to test the most obvious effect, the decline in natural capital for rural households.

Before proposing the model, it would be useful to re-visit the flows in the framework model. Some time has now been spent building up a picture of livelihood assets for rural and urban households. It has been noted that trends, both of rise and fall, emerged in the store of assets over time, as households responded to events — changes in political environment, markets and policies, changes in the natural environment. These responses flow through to affect choice in livelihood strategies, and the outcome of those changes in strategies flows back to affect the store of livelihood assets.

The decline in natural capital in the rural subsistence-plus livelihood is one of two prominent features to come from the analysis of the livelihood asset pentagons, and the most
prominent component of that decline has been the decline in fallow. The uncertainty of the improvement in social capital in the urban subsistence-plus livelihood has already been noted, and almost certainly represents a residual problem with the initial selection of the 'provenance' variable.

What is needed is an explanation for the decline in fallow periods, a change in practice by the subsistence gardeners. If the framework model is to prove useful, an explanation for this change should arise out of the examination of the modifying agents, and the trends and shocks which have contributed to that decline.

From the earlier optimal land use distribution projections, land-use pressure caused by withdrawals to leasehold was identified in Shefa province, particularly for Efate island. If the working model tests that assertion, it may be possible to confirm the effects of the land-boom on subsistence-plus households, or it may be that there are other factors which will be revealed.
Chapter 8

Vanuatu livelihoods:
Modifiers, strategies and outcomes

8.1 Contextual and structural elements

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**Social Relations**
- gender
- class
- age
- ethnicity
- family/kinship

**Institutions**
- rules and customs
- land tenure
- markets in practice

**Organisations**
- associations
- NGOs
- local admin
- state agencies
- church

**Trends**
- environmental trends
- fashions

**Shocks**
- drought
- floods
- pests
- diseases
- civil war
- cyclones
- earthquakes
- volcanoes

Figure 8.1: Modifying factors and contextual background

Figure 8.1 shows the area of Ellis’ (2000) framework which is now to be examined. The
tasks for column A have been completed, and consideration now moves to columns B and C.

While few difficulties are presented in a qualitative analysis of the modifying effect of social relations, institutions and organisations on the deployment of livelihood assets, and of the effect of contextual trends and shocks, a quantitative analysis is more difficult.

To overcome this problem, in constructing the asset pentagons, two data sets were compiled, an earlier and a later set. Changes in the variable values are linked to the effects of modifying agents and changing contexts.

Already, the decline in rural natural capital has been highlighted. A working model will be used to test for causes of the decline in fallow periods. The apparent increase in social capital in urban areas is large but probably an artefact of a poorly chosen variable. These were the major features, but others were present. Once these other features have been identified and quantified, particular external influences — shocks, trends or the actions of institutions, their policies or their processes which were implicated in the change — may be suggested.

These changes in variable values over time appear below, with rural and urban sets treated separately.

**Rural livelihood assets**

**Figure 8.2: Vanuatu rural subsistence-plus livelihood asset pentagons:**

*Earlier and later datasets*
As noted earlier, the volume of the rural livelihood asset pentagon shrunk by 13 per cent overall.

The area of the earlier rural pentagon is 175.4 units, the later 152.5 units.

For each of the five capitals, the individual movements between the earlier and the later values were:

Natural capital — 2.3 units decrease

The decline in natural capital is largely due to the decline in fallow periods. The significance of this decline is questioned by some (Allen 2000, Vanuatu National Statistics Office 1994, maybe Bourke 1999) and condemned out of hand by Albers and Goldbach (2000) as producing irreversible environmental change. There is little doubt that fallow periods have shortened quite dramatically, and that over the next decade a clearer picture may emerge of the effects of an attenuated fallow. This shortening of fallow periods is observed across Melanesia and other Pacific locations (Bourke 1999).

Social capital — 0.8 decrease

The decline in social capital is due largely to declining numbers of local language speakers, and in church or custom adherence, but provenance has also declined. Vari-Bogiri (2008), Friedlaender (2007) and Nettle and Romaine (2000) have all addressed the consequences of the decline and disappearance of local languages.

Physical capital — 0.7 decrease

The decline in physical capital is almost entirely due to a tendency towards specialisation in the production of cash crops, with the consequence that there is a relative downward move in the composite value. A quick glance at Table C.12 will verify this phenomenon. Linked to this are climate aspects. The northern islands are too hot to grow coffee; the southern islands too cold for cocoa.

Human capital — 0.3 increase

Human capital grew slightly in relative terms, with improvements in health and access to knowledge being the cause. A decline in school attendance between the 1999 Housing and Population Census and the Multiple Indicator Cluster Survey (Shuaib and Rahman 2008), has not been borne out by the 2009 Housing and Population Census, with figures returning closer to trend (Vanuatu National Statistics Office 2012: iv)

Financial capital — 0.1 increase

Although the composite measure, financial capital, remained the same, its component measures showed considerable movement. Cattle production grew; kava, coconuts and other livestock declined; wages and salary grew slightly in relative terms, but remained a very small component of livelihood. The relatively low value is due to two causes. Specialised production causes extremes in relative values, and wages and salary values are very low relative to urban values.

If we summarise the declining measures by grouping the cropping activities, we have three main trends:

(i) decline in percentage of households growing all cash crops — coffee, cocoa, pepper, vanilla, cattle, kava, coconut and other livestock.\(^1\)

\(^1\)A cautionary reminder is required here. Production may have risen in volume, with specialisation or any number of other causes, but the percentage of households participating has declined.
(ii) shortening of fallow
(iii) losses in local language use, decline in provenance and decline in church/custom adherence

Urban livelihood assets

By contrast, the urban livelihood experienced a 22 per cent expansion in the asset-base.

Figure 8.3: Vanuatu urban subsistence-plus livelihood asset pentagons: Earlier and later datasets

The area of the earlier urban pentagon is 123.99 units
The area of the later urban pentagon is 157.51 units
For the five capitals, the changes in value are:

Natural capital — 0.6 units increase

This improvement is highly suspect as it is due to large rises in percentage with forest access (see Table 7.4). That relative rise in forest access is due in most part to a relative decline in rural access, a closing of the gap. The later figure came from a question on solid fuel use in the Multiple Indicator Cluster Survey (Shuaib and Rahman 2008). The 1989 census question also asked about solid fuel use. There was a real upward move (see table on p. 243), but it may have been a result of more households buying wood and charcoal.
at the market, rather than collecting forest resources. As that cannot be determined, this apparent feature will not be further considered.

Social capital — 2.4 increase

A higher value for provenance is the main contributor (see discussion, p. 133).

It is possible that second generations in informal settlements may have accumulated some recognition of rights over time. These would include those rights recognised by neighbours — rights to garden areas, trees, housing and land. These 'rights', because they are consensual, are often seen as 'custom', in the same way, as Bolton (1998) reports, that chiefs are given power within urban informal communities by consensus.

The apparent decline in church and custom followers is problematical, as custom adherence is the major cause. What the custom numbers may truthfully be will remain something of a mystery.

Physical capital — no change

Human capital — 0.8 increase

Human capital has risen as a function of an improvement in access to knowledge. This is mainly due to improved access to telecommunications services.

It is important to note that another component in this measure is school education, which showed a decline in urban areas. A 96 per cent rate of children who had attended school in Port Vila in 1999 had dropped to 84.8 per cent in 2008, while in Luganville 90 per cent dropped to 81.3 per cent (Vanuatu National Statistics Office 1999: 102 and Shuaib and Rahman 2008: 95). However, the 2009 Housing and Population Census results indicated a return to trends, with urban school attendance at 90.8 per cent. The decline may have been due to sample versus full count differences.

Financial capital — no change

There is a high dependence on wages and salary. A high dependence on wages and salary earning is of little concern in times of low unemployment, but where unemployment levels are high, as they are in the two urban areas, it is highly problematic.

Changes in urban livelihood assets have two main trends —

(i) improvements in telecommunications access

(ii) much higher percentage of 'natives' of Port Vila and Luganville — higher urban provenance

For each of these five main trends (three rural and two urban), modifying agents and shocks and trends which may have contributed to the changes in value need to be assessed.

Ellis (2000), as will be recalled, was able to isolate modifying agents using focus group discussions. Having identified and quantified the five major changes, we now canvass possible modifying factors and trends and shocks which may be implicated in the changes.

The candidates for causality are shown in Table 8.1, which identifies modifying elements, then shocks and trends to which the movement in the livelihood asset-base might be attributed.

Some of the possible causes are beyond the scope of the working model, which concentrates on rural land pressure, but they still require investigation. These will be dealt with first. The particular decline in the asset base to which the working model applies is the
decline in natural capital, especially that attributable to shortening fallow periods. This will be dealt with last. This plan is reflected in the placement of items in the table and they will be discussed in table order.

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<th>shocks and trends</th>
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8.1.1 Urban factors

Improved telecommunications: modifying elements

This initiative, sponsored by AusAID and the World Bank, required the government to sell its 33 per cent stake in the former monopoly provider Telecom Vanuatu Limited, in late 2007, as a pre-condition for the introduction of a second service provider, Digicel. This opening up to competition has improved access throughout Vanuatu, with over 85 per cent of the population now having mobile telephone coverage, according the the 2010 annual report of Vanuatu Telecommunications and Radiocommunications Regulator (2010: 5).

Improved telecommunications: shocks and trends

Telecommunications coverage has been extended to most rural areas. An important aspect of this extended coverage is greater opportunity of maintaining kinship and extended family connections between urban-based and rural family and kin networks. However, any improvement will need to be measured over time. From quite extensive personal experience, most mobile phones sold are pre-paid and many are in a permanent state of 'zero balance' — no credit. This condition seems to prevail with either provider, TVL or Digicel. It may be that the apparent improvement is not sustained beyond the introductory period, although the Regulator (Vanuatu Telecommunications and Radiocommunications

\*Vanuatu Commodities Marketing Board.
Regulator 2010: 7) reports mobile phone growth from 20,000 'active subscribers' in 2007 to more than 160,000 in 2010.

Urban provenance: modifying elements

While there are many formal urban leases with certain tenure, there are large areas of informal settlement, where people reside at the whim of the custom land owners. In the informal settlements electricity and water supply are uncertain, and pit latrines are the most common toilets (Connell and Lea 2002, Chung and Hill 2002, or the study which they relied on extensively, Mecartney 2001). Because tenure is uncertain, people living in these areas are understandably reluctant to invest capital in improved waste disposal systems and electricity or in improved dwellings. Water reticulation is mostly controlled by the custom land owners, who sell water from their own 'pipe', while refusing to allow UNELCO, the water service provider, to expand water reticulation into the informal settlements.

There are eviction threats from custom land owners from time to time, but the longevity of the informal settlements would suggest that there is a transitional process going on, somewhat along the lines of 'adverse possession', where informality may be attaining quasi-formality. Many informal settlers are paying rent on land, and charging rent in their turn, on rooms or beds. In addition, there are 'informal' settlers residing on urban leases, where rent is being charged by the urban leaseholder.

On balance, informal settlement in urban areas seems to have inferior status to usufruct in rural areas, but is not without some social legitimacy, if not legal recognition. While the custom owners are making money out of the informal settlers the situation is stable. However, the risk of that situation changing — if a better offer is made, for example — is high.

Urban provenance: shocks and trends

Creolisation is on the rise in urban areas, and many young people are at risk of losing connections with their island cultural heritage.

As the Port Vila-born population grows, circular migration declines (Bonnemaison 1977; Storey 2003; Connell and Lea 2002). As a result, family and kinship ties are loosened, as is the ongoing connection to the island home. Circular migration declines also because the local-born take the work in the urban areas and this impacts more on rural families than on urban dwellers, as remittances from circular migrants are harder to come by.

Any decline in school attendance is of real concern in urban areas, where access to exchange economy jobs is a possibility, if not always a reality. This situation can be seen across Melanesia, with urban unemployed youth associated with rising crime rates, or expatriate fear of such an outcome. Declining school attendance limits livelihood diversity. The recent AusAID project which aims to end school fees has reportedly helped to raise school attendance levels (AusAID 2010), and this is borne out by the 2009 Housing and...

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3Paul Iakula, pers. comm. 2008. Paul owns and drives taxis. He said that he would not spend money on good housing until he could afford an urban lease.
Population Census (Vanuatu National Statistics Office 2012). Nevertheless, the longer-term capacity of the Government to provide the range of education services expected can hardly be improved by reductions in revenue collection.

8.1.2 Rural factors

Production percentage decline: modifying elements

The Vanuatu Commodities Marketing Board has been a major problem for the government since its creation in 1988. The Asian Development Bank (2009) recommended that it be abolished. Originally set up to promote copra, it has become a vehicle for political patronage and little else.

The ADB believes:

.. its marketing activities can now be undertaken by the private sector, and its quality control functions by the quarantine authorities


On past evidence, such a belief may be naive. Nevertheless, most believe that the demise of the VCMB would be a boon for producers and for the national purse.¹

The European Union ban on kava imports, initiated by Germany in 2002, is discussed in Appendix C.4 (see p. 247). Kava is exported to Australia, Fiji and New Caledonia. The VCMB has nominal control of kava marketing and export, and has been embroiled in a long running court case with a New Caledonian exporter. The continuing European Union ban limits export opportunities but domestic demand, as shown by the lines of government cars at kava bars, seems robust.

Production percentage decline: trends and shocks

Production for exchange among subsistence farmers is opportunistic. If prices are good or they have pressing needs, they produce for exchange. If prices are poor or need for cash is minimal, they produce for their own consumption. In a period of falling prices, production for exchange is dropping. The same phenomenon is described for the Solomons in Volume Two of the Solomon Islands Smallholder Agriculture Survey (Jansen et al. 2006: 8).

It is reasonably safe to conclude that the decline in participation in production for exchange is part of the normal cycle and that a rise in prices or needs would be likely to trigger a rise in production.

Specialisation in particular crops has been a longer-term trend. Malekula is the major grower of cocoa, Pentecost and Maewo the major growers of kava, and coffee can only be grown south of Efate, almost exclusively on Tanna. Specialisation is supported by reliable transport to markets and disease control.

Neither component — reliable transport nor disease control — can be assured in the long term.

¹In 2006, the Council of Ministers agreed to pay US$0.5 million to three Chinese ship owners for debts owed by VCMB (http://www.rnzi.com/pages/news.php?op=read&id=25111, accessed 17/01/2011).
However, if specialisation proves to be risky, there is little doubt that the old regime could be reinstated, with widespread, non-specialised production returning.

Social capital decline: modifying elements

It is unremarkable that most donor aid money is spent in the urban areas or their hinterlands, and it is equally unremarkable to note that much aid is driven by neoliberal policies, which seek to develop private sector capacity. Such capacity is more likely to be found, if anywhere, in the urban areas. The networks supporting the selection of projects and the distribution of funds rarely extend beyond the two urban centres. The international NGOs which are managing the funded projects of the donor countries have operational centres in Port Vila, but little penetration elsewhere. This problem is not specific to the Pacific. Easterly (2007) and Powell and Findlay (2011) discuss similar phenomena in Africa. Local NGOs and community-based organisations (CBOs) and the churches have more reach, but less access to the major funding donors. An illustration may best show the limitations of the networks in providing a common space, or clearing house, for the expressed needs of the Vanuatu government and local NGOs and CBOs to be met by the aid donors.

There is a small non-government organisation in Port Vila called Wan Smolbag, which began life in 1989 as a theatre company, and then diversified into a number of other areas — education, health promotion and various media productions and media campaigns associated with aid projects. Wan Smolbag is located at Tagabe, close to the Black sands informal settlement and draws many of its actors and programme participants from this area, but has many outreach centres on other islands. Wan Smolbag is a highly successful and highly respected NGO which is heavily supported in its operations by the major aid donor countries, and which is supported by overseas volunteering programmes from Australia, the European Union and New Zealand. One of the major reasons for its success is that its founding director from 1989 to 2009 (who continues as artistic director), and the major scriptwriter are both expatriates from the United Kingdom.

Aid donation comes, in the end, to a face-to-face meeting. Here, ‘wantok’ rules apply — a white face prefers a white face.

The U.S. Peace Corps often run projects in rural villages, but the nature of the projects is such that the agenda is set by Peace Corps, rather than the villagers. An example of such a project is the Nguna-Pele Marine Protected Area, where a group of villages on two islets offshore from North Efate (see map A.1) ‘asked’ for assistance from Peace Corps in setting up local marine protection areas. The help from Peace Corps came with strings attached. There is a local undercurrent of resentment that the costs — withdrawal of subsistence littoral resources — outweigh the benefits of community boats and other community resources and tourism, to which access is not always open, or free (Bartlett (2006) provides the Peace Corps view on this project, which he led in 2004).

Similarly, the World Heritage nomination of an area close to Port Vila (Wilson, Ballard and

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3See Glossary.
4Hilama — wan smolbag = one small bag.
5This is a borrowing from ‘lokipsin’ (See Glossary). One talk: someone who is related closely and who speaks the same language.
6Wan Smolbag’s organisational chart shows the breadth of their enterprise (http://www.wansmolbag.org/admin/download/wborganchart.pdf, as at 22 June, 2012).
7The website is http://www.marineprotectedarea.com.vu.
Kalotiri 2007), used the tourism potential of the setting\textsuperscript{10} to persuade the islanders to refuse developers' offers for their lands and to support the project. Tourism, in this case, meant re-enactment of western archaeologists' and anthropologists' views of possible scenarios in the 'Roi Mata' saga, elsewhere dealt with, for visiting tourist groups.\textsuperscript{11}

There is little likelihood of donors seeking to support local language schools or to document local languages, or to assist with maintenance of cultural practices that have no tourist potential.

**Social capital decline: trends and shocks**

The nature of the interplay between modernity and tradition is sometimes a puzzle. Communications have improved generally, and there is, superficially at least, engagement with global trends in the urban area of Port Vila. This engagement is expatriate-led, however, and the extent to which new technologies and global fashions and trends penetrate the community is contentious.

Outside the capital, there are some surprises.

Many villages have solar collectors or generators, which enable electrical devices to be run for short periods. Most villages have one DVD player at least, and there are cheap DVD copies available in Port Vila and Luganville. Radio reception is now more widely available, and television is available (evangelical Christian networks only). These provide windows to modernity, although it is a modernity which most in the West would see as rather 'old-fashioned'.

Western dress is worn by all young people with sports brand copies and board shorts being standard uniform. Surprisingly, for ceremonial occasions, 'aelan dres' for young women and 'lavalava' for young men\textsuperscript{12} are worn over the shorts and t-shirts. Older women in the villages usually wear 'aelan dres' and men wear standard western dress. Hawaiian shirts are popular formal wear for men.

Most families have relatives in Port Vila or Luganville, and extended mobile phone coverage has improved communication between town and country branches of families.

This is an exposure to modernity, but the clothing is often second-hand clothing, exported from Australia and New Zealand by the charities who sell wholesale to Pacific buyers what would not sell in Australian or New Zealand charity shops. Mobile telephones are community property, as are DVD players, televisions, radios and personal computers. Internet exposure is limited by the lack of electricity and lack of availability.

Sahlins (2000: 521) speaks of the 'indigenization [sic] of modernity'. The modernity seen in rural Vanuatu is strongly 'indigenized' and selective.

As internal migration rises in rural areas and inter-island marriages and less formal unions occur, the number of people in villages who do not speak the local language or know the local customs or social mores begins to reach a critical 'weight', where an accommodation

\textsuperscript{10}A series of the television show 'Survivor' was shot there in 2004, and the French 'clone' of 'Survivor', 'Koh-Lanta' followed in 2006.

\textsuperscript{11}Why a Polynesian invasion site was chosen as a World Heritage nomination site for the Melanesian islands of Vanuatu is difficult to explain, but the Vanuatu Cultural Centre chose it.

\textsuperscript{12}'Aelan dres' (island dress) is the descendant of the 'Mother Hubbard' dresses which the missionaries insisted women wear, the 'lavalava' is Polynesian tradition, presumably introduced through Samoan missionaries.
must be made to the outsiders. This is a contributing aspect in the decline and disappearance of local languages, and by extension, loss of cultural and social knowledge and customs.

**Shortened fallow:**

**modifying elements**

Agricultural extension programmes, all funded externally, have emphasised cash crops and specialisation (Weightman 1989).

Recently, studies by Pollock (2002); Lebot 2008; and Sardos 2008, already cited in this study, have concentrated on documenting the diversity of the subsistence base. In 2009 the European Union funded a programme to protect and enhance the vegetative base of Melanesian subsistence.13

These are timely measures, but will not make up for the years of failed experiments and unwise introductions which donor-funded agricultural extension has left as its major legacy (Bakeo and Qarani 2003; Bakeo 2003). Agricultural extension failures have been spectacular, and have left a legacy of pests and invasive species.

**Shortened fallow:**

**trends and shocks**

This is a major point in the analysis. It is here the working model — Land pressure as the cause of the decline in natural capital through decline in fallow periods — will be tested.

Land pressure is taken to mean a rise in land use intensity or intensification, which is producing pressure on the land resource.

The evidence for land pressure being the principal causative agent in decreasing fallow is strongly indicated from the Pareto year projections (see Table 5.8), but only in specific locations — Efate and other parts of Shefa province.

Those projections indicated that land pressure, Vanuatu-wide, may become problematical some time around mid-century, but not in the immediate future.

For urban and peri-urban dwellers land pressure is a perennial problem as they are using land without rights to it, and many are competing for comparatively small areas of land. To leave land to fallow would almost certainly be to lose it to another, so continuous occupation and cultivation makes sense, despite the likelihood of diminishing returns. This impetus does not seem to apply for rural populations.

This leaves us with something of an impasse.

There is an obvious and widespread decrease in fallow length. But there seems, at least on the face of it, to be little or no shortage of suitable land available for use and thus no incentive for the intensification of land use.

What might be a causal factor in the fall? To begin, there is a need to quantify the extent of the expanded land use.

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If the percentage of land under garden cultivation is considered, from the 1984 Agriculture Census to the 2006 Agriculture Census there was a rise of around 60 per cent.

Table 8.2: Land under garden cultivation: Percentage increase 1984 — 2006

<table>
<thead>
<tr>
<th>year</th>
<th>km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>47.08</td>
</tr>
<tr>
<td>2006</td>
<td>75.11</td>
</tr>
<tr>
<td>percentage increase</td>
<td>59.53%</td>
</tr>
</tbody>
</table>

(VNSO 2007a, VNSO 1984)

Calling to mind the earlier discussion on pressures in Tikopia (Chapter 5) the most obvious contender as a causal influence would be population growth.

If population growth equalled, or was greater than, that of the rise in land use, an inference could be drawn that growing population was a cause of land use intensification.

This idea is based on the assumption that only if population rise outstripped land use expansion would there be an inferential trigger to intensify land use. That assumption and the inference are now examined.

The Boserup formulation

At this point we have to introduce some theory to assist in exploring the relationship between land use and population.

Ester Boserup (2005) proposed a model which provided an explanation of the nature of agrarian change under population pressure. She suggested a developmental sequence in agricultural practices under population pressure, which had swidden (slash and burn) as its initial state. As population pressure grows (in her model), fallow periods shorten and cropping periods lengthen until annual production is common. Productivity decreases, and there are diminishing returns to labour. This in turn leads to innovation in farming practices (fertilising, ditching, irrigation, weed control) which promotes further intensification, but ultimately increases the workload required and decreases the productive efficiency of agricultural workers.

Boserup's model is a meta-theory, a 'one-size-fits-all' explanation, which has been subjected to intense scrutiny and has been largely discredited as an aid to understanding specific farming systems (see Allen and Ballard 2001 and below), but retains currency as a framework for academic debate.

Her formulated model was used extensively to account for observed phenomena in Papua New Guinea in the period of initial European contact with Highland populations. Here, the 'usual' state of Melanesian agriculture, that of small, mobile populations at low densities using swidden with littoral and forest hunting and collecting was supplanted by larger, sedentary groups using permanent, intensive cultivation of sweet potato with pig husbandry. This surprising discovery spawned the initial outbreak of theorising by a group of scholars, many at the Australian National University, and led by H.C. Brookfield.

In 1971 (Brookfield with Hart 1971), Brookfield used her model to explain population density variations across Papua New Guinea. In 1984 (Brookfield 1984), he considered the model in the light of sustainability, and in the light of returns to labour. This time he felt that
Boserup’s silence on sustainability and her simplistic choice of population density as the causative variable in agrarian land use intensification presented enough difficulties to curb his earlier enthusiasm. By 2001, he was completely disenchanted. He wrote that not only was the model simplistic and uninformative for case studies, the notion of intensification itself militated against an understanding of the complex nature of agrarian change, where no iterative developmental sequence could be found (Brookfield 2001).

In 2001, a volume of the journal Asia Pacific Viewpoint devoted two issues to a range of responses to the development of theorising which had the formulation as its framework and in which Brookfield (2001) appeared. For many of the writers, the linearity and deterministic nature of the model did not allow for a sophisticated understanding of the social dimensions of agrarian change (Allen and Ballard, Minnegal and Dwyer, Brookfield, Gardner, Bourke 2001 et passim.) For others, such as Allen, B. (2001), working with large-scale, up to national-level, figures, some small modifications made the data fit the model adequately.

Boserup’s formulation is a good starting point to examine the possible connection of population growth with land use intensification.

In effect, her formulation can be simplified as:

population density $\rightarrow$ land use intensity

Table 8.2 shows that there was an expansion in the area under cultivation between 1984 and 2006, but this is not the same thing as an intensification in patterns of land use.

Table 8.3 shows percentage population growth between 1979 — 2009 and 1989 — 2009. Both values are provided, for comparison with the land increase, from 1984.

<table>
<thead>
<tr>
<th>sector</th>
<th>1979-2009 (%)</th>
<th>1989-2009 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>110</td>
<td>64</td>
</tr>
<tr>
<td>urban</td>
<td>189</td>
<td>118</td>
</tr>
<tr>
<td>rural</td>
<td>93</td>
<td>52</td>
</tr>
</tbody>
</table>

(SPC 1979, VNSO 1989, VNSO 2010)

The rural percentage population growth in the period 1989 — 2009 was 52 per cent, compared with a 60 per cent rise in land area under garden cultivation.

It can be concluded that population density has risen, but not at greater rates than the growth in land area being utilised. McAlpine and Freyne (2001: 209-218) report population percentage growth in New Guinea as five times higher than land extensification.

Thus, for Vanuatu, the Boserup formulation is not proven at the present time.

If the Pareto optimality projections (Chapter 4) are recalled, areas of good agricultural land remain available for future use, but for Shefa province, and even more so for Efate, the situation is less sure, with the likelihood that Pareto optimality is passed. In a setting such as Efate, where Pareto optimality has been reached or passed, the conditions arise which should enable Boserup’s formulation to be tested.

If we assume that Efate has passed Pareto optimality, can the formulation be proven for Efate?
Table 8.4: Land under garden cultivation: Percentage growth 1984 — 2006; Population percentage growth 1989 — 2009: Efate

<table>
<thead>
<tr>
<th>Land</th>
<th>Year</th>
<th>km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>2.80</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>9.94</td>
<td></td>
</tr>
<tr>
<td>Percentage rise</td>
<td>255.0%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Population</th>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>11,557</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>21,789</td>
<td></td>
</tr>
<tr>
<td>Percentage rise</td>
<td>88.53%</td>
<td></td>
</tr>
</tbody>
</table>


There is an even greater disparity between land extensification and growth in population, with land far outstripping population. Once again, Boserup’s model is not confirmed.

If population density cannot be proven as a causal influence, but there is land use intensification, there must be another cause, or causes.

Land use intensification — other possible causative agents

A number of other causes of land use intensification have been advanced, particularly by Brookfield. These are:

1. Social production — intensification to produce a 'social' surplus for reciprocity or redistribution (Brookfield 1972b)

2. Cultural complexity such that any intensification or extensification is too multifaceted to be summarised (Minnegal and Dwyer 2001)

3. Intensification may be natural as re-population to more normal levels occurs (Brookfield with Hart (1971); Brookfield 1984; 2001)

4. More cash cropping and the introduction of modern methods (Brookfield 1972b)

Brookfield (Brookfield with Hart 1971; 1972b) proposed an alternative motivation for land use intensification, after testing the Boserup hypothesis in 44 agricultural systems in Papua New Guinea. He noted the difficulties in incorporating a variety of agricultural techniques, measures and practices into a single description of 'intensification' (1971: 88-92), which led to his use of her formulation, for the sake of simplicity.

Brookfield with Hart (1971) found that they were unable to prove the Boserup-based hypothesis. They note other mechanisms which may determine land use intensification. Particularly, they note the connection of intensive land use with the social needs of surplus production. The New Guinea highlands farmers use sweet potato mainly to feed pigs which are raised in large numbers for social distribution in prestige-seeking ceremonies. Sweet potato production is geared not to accommodate population density, but to the...

The impact of modernity was examined, and the relatively minor efficiencies gained through the bushknife and the safety match noted. The effects of the introduction of the cash economy and cash crops on land use intensity, particularly the gradual replacement of traditional products for prestation by European 'prestige goods' — rice, tinned meat and fish, which have to be purchased with dividends of cash cropping — was added to the mix of causative possibilities (Brookfield 1972b: 40-41).

Lastly, Brookfield with Hart turned to instances of disintensification of agriculture throughout Melanesia, where evidence exists of former intensive practices (irrigation ditches, terracing of hillsides), which have been abandoned.

Generally in eastern Melanesia, though, we see the combined effect of almost all the forces discussed. Population numbers fell for decades, and the decline was temporarily augmented by labour recruiting. Declining numbers, and greatly improved mobility, released many small islands from a condition of population pressure, and the smaller populations remaining often relocated in order to participate in the new economy, or to group around Christian missions. New food crops were widely adopted, and the cash economy, with its revolutionary change in activity and consumption patterns, was very thoroughly diffused. When population again grew, pressure could be quite easily relieved by migration and employment, and using resources for cash crops rather than food crops

(Brookfield with Hart 1971: 122).

The extensiveness of the quote is not to indicate agreement with the sentiments expressed, but to demonstrate the ease with which assumptions can be made which ignore the basis of the livelihoods being described — subsistence-plus — and which forget the dynamic and opportunistic nature of agricultural production for exchange. Coffee prices fall, copra prices fall, cocoa prices fall, disease hits kava and buai14, rice and tinned fish prices rise and before long, people are once again growing solely for their own consumption.

Nonetheless, Brookfield with Hart (1971) present a more nuanced view of possible causes of land intensification which may be of use in seeking answers to the problem of declining fallow and extended cropping.

The argument advanced by Minnegal and Dwyer (2001), based on their study of a small region in Papua New Guinea, was that the cultural complexity of relations made it impossible to separate out causal components. At the micro-level it its often difficult to isolate particular causes,15 because of the interconnection of elements, and the argument has some weight. At the grosser, national level, where the concerns of this thesis lay, particular factors become statistically more significant simply because they appear regularly everywhere. There is little reason to suspect that the cultural complexity of Vanuatu is of a lesser order than that of Papua New Guinea, but when influences are aggregated to macro-levels, some are more important than others.

Before moving from this general view of causes of land intensification to studies in Vanuatu which may fit with one or other of the possible causative components outlined, another general study will be examined.

14 Tokpisin' term for betel nut.
15 The 'can't see the forest for the trees' argument.
In 1976, Brown, a former Brookfield collaborator, with Podolefsky, turned again to the New Guinea Highlands studies to re-examine the dynamics of agricultural intensification. They tested a number of variable pairs — population density and agricultural intensity; agricultural intensity and fallow period; population density and land tenure; agricultural intensity and land tenure; land tenure with fallow period — and found that the closest correlation was obtained between land tenure and length of fallow. They note:

> While group territory is recognised nearly everywhere, individual plots are held and inherited mainly where the fallow period is short, (and) trees are planted by the owner

*(Brown and Podolefsky 1976: 221)*.

They continue:

> Individual land tenure might almost be a social or cultural concomitant of the frequency of land use (or length of fallow). Moreover, it is clearly related to permanence of occupation and continued use or claim to land recently cultivated. This continuity of tenure is reinforced in those areas where shrubs and trees are planted in and around gardens and settlements during fallow, for their decorative and economic value, fruits, timber, and also for use as identifying marks of ownership


Brown and Podolefsky also note that J.A. Barnes said:

> In non-literate societies, long-lived trees take the place of written records

*(personal communication, as cited by Brown and Podolefsky 1976: 230-231)*.

Clearly, this assertion of another possible causative agent in land intensification, that of assuring or reinforcing claim to tenure needs to be tested against the Vanuatu studies. It presents an entirely new idea, that uncertainty of tenure may drive land intensification.

**Vanuatu studies and possible causative agents**

What supporting evidence can be found in Vanuatu studies for any or all of the factors outlined?

First, we examine Brookfield's idea of social production as a cause of intensification.

Grade-taking and other prestige-earning ceremonies continue to be important throughout Vanuatu, and have been well-documented. However, evidence has been presented earlier in this chapter of declines in cultural elements: language, professed adherence to custom and provenance. Those structures provide the milieu for social production.

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2. Former Professor of Anthropology at the Australian National University. A sociologist who worked in Africa before New Guinea, credited by some with introducing the term 'social network' into sociology — who continues to publish (last major work 2004).
3. Nimangki is the common term, origin unknown by the author.
5. Perhaps cultural production is a more accurate rendering.
seems unlikely that the demands of social production would, in a period of cultural decline, be the reason for land use intensification.

Brookfield examined intensification/disintensification in 1972 (Brookfield 2001; 1972b) and concluded that the evidence of what he termed 'landesque capital'; abandoned human-made structures such as ditching, terracing, facilitation of colluvial flows and pond irrigation features, were an indication of levels of land use intensity in the past which showed that de-population had caused a disintensification of agricultural land use. This disintensification was now in the process of being reversed, as Pacific and Melanesian populations grew in the post-war era.

Spriggs (1982; 1983) showed that human-made irrigation structures were evident and important very early in the Lapita archaeological record, with his evidence from a site in Aneityum, the southernmost island in Vanuatu (see Figure A.2). The populations at that time (3,500 B.P.) are likely to have been smaller than those immediately preceding European contact. While this is not conclusive evidence that 'landesque' capital is not necessarily correlated with population, it gives pause to jumping to the conclusion to which Brookfield seemed to have leapt. Bayliss-Smith, in Denham, Iriarte and Vrydaghs (2007) has also shown how a variety of explanations may fit observed structures, and that definitive explanations of archaeological sites tends to 'lock' further observations into the initial finding. Particularly, Spriggs and Bayliss-Smith seem to cast further doubt on the Boserup linkage of population and intensification. Brookfield himself warns of finding this conclusion. He further speculates that 'intensification' itself may not be proven by such features as human-built structures (Brookfield 2001: 181-183).

Finally on this point, it behoves us to consider the amount of land available, and to remind ourselves that according to the earlier projections in this study, there was, in most locations, ample available land for population growth, at least according to Quantin (1982).

Bourke, in his 1999 survey of agricultural systems in Vanuatu, felt that cash cropping was a cause of agricultural intensification. He noted the widespread decline in fallow periods and the longer cropping periods, primarily since the end of the World War II.

Prior to 1900, and probably prior to 1940 in most locations, only one planting was made before land was fallowed, apart from the permanent irrigated taro pondfields. In half of the agricultural systems delineated in this survey, two plantings are now made. Occasionally, three or more plantings are now made before fallowing.

(Bourke 1999: 14).

Bourke also favoured population growth and modernity, where cash cropping gained more prestige than custom crops for exchange, as other causal elements (1999: 7,12-13).

Allen (2001:104-106) reported that for the islanders of Malo, cash cropping was widely adopted to obtain cash to purchase prestige foods in Luganville, thus improving, in his view, food security by diversification. While his conclusion about food security can be disputed, the rise in cash cropping seems reasonable and is mirrored in most hinterland villages, with relatively easy access to Port Vila or Luganville. He also reported:

At the same time, there has been further intensification... involving a decrease in the fallow length or an increase in the cropping period, or both..
cropping periods have increased from one year, to an average of two and five years in West and East Malo respectively  
(Allen 2001: 60).

According to his informants, the lengthening in the cropping period commenced some time immediately before or after the Second World War.

Allen noted another item, which he felt was a more significant cause of intensification. This item will be dealt with when the Brown and Podolefsky formulation is discussed.

Dye's (1979) study of the Walarano area on Malekula does not examine cash cropping, but mentions that 'European' vegetables (carrots, cabbage) and fruits (pineapple, citrus, sour sop, custard apple) were grown by some villagers (Dye 1979: 7-10) for sale at a monthly market. She also noted that a co-operative store, run by the villagers, provided tinned meat and fish, rice, biscuits and other prestige foods. We can presume from these hints that cash cropping was present.

In the beginning of this chapter, it was noted that one of the features of the relative decline in rural livelihood assets was a decline in numbers of people participating in cash cropping, contemporaneous with the decline in fallow periods and the lengthening of cropping rotations. On the strength of that feature alone it would seem unlikely that greater levels of cash cropping are a prime cause of intensification.

The 2006 agricultural census (Vanuatu National Statistics Office 2007a: 31) showed that very few additional measures to improve yield have been taken up by gardeners, other than selecting species with higher yielding characteristics. Fertilisers (1.3 per cent), plastic sheeting to cover roofings (1.9 per cent), pesticide use (0.4 per cent), mulching and other crop improvement techniques had very low uptake rates. In addition, the major technological advances involved in gardening were the bush knife, the wheelbarrow and for some, the shovel.

It is hard to conclude that the introduction of modern methods has had any impact on land use intensity.

Lastly, we examine the evidence that land use intensification has its cause in the need to establish, or reinforce, claims to land, as found by Brown and Podolefsky (1976).

Allen (2001), in his Malo study, noted that there was a serious sustainability issue for the island. The villagers were planting tree crops, coconut or cocoa, in gardens after harvest and this was causing land shortages for gardening:

Villagers throughout Malo, particularly young men, often plant coconuts and, to a lesser extent, cocoa in their gardens at the beginning of the cropping period. Rather than being returned to fallow at the end of the cropping period, these gardens are allowed to become pure stands of coconuts or cocoa. This process is removing arable land from the shifting cultivation cycle and it represents a significant and on-going change in land use on Malo


Jansen et al. (2006) identify similar motivation and responses in the Solomon Islands. They note the tendency to use crop planting as a means to establish tenure or rights to land:

As land pressure increases, planting cash crops has become an assertion of
land ownership and can increase land pressure as people rush to occupy and
claim their land with permanent crops
(Jansen et al. 2006: 4).

This is compelling, if scant, evidence. A search in the literature for studies which may
have elaborated or contested the results of Brown and Podolefsky was not rewarding. It
appears that their results were not widely accepted, although Hagos and Holden (2006)
draw similar conclusions in an Ethiopian study.21

If this evidence is to be applied to the Vanuatu context, a number of things must be con-
sidered.

First among these is the continuing high demand for land — the 'land boom' — expatriate
developers actively seeking to lease land from the owners. It is the high level of demand
for land that has driven much of the recent concern over land issues within Vanuatu and
which culminated in the 2006 Land Summit. Subsequently, a number of external donors
and international organisations have sponsored programmes designed to clarify land own-
ership and transfer systems. On the face of it at least, these programmes are implementing
recommendations from the Land Summit (Lunay et al. 2007).

The high level of demand has been matched by a willingness to supply.

The willingness of some ni-Vanua to enter into leasehold agreements for land is beyond
dispute. Politicians, government employees and political party officials exempted, lease
settlements are the only way for many to secure quantities of cash. Cash remains for most
the only means of making purchases of western goods, as banks are reluctant to negotiate
large personal loans without security. Security, for bankers at least, does not include land
held under traditional tenure.

While willingness is one condition needed to supply, there is another — ability, or more
correctly in this instance, legitimacy or rightful ownership. The question of rightful own-
ership is as intrinsic as it is intractable. It cannot be resolved definitively. While it continues
to be the intention of this study to sidestep the vexed question of rightful ownership, it is
necessary to shed some light (see also discussion, Chapter 3).

In 1980, the Constitution returned all lands to the rules of custom (Constitution of the
Republic of Vanuatu 12: 73, 74). These 'rules of custom' were formulated and maintained
in a non-literate society and were, of necessity, consensual. That is to say that although
linearities or some other systemic use of relationships may have been the basis of 'rightful
ownership', whatever that may have meant, without community support these rules would
have been unenforceable. It is precisely that lack of consensus which today makes the
question of rightful ownership impossible to resolve. The chiefs of the island courts are not
trusted by the villagers, either because it is assumed that decisions will be motivated by rent-
seeking behaviours, or because their traditional knowledge is not believed or respected.22

Political leaders are not trusted for similar reasons. Supreme Court decisions made on
islands other than Efate are not uniformly enforced because there are not enough police
to enforce them, or the decisions are not communicated (Forsyth 2007).

The situation is such that there is no ownership which is beyond dispute, even where the
Government has acquired land compulsorily. All land is, or has the potential to be, in

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21 Citations were found on Google Scholar, mainly in archaeology, with some ethnographic studies on
populations in Papua New Guinea, which were not concerned with more universal applications of the results.
22 Their entitlement to a 'chieflty title' may not, in fact, be recognised.

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disputed tenure. Where there is no demand, this uncertainty is a nuisance; where demand is high, it guarantees that there will be aggrieved parties, litigation and uncertainty.\footnote{Chronologically, the developments above can be seen in Rodman (1995), Farran (2002), Slatter (2006), Farran (2009) and Porter and Nixon (2010).}

In such a situation, where no tenure can be established with certainty, it would be unsurprising if many turned their attention to finding a means of establishing, or reinforcing, tenure they believe they hold. As Brown and Podolefsky (1976), Allen (2001) and Jansen et al. (2006) have all observed, this can take the form of planting trees, or other cash crops, on garden land after harvest, in order to continue the occupation of the land and thus continue tenure. This practice is problematic and both Allen (2001) and Jansen et al. (2006) have concerns for its sustainability over the longer term. Community consensus continues to uphold that the planting of trees confers a conditional right of use; tenure, in effect.

In this light, it appears that the working model used to test for the causes of decline in fallow needs some refinement.

Rather than land pressure being a root cause of declining rural livelihood assets, it becomes a proximate cause. Underlying this, the root cause of declining rural livelihood assets appears to be the uncertainty of land tenure arrangements.

The working model can thus be modified:

**Uncertainty of land tenure arrangements is causing a decline in livelihood assets for rural subsistence-plus households**

In this form, the working model presents the most plausible explanation for the decline in fallow, and the subsequent decline in natural capital for rural households.

**Shortened fallow:**

**trends and shocks: the 'land boom'**

This is the final item to be dealt with from Table 8.1. The various impacts of the land boom have been extensively examined in Chapter 5 and immediately above and will not be revisited here, but are included in the following summary findings on mediating agents.

**Findings: modifying and contextual factors**

(i) The shortened fallow period and land use intensification seems to be directly linked to the land 'boom', as uncertainty over continued access to land and land tenure arrangements has been identified as a causal agent in intensification, with people attempting to ensure entitlement through continuous production.

(ii) The decline in rural social capital is significant on culture and language loss grounds, and because donor aid is directed towards urban projects, or at times, against cultural practices.\footnote{In the Marine Protection Areas, fishing is controlled not by traditional taboo, but by 'social contracts' with the U.S. Peace Corps, where material assistance is the *quid pro quo* for abandoning certain types of fishing.}

(iii) For urban households, improved telecommunications access may or may not be a long lasting benefit, and the rise in urban 'native' populations, with concomitant creolisation, is not a certain social benefit.
(iv) The decline in rural production participation rates seems to be a result of specialisation, rather than external influences. This process is cyclical in nature and reversible.

8.2 Livelihood strategies

Focus now moves to columns D and E in the Ellis (2000) framework model:

Figure 8.4: Livelihood strategies and their composition

<table>
<thead>
<tr>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>resulting in</td>
<td>composed of</td>
</tr>
<tr>
<td>Natural resource-based activities</td>
<td>collection/hunting</td>
</tr>
<tr>
<td></td>
<td>cultivation (food)</td>
</tr>
<tr>
<td></td>
<td>livestock</td>
</tr>
<tr>
<td></td>
<td>non-farm NR</td>
</tr>
<tr>
<td></td>
<td>littoral and ocean NR</td>
</tr>
<tr>
<td>livelihood strategies</td>
<td>Non NR-based activities</td>
</tr>
<tr>
<td></td>
<td>rural trade</td>
</tr>
<tr>
<td></td>
<td>other services</td>
</tr>
<tr>
<td></td>
<td>rural manufacture</td>
</tr>
<tr>
<td></td>
<td>remittances</td>
</tr>
<tr>
<td></td>
<td>other transfers</td>
</tr>
<tr>
<td></td>
<td>reciprocity</td>
</tr>
</tbody>
</table>

The subsistence-plus livelihood

At the beginning of the previous chapter (see p. 115) core-plus strategies in Vanuatu were examined at some length and were found to be in operation in all rural households, where they were expected, and in most urban households, where they were not. The core activity was subsistence — ensuring that the household had sufficient food and shelter. Around this core, other livelihood activities took place, but not at the expense of the core activity.

To evaluate such a livelihood by means of typologies, an assumption that the aim of the core activity is achieved under normal conditions is helpful. Other activities which are undertaken can then be isolated to gain an understanding of the security and sustainability of the livelihood strategy typology.
Measures to be utilised are constrained to subsistence-appropriate terms; access to resources measured by percentage participation. Subsistence-plus livelihood typologies will be identified, using percentage participation values for the non-core activities of livelihood.

Ellis (2000) examined two other analytical methods for interrogating livelihood strategies, indices of diversity and income portfolios. Neither method will be attempted, as the data sets for this study do not provide a breakdown of activities at the household level, which is required to implement both these techniques.

8.2.1 Subsistence-plus livelihood typologies

In developing the typologies, we have noted that subsistence is the core activity. Gardening is vital to Vanuatu subsistence, but natural resource collecting is also a central activity.

It would seem reasonable, then, to define subsistence requirements as garden access and natural resource collecting. These will be taken to form the subsistence core and will be excluded from the 'plus' element. This produces a slight positive bias in favour of the urban livelihood, whose access to resources is less than rural households.

Percentages of households participating in particular activities cannot be added or combined as can be done with values for different sources of household income. Under such a restriction only a simplified ranking can be obtained, where the relative participation rates are ordered from 'most' to 'least important'.

Urban and rural subsistence plus livelihoods — a typological ranking

For the compilation of the typology table, only the following variables were considered, as they are production variables:

- cattle production
- kava production
- coconut production
- other cash crops (coffee, cacao, pepper, vanilla) production
- wages and salary

One production variable — other livestock (pigs and chickens) — was excluded as participation percentages were not available, only household average numbers.

The variables for rural households come from the 2006 Agriculture Census. The variables for the urban livelihood, except wages and salary, are drawn from the 1999 population census, as they are the only available percentages. All 1999 census figures are above trends from the other population and agriculture censuses. This anomaly heightens the bias in favour of urban households already identified. We note that small business, an option strongly favouring urban households, is unable to be included, which effectively restores some balance.

The results in Table 8.5 show a clear advantage for rural subsistence-plus households in participation rates. More than 50 per cent of rural households produce either cattle, kava or coconuts. It is highly likely that some rural households would be engaging in more than
one of the 'plus' elements. In contrast, less than 30 per cent of urban households produce
cocosnuts and half that number have cattle. This is indicative that rural households have
access to a more diverse range of livelihood strategies.

Table 8.5: Urban and rural subsistence-plus livelihoods:
A typological ranking

<table>
<thead>
<tr>
<th></th>
<th>urban</th>
<th></th>
<th>rural</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>subsistence + wages</td>
<td>32.0</td>
<td>subsistence + coconuts</td>
<td>69.8</td>
<td></td>
</tr>
<tr>
<td>subsistence + coconuts</td>
<td>29.0</td>
<td>subsistence + kava</td>
<td>59.1</td>
<td></td>
</tr>
<tr>
<td>subsistence + cattle</td>
<td>15.1</td>
<td>subsistence + cattle</td>
<td>50.7</td>
<td></td>
</tr>
<tr>
<td>subsistence + kava</td>
<td>12.7</td>
<td>subsistence + other crops</td>
<td>14.9</td>
<td></td>
</tr>
<tr>
<td>subsistence + other crops</td>
<td>4.8</td>
<td>subsistence + wages</td>
<td>5.6</td>
<td></td>
</tr>
</tbody>
</table>

(VNSO 1999, VNSO 2007a)

The subsistence-plus wages livelihood strategy strongly favours urban households, in com-
parison with rural dwellers. However, this advantage is comparative only. The strategy is
available to less than a third of urban households, and the situation seems to be growing
steadily worse. The percentage participation in wages and salary earning in urban house-
holds has shown a marked decline over time. In 1967, the value was 79.4 per cent; in 1979,
77.7 per cent; 1989, 68 per cent; and 1999, 50 per cent. The 32 per cent value in the table
comes from 2006.\(^{25}\) For rural households the figures are 1979, 3.7 per cent; 1984, 4.0 per
cent; 1989, 9.3 per cent; 1999, 10.4 per cent; and 5.6 per cent in 2006. There is no trend
apparent in the rural figures, but causes for the urban decline can be offered.

The percentages with access to wage and salary prior to 1989 can be explained by the
colonial ban on ni-Vanuatu residing in urban areas unless they were in employment. This
inflates percentage participation. The 1999 census is, as noted elsewhere, often above
trend. These inflated percentages are definitely a causal element in the apparent decline,
but to what extent is unknown.

The decline in circular migration and the rise of permanent migration described by Bon-
nemaison (1977) and Connell (1985), could have been expected to influence population
structures, with a higher percentage of the population under working age. Such has not
been the case. There has been change in the population structure in urban areas over the
period of population censuses 1967—2009, but that change has been a decline in per-
centage population under 20 years (INSEE 1967: 47-49 c.f. Vanuatu National Statistics
Office 2010b: 11).

One could expect that as the market economy becomes more developed, opportunities
for unskilled and semi-skilled employment would decline. From the censuses, in 1979,
18.1 per cent of employment was unskilled or semi-skilled (subsistence occupations were
excluded); in 1989, 19.3 per cent; in 1999, 16.4 per cent; by 2006, 16.8 per cent. These are
Vanuatu totals, not urban totals, but the strong impression gained is that there has been
little change in the composition of employment. It is interesting to note that the largest
unskilled occupation cohort continues to be domestic servants (house girls, cleaners and
gardeners), a reflection of how little has changed since colonial days.

It seems that not only is access to employment declining, but proportions of unskilled and
semi-skilled jobs have remained stable, so the decline is across the board.

When we examined rural and urban asset pentagons in the previous chapter, the later pentagons showed almost equivalent volumes in urban and rural livelihood asset-bases. From this equivalence, it can be said that while there is no relative disadvantage to urban households, they have fewer livelihood strategy options to choose between and this, of itself, makes them more vulnerable to livelihood failure (Cannon, Twigg and Rowell 2003).

8.3 Livelihood outcomes

Figure 8.5: Livelihood security and sustainability outcomes

We move now to the final column of the Ellis framework model to assess livelihood security and sustainability outcomes.

As the model is a representation of livelihood, it could be expected that any outcomes identified will be closely linked with the results from previous steps in the analysis, and such is the case. We have already identified some outcomes, both in terms of security and sustainability of livelihoods.

In building livelihood asset pentagons, a decline in livelihood assets for rural households over time could be traced. Examination of the effects of modifying and contextual agents on livelihood showed that land withdrawals have heightened levels of insecurity about land tenure and rights of usufruct, and have dramatically reduced the extent of littoral and forest resources available for exploitation by rural and urban subsistence-plus households. Formulation of a subsistence-plus livelihood typology showed that urban households have less options for livelihood diversity and that opportunities for wage and salary earning — the main source of financial capital for urban households — are declining.

In Figure 8.5, livelihood security and environmental sustainability, the two broad areas of outcomes of livelihood strategies are separated. In the analysis which follows they are taken
as an integrated whole, livelihood security and sustainability.

Again, from Figure 8.5, income level, income stability and seasonality are listed as elements of livelihood security, along with degrees of risk. For rural subsistence-plus households, neither income level, nor income stability are consistent with the subsistence-appropriate unit of measure, access to resources measured by percentage participation, and wage and salary earning are of minor importance. Low seasonality is important for rural and urban households alike. The other elements are of greater moment for urban households, particularly income level, and will be considered.

All livelihoods involve 'degrees of risk', the other element in the figure above, and that will also be examined.

Before proceeding, there is a need to separate environmental sustainability concerns related immediately to livelihoods and those of a more universal concern. The more general concerns may indeed impact on livelihoods, but are not integral to the livelihood, with two exceptions. Shark finning and beche-de-mer collecting are littoral resource exploitation. Lack and Meere (2009) detail regional plans for endangered shark populations and Pacific-wide concerns with declining shark numbers and shark finning. Although there is some beche-de-mer aquaculture, littoral collecting remains the principal means of supply. 26 Quantitatively, the extent of both shark-finning and beche-de-mer collecting activities in Vanuatu is unreported.

General environmental concerns

Vanuatu is an archipelago, and the global predictions for climate change are being, or will be undoubtedly, felt in some form. Morton (2007) lists climate change effects on subsistence and smallholder agriculture, particularly the increased risk of crop pests and diseases. Already, periods of raised ocean temperatures have caused coral bleaching and death. Vanuatu has mainly high islands with few atolls, which are the types of island most at risk from inundation through rising sea levels. However, most gardening takes place on the coastal, coral shelf on all islands and this places gardening under threat from more extreme weather events, with cyclonic storm surges likely to inundate gardens.

Climate change aside, there are other environmental concerns not related directly to livelihoods.

The Secretariat of the Pacific Regional Environment Programme27 advises:

Vanuatu's biodiversity is threatened by a number of introduced species of plants and animals and over-harvesting of some reef and lagoon fish. However, quarantine protocols have been developed to prevent the import of weeds, pests and diseases. As a result, Vanuatu is largely free of animal diseases and parasites, which has allowed the cattle industry to flourish


This positivity on the part of SPREP, while good news for the Vanuatu cattle industry, needs to be tempered a little by acknowledging and examining some wider environmental concerns.

26 The FAO has a good overview: http://www.fao.org/docrep/007/y5501e/y5501e07.htm.

27 SPREP is the English acronym, PROE — 'Le programme régional océanien de l'environnement' is the French.
The collapse of pelagic fish populations is a world-wide issue, with European and Taiwanese long-liners chasing the remaining ocean tuna populations. In 2009, the Chinese government handed over the keys to a processing plant located at Blacksands (Figure A.3). The agreement signed by the Government gave Vanuatu 41 per cent of the shares and the China National Fisheries Group Corporation 50 per cent. As of January 2011, no fish had been processed, according to the Vanuatu Daily Post. As of January, 2012, the Pacific Islands Development Program at the East-West Center in Hawai‘i reports that the project at Blacksands has been abandoned, and construction is set to begin at an alternative site in South-East Efate, at a former manganese mining operation at Forari. Despite delays, it seems that intent remains strong. Game fishing is a large tourist drawcard, with a fish attracting device installed south of Eretoka, outside Mele Bay (see Figure A.1). Most operators claim to be ‘tag and release’ boats, but there is evidence that many fish are neither tagged nor released. For some years (2002-2007), a company was licensed to take coral fish species and live coral for the aquarium trade.

There is an ongoing turtle monitoring programme for all species, where nest sites and hatching are recorded, and agreements have been made to ban turtle catching. Expatriate resort owners have begun cashing in on the attraction of these programmes, with anecdotal evidence that locals are catching baby turtles and selling them to the resorts for captive breeding programmes. Most islands have nesting sites, and turtle has long been a food source.

Local fishers continue to exploit Chinese demand for shark fin and beche-de-mer, with little government interference.

Coral bleaching due to rising ocean temperatures has been noted immediately above. Two major areas of reef death are in Vila Bay (see Figure A.3), and are not traceable to ocean temperature. One area is the yacht moorings between Ifira Island and the Market House, where reef destruction is attributed to diesel and other discharge from visiting and locally owned yachts. The second area is the Erakor lagoon, which has international resorts at either end, Le Lagon at the seaward end and the Palms at the other. Both deny dumping sewage into the lagoon, but it is difficult to imagine where else septic tank overflows would go during heavy rains and cyclones.

Sandalwood was one of the attractions which first drew Europeans to Vanuatu. The British were seeking to improve their trade relations with China and sandalwood is a major raw material for incense. Efforts have been made to replant areas on Erromango and other locations with sandalwood species, with some success, but they are slow-growing, so will only be of longer-term benefit.

Other environmental concerns are related to livelihoods and will be treated as livelihood sustainability concerns. From Figure 8.5, sustainability issues listed were soils and land quality, water, rangeland, forests and biodiversity. Cultural sustainability was added to

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29 http://www.dailypost.vu/ dailypost/comment/reply/10777quicktabs_1=1.
31 From personal experience, this is the case. I lived for a time behind a small-goods maker in Port Vila and observed numbers of black marlin arrive for smoking. Marlin also appeared from time to time in the ‘European’ supermarket at Nambatu (see map A.3).
33 See www.vanuatu.islands-diving.com/resorts_ex.cfm? MemberId=501.
34 On the author’s last visit to Luganville in June 2008, the largest petrol sales outlet on the main street had signs offering to buy sea cucumber, and shark fin soup was on the menu at one Chinese restaurant, at least.
35 See http://www.sdp.org for more details on this issue.
8.3.1 Livelihood security and sustainability

In the table below, issues of livelihood security and sustainability have been paired.

<table>
<thead>
<tr>
<th>issue #</th>
<th>livelihood security issue</th>
<th>livelihood sustainability issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>land use intensification land insecurity</td>
<td>biomass loss and ecosystem change cultural sustainability</td>
</tr>
<tr>
<td>2</td>
<td>land withdrawals</td>
<td>loss of usufruct rights and natural resource access</td>
</tr>
<tr>
<td>3</td>
<td>declining urban wage and salary options</td>
<td>land pressure, water pollution, over-exploitation of natural resources</td>
</tr>
<tr>
<td>4</td>
<td>negative impacts of development aid</td>
<td>invasive species, crop failures</td>
</tr>
</tbody>
</table>

Land insecurity:
biomass loss and ecosystem change

In this study it is argued that land insecurity, or feelings of insecurity about land rights, have been the root cause of land use intensification.

The prognosis for the effective resolution of the land tenure issues is very poor. The constant stream of legislation and regulation from the government has achieved little or nothing. The intrusion of outside agencies, AusAID and others, has contributed to a growth in land insecurity and the actions of some ni-Vanuatu eager to 'cash in' on the uncertainty of tenure has added to the confusion.

There is little or no doubt that the associated environmental issue — biomass loss and ecosystem change — is a by-product of land intensification and insecurity. Were the issue of land insecurity to be resolved, it would seem consistent to suggest that the reason for land intensification would disappear, probably leading to Brookfield's (1972b) 'disintensification', as occurred on Tikopia (Kirch and Yen 1982). If environmental management regimes such as weeding, replanting of lost woody fallow species and lengthened fallow periods were instituted it could be expected that environmental degradation would be ameliorated. Eradication of the two introduced tree species — Ecuador Laurel and Leucaena — the latter which is of some use as cattle feed, or of the invasive grasses, is unlikely to be achieved.

It needs to be restated that what is being described is a sustainability which in all likelihood still exists, not a western-style 'restoration or recreation of sustainability' situation, where the tipping point has been long passed.

The issue of cultural sustainability is less easy to deal with. Some have linked declining cultural diversity with declining biodiversity (Nettle and Romaine 2000 : 28). Elsewhere, cultural loss has not affected livelihood (Kirch and Yen 1982 on Tikopia). It seems feasible that language loss can be equated with cultural loss, and, that being the case, then cultural sustainability is under threat from land insecurity, with usufruct compromised and with local language use in decline (Nettle and Romaine 2000: 166-176).
Land withdrawals: loss of rights and access

The most immediate impact of land passing into leasehold is on the access of the indigenous populations to that land, both for natural resource collecting and for exercising usufruct rights to make gardens. Expatriate leaseholders, particularly those of recent origin, are likely to deliberately misconstrue the conditions of leasehold, which does not include the right to exclude (Constitution 79(2)). In the technical report to the 2006 National Land Summit, the authors point out that:

Poor land management and subdivision controls [sic] has resulted in areas of public or customary land becoming inaccessible to the custom owners or general public

(Lunnay et al. 2007: 37).

Littoral and forest access provides the means to meet dietary needs — protein from the shore, through fish, shellfish and crustaceans; fruits from the forest. All these are 'free', public goods in effect. Alternative sources of protein are tinned fish and meat or chicken wings and sausages. Alternative sources to energy foods from the forest are the standard western fare of biscuits, chips and other highly processed products, all of which are implicated in the health problems associated with obesity, diabetes mellitus and hypertension and dental caries which continue to rise in Pacific communities (Coyne 1984; 2000). Not only are they unhealthy options, they are relatively expensive.

Ultimately, as more land is withdrawn, there will be over-exploitation of the remaining natural resources and biodiversity will decline.

Declining urban wage and salary options: land pressure, water pollution, over-exploitation of natural resources

High levels of population density in urban areas, particularly in the peri-urban areas of Port Vila, mean that there is a shortage of land available for gardening, even that permitted by traditional owners.

In a situation where wage and salary earning is in decline, urban households depend more and more on subsistence production. With scant land resources available, many face livelihood failure. High population density and overcrowding in informal settlements has led to greater levels of stream and shoreline pollution and groundwater contamination from latrines (Chung and Hill 2002). Reticulated water is unavailable, or exorbitantly priced, in the informal settlements and water-collection from runoff is commonly stored in old fuel drums or refrigerators rolled on their side. There is no garbage collection and waste is usually disposed of by burning. Mecartney (2001: 157-165) reports poor water quality, groundwater contamination from latrines and open water storage all having adverse impacts on health and notes that vector-borne diseases, hepatitis in all its forms and gastrointestinal infections are everyday concerns in the informal settlements.

Hungry people are unlikely to take the longer-term view of exploitation of natural resources. Over-exploitation of the littoral and forest resources of Vila Bay, is commonplace. Firewood bundles for sale now occupy a much larger area at the Market House, as urban households are unable to collect enough wood for cooking.
Over-exploitation is not able to be controlled by municipal, community or traditional sanctions.

**Negative impacts of development aid: invasive species, crop failures**

In Chapter 7, the negative impacts of agricultural and forestry extension were canvassed, particularly the introduction of colonising invasive species as possible cash crops.

Included in the list were the plant species:

(a) Ecuador Laurel (*Cordia alliodora*)
(b) Conflict tree (*Leucaena lenophala*)
(c) Mile a minute weed (*Mikania micrantha*)
(d) Elephant grass (*Pennisetum purpureum*)

On the island of Tanna there are feral horses. Goats, in varying degrees of domestication, are found on most islands. Weightman (1989) details the many past attempts to develop sheep and dairy industries, and to introduce rice and other cereal species to the archipelago.

These plant and animal introductions seem to have been made without an elementary precautionary approach — no risk assessment, certainly no environmental impact assessment. This lack of assessment is inarguable, because any rudimentary risk assessment would note the ubiquitous lack of capacity of Pacific nations to find and apply funds for the eradication of established invasive species. The Secretariat of the Pacific Regional Environment Programme, in its 2000 regional strategy document on invasive species in the Pacific, addresses this issue directly.

> There is a shortage of technically trained personnel in Pacific island countries and there are inadequate quarantine and risk assessment facilities. There is insufficient funding for training of personnel, establishment of infrastructure, development of risk assessment procedures, and management and research on invasive species

(Secretariat of the Pacific Regional Environment Programme 2000: 4).

In other words the situation is a 'Pandora’s box'. Any introduction of a new species has the potential to become a catastrophe.

If it is beyond the capacity of governments of Pacific nations to combat invasive species, then it is unrealistic to expect that rural and urban households affected by these incursions will have the means, or the expertise, to deal with them. Under these conditions, invasive species have the dual impacts of increasing livelihood insecurity and environmental degradation.

Recent studies have highlighted the importance of forest resources to subsistence livelihoods. Lentinis (2000: 41-2) argues that 'arboreal-based subsistence economy' more accurately describes Melanesian swidden in the archaeological record. This dependence on forest resources, critically in natural disasters, is directly threatened by the colonising Ecuador Laurel and *Leucaena* (despite its widespread use as firewood). *Leucaena* suckering produces thickets which overwhelm any native species (Bakeo and Qarani 2003).
There have been many successful introductions: a range of tropical fruits — mango, avocado, soursop, custard apples — along with salad vegetables and beef cattle have all been assimilated into the production system, but these introductions differed in two major ways. They had a history of successful introduction into new environments and their growing habits in similar climates were well understood.

Finally, the concentration of aid in metropolitan areas and the aim of that aid — economic transition — has impacts on cultural sustainability. Little aid money has gone to the encouragement of traditional, cultural knowledge and some has actively undermined it. The current uncertainty in land tenure systems is an obvious example, where traditional systems have been made unworkable by the imposition of legal standards of proof.

There is a decline in the assets of both rural and urban livelihoods, and these declines have negative consequences for the livelihood outcomes of Vanuatu households, both in security and sustainability.

The overall results of the livelihood framework analysis are discussed in detail in Chapter 10.

This marks the end point of the Vanuatu livelihood framework analysis, the third research task. The Ellis (2000) model next returns to the livelihood platform, where this analysis began.

In the following chapter, the results of the three research tasks already undertaken — the valuation of the costs of land withdrawal, the land use projections and comparison, and the livelihood framework analysis — will form the basis for a widening of this enquiry into subsistence-based livelihoods and their security and sustainability, from the national to the world scale.
Chapter 9

Resilience to Food Insecurity: a Food Resilience Index and Ranking

9.1 Context and why it matters

The fourth and final research question is:

Can a measure be developed which enables all economies — subsistence, exchange and those between — to be assessed and ranked in common terms?

To address this question, an indexed measure will be developed and a selected group of countries ranked on the index.

Before beginning, it may be helpful to link the case study, Vanuatu, to the wider world context explored in this chapter.

The study has, to this point, been testing, in a variety of ways and using a succession of models, the assertion of the people of Vanuatu that their traditional systems of land and livelihood are of greater economic value than development economists are prepared to grant them. The valuation of the costs of land withdrawal indicated that they may have a case, and that the models which are used by development economists may seriously underestimate the economic returns to subsistence-based livelihoods. The series of land-use projections then showed that the withdrawal of land to leasehold, seen by development economists as an essential step on the road to commercial agriculture and the development of a globally-connected market economy, may in fact be detrimental to the current livelihoods, without producing benefits to those seeking to move to exchange-based systems of livelihood.

Next, the study examined and compared rural and urban livelihoods by adapting a model developed by DIFD for rural livelihood analysis, in that the unit of measure was not currency- or cash-based equivalents, but levels of access to resources, measured by percentage participation rates. This analysis reinforced the tentative indications of the previous models. Those in Vanuatu following subsistence-plus livelihoods — not only rural populations, but the majority or urban-dwellers as well — were experiencing the supposed
benefits of development as detrimental to their livelihoods, and opportunities in the exchange economy had contracted over time.

Does the experience of subsistence-based producers in a Pacific micro-state have any wider implications, in a world where, despite the aspirations of development theorists, half or more of the world's population continue to engage in subsistence production as the core of their livelihood? That is the question which the following model attempts to explore.

This index will utilise the results of the Vanuatu case-study, where the three completed research tasks showed first that the economic returns to subsistence-plus farmers may be much higher than imputed costs or consumption suggest. Second, it was demonstrated that land withdrawals have had significant impacts in specific areas of Vanuatu, especially on the island of Efate, where more than twice the optimal number of households may be utilising the available land resources. Thirdly, it was shown that livelihood security and sustainability — subsistence-plus for both rural and urban households — declined over a 30 year period, without any significant growth in other means of livelihood.

These results will inform the selection of variables for the proposed index, which aims to measure resilience to food insecurity. This was chosen as the contextual background, since all livelihoods aim to deliver adequate amounts of food and shelter to household members.

In the review of literature (Chapter 3), the proliferation of indices, indicators and metaphors of development — of cost of living, development, sustainability, happiness, liveability, poverty and many more — was examined, and three development indicators, which tended to be metaphoric in character, were singled out for discussion in some detail; the Ecological Footprint, the International Poverty Line and the Human Development Index.

All three shared common, fundamental characteristics. They were insensitive to contextual background and were largely made up of normative measures of value.

The Ecological Footprint, which champions the smaller, less developed nations, does so because it is focussed on environmental sustainability to the exclusion of political, social or cultural contextual elements. It is normative in character because it promotes low levels of consumption and waste disposal as the sole means of achieving a sustainable level of human environmental impact, regardless of how, and at what political, social or cultural cost, these levels are achieved.

The Human Development Index measures variables which are appropriate to market-based, industrialised and globalised societies — life expectancy at birth, level of school education, and Gross National Income (GNI) per capita — but not necessarily so to other societies and other economic systems. Only market-based societies can score well on the index, so the variables, as selected, are normative, insensitive to context, and in some cases insensitive to fact. For example, subsistence producers do not contribute to, or share in, Gross National Income, but are included in the total population for the 'per capita' calculation, thus producing consistently low, and inaccurate, estimates for this measure in countries where subsistence production systems are dominant. The World Bank may undervalue subsistence production (see below), but at least it acknowledges its existence!

A case was presented (Chapter 4) for a rethink of the way in which subsistence-based livelihoods have been evaluated, by assessing the costs of land withdrawal to subsistence-plus livelihoods. This assessment indicated that the methods used in accounting for subsistence production in the World Bank's International Poverty Line, and more generally in develop-
ment economics — imputation of consumption or production — may greatly undervalue subsistence in cash terms. The International Poverty Line defines poverty in terms of lack of material goods, and is insensitive to other contextual influences, particularly the social and cultural aspects of human life, which may not be measurable by levels of material goods (Sahlins 1972).

The composite measure proposed here; that of a ranking of a selection of countries in terms of their resilience to food insecurity, provides, and is constrained by, that specific context for measurement. The variables chosen to represent the indicators of resilience to food insecurity will be tested, to be as non-normative as possible.

### 9.1.1 Current world food insecurity

As world population moves towards seven billion, how does world food insecurity stand? Two parameters, world food prices and world cereal stocks, are both moving in the wrong direction.

World food prices remained relatively stable between 1990 and 2007. Prices then rose steeply, and after a severe dip during the 2008-9 global financial crisis, returned to their pre-crisis rates of growth in 2011. Since then prices have declined and are projected to continue to do so.


World cereal stocks represent the safety net against food shortage. Figure 9.2 shows cereals stocks, production and consumption since 2002. The chart is presented in a deliberately optimistic manner. The right axis, which goes from zero to 800 million tonnes is used for stocks, the left, which goes from 1,700 million to 2,500 million tonnes, for production and utilisation. If one axis only was used, say from zero to 2,500 million tonnes, the low level of stocks, compared to production and use, would be apparent.
The stock to use ratio has declined over the past decade, from 31.3 per cent in 2000, to 21.7 per cent in May 2012.$^1$

In a time of rapidly rising food prices and in a world where, since 2000/01, production and consumption have been in lockstep$^2$ now at over 2,300 million tonnes per annum, a stockpile of 500 million tonnes is less than three months’ supply worldwide, in the event of a catastrophic crop failure and rundown of reserves. In the same period (2002 — 2012), world population has grown from 6.249 billion to 7.020 billion; 770 million more people, or 11 per cent.

This, then is the contextual background: one of increasing food insecurity, with trends of rising prices and dwindling supplies, and steadily growing world population.

In such a context, what indicators of resilience to food insecurity might be important?

### 9.1.2 Indicators of resilience to food insecurity

One strategy which will be excluded from the index at the outset is the predominant strategy employed in the globalised economies, the use of purchasing power in the global food system. This exclusion is made for the following reasons.

The current world food situation is without precedent, given world population levels. The increasing complexity of the global food system (Hendrickson et al. 2008) and the

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$^2$In the period 2000-2012, production grew by 20.64 per cent and utilisation grew by 18.56 per cent (FAO 2011.xls). This means that production grew by a net 2.08 per cent, at a time when population grew from 6.094 billion to 7.020 billion, a rise of 13 per cent. ([http://www.census.gov/population/international/data/idb/](http://www.census.gov/population/international/data/idb/))
propensity for systemic failure in highly complex systems (Watts 2003; May 2010) make single strategy approaches more high-risk, simply because there is no fall-back position, no spreading of risk. There is no implication that purchasing power is not an effective strategy, simply that any one strategy, which is followed to the exclusion of other instruments, decreases strategy diversity. Diversification spreads risk.

The variables chosen as indicators of resilience to food insecurity have been selected on the basis that they can meet two tests.

The first is appropriateness to subsistence-based livelihoods, without excluding other livelihoods. This will, in effect, mean that cash measures will be excluded and measures based on access and participation will be favoured.

The second test is that the variables should not exhibit any normative intent, or content. This is a more difficult test to pass. It will be noted where the constraint is broken.

Before listing the indicators, it is incumbent to acknowledge the limitations of this exercise. Some of the information has been drawn from internet sources, and not all have been verified. The selection of the indicators themselves — natural resource sufficiency, food sufficiency, low seasonality and high yield production, livelihood adaptability and urban food production — was informed by results of the previous research tasks in the study. There may well be other factors which merit consideration, but for this study, the indications are that these chosen factors are strengths in the Vanuatu economy, and are likely to be strengths in other, similar economies. Whether globalised, networked economies benefit from any, or all of the factors, is a moot point. The contention made here is that if purchasing power begins to fail to provide a livelihood, what other strategies are available for the globalised world?

**Indicator One: sufficient agricultural land to feed the total population (agricultural land area per capita)**

Where there is not enough land to feed the population, there is inherent risk of food insecurity. If the global food network is unable to deliver replacements for in-country deficiencies, people experience food shortages. An assumption is made that in times of food insecurity, governments are more likely to intervene if increased food production is exported, in the case that the agricultural land is under foreign ownership.

Agricultural land available for total population is calculated by dividing the total agricultural land area, taken from the FAO database (http://faostat.fao.org/) by the total population as estimated in May 2012 in the CIA Factbook (https://www.cia.gov/library/publications/the-world-factbook/geos/).³

The variable passes the two tests. It is not normative in character, and is appropriate for subsistence-based production, without any inherent bias against other production systems.

³Attention has previously been drawn to the FAO method of estimation, which measures only currently used agricultural land, not potential agricultural land, (see p. 60)
Indicator Two: evidence of self-sufficiency at total population levels
(net food imports as percentage of imports)

Countries which are net importers of food are at higher levels of risk than those that have been providing enough food for their population. While this factor is historical in nature, and not predictive — in the sense that past performance does not help to predict future performance — it indicates where the possibility of food insecurity exists, or has been experienced. It must be kept in mind that a negative net value may be simply a matter of choice. Countries (or the people in them) may choose to import food and export other higher-value goods to pay for that food. This is a major element in the purchasing power strategy, excluded from consideration. High trade countries are maximising their purchasing power.

Net food import data was sourced from Ng and Aksoy (2008). This remains the most recent World Bank sponsored study. The numbers presented refer to ‘raw food’ — cereals, beets, roots and meat — with processed food and textile goods excluded. Ng and Aksoy (2008: 29-34) present two sets of figures — raw values of imports and exports in dollars and net food imports as a percentage of all imports. The second was chosen because it shows the relative magnitude of the excess or deficit, and because it meets the criterion of avoidance of cash terms. Net importers have a negative percentage; net exporters have a positive percentage.

There is a minor normative element in this variable, because subsistence production is not measured in import/export data, but this is balanced by an assumption that if a country with high levels of subsistence-plus production is not a net food importer, then that subsistence-based production is meeting the needs of the population. Alternatively, it must be admitted, it could mean that the country is unable to import, due to financial constraints. The argument turns on the evidence, or lack of it. If a country is unable to import sufficient food to feed the population, then a humanitarian disaster would be likely to occur, and such disasters are increasingly difficult to hide in the more transparent world in which we live.

Indicator Three: indications of subsistence-based livelihoods in urban populations
(percentage urbanisation plus percentage population in agriculture)

In Vanuatu, urban households were found to be engaged in subsistence-based production, which gave greater livelihood security than wage and salary earning. Under such conditions, if the percentage population engaged in agriculture were added to the urban population percentage, the total could be expected to exceed 100 per cent.

This item is calculated in that manner. If, added together, these two percentages add to more than 100 per cent, we can make the inference that subsistence-plus livelihood patterns similar to those found in urban populations in Vanuatu are likely to be found in the urban populations. Of the 48 countries listed as 'Least Developed Countries' by the United Nations Development Programme, 30 fit this pattern. This factor has been chosen because it is an indicator that degrees of self-sufficiency are likely to exist in urban areas in the 'Least Developed Countries', regardless of employment levels, wage levels and relative wealth.

The 'Pro Huerta' programme, initiated in Argentina and adopted in Haiti in 2005, aims to encourage, or re-introduce, urban subsistence gardening as a means of promoting health-
ier diet and greater food self-sufficiency among urban settlers. East and Dawes (2009) document the growth of home gardening in Kiribati, as a result, in part, of aid-sponsored projects.

The figures for urbanisation percentages and percentage population involved in agriculture were taken from country profiles on the *CLA Factbook* website and verified against 1990 *Earthtrends* values, from the World Resources Institute. *Earthtrends* figures are derived from Food and Agriculture Organisation, World Bank and United Nations Economic and Social Affairs Department statistics.

In terms of the two constraints, this variable is appropriate to subsistence-based production, but less so for highly urbanised populations with small percentages of population engaged in agriculture, where no inference about urban self-sufficiency can be drawn from a score approaching 100 per cent. This normative bias is acknowledged as a shortcoming in this measure.

**Indicator Four: agricultural and climate features**  
*(ratio of high yield to low yield crops plus climate influence)*

High-yielding crops have an advantage in that higher returns can be gained from smaller parcels of land. Root crop yields are much higher than cereals. Across all countries, the yields vary from three times higher to many times higher, but the mean is somewhere near six times. Elsewhere in this study (see p. 234), it has been noted that tropical and sub-tropical agriculture has an advantage over temperate agriculture in that cultivation can be year-round, whereas temperate agriculture has two cropping periods at most. Intensive cereal production, although mostly associated with temperate production, is undertaken in tropical and sub-tropical systems, rice paddy in particular. Likewise, root crop production, most associated with tropical and sub-tropical production, is undertaken in temperate climates: potatoes and sweet potato varieties mainly; but including sugar beets, carrots, parsnips and turnips.

Climate information was drawn from the *CLA Factbook* country profiles, with dominant climate used for larger countries with a variety of climates. A simple two-point scale was used, with tropical and sub-tropical production scored as two, and temperate production scored as one. The ratio of root crops to cereals is derived from *Earthtrends* data. These two features, high yield agriculture, plus a climate score, make up the values for this indicator of resilience.

This variable fits the subsistence-appropriate and non-normative constraints.

**Indicator Five: livelihood adaptability at the total population level**  
*(100 minus percentage urbanisation added to percentage refugee and internally displaced population)*

High levels of urbanisation are an indicator for inflexibility in livelihood options and a lack of capacity to adapt to other livelihoods, or to self-sufficient production, in the event of critical food shortages.

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5http://earthtrends.wri.org
6earthtrends.wri.org — the agriculture and food country profiles were the basis of this calculation
7http://earthtrends.wri.org — the World Resources institute
Land tenure arrangements may also contribute to adaptability, or militate against it. Land entitlement may be critical in periods of food insecurity, or where food insecurity becomes established. In such times, land as food growing space, rather than land as amenity is paramount. The loss of land entitlement through population displacement, or due to the commodification of land, is a crucial element in livelihood loss. As will be seen, this feature is endemic in Africa, where civil wars and internal strife have reduced food security in otherwise resilient countries.

Urbanisation percentages were drawn from the CLA Factbook, while land tenure arrangements information was referenced individually, from the USAid website.\(^8\) Percentages of internally displaced populations and refugees are taken from the Global Trends Report 2010 of the United Nations High Commissioner for Refugees (2010) and United Nations High Commissioner for Refugees (1994). The UNHCR numbers for refugees and Internally displaced people were aggregated for each country.

There is a difficulty in attribution in this variable. Refugee populations have been attributed to their country of refuge, rather than their country of origin. This attribution was made with some misgivings. Should refugees be counted as a problem for their country of origin, or for their country of refuge? In the end, it was decided that refugees are a present problem for their country of refuge, so they were attributed there. This is not an issue for internally displaced populations.

The score is obtained by adding the percentage of urbanised population and refugees and internally displaced persons as a percentage of the population. While refugees are not residents, they lack livelihood assets and entitlements, and thus have low capacity for adaptation.

While high levels of urbanisation are a feature of market-oriented economies, perhaps an indicator of a normative element in this variable, it is the combination of urbanisation and internal displacement which forms the values, and internal displacement is a feature of subsistence-based economies in Africa and elsewhere. The terms are appropriate to subsistence-based and other systems.

### 9.2 Data and Tables

#### 9.2.1 Selected Countries

Time and space did not permit an exhaustive study of every country and economy, so selections were made to try and capture the extremes, and two countries were chosen to represent points somewhere in the middle.

The group of countries selected are: the 48 countries which make up the United Nations list of 'Least Developed Countries',\(^9\) the top ten countries on the Human Development Index;\(^10\) and China and India, currently the two most significant transitional economies.

The 'Least Developed Countries' include some doubly labelled, as Landlocked Developing Countries or as Small Island Developing States. The listed countries qualify for 'special' treatment — as outlined in the so-called Brussels Declaration — part of the Third United

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8[^http://usaidlandtenure.net/usaidlppproducts]: [http://usaidlandtenure.net/usaidlppproducts]

9[^Certain countries were excluded from the final table — Timor-Leste, and Tuvalu in the Pacific, because of size in the case of Tuvalu and lack of available information in the other case.]: Certain countries were excluded from the final table — Timor-Leste, and Tuvalu in the Pacific, because of size in the case of Tuvalu and lack of available information in the other case.

10[^Excluding Liechtenstein, which is entirely anomalous]: Excluding Liechtenstein, which is entirely anomalous

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Figure 9.3: Least Developed Countries list

<table>
<thead>
<tr>
<th>Africa</th>
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<tbody>
<tr>
<td>1 Angola</td>
<td>18 Madagascar</td>
</tr>
<tr>
<td>2 Burkina Faso#</td>
<td>19 Malawi#</td>
</tr>
<tr>
<td>3 Benin</td>
<td>20 Mali#</td>
</tr>
<tr>
<td>4 Burundi#</td>
<td>21 Mauritania</td>
</tr>
<tr>
<td>5 Chad#</td>
<td>22 Mozambique</td>
</tr>
<tr>
<td>6 Comoros*</td>
<td>23 Niger#</td>
</tr>
<tr>
<td>7 Central African Rep#</td>
<td>24 Rwanda#</td>
</tr>
<tr>
<td>8 Eritrea</td>
<td>25 Sao Tome &amp; Principe*</td>
</tr>
<tr>
<td>9 Ethiopia</td>
<td>26 Senegal</td>
</tr>
<tr>
<td>10 Gambia</td>
<td>27 Sierra Leone</td>
</tr>
<tr>
<td>11 DRep Congo</td>
<td>28 Somalia</td>
</tr>
<tr>
<td>12 Guinea</td>
<td>29 Sudan</td>
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<tr>
<td>13 Djibouti</td>
<td>30 Togo</td>
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<td>14 Guinea-Bissau*</td>
<td>31 Uganda#</td>
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<td>15 Eq. Guinea</td>
<td>32 Tanzania</td>
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<td>16 Lesotho#</td>
<td>33 Zambia#</td>
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<td>17 Liberia</td>
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<table>
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<td>37 Cambodia</td>
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<td>38 Kiribati*</td>
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<td>39 Lao PDR#</td>
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<tr>
<td>40 Myanmar</td>
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<td>41 Nepal#</td>
<td></td>
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<tr>
<td>42 Samoa*</td>
<td></td>
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<tr>
<td>43 Solomon Islands*</td>
<td></td>
</tr>
<tr>
<td>44 Vanuatu*</td>
<td></td>
</tr>
<tr>
<td>45 Yemen</td>
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</table>

<table>
<thead>
<tr>
<th>Americas</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>46 Haiti</td>
<td></td>
</tr>
</tbody>
</table>

# Landlocked Least Developed Country
* Small Island Developing State

(UNCTAD 2011)

The World Food Programme,\(^1\) another United Nations agency, has food aid programmes for all of the African countries on the Least Developed Countries List.

Currently, there are 33 African countries, 14 Asia and Pacific countries and Haiti, from the Americas. Vanuatu is doubly-labelled, as both Least Developed Country and Small Island Developing State.

Next, Table 9.1 shows the top ten high-ranking countries on the Human Development Index. China and India, which rank as medium in human development, are ranked 89 and 121 respectively.

\(^1\)http://www.wfp.org has programme outlines, data sets etc.
There are no real surprises in this list, although recent economic history would suggest that Ireland may have fallen somewhat, and recent natural (and nuclear, perhaps) history has been unkind to Japan.

Climatically, this group is varied, with perhaps a preponderance of temperate production systems.

Table 9.1: Top Human Development Index countries, China and India

<table>
<thead>
<tr>
<th>Country</th>
<th>HDI rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>1</td>
</tr>
<tr>
<td>Australia</td>
<td>2</td>
</tr>
<tr>
<td>New Zealand</td>
<td>3</td>
</tr>
<tr>
<td>United States</td>
<td>4</td>
</tr>
<tr>
<td>Ireland</td>
<td>5</td>
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<td>Liechtenstein</td>
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<tr>
<td>Netherlands</td>
<td>7</td>
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<tr>
<td>Canada</td>
<td>8</td>
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<tr>
<td>Sweden</td>
<td>9</td>
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<tr>
<td>Germany</td>
<td>10</td>
</tr>
<tr>
<td>Japan</td>
<td>11</td>
</tr>
<tr>
<td>China</td>
<td>89</td>
</tr>
<tr>
<td>India</td>
<td>121</td>
</tr>
</tbody>
</table>

(UNDP 2010)

9.2.2 Data sets

Two sets have been compiled. The earlier set contains data from around 1990. The later from around 2005.

The objective in collecting two sets was to measure and compare changes, and see if reasons for those changes could be identified.

The Food Resilience Index itself was calculated on relative values, in a similar process to that used in constructing asset pentagons in the livelihood framework analysis. Each variable was relativised, by making all scores relative to the top score for each variable. All relativised variable scores were then added together to give the Food Resilience Index value.

Raw and relative data sets for Food Resilience Index 1990 and 2005 and the complete rankings appear in Appendix F, along with the full tables containing all component values, from the spreadsheet used to process the information.

Data limitations

One variable in particular needs further discussion. The indicator relating to agricultural and climate features was calculated using a ratio of low yield production to high yield production and adding a weighting for climate features; two for tropical or subtropical production, one for temperate systems and others.
Table 9.4: Agriculture and Climate variable impact: 1990, 2005

<table>
<thead>
<tr>
<th>agriculture type included 2005</th>
<th>agriculture type excluded 2005</th>
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<tbody>
<tr>
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<td>Mauritania</td>
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<tr>
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Table 9.4: Agriculture and Climate variable impact: 1990, 2005

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<tr>
<th>agriculture type included 1990</th>
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<tr>
<td>23.89</td>
<td>20.90</td>
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<tr>
<td>Mauritania</td>
<td>Vanuatu*</td>
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<tr>
<td>23.02</td>
<td>20.88</td>
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</tbody>
</table>

For countries with higher cereal production, the ratio gives a value between one and zero. For countries with higher root and tuber production, the value is higher than one, and can escape to very high values for countries with almost exclusively high yield production. In the case of Vanuatu, where almost no cereals are grown (corn is a small exception), the value approaches 50. This bias, in favour of countries with little or no cereal production, was tested by compiling the index excluding this variable and comparing results with the variable included. The comparative top ten tables are shown (Figure 9.4).

The disproportionate impact of the unconstrained agriculture and climate variable is clear. Cereal producing countries, such as Australia, Eritrea and Mauritania are ranked much higher when the variable is excluded.

To minimise this effect, the maximum value for the high yield/low yield ratio was constrained to five. When relativised, the spread of values is much less extreme, and the bias largely disappears, notwithstanding a slight bias towards temperate climate production when the climate component score, in which the weighting favours temperate production (2 for subtropical and tropical, 1 for temperate and other) is added.

The value for agricultural land per capita has a similar extreme spread on relative values, but as this is a ‘real’ and not a derived measure, constraint was not contemplated.

### 9.2.3 Food Resilience Index Rankings

Sources for the following rankings have already been identified in Section 9.1.2.

The top ten countries in both 1990 and 2005, in terms of the indicators of resilience to
food insecurity chosen are either Pacific or African countries, from the Least Developed Country list. The bottom ten countries in 2005 include seven high Human Development Index score countries, also the case in 1990.

Vanuatu topped the Food Resilience Index for both time series, 1990 and 2005, with total scores above 30. Japan and Norway shared bottom place, with scores less than half that of Vanuatu, both in 1990 and in 2005. Australia, New Zealand and the Netherlands have the highest scores for the so-called developed countries, due to abundant land availability (Australia), high levels of food export production (New Zealand) and high levels of high-yield cropping (potatoes and beets) in the case of the Netherlands.

These results seem, at first, to be counter-intuitive, so well inculcated is the idea of the superiority of the dominant mode of development — the globalised, networked economy. If it is recalled that purchasing power, a common strategy has been excluded from consideration, then the results can be seen in context. Additionally, it can be inferred that purchasing power is, for these 'highly developed' countries, not one of a diverse set of strategies, but the dominant, perhaps the only, one.

Nonetheless, in deference to that deeply held notion of globalised, networked superiority, the implications of the results for so-called developing countries will be discussed separately first.

First, remember that in constructing the Food Resilience Index, indicators of resilience were chosen on the basis that they were able to be measured in subsistence-appropriate terms, not in currency or currency equivalents; and secondly, on the basis that the indica-
tors were not normative in nature — no particular set of characteristics was preferred to others.

Not surprisingly, under such constraints, countries with little capacity to compete with purchasing power in the global food system, as the 'least developed countries' are, were found to have a suite of strategies for ensuring resilience to periods of food insecurity. The most resilient countries, those in the top ten, with the exception of Eritrea in 1990, have tropical or sub-tropical climates, high yield root and tuber staples and strong evidence of urban subsistence production. Their resilience resides in their self-sufficiency.

Indications are that there is little prospect of these countries reaching a point where their capacity to compete with purchasing power in the global food system, particularly in the context of worsening conditions, will be such that they can afford to sacrifice some of their self-sufficiency for the 'benefits' of globalisation.

For those countries high on the Human Development Index, low scores in these five indicators may have little significance. Even if world food prices continue to rise and stocks continue to fall, their wealth, relative to other countries using the same strategy, should ensure that the crisis would need to be catastrophic to begin to hurt them. For those countries reliant on the purchasing power strategy, but which are not at the top of the Human Development Index, the prospect is less certain. They may be worse off than the small island developing states and landlocked least developed countries which have performed well in the Food Resilience Index. They will not be able to compete with richer countries in purchasing power, nor will they have the spread of elements of resilience to be more self-sufficient.

Hopefully, this exercise has been able to demonstrate that notions of development can be shown to be contextually contingent. In a food-insecure world, the strategy of globalised, networked economies — purchasing power in the global food system — may not represent the most effective means of managing the risk of food shortages, particularly for those less wealthy nations whose capacity to compete will be compromised in a context of scarcity. Levels of 'development' for many countries may be better represented by commitment to fostering a broad, a diverse, range of instruments of resilience to contextual challenges, rather than by narrowing the base of resilience to a single strategy.

Where food insecurity risk is managed by only one method, where all the eggs are put in one globalised, networked basket, so to speak, any failure could be catastrophic.

**Food Resilience Index trends over time**

To conclude this task, a brief examination of those countries with the largest movements in the index value between 1990 and 2005, may be of interest. Index movements over time should reveal underlying changes and possible causes of those changes. The following table shows the ten countries whose movement in values was most strongly negative between 1990 and 2005, and the ten countries which experienced the largest positive change in the index over that period.

The countries which experienced negative change in their Food Resilience Index value are heterogeneous, with representatives from Africa, Asia and Oceania (New Zealand). The group also runs the development gamut; with some Least Developed Countries, a transitional economy and a high Human Development Index value country.
Notably, Somalia has had the largest negative movement, with civil strife, internal displacement and the Horn of Africa drought obvious contributing causes. The value for each indicator has shown a decline, but particularly in adaptability, in which the impact of internally displaced populations is captured. Here the decline, in relative terms, was from 7.58 to 5.52. It is worthy of note that Somalia ranked second in food exporters, behind New Zealand, in both 1990 and 2005.

Haiti has experienced massive urbanisation in the period, a collapse in rural populations and a decline in urban subsistence. Eritrea, too, has been in drought, but it is the dramatic fall in agricultural land per capita which is responsible for the decline. Madagascar experienced a fall in food self-sufficiency and a decline in urban subsistence. The Comoros had a severe decline in food self-sufficiency, while China experienced a rise in that indicator, which was masked by falls in adaptability, due to rapid urbanisation, and in urban subsistence, due probably to rapid industrialisation.

For New Zealand, Bhutan, Guinea Bissau and Nepal, small relative declines in adaptability and urban subsistence were responsible for the slight drops.

The group of countries experiencing positive change were African nations, with Europe and the Middle East also represented. This group was composed of Least Developed Countries, with the exception of Germany.

Relative improvements in food self-sufficiency were experienced in all countries in the group.

Lesotho experienced relative growth in urban subsistence capacity, as did Sudan, Yemen and Zambia, to a lesser extent. Only Liberia, Zambia and Germany experienced increases in adaptability, which may indicate that displaced populations continue to be a source of vulnerability to food supply failure in African nations, even where conflict has diminished or ceased. However, Angola ended a 22 year civil war in 2002, yet had a relative decline in adaptability, due to higher levels of urbanisation. Refugees and internally displaced numbers were 20,000 in 2005, against 100,000 in 1990. Urbanisation rose from 37.3 per cent in 1990 to 48.96 per cent in 2005. Only a case-by-case examination of the adaptability variable would show the impact of internal displacement and such is beyond the scope of this study.

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12 An indication that the values for this variable are themselves to be treated with suspicion.
Nevertheless, correlation between events and changes in the Index value give some comfort, and indicate that it may be of some use.

Further discussion of the results of the Food Resilience Index rankings appears in the next, and final chapter.
Chapter 10

Results and Conclusions

10.1 Results

This study set out to examine four questions:

1. Can an evaluation of land withdrawal costs provide a better picture of returns to the subsistence-plus livelihood than the World Bank method?

2. Can projections of optimal land use provide a measure of the extent of the impact of land withdrawals on rural subsistence-plus livelihoods?

3. Can a standard model of livelihood analysis be adapted to assess the security and sustainability of Vanuatu subsistence-plus livelihoods?

4. Can a measure be developed which enables all economies — subsistence, exchange and those between — to be assessed and ranked in common terms?

The questions proceed in order from the specifics of individual households; through the general level of Vanuatu livelihoods; to the universal level of livelihoods worldwide.

The research tasks also proceed in that order, from the specific — costs of land withdrawal and the cash-equivalent value of the livelihood; through a general examination of Vanuatu livelihoods, to the universal — an indexed valuation of a sampling of countries and economies, in terms of resilience to food insecurity.

It was envisaged that each of the tasks would contribute to an iterative whole. Each step would be a prerequisite for the next, and each would be incorporated in the next iteration.

Likewise, each step represented a challenge (and an alternative unit of measure) to the dominant measures of international comparative development. These challenges, and alternative measures, were attempts to develop the 'strong objectivity' proposed by Sandra Harding. Her argument, it will be recalled, ran that between the polar opposites of epistemological relativism, where nothing can be compared; and epistemological absolutism, where everything can be compared, but only within one dominant paradigm; there remains the possibility, by 'beginning thought from marginal lives', of objective comparison (Harding 1992: 581).
The central aim of the thesis has never been to produce quantitative data beyond impeachment. It has been to produce models of economic features which provide an alternative critical method of examining the dominant models of development. Quantitative treatment has been chosen because the dominant measures which were to be challenged are quantitatively based models. Although the bulk of data utilised to form the models was drawn from standard sources, where such data were not available the best anecdotal evidence was incorporated, as it has been in the calculations lying behind the apparently unimpeachable development indices and poverty lines. If the reader leaves this thesis with one thought — that the dominant models of development deserve to be much more stringently examined, criticised and, perhaps, even rejected — then this thesis will have succeeded in its central aim.

Therefore, if inaccuracies, or uncertain assumptions are noted by the reader in the data used in the construction of the models presented in this study, it is hoped that that discovery may lead them to consider and question the inaccuracies and biases of the dominant models more closely. It may even lead the reader to re-consider how closely these dominant models approximate the reality of livelihoods worldwide, because for many development economists, the Human Development Index and International Poverty Lines have become the reality, rather than a model.

10.1.1 Valuation of costs of land withdrawal from traditional use and proxy measure of livelihood

Total costs of the withdrawal of land from traditional use, monthly, were calculated to be VUV50,960 per household.1

If environmental services costs are subtracted because they are specific to the land itself, the remainder forms a proxy value of the economic returns to the livelihood for the representative adult and child of VUV48,988 monthly. If only food and shelter costs are considered and all other costs ignored, then the proxy for the livelihood value is VUV40,798 monthly.

This can be favourably compared with the Vanuatu minimum wage, VUV26,000 monthly.

Favourable comparisons can also be made with the value of own account production provided in the 2006 Vanuatu Household Income and Expenditure Survey (Vanuatu National Statistics Office 2007b), which also formed the basis for Vanuatu National Statistics Office Poverty Line calculations (Vanuatu National Statistics Office 2007c). The value provided was VUV16,840 monthly (Vanuatu National Statistics Office 2007b: 41). This value was used in a number of reports on poverty lines and the incidence of poverty in Vanuatu (VSNO 2007a, Whiteford et al. 2010, Whiteford and Yoshihara 2011, Robertson 2010 are all 'legacy' documents) for the World Bank, UNICEF and the Asian Development Bank.

At the higher proxy value, VUV48,988 monthly with hidden costs quantified, the returns to the subsistence-plus livelihood are nearly twice that of the Vanuatu minimum wage earner, and three times higher than that imputed (VUV16,840) in the 2006 HIES (Vanuatu National Statistics Office 2007b).

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1 The representative household was the population density on the standard land area, 1.2 persons, assumed to be one adult and one child.
At the lower value, VUV40.798, where food and shelter alone are considered, the returns are one and a half times those of the minimum wage earner, and two and a half times the imputed value in the 2006 HIES.

If the results of this method of valuation had not been orders of magnitude higher than the valuations implicit in the Vanuatu minimum wage, and the imputation of own-account production which have found their way into International Poverty Line calculations, then there would have been cause for considering that a case had not been made. An argument could have been mounted successfully that the discrepancies in data, and the anecdotal nature of some data in the present valuation, were sufficient to make hollow any claim that the dominant measures needed to be called into question. The order of magnitude difference are enough to suggest that there is a possibility, perhaps strong, that the approximation to reality of the dominant models is less than it would appear.

10.1.2 Land use projections and comparison

A series of projections and a comparison were employed to determine the extent of the effects of land withdrawals on rural households. This built on the picture of land withdrawal costs already calculated.

The projection series showed that land withdrawals to leasehold had had severe effects on Efate, where optimal land use distribution had been passed, with 3,525 households utilising agricultural land optimal for 1,346 households.

In Shefa province, the situation was also severe, with Pareto optimal land distribution reached.

Elsewhere in Vanuatu, the projections showed some leeway to optimal land use distribution, in the order of 50 years.

Tikopia, an island much closer to the horizon of unsustainability, was chosen as a proxy for comparison with the situation in Vanuatu and as a cross-reference for the projection series results.

The comparison showed that for most of Vanuatu, there was little evidence of the active measures of population and natural disaster risk management seen on Tikopia. Some islands were regarded as overcrowded (Paama and Tongoa), but on Efate, where the projections indicated a dire situation, there was little evidence of Tikopia-like measures in place, aside from the steep decline in fallow periods and moves towards permanent cultivation.

The lack of corroboration from the comparison with Tikopia suggests that a cautious reading of the results from the projections is the safest course to follow.

The rate of land withdrawals remains a concern. The development model suggests that land liberalisation is a prerequisite in the transition to a market economy. If that transition does not occur, then those whose livelihoods depend on traditional land systems will be disadvantaged by land liberalisation. If the market economy is growing and employment, small business and other livelihood opportunities are being created, then the land withdrawals may indicate a net benefit. If such is not the case, and the next section demonstrates that it is unlikely, then the loss of land is destructive.
10.1.3 Livelihood framework analysis

From the specifics of the costs, and the extent of the effects, of land withdrawal on the livelihoods of rural households, the study moved to the more general comparative study of Vanuatu livelihoods.

The framework for analysis offered by Frank Ellis (Ellis 2000), and some of the methodologies he suggested, were used for the analysis, but the units of measure adopted were those which measure access to resources, principally by percentage participation. In adopting this course, cash-based, or wealth-based measures were avoided. This was entirely in keeping with the aim of this study, to utilise measures which did not discriminate against economic systems where cash and wealth were not the sole determinant of levels of access to resources. It may be said that the model was not challenged in this instance, but the assumptions underlying the formulation of the variables measured were, because they were the assumptions of the dominant model in the economics of development.

Two asset pentagons were constructed, earlier and later sets, for assessment of the impacts of policies, institutions and processes; and of trends and shocks. Impacting influences were identified.

Typologies of livelihood strategy were developed which utilised subsistence-based measures to form a set of subsistence-plus typologies, with subsistence the core component.

Finally, impacts on livelihood security and sustainability were discussed, but not quantified.

The livelihood framework analysis found that, contrary to expectations and to the dominant development discourse of ‘transitional’ economies, most urban dwellers were following subsistence-plus livelihoods, and that wages and salaries were, with the probable exception of the urban elite, insufficient for viable livelihoods. For the remainder of the analysis, urban households were characterised as following subsistence-plus livelihoods, with a narrow (wage and salary) base of financial capital assets.

Rural livelihood assets were seen to have declined, unequivocally, over time. For urban households, despite a likely growth in overall assets, access to wages and salary-earning opportunities, on which they solely rely for financial capital, had declined steeply since Independence.

A serious decline in fallow and other features of agricultural intensification were noted. It was found that increasing uncertainty about land tenure meant that those holding land were reluctant to release their hold, for fear of losing their entitlement. This meant that almost permanent cultivation was becoming widespread, less because of consumption needs, and more as a means of securing tenure. This feature, coupled with high levels of land withdrawals, is producing a downward-spiralling feedback loop in which, as more land is lost through withdrawal, the less likely people are to release any holding they have.

Subsistence-plus typologies of livelihood strategies showed clear advantages for rural households, which had a more diverse range of livelihood assets than urban households. Urban household's overwhelming reliance on wages and salary, or small business, to supplement the subsistence 'core' makes them more vulnerable to livelihood failure.

Livelihood security and sustainability were both at hazard, particularly for urban households, with declining access to wages and salary, and no formal tenure rights. For all households, the threats posed by introduced species, some as results of failed agricultural
development projects, are growing and there is little or no government capacity to intervene.

Overall, the framework analysis has shown that many urban households and all rural households rely on subsistence-plus production. The percentage population following this livelihood is probably closer to 90 per cent of the population, than the 75 per cent claimed in the 2006 Agricultural Census (Vanuatu National Statistics Office 2007a).

It appears that, in the enclave economy of Port Vila, access to wages and salary are in decline, giving a lie to the notion underlying much of the international development aid assistance that the economy is transforming to a market economy.

What is certain is that the efforts to promote that transition are having major negative effects, with declining rural and urban livelihood assets and declining livelihood security and sustainability.

10.1.4 Food Resilience Index and rankings

The final research task broadened the scope of the study from the general (Vanuatu) to the universal (World), or the nearly universal, as not all countries were included in the Food Resilience Index rankings.

This final challenge to the dominant measures of development, including the Human Development Index, the International Poverty Line and the Ecological Footprint, began with an insistence that any ranking of performance must be grounded in some context, and that the measures chosen must not be normative in nature, so that all types of economy would, or could, rank highly on the basis of performance over a range of indicators.

Presently, world food prices are at historically high levels, and world food stocks are in decline. This situation provides the contextual background for the Food Resilience ranking — world food insecurity. The measures chosen: agricultural land per capita, national food self-sufficiency, urban subsistence-plus capacity, population adaptability and, finally, climate and agriculture type were selected on the basis that they had been shown to be advantageous for Vanuatu households. Each indicator fitted the food insecurity context and all were characteristics which could be present in any economy, from subsistence through to globalised, networked market economies.

The results were, on face value, controversial, and similar to those found in the Ecological Footprint rankings, where it is the highly-developed economies which are the biggest polluters and greediest consumers of natural resources, and which score badly while the less-developed countries do well, whether they are starving or not.

So it was in the Food Resilience Index rankings, with countries which are not highly reliant on purchasing power in the global food system, scoring well and those very reliant on it scoring poorly.

Two rankings were compiled — a set of early 1990s data and another from around 2005. In addition to the absolute rankings, comparisons over time could also be made. There was little change overall, but countries experiencing increasing urbanisation or higher levels of internal displacement, or refugees, such as Somalia, dropped down the rankings, while those with improved food self-sufficiency, such as Lesotho, rose.

In effect, the most important result of the Food Resilience Index ranking was that it clearly illustrated there are two very different options in play, world-wide, to maintain resilience to
food insecurity. For the globalised, networked economies one strategy alone has assumed
over-riding importance — access to the global food system through comparative advantage
in purchasing power. All other strategies are discounted. These countries had low scores
in the Food Resilience Index ranking

For other economies, particularly those with high levels of subsistence production, the
option taken is to maintain a diverse range of agents of resilience. These countries had
high scores.

In a time of rising prices and falling stocks more intense competition for food may mean
that middle ranking countries relying on purchasing power may begin to experience failures
in food supply as they are priced out of the market, and if they lack diversity in elements
of resilience to food insecurity, that failure in supply may have dire consequences.

The Food Resilience Index ranking indicates that for those countries with limited capac-
ity to compete in terms of purchasing power, maintaining a diverse range of factors of
resilience would seem a prudent course.

Such a course, in the eyes of the international agencies and the donor aid countries at least,
would not be favoured. For them, purchasing power seems to be the main thing, if not the
only thing.

10.1.5 Conclusions

The objective of this study has been to test the possibility of achieving Harding's 'strong
objectivity'.

In the introduction it was estimated that half of the human population of the Earth may
follow subsistence-based livelihoods, and they have done so for many years, some for
thousands, yet nowhere and never is there a suggestion that they may have as good, if not
better answers to the problems of livelihood, society and culture as those who follow a
different way.

Beginning in rural Vanuatu, this study has searched for those answers.

What follows here is an attempt at synthesis of the research findings, in search of objective
truth.

The study presents a simple story,

Most ni-Vanuatu households, rural and urban, follow subsistence-plus livelihoods. Those
livelihoods are undervalued by International agencies, but on the evidence presented in
this thesis, provide far better returns than those obtained by a Vanuatu minimum wage
earner.

Above all, the subsistence-plus livelihood relies on entitlement to, and availability of, good
agricultural land. When current trends — large-scale withdrawal of land, increasing un-
certainty about land tenure systems and the supposed 'transitional' state of the Vanuatu
economy — were examined in the light of that finding, the land withdrawals themselves,
the efforts by government and external donors to bring certainty to land tenure and policies
designed to increase exposure to international markets, could all be shown to be actively
detrimental to the subsistence-plus livelihood.

When evidence indicated that not only rural households, but also urban households were
engaged in subsistence-plus production, the detrimental nature of the interference was
further amplified.

Declines in the security and sustainability of the subsistence-plus livelihood have not been matched by greater access to the market economy, as access to wage and salary options are declining, and wage and salary levels are too low to provide viable options. Overall, livelihood security and sustainability are in decline.

If the nature of subsistence-plus livelihoods elsewhere in the world echoes those of Vanuatu, then the detriment brought by policies designed to lead households away from self-sufficient production towards market-based production and work-force participation is, in all likelihood, being experienced well beyond Vanuatu.

World-wide, there is a decline in food stocks and food prices have risen steeply since 2000. In such an environment, most countries in which subsistence-plus production is the dominant production system have a diverse range of strategies which make them resilient to food insecurity. For the globalised, networked economies, a diverse range of strategies is less evident. Middle-ranking countries which rely on purchasing power in the global food system are likely to be more vulnerable to food insecurity, and in terms of resilience, less 'developed'.

This story rests on one fundamental proposition — that Vanuatu subsistence-plus livelihoods provide far better returns than those obtained by those earning the Vanuatu minimum wage or by those indicated in the imputations of own-account production produced in the National Accounts and adopted in Poverty Line estimates, and if that be the case, then subsistence-based livelihoods everywhere may also compare favourably with other livelihoods. This proposition is understood, perhaps intuitively, by the ni-Vanuatu subsistence-based producers themselves as being closer to the reality of their lives than any models of development may suggest, as they have claimed (Regenvanu 2009).

That proposition is in direct opposition to, and is contested by the valuation of subsistence-plus production promulgated by the World Bank and the United Nations development agencies, which place the returns below those of the Vanuatu minimum wage earner. World-wide, these agencies assess subsistence-based production as inferior to other livelihoods. For them, too, this proposition is fundamental to the 'one path' view of development.

If they are closer to the truth, then there is an objective basis for donor-aid and international agency-driven development, because there is an imperative for economic transformation. The risks involved in supporting that transformation: land insecurity; livelihood insecurity; social and cultural upheaval among many, can be countenanced.

The pain may, in effect, be worth it.

If, however, the results presented in this study are a closer approximation to objective truth, then the ni-Vanuatu 'grasruts' idea that their subsistence gardening and village culture are viable alternatives to market economy livelihood options can be seen in a similar light, as a reasonable approximation of objectivity.

The situation has the makings of parallel universes.

In one universe, subsistence returns are higher than those of the market economy, so subsistence-plus production should be maintained, as should the land tenure systems which support it.

In a food insecure world in this universe, policies which militate against the livelihood should be discontinued, because they are causing harm for uncertain gain.
This is the universe of the ni-Vanuatu 'grasruts' and the three billion or more others in the world who are likely to be following subsistence-based livelihoods.

In the other universe, subsistence returns are lower than market-based returns, and the people are 'poor'. Only transition to market-based production and market-based economy will enable growth, higher returns and the alleviation of poverty. With successful transition, purchasing power will grow.

In this universe, development is impervious to context. Whether the world is food insecure or not, school education, share of gross national income and length of life expectancy are vital indicators of development.

Whether supposedly 'poor' households have greater self-sufficiency or not, they need to develop market-based strategies to become 'less poor'.

In this universe, policies which inflict collateral damage on subsistence-based livelihoods are assisting in the alleviation of 'poverty' and should be persisted with and perhaps expanded.

This is the universe of the agents of the globalised, networked world market economy; the United Nations development agencies, the World Bank, the donor countries and their non-government sub-contractors.

In the end, it may well come down to the first brick in the wall — the foundational idea — to mix the metaphors a little, one last time.

Is the valuation of subsistence-plus livelihoods provided in this study closer to the objective truth of those livelihoods? Or are estimates made by the World Bank economists of the imputed costs of consumption — based on an estimate of consumption with few standard quantities; no standard prices; not verified by measurement; and is self-reported, in many cases, by persons with unknown levels of literacy and numeracy — more likely to closer approximate the real situation, the 'truth' of subsistence-plus households?

It is on the basis of those estimates that the insecure edifice of 'Development' is built.

10.2 Further studies

Three areas covered in this thesis seem worthy of consideration for further study.

The evaluation of the economic returns to the Vanuatu subsistence-plus farmers is a radical departure from the traditional methods of calculating the value of subsistence production. Further case studies in other places and other farming systems, utilising the methodology — determining a standard livelihood area and a population density on that area, and then assessing costs of withdrawal of that area from production — would provide a more certain basis for calling imputation methodology into question.

Second, a more comprehensive examination of factors of resilience to food insecurity, coupled with a more extensive ranking of countries on the Food Resilience Index, including some middle-ranked countries in the Human Development Index, would provide a more certain basis for the concerns expressed in the previous section about competitive disadvantage and lack of resilience. It has been assumed in this study that they do not employ a range of strategies. Such may not be the case.

Lawson's (2007) notion of 'big D' development is recalled here.
Lastly, the feasibility of comparing all economies on a common basis, a task which seemed at the outset unlikely to succeed, seems to have been a limited success, at least. The common basis I am referring here is the measurement of access to resources by percentage participation. It should be possible to construct asset pentagons for a wide variety of livelihoods across the entire range of economies, and then to compare them. Such a comparison would provide an alternative to the dominant measures, which rely so heavily on cash-based or cash-dependent variables.

For those who continue to struggle to understand why development aims are so rarely matched by their outcomes, light may be shed.
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Appendix A

Selected maps

Figure A.1: Efate and islets
Figure A.2: Vanuatu

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Figure A.3: Port Vila
Figure A.4: Santo and islets
Figure A.8: Erromango

Figure A.9: Ambrym
Figure A.10: Lukanville, Aore and Malo
Appendix B

Pareto year calculations and methodology

To calculate the year of Pareto optimality for agricultural land, a spreadsheet macro was used, designed to iterate population growth at a set rate. The macro was run until the best fit year was reached for each scenario.

The macro results were verified against a standard calculation for population growth:

\[ T = \left( \ln(P(t2)) - \ln(P(t1)) \right) \div R \]  \hspace{1cm} (B.1)

Where \( T \) is the time in years taken for a starting population, \( P(t1) \), to reach an end population, \( P(t2) \), at a particular rate of growth, \( R \).

Vanuatu

1. Quantin's figure for good agricultural land is 5403km\(^2\) (Vanuatu National Statistics Office 1984: 5.11)

2. How much of this land is already used for all Vanuatu agriculture?

Table B.1: Agricultural land use: Vanuatu\(^1\)

<table>
<thead>
<tr>
<th>crop</th>
<th>( \text{km}^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>gardens</td>
<td>7.5</td>
</tr>
<tr>
<td>coconuts</td>
<td>118.0</td>
</tr>
<tr>
<td>kava (@ 485 plants/hectare (1))</td>
<td>38.0</td>
</tr>
<tr>
<td>cacao</td>
<td>22.2</td>
</tr>
<tr>
<td>coffee</td>
<td>3.5</td>
</tr>
<tr>
<td>vanilla</td>
<td>6.6</td>
</tr>
<tr>
<td>pepper</td>
<td>0.2</td>
</tr>
<tr>
<td>cattle (75% — only those in paddocks)</td>
<td>53.6</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>249.6</strong></td>
</tr>
</tbody>
</table>

---

\(^1\)VNSO 2007a, (1)https://spc.int/cis/PacificKavaProducersGuide/Chap1.htm
3. Subtract land currently used from land available (km²):

\[ 5403 - 250 = 5153 \]  \hspace{1cm} (B.2)

4. The average amount of land allocated for garden and coconuts per household over the three censuses 1983, 1993 and 2007 is 3.76 hectares (0.0376 km²), so if we divide 5153 by 0.0376, we will obtain a value for the ‘carrying capacity’ of the land in households — this is 137,048 households.

\[ 5153 \div 0.0376 = 137,048 \]  \hspace{1cm} (B.3)

5. Rural population has grown at around 2.8% per annum, over the past forty years (censuses 1967 — 2009), so Pareto optimality year will be reached when the population is 137,048 households.

6. Using the population iterator macro, at 2009 (Vanuatu National Statistics Office 2010) there were 34,887 rural households — to get from 34,887 to 137,048 households at a growth rate of 2.8% per annum will take until 2060, with land withdrawals ignored.

\[ 34,887 \div > 137,048@2.8\% p.a.2010\div>2060 \]  \hspace{1cm} (B.4)

7. **best case scenario**

Now subtract land withdrawals to leasehold (km²). That is 10% land loss on Santo/Malo = 176km², and 60% land loss on Efate = 304km². Land loss is for Santo/Malo and Efate only, other losses not taken into account.

\[ 5153 - (176 + 304) = 4673 \]  \hspace{1cm} (B.5)

8. The carrying capacity in households is now reduced to:

\[ 4673 \div 0.0376 = 124,293 \]  \hspace{1cm} (B.6)

9. Pareto optimality in the best case scenario will be reached in 2056.

\[ 34,887 \div > 124,293@2.8\% p.a.\div>2056 \]  \hspace{1cm} (B.7)

10. **worst case scenario**

Pareto optimality will be reached in the in 2052.

\[ 5153 - (528 + 456) = 110,898 \]  \hspace{1cm} (B.8)

110,898 households

\[ 34,887 \div > 110,898@2.8\% p.a.\div>2052 \]  \hspace{1cm} (B.9)
Table B.2: Agricultural land use: Sanma

<table>
<thead>
<tr>
<th>crop</th>
<th>km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>gardens</td>
<td>1.5</td>
</tr>
<tr>
<td>coconuts</td>
<td>15.5</td>
</tr>
<tr>
<td>kava (5,184,000 plants @ 485 plants/hectare(1))</td>
<td>10.7</td>
</tr>
<tr>
<td>cacao</td>
<td>1.4</td>
</tr>
<tr>
<td>coffee</td>
<td>0.0</td>
</tr>
<tr>
<td>vanilla (3723 parcels @ 0.64 ha. per parcel)</td>
<td>2.4</td>
</tr>
<tr>
<td>pepper (1259 parcels @ 0.34 ha. per parcel)</td>
<td>0.1</td>
</tr>
<tr>
<td>cattle (3191 paddocks @ 6 ha. per paddock)</td>
<td>19.1</td>
</tr>
<tr>
<td>total</td>
<td>50.7</td>
</tr>
</tbody>
</table>

Sanma

1. Quantin’s estimate is 1810km².
2. How much is used now for all agriculture in Sanma?
3. available land (km²):
   \[1810 - 50.7 = 1759\] (B.10)
4. carrying capacity in households:
   \[1759 ÷ 0.0376 = 46,782\] (B.11)
5. At 2009, there were 6,639 households. To reach 46,782 households will take until 2080, in a no land withdrawn scenario.
   \[6,639 - > 46,782@2.8\%p.a. - > 2080\] (B.12)
6. best case land loss (10%) is (km²):
   \[1759 - 176 = 1583\] (B.13)
7. carrying capacity in households is reduced to:
   \[1583 ÷ 0.0376 = 42,104\] (B.14)
8. Pareto optimality is reached at 2077.
   \[6,639 - > 42,104@2.8\%p.a. - > 2077\] (B.15)
9. worst case land loss (30%):
   \[1759 - 528 = 1231\] (B.16)
   households carrying capacity is:
   \[1231 ÷ 0.0376 = 32,747\] (B.17)

\(^2\) (VNSO 2007a, (1)https://spc.int/cis/PacificKavaProducersGuide/Chap1.html)
10. Pareto optimality is reached in 2067.

\[ 6,639 - > 32,747 \times 2.8\% \times p.a. - > 2067 \]  \hspace{1cm} (B.18)

**Shefa**

1. Quantin's estimate is 791km² (Epi 195, Tongoa 53, Efate 543).
2. How much is used now for all Shefa agriculture?

<table>
<thead>
<tr>
<th>Crop</th>
<th>km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>gardens</td>
<td>1.5</td>
</tr>
<tr>
<td>coconuts</td>
<td>44.0</td>
</tr>
<tr>
<td>kava (@ 485 plants/hectare (1))</td>
<td>2.1</td>
</tr>
<tr>
<td>cacao</td>
<td>0.4</td>
</tr>
<tr>
<td>coffee (assuming 12% of total production)</td>
<td>0.4</td>
</tr>
<tr>
<td>vanilla (690 parcels @ 0.64 ha, per parcel)</td>
<td>0.4</td>
</tr>
<tr>
<td>pepper (4 parcels @ 0.34 ha, per parcel)</td>
<td>0.0</td>
</tr>
<tr>
<td>cattle (819 paddocks @ 6 ha, per paddock)</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>53.7</strong></td>
</tr>
</tbody>
</table>


3. available land (km²):

\[ 791 - 53.7 = 737 \]  \hspace{1cm} (B.19)

4. At 2009 there were 6,911 households. Carrying capacity is:

\[ 737 \div 0.0376 = 19,609 \]  \hspace{1cm} (B.20)

5. Pareto optimality for 19,609 households in a no land loss scenario is 2048.

\[ 6,911 - > 19,609 \times 2.8\% \times p.a. - > 2048 \]  \hspace{1cm} (B.21)

6. **best case** 60% land loss scenario is:

\[ 737 - 304 = 434 \]  \hspace{1cm} (B.22)

7. households carrying capacity is reduced to:

\[ 434 \div 0.0376 = 11,532 \]  \hspace{1cm} (B.23)

8. Pareto optimality is reached at 2029.

\[ 6,911 - > 11,532 \times 2.8\% \times p.a. - > 2029 \]  \hspace{1cm} (B.24)
9. **worst case** 90% land loss scenario is:

\[ 737 - 456 = 282^3 \]  
\[ \text{(B.25)} \]

10. households carrying capacity is now:

\[ 281 \div 0.0376 = 7494 \]  
\[ \text{(B.26)} \]

11. Pareto optimality is reached in 2013.

\[ 6,911 - > 7494\% @ 2.8\% p.a. - > 2013 \]  
\[ \text{(B.27)} \]

**Efate**

1. Quantin's estimate is 543km².

2. How much is used for all agriculture?

3. No breakdown is available for each crop, so a percentage of the Shefa estimate is used, obtained from calculating the good potential land on Efate as a percentage of that for Shefa.

\[ 543 \div 791 \times 100 = 69\% \]  
\[ \text{(B.28)} \]

4. 69% of 53.7(Shefa total) is (km²):

\[ (53.7 \times 69) \div 100 = 36.9 \]  
\[ \text{(B.29)} \]

5. available land is (km²):

\[ 543 - 36.9 = 506 \]  
\[ \text{(B.30)} \]

6. At 2009 there were 3,525 households. Households carrying capacity is:

\[ 506 \div 0.0376 = 13,461 \]  
\[ \text{(B.31)} \]

7. Pareto optimality for 13,461 households, in the no land loss scenario is 2058.

\[ 3,525 - > 1346\% @ 2.8\% p.a. - > 2058 \]  
\[ \text{(B.32)} \]

8. **best case** The 60% land loss scenario is:

\[ 506 - 304 = 202 \]  
\[ \text{(B.33)} \]

9. this reduces households carrying capacity to:

\[ 202 \div 0.00376 = 5384 \]  
\[ \text{(B.34)} \]

10. Pareto optimality is reached at 2025.

\[ 3,525 - > 5384\% @ 2.8\% p.a. - > 2025 \]  
\[ \text{(B.35)} \]
11. **medium case** 75% land loss scenario is:

\[ 506 - 380 = 126 \]  \hspace{1cm} (B.36)

12. reduced households carrying capacity is:

\[ 126 \div 0.0376 = 3365 \]  \hspace{1cm} (B.37)

13. Pareto optimality is reached in 2006.

\[ 3,5235 - 3365 @ 2.8\% p.a. - > 2006 \]  \hspace{1cm} (B.38)

14. **worst case** 90% land loss scenario is (km²):

\[ 506 - 456 = 50 \]  \hspace{1cm} (B.39)

15. carrying capacity reduces to:

\[ 50 \div 0.00376 = 1346 \]  \hspace{1cm} (B.40)

16. Pareto optimality *not* reached in 1975!

\[ 3,525 - 1346 @ 2.8\% p.a. - > 1975 \]  \hspace{1cm} (B.41)
Appendix C

Rural and urban subsistence-plus livelihoods: Raw data tables and technical notes

C.1 Human capital

Variable measures for human capital

- household size
- access to information/ knowledge
- health

Household size

This variable shows productive capacity (Chayanov 1986) — what is the household productive capacity?

The average household in Vanuatu has fluctuated around 5.1 persons since census-taking began. Given the population structure is of 'pine tree' type, with 50 percent of the population under 20 years of age (Vanuatu National Statistics Office 2010B), this translates to slightly more than two workers per household.1 Adult Equivalent Units have not been attempted, as these seem to be constructed on quite arbitrary assumptions about how much work children perform (see Creedy and Sleeman 2005: 2-3 for an example).

---

1 Shuaib and Rahman 2008: xvii give a ratio of dependants to adults of 0.83.
Table C.1: **Household size: Provinces, Rural, Urban and Vanuatu**

<table>
<thead>
<tr>
<th>Province</th>
<th>1967</th>
<th>1989</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malampa</td>
<td>4.9</td>
<td>4.9</td>
<td>4.5</td>
</tr>
<tr>
<td>Penama</td>
<td>4.7</td>
<td>5.0</td>
<td>4.5</td>
</tr>
<tr>
<td>Sanma</td>
<td>5.5</td>
<td>5.0</td>
<td>4.8</td>
</tr>
<tr>
<td>Shefa</td>
<td>5.9</td>
<td>5.5</td>
<td>4.8</td>
</tr>
<tr>
<td>Tafea</td>
<td>5.7</td>
<td>5.5</td>
<td>5.5</td>
</tr>
<tr>
<td>Rural</td>
<td>5.1</td>
<td>5.1</td>
<td>4.8</td>
</tr>
<tr>
<td>Urban</td>
<td>5.0</td>
<td>5.1</td>
<td>4.8</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>5.1</td>
<td>5.1</td>
<td>4.8</td>
</tr>
</tbody>
</table>

(INSSE 1967: 45, VNSO 1989: 93, VNSO 2010: 3.8)²

All provinces and the urban areas show a downward trend in household size, with Penama increasing in 1989, but returning to trend by 2009. If households are getting smaller, then their productive capacity is reduced. Households are likely to have surplus capacity (Gudeman 1978, Chayanov 1986 for the life cycle of household surplus capacity), but that is impossible to measure without breaking down the figures into household types.

**Access to information/ knowledge**

This measure combines a number of variables — school education, availability of traditional knowledge, access to radio and access to telephone (mobile and landline).

In industrialised societies, level of school education is a clear indicator for livelihood security prospects as it is linked to social and cultural entitlements.

Table C.2: **Percentage school age children who attended: Provinces, Rural, Urban and Vanuatu**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Malampa</td>
<td>66.8</td>
<td>80.4</td>
<td>n/a</td>
<td>88.0</td>
<td>93.1</td>
</tr>
<tr>
<td>Penama</td>
<td>57.4</td>
<td>71.6</td>
<td>n/a</td>
<td>81.0</td>
<td>75.2</td>
</tr>
<tr>
<td>Sanma</td>
<td>60.1</td>
<td>63.0</td>
<td>n/a</td>
<td>74.0</td>
<td>75.7</td>
</tr>
<tr>
<td>Shefa</td>
<td>65.8</td>
<td>83.4</td>
<td>n/a</td>
<td>94.0</td>
<td>82.7</td>
</tr>
<tr>
<td>Tafea</td>
<td>46.6</td>
<td>52.2</td>
<td>n/a</td>
<td>53.0</td>
<td>70.4</td>
</tr>
<tr>
<td>Rural</td>
<td>59.3</td>
<td>73.1</td>
<td>79.9</td>
<td>82.0</td>
<td>79.6</td>
</tr>
<tr>
<td>Urban</td>
<td>n/a</td>
<td>n/a</td>
<td>93.4</td>
<td>95.0</td>
<td>83.8</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>55.0</td>
<td>71.6</td>
<td>80.6</td>
<td>83.3</td>
<td>80.4</td>
</tr>
</tbody>
</table>

(INSSE 1967: Tableau 10, SPC 1979: 92; Table 72, VNSO 1989: 43; Table 14.1, VNSO 1999: 102; Table 3.1, Shuaib and Rahman 2008: 95: Table E.D.3)³

In other societies, where livelihood strategies are passed on using traditional, unwritten knowledge (as subsistence-plus agriculture is), then there are grounds for discounting the

²1967 and 1989 numbers for Penama, Malampa and Shefa provinces are derived from older Local Government Regions by aggregation.

³INSSE: percentage figures from most populated islands only.
importance of school education. This discounting should be at a higher rate as school education is provided in English or French, neither of which are widely spoken in ni-Vanuatu communities. However, subsistence-plus households do engage with the exchange economy, and cash is required for school fees and prestige goods, so school education cannot be entirely discounted, but needs to be incorporated with acquisition of traditional knowledge.

The values given are calculated from numbers of children of school age who never attended school, which were available. Conversely, school attendance was not. The values are thus 100 less the percentage of children never schooled.

Numbers by year level reached was available, but introduces a notional qualitative element — more years equals better — which cannot be proved one way or the other and so has not been included.

Aside from the anthropological studies, which are rich, but local, there is no direct, broad scale information on acquisition of local knowledge. However, where children reside in their birthplace, and speak the local language, it can be safely assumed that they will acquire local knowledge and local social and cultural entitlements. The figures in Table C.3, which show the percentages of people who reside in the area where they were born, provides such a measure.

Table C.3: Percentage residents in their birthplace: Provinces, Rural, Urban and Vanuatu

<table>
<thead>
<tr>
<th>Province</th>
<th>1967</th>
<th>1989</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malampa</td>
<td>97.9</td>
<td>89.9</td>
<td>89.8</td>
</tr>
<tr>
<td>Penama</td>
<td>95.7</td>
<td>92.1</td>
<td>90.6</td>
</tr>
<tr>
<td>Sanma</td>
<td>63.3</td>
<td>89.7</td>
<td>93.6</td>
</tr>
<tr>
<td>Shefa</td>
<td>75.5</td>
<td>81.1</td>
<td>88.3</td>
</tr>
<tr>
<td>Tafea</td>
<td>98.1</td>
<td>95.1</td>
<td>92.1</td>
</tr>
<tr>
<td>Rural</td>
<td>97.4</td>
<td>90.4</td>
<td>90.3</td>
</tr>
<tr>
<td>Urban</td>
<td>38.2</td>
<td>44.3</td>
<td>85.8</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>87.1</td>
<td>81.4</td>
<td>89.3</td>
</tr>
</tbody>
</table>


These figures are used again later in this section as a measure for social capital, but are relevant to both areas. Ni-Vanuatu see the opposing forces of tradition and modernity as a battle between 'skul' and 'kastom'4(Jolly 1997), but in effect, rather than being mutually exclusive, they can be added together to provide a blended, enhanced measure of human capital in any population in Vanuatu, with one important note of caution. Urban provenance has been on the rise, but cannot be said unequivocally to confer social and cultural benefits, because the society and culture of the urban areas are heterogeneous, and the urban language is Bislama, which likewise confers no benefits.

Table C.3 shows residents living in their birthplace as a percentage of population, an indicator of capacity for local knowledge acquisition.

Taking the two sets of figures for schooling and provenance together, there are some noteworthy aspects when considering human capital assets.

4Bislama — school and custom traditions.
School attendance rose from 1967 to Independence, but has subsequently declined, overall and in both urban and rural Vanuatu. Provenience has declined generally in rural areas.

| Table C.4: Percentage population with radio ownership/access: Rural, Urban and Vanuatu |
|---|---|---|
| 1979 | 1989 | 1999 |
| Rural | 48.4 | 44.5 | 45.0 |
| Urban | 76.1 | 76.8 | 77.0 |
| Vanuatu | 52.4 | 50.7 | 52.0 |

(STER 1979: 106; Table 86; VNSO 1989: 109: Table B27, VNSO 1999: 144-5: Table 4.10a)

While there is a national television broadcaster, there is no service outside Port Vila, other than Christian channels. As a result, television access/ownership has been excluded from the variables.

The collection of data on radio ownership or access to broadcast has been patchy.

Radio is an important source of information, particularly in providing disaster warnings. Radio Vanuatu provides emergency broadcast services during cyclones and other extreme events — tsunami warnings, volcanic eruptions.

Service to the more remote islands by the national broadcaster has only recently been resumed after a long period of decline in service area. Radio Australia and the BBC World Service are received throughout the archipelago, but more so for the northern areas, and less so in the south. Radio has been used by a number of initiatives in agriculture as a means of dissemination of information (Chapman et al. 2003).

In the 1979, 1989 and 1999 censuses, radio ownership or access was enumerated, however in the 1979 and 1989 reports only aggregates for rural and urban areas and all Vanuatu are provided. The 1999 census report does provide a breakdown to island level, but the final data set has been constrained to rural, urban and Vanuatu overall.

Recent improvements in radio coverage are a result of concerted efforts by Radio Vanuatu and AusAID (Jean-Gabriel Manguy, pers. comm. 2008).

| Table C.5: Percentage population with telephone: Provinces, Rural, Urban and Vanuatu |
|---|---|---|
| Province | 1999 | 2009 |
| Malampa | 21.5 | 75.0 |
| Penama | 29.7 | 71.0 |
| Sanma | 9.5 | 81.0 |
| Shefa | 41.1 | 87.0 |
| Tafea | 4.9 | 63.0 |
| Rural | 20.4 | 44.5 |
| Urban | 27.2 | 87.0 |
| Vanuatu | 22.0 | 76.0 |

(VNSO 1999: 154-5: Table 4.10f, VNSO 2010B: 27)
In 2008, telecommunications were liberalised and the former monopoly provider (Telecom Vanuatu Limited) faced competition from Digicel, which extended mobile network capacity from two small areas — around Port Vila and Luganville to almost all regions.\(^5\) It is perhaps too generous to count access to telephone services as a measure of human capital, but it does provide the capacity to obtain information. In addition, telephone services provide early warnings in weather events or other natural hazards.

The 1999 census is the earliest available source on phone use. There was no mobile service at this time. The 2009 census provides some figures on mobile phone ownership, but in the summary release there is no breakdown into owned, shared or accessible services. From personal knowledge, many mobile phones are shared or household-owned, and many services are not in use.\(^6\)

Internet usage has been excluded although both modem and broadband are available through Telecom Vanuatu Limited and wireless broadband through Digicel, both at relatively high cost to the subscriber. The available numbers do not distinguish between commercial, institutional, government and home users.

The values for radio and telecommunications access are strongly influenced by the availability of electricity. Electricity from the grid is only available in a few major locations — provided by UNELCO, a subsidiary of the French transnational energy company Suez — provided either by diesel generators, wind turbines or hydro-generation. Elsewhere batteries, solar panels, wind turbines and diesel/petrol generators are required for electricity supply (to charge mobile phones, laptop computers, run lights and view digital versatile disks). It is impossible to estimate the influence that lack of access to mains’ electricity has on the uptake of radio, telecommunications services and computer use. Computers are hungry consumers of electrical power, even to the charging of laptops.\(^7\) There are a number of (perhaps apocryphal) stories of class-sets of computers sitting, monument-like, in classrooms on remote islands which have no access to electricity generators, generously donated by people to whom the idea that electricity may not be available for computers had obviously not occurred.

Health

There are two aspects of health which directly affect livelihood — health issues and access to health services. Both these aspects will be combined in the health measure. There are serious deficiencies in continuity in health data — Coyne’s studies (1984 and 2000) and the recent Multiple Indicator Cluster Survey (Shaib and Rahman 2008) summarise most of the available information, but the period 1990 — 2000 is something of a data desert.

Health issues

Two significant health issues will be excluded from the health sets, due to difficulties with the data. They are life expectancy at birth — the only available information is aggregated at national level — and sexually transmitted infections, for which information was collected at Vila Central Hospital on two occasions, but subjects’ place of residence was not


\(^6\) Any time one buys a mobile phone in Vanuatu, the user can expect many calls from people wanting to talk to the many previous owners of the number. Mostly pre-paid mobile phones are sold, and many are discarded after a few refills, or lost or (frequently) stolen.

recorded. Neither survey could thus provide differentiated rural and urban values. Despite this exclusion, some discussion of the problem of STIs is warranted.

In a 2000 study at Vila Central Hospital, rates of sexually transmitted infections were high. 39 per cent of 545 women presenting for their first antenatal visit had at least one of four STIs — Chlamydia, Gonorrhoea, Syphilis or Trichomona. Many had multiple infections (World Health Organisation 2000). This study was followed up in 2005 (World Health Organisation 2006: 106-122). This time single infections were found in 18.4 per cent of the study population, but for unknown reasons Trichomona, the most common infection in the earlier study was not included in the results. If the rate of trichomonas infection had held constant (27.5 per cent in 2000), then the number for those studied with at least one sexually transmitted infection would be 45.9 per cent. It is impossible to confidently discuss trends with these information gaps.

In passing, it must be said that HIV/AIDS would seem to be an inevitable medical problem in the near future, if not at present, given the high rates of other sexually transmitted infections. The free movement of students attending the University of the South Pacific between Melanesian and Polynesian countries, the frequent travelling of politicians and civil servants to other countries and the high numbers of tourists on short-time stays adds to the likelihood. However, there is government-level reluctance to accept this, aided and abetted by the absence of autopsy and post-mortem examinations to determine cause of death. Many more young people seem to be dying of 'cancer' and 'pneumonia' than was formerly the case. The following health issues will be considered:

- western diet problems
- child undernourishment
- infant deaths
- child deaths

There is Pacific-wide concern about the effect of western diet on Pacific peoples. Rising rates of diabetes mellitus, hypertension, heart disease and morbid obesity are all connected by researchers with the adoption of rice and cereals as staples, the over-reliance on tinned meat and fish and the consumption of high levels of sugar and salt in pre-packaged items (Coyne 1984; 2000)

In addition to dietary concerns, the incidence of sexually transmitted infections is very high in Vanuatu. Hepatitis infections, tuberculosis and childhood diseases are endemic, as are malaria and dengue fever (Shuaib and Rahman 2008).

Coyne (1984; 2000) believed that the problems involved in the adoption of western diet have had more impact on urban populations. Urban populations are at greater risk because they have less certain access to gardening land. Some urban households may rely on being supplied with food by their hinterland kin. The produce from the hinterland is traditional fare — root crops, banana, dry coconut and perhaps pawpaw and island cabbage.

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8The HIV/AIDS non-government organisation AVERT gives the following 1999 estimates of STD infection rates for Australia (2.7 per cent), North America (1.9 per cent) and Sub-Saharan Africa as 11.9 per cent — www.avert.org/std-statistics.htm.

9This information was anonymously supplied by a person from a professional medical background, but is common knowledge.
Table C.6: Percentage food intake from imports 1985; Body
Mass Index Males 1984

<table>
<thead>
<tr>
<th>Measure</th>
<th>Urban</th>
<th>Hinterland</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>% energy intake</td>
<td>53.5</td>
<td>35.1</td>
<td>10.5</td>
</tr>
<tr>
<td>% protein</td>
<td>40.8</td>
<td>33.2</td>
<td>12.8</td>
</tr>
<tr>
<td>% carbohydrates</td>
<td>59.5</td>
<td>40.2</td>
<td>9.8</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>25.9</td>
<td>24.1</td>
<td>22.6</td>
</tr>
</tbody>
</table>

(Coyne 2000: 32; Table 2.6 (from 1985 SPC Technical Paper 203), Coyne 2000: 317: Appendix 4 (from 1987 SPC Technical Paper 192))

Often it will be produce which has not been sold at the market by the close of trading, and for which those coming to market do not wish to pay a return fare to transport home (Leipakoa, pers. comm. 2008). Purchased food, the alternative, is often preferred as it has some prestige value. Rice is by far the largest component and is commonly eaten in combination with root vegetables. Bread, biscuits and tinned meat and fish are regularly eaten. There is also a considerable market for highly processed foods. Two-minute noodles are a favourite, generally eaten dry by children. Ice cream and sweets are also popular (Coyne 2000: 19; and throughout, Coyne 1984)

A second factor of importance in explaining why urban populations are more at risk is their proximity to ports. Little food is transported to Vanuatu by air, so shipping is the primary means of circulating imported western foods. There are reasonably regular services between the northern islands and Port Vila, but less frequent services to Tanna and the southern islands. This means that for periods of time, imported foods are not available. Such is never the case in Port Vila, or Luganville.

Table C.6 gives some indication of the concentration of the impacts of western diet on urban and hinterland populations. The rural populations, with much less frequent transport service and less access to cash, show only marginal effects. Body Mass Index is used as a measure of obesity, and in some societies, anorexia nervosa. The latter is not a significant problem in Vanuatu at this time. Higher Body Mass Index values indicate higher levels of obesity.

To give a Pacific perspective, comparative figures for rural males in Fiji (Melanesians) and Papua New Guinea are 25.9 and 22.4 respectively (Coyne 1984: 85: Figure 14).

In 2001, 15.9 per cent of the population of Vanuatu fitted the definition of obesity (Moses 2001: 2, from World Health Organisation database)

Mortality and malnutrition rates in children are used as indicators in the Millennium Development Goals targets. The under-five mortality target reduction is by two-thirds between 1990 and 2015' (United Nations Department of Economic, Social and Cultural Affairs 2009). The current reduction is 50 per cent (Shuaib and Rahman 2008: 17).

World Health Organisation guidelines identify undernourishment when weight is more than two standard deviations below the global indicator.

Shuaib and Rahman (2008: 23) note that undernourishment is more attributable to ignorance of dietary requirements for children than lack of available food. The disparity between the contemporary Veneman (2009) and the Shuaib and Rahman (2008) data on infant mortality calls both into question.

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Table C.7: Mortality and undernourishment rates for children: Provinces, Rural, Urban and Vanuatu

<table>
<thead>
<tr>
<th></th>
<th>Infant mortality (per 1000)</th>
<th>Under 5 mortality (per 1000)</th>
<th>% 0-5yrs undernourished</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanuatu</td>
<td>48</td>
<td>62</td>
<td>n/a</td>
</tr>
<tr>
<td>2008/9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malampa</td>
<td>n/a</td>
<td>n/a</td>
<td>15.7</td>
</tr>
<tr>
<td>Penama</td>
<td>n/a</td>
<td>n/a</td>
<td>21.8</td>
</tr>
<tr>
<td>Sanma</td>
<td>n/a</td>
<td>n/a</td>
<td>19.6</td>
</tr>
<tr>
<td>Shefa</td>
<td>n/a</td>
<td>n/a</td>
<td>12.7</td>
</tr>
<tr>
<td>Tafea</td>
<td>n/a</td>
<td>n/a</td>
<td>11.4</td>
</tr>
<tr>
<td>Rural</td>
<td>26</td>
<td>32</td>
<td>16.1</td>
</tr>
<tr>
<td>Urban</td>
<td>23</td>
<td>27</td>
<td>15.2</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>28 (Veneman 2009)</td>
<td>34</td>
<td>n/a</td>
</tr>
<tr>
<td>25 (Shuaib and Rahman 2008)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Shuaib and Rahman 2008: 17, Veneman 2009: 129: Table 1)

Access to health services

Much of the research interest in health provision is concentrated on birth and early childhood issues, however the measure of access — percentage who had a trained medical professional at birth — is a reasonable indicator of access for a range of health matters.

Table C.8: Access to health professionals: Provinces, Rural, Urban and Vanuatu

<table>
<thead>
<tr>
<th>Area</th>
<th>percentage with access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malampa</td>
<td>92.5</td>
</tr>
<tr>
<td>Penama</td>
<td>81.2</td>
</tr>
<tr>
<td>Sanma</td>
<td>72.5</td>
</tr>
<tr>
<td>Shefa</td>
<td>91.7</td>
</tr>
<tr>
<td>Tafea</td>
<td>83.0</td>
</tr>
<tr>
<td>Rural</td>
<td>83.1</td>
</tr>
<tr>
<td>Urban</td>
<td>87.1</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>83.7</td>
</tr>
</tbody>
</table>

(Shuaib and Rahman 2008: 81: Table RH.3)

Nominally, the health system has five hospitals, one in each provincial centre, which provide obstetric, paediatric, surgical and inpatient and outpatient medical services.

There are five urban dispensaries in Port Vila and three in Luganville staffed by a nurse or nurse practitioner.

In rural areas, there are 32 health centres (Foster et al. 2009), with at least one professionally trained staff member who supervises aid posts and dispensaries in the health centre’s
catchment area.

There are 96 rural dispensaries and 188 aid posts, staffed by community volunteers with some training (World Health Organisation 2006: 106)

This should be taken as the optimum level of health services — it is likely that many of the smaller facilities would have staff vacancies or not be manned at all.\textsuperscript{10} Table C.8 shows the availability of professional health staff — doctor, nurse or midwife — across the five provinces, for rural and urban areas and all Vanuatu.

It is difficult to find explanations for the large differences at the provincial level as inter-island air services provide similar levels of service to all provinces and there is no variation in the universally poor state of the roads! The difference in access must be caused by factors other than remoteness, not noted in the Multiple Indicator Cluster Survey (Shuaib and Rahman 2008).

C.2 Physical capital

Variable measures

- cropping capacity
- cropping diversity
- proximity
- agricultural technologies
- cash cropping — rural households only

Cropping capacity

This measure and cropping diversity are designed to encapsulate two measures of the exposure of Vanuatu subsistence gardeners to risk of crop failure. Cropping capacity is the measure of growing season, climate and soils and nutrients. If plantings of food crops can be undertaken year-round, then any particular crop failure will be mitigated by the availability of alternative sources of food. Conversely, if crops cannot be grown year-round, then any shortage caused by a crop failure cannot be remedied until the next harvest season, other than by purchase or exchange in some form. In some temperate regions this shortage will be less than 12 months, where there is a capacity for summer and winter cropping (two harvests per year). Elsewhere, only one crop can be grown annually. There the shortage will persist for the full 12 months.

This is not a measure of how well farmers are able to overcome the difficulties presented by the climate. Temperate agriculture has as long a history as tropical agriculture, if not longer (Braidwood et al. 1974; Abbo et al. 2008; Kiple 2007). This is a clear indication (if one were needed) that human intervention is a strong determinant of outcomes. Nonetheless, the natural advantages of a particular climate for the development of a human response is a critical measure of food security.

\textsuperscript{10} Vanuatu Daily Post 10 March, 2011 contains a statement from the Minister warning nurses to man their posts or be sacked — www.dailypost.vu.
Cropping capacity can be considered by the length of the growing season, and by the factors which determine the length of the season — rainfall, temperature and soils. Soils are in turn influenced by the supply of nutrients.

The following discussion compares tropical agriculture with temperate agriculture. The temperate agriculture examples are drawn from Australian information, but can be generalised to most temperate agricultural regions (Weiss et al. 2004; Allaby et al. 2008).

In tropical regions crops are grown year-round (see Allen 2001; Dye 1979; Lebot 2008; Sardos 2008; Bourke 1999 for Vanuatu). In temperate regions many areas can grow winter and summer crops, but the capacity to store harvests, both in terms of storage facilities and the storage life of the crop itself, becomes critical when there are periods when there is nothing to harvest (Brown et al. 2008, Cohen and Armelagos 1984). Storage in tropical regions is less important, as, in normal conditions, there is always something to eat (Eileen Boe, pers. comm. 2005).11

Figure C.1: *Wheat production: Selected producers on six continents: 2005/6 to 2009/10*


Dryland cereal agriculture is the dominant cropping system of temperate regions, and is completely at the mercy of rainfall. It is not a simple matter of 'How much?' — 'When?' is of equal moment. Crop yield varies according to rainfall and temperature, but lack of rain is critical. Without rain, it does not matter whether the temperature is low or high. Rainfall variability is high across the temperate agricultural regions. Figure C.1 indicates the variability in world wheat production for a five year period. Both dryland and irrigated production are included, thus the real impact of rainfall variability is moderated. Nevertheless, countries where dryland production dominates, such as Australia, are readily identifiable. Drought periods are also easily identified, aligned with years of low production.

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11Eileen, the former Vanuatu National Librarian, explained that on the islands, people eat what they have — 'if there is banana, we eat banana, then banana and then more banana!'
Periods of drought also occur in tropical regions. In the Pacific droughts occur when the Southern Oscillation phenomenon is at an extreme, but they are a substantially lower level of risk of occurrence than in the temperate zones.\textsuperscript{12}

Variability in ambient temperature is also a feature of temperate regions, particularly during the Spring when winter crops (wheat, oats, barley, rape (canola)) are maturing, less so in Autumn when summer crops (maize, sorghum, pulses) are ready for harvest.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
 & Annual & February & August \\
\hline
\textbf{Donald} & & & \\
mean & 20.7 & 29.8 & 14.8 \\
maximum & 22.6 & 33.4 & 19.1 \\
minimum & 20.2 & 27.4 & 13.0 \\
\hline
\textbf{Port Vila} & & & \\
mean & 25.0 & 27.0 & 23.0 \\
\hline
\end{tabular}
\caption{Mean annual, February and August maximum temperatures: Donald, Victoria, Australia and Port Vila, Vanuatu}
\end{table}


For comparison with Port Vila, Donald, a cropping area in central Victoria, Australia, had, over a 34 year period (1967 — 2000), the following temperature features (see Table C.9).

For Donald, not only is the range wide over the year (14.8 to 29.8), but the variability between years for the same month is also wide (27.4 to 33.4 for February, 13.0 to 19.1 for August), six degrees in both months.

In the tropics, the picture is quite different. The annual average temperature maximum in Port Vila is 25 degrees Celsius, The August (coldest month) mean maximum is 23 degrees and February is 27 degrees. The variability range for the year is only four degrees.

The final element in cropping capacity is soils and nutrients. In Vanuatu, soils are rarely ‘improved’ by the application of fertilisers. Farmers rely on fallowing and regrowth for soil improvement.\textsuperscript{13}

In Australia, wheat production is heavily reliant on the application of large quantities of super-phosphate. The Department of Primary Industry in New South Wales makes the following recommendation to farmers:

Most Australian soils...are naturally low in phosphorus. While native plants are adapted to these low levels, introduced crops and pasture grasses are not, which means you need to apply phosphorus fertilisers to soil to achieve productive yields.


Crop failure risk management is simpler when year-round cropping is possible.

A ten point scale will be used as the measure, where:

- 10 is year-round cropping

\textsuperscript{12}Allen, B. 1997 gives an overview of 'El Nino' droughts in Papua New Guinea, particularly the 1997 event.

\textsuperscript{13}The 2006 Agricultural Census gives 446 households as using fertiliser for soil improvement, or 1.3 per cent of all rural households (Vanuatu National Statistics Office 2007: 111: Table 4.14).
• 6 is two crops per year
• 2 is one crop per year

Across rural and urban Vanuatu, the score on this scale would be 10.

Cropping diversity

If a large number of different species are grown, and a large number of varieties within species, then the risk of catastrophic crop failure through disease or unsuitable climatic conditions which bedevils monoculture is averted, or at least minimised (Scott 1976).

Allen (2001), Bourke (1999), Lebot (2008) and Sardos (2008) comment at length on the diversity of species and cultivars in Vanuatu agriculture, with often more than 10 varieties of each main root crop (yam, taro, cassava, sweet potato) being grown. Extensive arboriculture (including banana) with fruit and nuts, along with breadfruit, adds to dietary diversity. Allen remarks that on Malo 108 cultivars of breadfruit are recognised (2001: 28, 58-9)

Table C.10: Cropping diversity Australian grain farms: 2008/9 and five year average 2004/5 — 2008/9

<table>
<thead>
<tr>
<th>crop</th>
<th>2008-9(%)</th>
<th>five year average(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>wheat</td>
<td>58</td>
<td>56</td>
</tr>
<tr>
<td>oats</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>barley</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>sorghum</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>oilseeds</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>pulses</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>other grains</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

(Crooks and Levantis 2010: 8)

Temperate agriculture, by contrast, has long been on the road to monoculture.

Table C.10 shows cropping diversity for Australian grains farms in 2008— 9 and average diversity for the past five years.

A 10 point scale will also be used for this component.

• 10 points — more than ten crops under cultivation
• six points — between five and nine crops
• two points — less than five different crops

On the 10 point scale, Malampa, Penama, Sanma, Tafea, Shefa Provinces and rural Vanuatu would score 10. In urban areas, fear of theft reduces the diversity, so they would score six. Australian grains farms would also score six, although two crops, wheat and barley make up 75 per cent of all grains grown. To be fair, there are a number of varieties of wheat and barley (and the other grains mentioned), which also represents diversification. As a result, the the diversity of Australian agriculture is understated, without really diminishing the contrast between tropical and temperate cropping options.
Proximity

Gardens may be close to home, or may be at a considerable distance. In Malampa Province, many people live on offshore islets, but have gardens on the main island of Malekula. This requires them to make at least a return canoe journey. If a garden can only be reached with a long walk, more energy is required to produce the same crop. If the journey to the garden requires motorised transport, then costs of production rise and cash is needed.

Unfortunately, there has been no consistency in the way proximity has been recorded in the various censuses. In 1984, the Agricultural Census provided a breakdown of walking times to gardens, but this was not recorded in 1993.\textsuperscript{14} In 2006 a breakdown between walking and other forms of transport was given, and this was also available from the 1984 census.

'Boat' would be canoe in most cases. Powered boats are used to transport market produce, but not for garden access. Truck is a generic term for motor vehicle, other than minibuses (bus) or heavy trucks, which are called 'kamyon' (from the French camion) in Blislama. The 1984 numbers are for percentage of households, the 2006 figures are for percentage of gardens.

<p>| Table C.11: Transport to gardens 1984, 2006: Provinces, Rural and Urban Vanuatu |</p>
<table>
<thead>
<tr>
<th>Area</th>
<th>Walk</th>
<th>Boat</th>
<th>Truck</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malampa</td>
<td>92</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Shefa</td>
<td>90</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Tafea</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rural</td>
<td>96</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malampa</td>
<td>84</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>Shefa</td>
<td>99</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Tafea</td>
<td>98</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Rural</td>
<td>95</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Urban</td>
<td>95</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

(VNSO 1984: 15:16: Table 8, VNSO 2007a: 105: Table 4.8)

The values for Shefa are probably inaccurate.\textsuperscript{15}

The figures for urban households are evidence-based guesses. Most informal gardening is done within walking distance of the dwelling (Ormerod 2005). The area around Teouma (see Figure A.1), in which many Port Vila families have gardens is fifteen kilometres from Port Vila. This is beyond walking distance for most, especially when fully laden with baskets.

\textsuperscript{14}In 2006 (Vanuatu National Statistics Office 2007a: 27) 52.6 per cent of gardens were less than 15 minutes walk, and 47.4 per cent were more than an hours walk. This adds up to 100 per cent, which seems to be inferring that there were no gardens between fifteen minutes and an hours walk. That is only infinitesimally possible.

\textsuperscript{15}In the 1960s, the people of Teta an islet in Vila Bay, had gardens on the main island (Brookfield, Brown-Glick and Hart 1969), so the 1984 boat number is possible if those gardens were still used, but that 6 per cent went by truck to their gardens is less so. It is doubtful if there would have been enough taxis or public transport trucks on Efate to carry them!

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Agricultural technologies

Agriculture can be undertaken with a digging stick, or with a combine harvester using global positioning system technology and other computer-assisted guidance and yield measurement systems. This variable measures requirements for subsistence gardening and other agricultural pursuits, on a scale which places the stick at the top of the scale and the combine harvester at the bottom. This placement is driven by environmental sustainability concerns, in addition to the major reason — accessibility. In brief, a stick is easier to own and operate than a combine harvester, and much easier to replace when it breaks.

The scale is a 10 point scale:

- 2 points — mechanical power and technology
- 4 points — animal power and machinery
- 6 points — machinery (copra dryer, cocoa fermenting box, plough)
- 8 points — steel hand tools (the bush knife, or machete)
- 10 points — no tools, no technology

For the subsistence-plus households of Vanuatu, the bush knife is obligatory. There is at least one specialised variant, the copra knife, but that aside, most farmers need nothing else in the way of tools. Digging sticks are widely employed in the planting of root crops. A wheelbarrow is a prized possession among women, who shoulder most of the burden of transporting garden produce between the garden and the house, but in its absence, human effort suffices. The absence of the bush knife would add many hours of labour to gardening, particularly in the preparation stages.

For Malampa, Penama, Sanma, Shefa and Tafea provinces and all of rural and urban Vanuatu, the score on the scale would be eight points, rather than 10, because of the bush knife. Copra is mostly sold unfermented by smallholders, to middlemen with dryers, or to cooperatives which do the processing. Cocoa is also grown in a cooperative model, with the cooperative holding the cocoa fermenting equipment.

Cash cropping

This measure has been included as physical capital, as the crops under consideration are those which have no role in subsistence. There are other crops which are sold, in fact all are if the opportunity arises, but they are grown firstly for consumption and have been included elsewhere as financial capital. The crops measured here — cocoa (cacao), coffee, vanilla and pepper — are not consumed, although unfermented cocoa pods are occasionally offered as a fruit in markets. As land in required to grow these crops, the physical capital is in reality the land, measured by the percentage participation in cash cropping.

Urban households do not have access to land for cash cropping, although the 1999 Census (Vanuatu National Statistics Office 1999: 160-1,164-5) did provide numbers for urban households, which indicated that coffee was grown by 1.4 per cent of urban Vanuatu households. Percentage households growing cocoa was 8.6 per cent. These have been excluded. The coffee values are very small, and while it may be that urban households had a cocoa tree, they would have been unlikely to have commercial numbers of trees.
Table C.12: Percentage households growing cash crops: Provinces, Rural Vanuatu

<table>
<thead>
<tr>
<th>Crop</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocoa</td>
<td>21.1</td>
<td>27</td>
<td>23</td>
<td>7.5</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Coffee</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
<td>17.9</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Vanilla</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Pepper</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>1993</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocoa</td>
<td>63.9</td>
<td>40.1</td>
<td>50.6</td>
<td>17.9</td>
<td>0</td>
<td>33.7</td>
</tr>
<tr>
<td>Coffee</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10.5</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>Vanilla</td>
<td>3.5</td>
<td>3.6</td>
<td>3.0</td>
<td>1.0</td>
<td>0</td>
<td>2.5</td>
</tr>
<tr>
<td>Pepper</td>
<td>3.2</td>
<td>6.8</td>
<td>9.0</td>
<td>5.0</td>
<td>2.0</td>
<td>5.1</td>
</tr>
<tr>
<td>2006</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocoa</td>
<td>69.2</td>
<td>23.0</td>
<td>24.1</td>
<td>7.4</td>
<td>0</td>
<td>25.0</td>
</tr>
<tr>
<td>Coffee</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>24.3</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>Vanilla</td>
<td>26.2</td>
<td>36.4</td>
<td>58.3</td>
<td>12.1</td>
<td>13.1</td>
<td>28.1</td>
</tr>
<tr>
<td>Pepper</td>
<td>2.1</td>
<td>2.8</td>
<td>2.7</td>
<td>0.6</td>
<td>0.6</td>
<td>1.7</td>
</tr>
</tbody>
</table>


Vanuatu has a history of unsuccessful attempts to introduce cereal agriculture, particularly rice. Coffee growing has at times virtually stopped, and government monetary encouragement of Tanna coffee growers is a bigger factor in the continuing industry than success, or profit.

There are climatic restrictions to cash cropping. Coffee cannot be grown North of Efate and cocoa cannot be grown South of Efate.

The large percentages for cocoa in Malampa are due to smallholder take-over of plantations after Independence and the highly effective Co-operative marketing the cocoa. McGregor and Watau (2009) undertook an intensive study of the Malekula cocoa Co-operative and were full of praise.

Peanuts are probably grown more widely than pepper, but were only included in 1993. Green, sun-dried and roasted peanuts in small plastic packs are market favourites.

C.3 Natural capital

Variable measures

- access to garden land
- access to coastal and forest resources
- garden fallow period

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Access to garden land

This variable measures the percentage of households which have access to land for gardening. It is axiomatic for ni-Vanuatu and for Melanesians generally that everybody who resides in a community is entitled to be given land to make a garden, a tenet of a continuing tradition of land management.

The effects of the current land boom were documented in land distribution projections (Chapter 5). Land dealings post-Independence have led almost inevitably to contested claims of traditional ownership (Slatter 2006; Farran 2002; Rodman 1995). Where modern notions of rights being established by legal and constitutional argument are met and contended with by older systems where rights are established by consensus-building, the right of usufruct is under threat, despite a constitutional guarantee of continued use rights (Vanuatu Constitution 79:2(c)).

In spite of the current turmoil about land tenure and the often violently expressed desire of expatriate leaseholders to exclude others from the leased land, the belief persists among indigenous Melanesians that land will be available for all who need to make a garden.

This measure tests that assertion. It is argued throughout this thesis that land access for use, not land tenure, is the ultimate prerequisite for the subsistence-plus livelihood. This, then, is a crucial measure.


<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>99.4</td>
<td>99.0</td>
<td>98.0</td>
<td>100</td>
<td>100</td>
<td>99.0</td>
</tr>
<tr>
<td>1999</td>
<td>99.1</td>
<td>98.8</td>
<td>94.1</td>
<td>94.5</td>
<td>96.0</td>
<td>96.8</td>
</tr>
<tr>
<td>(% no land)</td>
<td>3.1</td>
<td>3.9</td>
<td>9.3</td>
<td>5.5</td>
<td>8.5</td>
<td>3.9</td>
</tr>
<tr>
<td>2006</td>
<td>100</td>
<td>87.6</td>
<td>84.4</td>
<td>84.1</td>
<td>81.8</td>
<td>86.3</td>
</tr>
<tr>
<td>(% no land)</td>
<td>2.9</td>
<td>9.6</td>
<td>35.0</td>
<td>6.5</td>
<td>16.2</td>
<td>13.5</td>
</tr>
</tbody>
</table>

Access to garden land was measured in the agricultural censuses of 1984, 1994 and 2006, and in the population census of 1999. 1994 numbers have not been included because figures were collected for five islands only — Epi, Tanna, Santo, Malekula and Pentecost. Information on numbers who indicated they had no land in 1999 and 2006 has been listed. This is included only as a counterpoint to the access statistics, because it is uncertain if the response informing the figures are saying 'I have no access to land', or 'I don't own any land', or something else again.

While access to land remains high, the downward trend is cause for concern. In Tafea province, where the island of Tanna is a bastion of 'traditional' values, the decline is marked, and is confirmed by adding the percentage who had 'no land' with those who had a garden — 98 per cent. Similar exercises in adding together results in the other

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17 More accurately, it is the bastion of anti-modern sentiments, with millenarian sects of a range of types being a feature.
provinces give incongruent results, but that for Rural Vanuatu is also congruent at 99.8 per cent.

Malampa province has 'bucked' the trend. There are some areas on Malekula where communities have withdrawn from the trappings of modernity. Against this, there are areas on Ambrym (see Figure A.9) island, another part of Malampa province, where volcanic activity has destroyed garden land, at least temporarily.

Access to coastal and forest resources

In-shore fishing and shoreline gathering are important food sources and have been so throughout Melanesian history (Bedford, Spriggs and Regenvanu 2006, Bedford, Sand and Connaughton 2005). Wood gathered in the forest is the preferred fuel for cooking — either with stones, where a wood fire is used to heat the cooking stones — or barbecue-style cooking over charcoal. The large ground oven is only used for large-scale cooking.

Fruits, nuts and medicinal plants are sourced from the forest, and hunting utilises forest faunal resources. In the past access has been managed by traditional methods. More recently, western-style fencing and other security measures have intruded on that traditional management regime.

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>49</td>
<td>44</td>
<td>56</td>
<td>67</td>
<td>26</td>
<td>50</td>
</tr>
<tr>
<td>1989</td>
<td>49</td>
<td>44</td>
<td>51</td>
<td>66</td>
<td>38</td>
<td>50</td>
</tr>
<tr>
<td>1993</td>
<td>33</td>
<td>33</td>
<td>22</td>
<td>39</td>
<td>36</td>
<td>35</td>
</tr>
<tr>
<td>1999</td>
<td>72</td>
<td>64</td>
<td>59</td>
<td>74</td>
<td>57</td>
<td>67</td>
</tr>
<tr>
<td>2006</td>
<td>59</td>
<td>42</td>
<td>37</td>
<td>53</td>
<td>33</td>
<td>47</td>
</tr>
<tr>
<td>Port Vila</td>
<td>34</td>
<td>43</td>
<td>37</td>
<td>60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table C.14: Percentage of households using coastal resources — 1984 — 2006: Provinces, Rural, Urban and Vanuatu

Offshore reef and deep water fishing have been excluded from this measure, with some reservations. Deep water fishing is often undertaken for cash exchange purposes, with larger pelagic species being taken for direct sales to restaurants for expatriate and tourist consumption. Offshore fishing requires motorised fishing methods, as trolling is the preferred method. There is no fish market as such, although fish are sold at the Market house in Port Vila. Mostly, these are inshore species bought by ni-Vanuatu, with ciguatera poisoning being a constant, albeit low level threat.

It is difficult to be fully confident in the values presented here. The 1993 Agriculture Census figures seem to be well out of step on the low side and have been excluded, while the

18The 'smol nambas' people on Malekula refuse to participate in education or political life.
19Bislama 'chacoof', sold in bags at the Port Vila market.
20Trolling is towing a lure behind a moving vessel. In some Pacific countries this is done with sail-rigged canoes (Kiribati), but not in Vanuatu.

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1999 Census information, which is above trend, is included. The differences are consistent for all the provinces. Despite this problem, the downward trend for Shefa province, where much of the coastal land on Efate is now under expatriate control, indicates that an important livelihood resource is under threat.

Forest exploitation is complex. While arboriculture, as Latinis (2000) argues, is a major component of the 'subsistence' livelihood, it is not really forest exploitation in the sense of exploitation of 'free goods' — trees planted are trees owned (Allen 2001; Brown and Podolefsky 1976).

| Table C.15: Percentage of households using forest resources 1989 — 2006: Provinces, Rural, Urban and Vanuatu |
|---------------------------------------------------------|-------|-----------|-------|-------|-------|--------|
| Year | Malampa | Penama | Sanma | Shefa | Tafea | Rural Vanuatu |
| 1989 | 77.0 | 77.5 | n/a | n/a | n/a | 94.5 |
| 1999 | 97.0 | 97.5 | 96.4 | 84.4 | 98.4 | 92.4 |
| 2006 | 93.3 | 92.7 | 97.6 | 91.6 | 95.4 | 94.2 |
| Port Vila | Lakanai | Urban | Vanuatu |
| 1989 | 22.9 | 45.6 | 28.6 | 81.3 |
| 1999 | 33.4 | 64.8 | 41.8 | 83.1 |
| 2007 | 47.4 | 66.7 | 52.2 | 85.0 |

(Hunting for smaller mammals and birds is exploitation of the 'free goods' of the forest, but in none of the censuses or surveys has an attempt been made to quantify the extent of hunting. This leaves only the exploitation of timber for firewood and for construction, and mat and thatch-making materials.

It is not possible to completely reconcile the differing ways in which information was collected about fuel gathering in the censuses. In 1989, the results are derived from questions about fuel used for cooking, as was the case in 1999. In 2006 the question was asked directly about firewood collecting. Nonetheless, the values seem consistent. One prominent feature of the Port Vila Market is the many firewood bundles on sale — an indication of the demand for firewood and the lack of capacity to meet that demand by foraging.

On the question of the sustainability, the 2006 Agricultural Census (Vanuatu National Statistics Office 2007a: 84) collected information about replanting of trees. The values for households replanting are:

- Malampa — 13.8 per cent of households
- Penama — 27.1 per cent of households
- Sanma — 16.2 per cent of households
- Shefa — 16.4 per cent of households
- Tafea — 19.7 per cent of households
- Rural Vanuatu — 18.4 per cent of households

There is a wide disparity between the numbers exploiting timber for firewood and those replanting.
Garden fallow period

This variable is included as a proxy measure\(^{22}\) of land use intensification, an indicator for land stress and soil and biomass degradation. Fallow is an integral part of the subsistence gardening system, particularly woody fallow, where forest regeneration is allowed to take place. Boserup (2005) differentiates forest fallow and woody fallow. Bourke (1999) and Allen (2001) interpreted shrinking fallow periods as a danger sign. Allen describes the gardening system on Malo, and remarks:

> To gauge whether or not the fallow period has been sufficient, villagers rely on the height of the fallow regrowth in general, and the life cycle of a certain tree ('vumali') in particular. When this tree starts to die, after approximately ten years, the land is deemed ready for cultivation

(Allen 2001: 70).

Against this, Albers and Goldbach (2000) suggest that fallow regrowth is subject to the intensity of land use itself, and that at a certain level of intensification, the nature of regrowth is permanently changed from woody, diverse regrowth, to a pattern where one or two grass species dominate.

The authors of the 1993 census struggled with quantifying fallow, as the following excerpt shows:

> Measuring fallow periods is very difficult, and caution must be used in deriving conclusions drawn from them. Fallow periods are not 'set in time', they are as long as they need to be and farmers instinctively know from the type of tree they see growing in an area, and the size of those trees whether a piece of land has been adequately fallowed or not... Paama can be seen as a landshort island... it is frequently cited as having a shorter fallow period. However Paama has young volcanic soils which are among the most fertile in Vanuatu. The fallow period may be shorter than elsewhere in Vanuatu but not necessarily because land pressure forces it to be shortened. It may not need to be any longer


As there is not enough information to make qualitative judgements on the nature of the fallow regrowth, time periods alone are considered.

A ten point scale is used — ten best, two worst:

- 2 points — no fallow
- 4 points — less than 4 years
- 6 points — 4 to 10 years
- 8 points — more than 10 years
- 10 points — never used before\(^{23}\)

\(^{22}\)Increased cropping to permanent cultivation and soil improvement are other features — see Boserup (2005).

\(^{23}\)This is indicative only — as far as is known, never used before — would be more accurate.
Table C.16: Fallow periods in years 1984 — 2006: Provinces, Rural Vanuatu

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>10</td>
<td>6</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>1990(1993)</td>
<td>4(2)</td>
<td>6(6)</td>
<td>n/a(4)</td>
<td>4(2)</td>
<td>4(4)</td>
<td>4(n/a)</td>
</tr>
<tr>
<td>1999</td>
<td>n/a</td>
<td>6</td>
<td>n/a</td>
<td>6</td>
<td>n/a</td>
<td>6</td>
</tr>
<tr>
<td>2006</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>2</td>
</tr>
</tbody>
</table>

(VNSO 1984: 15.12; Table 5, VNSO 1990: 12: Table 5.2 (VNSO 1994: 168), Bourke 1999: 9, VNSO 2007a: 30)

There is no data on length of fallow for urban areas. It can be assumed that continuous cultivation would be the norm, as a means of keeping tenure.

There are the usual reconciliation difficulties between sets, with differing time periods chosen for aggregation. These difficulties notwithstanding, there is a clear trend to much shorter periods of fallowing in the period between 1984 and 2006. The method used to apply the scale was to choose the time period which was used by most households.24 Results from the 1990 Smallholder Survey are presented in preference to the results from the 1993 Agricultural Census, which are included, in brackets, beside the 1990 results. The reason for the preference was the presence of an aggregate value, for Rural Vanuatu, in the 1990 set.

The 2006 Agricultural Census report provided no tables, but summary information included (Vanuatu National Statistics Office 2007a: 30), indicates that some data was collected.

### C.4 Financial capital

#### Variable measures

- **cattle production** — rural households only
- **kava production** — rural households only
- **coconut production** — rural households only
- **other livestock production** — rural households only
- **wages and salary**

The criterion for the selection of indicators to measure in this group was, with the exception of wages and salary, that they have dual roles: they can be sold as cash crops; but more often they are produced for household consumption or custom use. As such, they perform a similar function to cash in the bank in that they can be used if needed or if a surplus has arisen in the course of production, but if not they do not lose value or utility. The same can be said of wages and salary, when they do not form the core component of livelihood.

In effect what is being measured is the capacity to produce a surplus, which when acting as a cash equivalent, can be converted to cash when and if the need arises. This quality is

---

24The mode of household percentages.
enhanced by durability, another feature which they share. Surplus root crops, bananas and fruits are also sold, but cannot be stored for long once they have been harvested.

Cash on hand, or in the bank, have not been measured because there is little likelihood that people would answer questions of that nature truthfully, and few ni-Vanuatu would trust a bank with their savings.\(^{25}\)

Small business activity is widespread, from stall-holding to arts and crafts production, roadside markets and catering. Unfortunately, none of this activity is reliably measured, because there is no taxation on income, so little incentive to collect information. This is a significant, but unavoidable limitation in the figures for financial capital.

**Cattle production**

Beef cattle have a changing role in livelihood.\(^ {26}\) In the past, they were an investment vehicle, where cash or in-kind exchange was the main purpose for keeping them. In more recent times there has been a movement towards the use of beef as custom gifts. In situations where a large group is owed a custom or pseudo-custom gift,\(^ {27}\) the bullock has begun to supplement pigs as a suitable gift (see Farran 2004).

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>29.5</td>
<td>33.4</td>
<td>47.0</td>
<td>36.3</td>
<td>33.0</td>
<td>34.0</td>
</tr>
<tr>
<td>1993</td>
<td>43.0</td>
<td>41.6</td>
<td>66.9</td>
<td>38.5</td>
<td>33.7</td>
<td>42.8</td>
</tr>
<tr>
<td>2006</td>
<td>53.7</td>
<td>50.0</td>
<td>60.6</td>
<td>33.7</td>
<td>60.0</td>
<td>50.7</td>
</tr>
</tbody>
</table>

(VNSO 1984: 14:10; Table 7, VNSO 1994: 85, VNSO 2007a: 171; Table 11.10)

Because of their size, and the general lack of refrigeration, cattle do not form part of the everyday diet. This anomaly keeps alive the uncertainty about whether cattle are financial or physical capital, as for cocoa, vanilla etc. They are usually bought with cash, and are most often sold for cash, but they can be used in custom duties. It has been decided to treat them as financial capital, because they are not always sold, as are cocoa, coffee and vanilla. One more quality cattle have (which emulates cash in the bank) is their durability. They can be held over ten or more years without depreciation.

The steady rise in cattle ownership is due to a number of factors, including access to two export abattoirs, one on Efate and one on Santo, good grazing conditions and suitable breeds of cattle being bred. 'Organic' credentials have also recently enhanced the 'brand'.

Cattle-raising has synergies with growing coconuts. The cattle are shaded by the trees and, in turn, keep the root zones of the trees clean.

---

\(^{25}\)From personal knowledge, bank staff are susceptible to wrongdoing.

\(^{26}\)There are no dairy cattle in Vanuatu at the moment. See Weightman 1989: 261-284 for a comprehensive history of the development of cattle production in Vanuatu.

\(^{27}\)The example I experienced was a family gift of half a bullock, cooked overnight in a ground oven, given to a church community for providing funeral services for a family member.
Kava production

Kava is the main cash crop for many people, particularly on the island of Pentecost. Walter and Lebret (2007) note that the kava grown there is held in high regard throughout Vanuatu. Nonetheless, kava is also consumed by these Pentecost households in considerable quantities, for custom reasons and as a social drug. The sale of kava in most other places is opportunistic, when it is surplus to custom and consumption requirements.

Table C.18: Kava production household percentages 1991 — 2006: Provinces, Rural Vanuatu

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>54.1</td>
<td>79.2</td>
<td>40.9</td>
<td>63.0</td>
<td>77.8</td>
<td>64.3</td>
</tr>
<tr>
<td>1999</td>
<td>49.4</td>
<td>80.4</td>
<td>62.3</td>
<td>55.4</td>
<td>68.4</td>
<td>59.3</td>
</tr>
<tr>
<td>2006</td>
<td>41.5</td>
<td>88.9</td>
<td>72.8</td>
<td>27.2</td>
<td>61.1</td>
<td>59.1</td>
</tr>
</tbody>
</table>

(VNSO 1999: 162-3; Table 4.13b, VNSO 2007a: 34, Secretariat of the Pacific Community 2001)

Kava producers benefited from a strong export demand from the European Union for medicinal use for a time in the late 1990s, but a health ban was placed by Germany on the importation in 2002 when a study alleged a link between kava and liver damage. This ban seems always about to be lifted according to Pacific news sources, but never is.28 Kava is exported to Fiji and New Caledonia and has also become a widely used recreational drug in ‘dry’ Aboriginal communities in Northern Australia.29

The nation-wide preference for kava from the northern islands can be seen in the trends, where production trends downward for Malampa, Shefa and Tafea over time, and upward in Sanma and Penama in the same period.

Coconut production

Copra production fluctuates widely. When prices are high or if cash is required, copra is produced. When prices are low, or when there is no requirement for cash, the coconuts are consumed. As the average family consumes around nine nuts each day (Vanuatu National Statistics Office 1984),30 coconuts are an integral part of the diet and are also used in personal hygiene, as a soap substitute.

At Independence most coconuts were growing in plantations. Over the ensuing thirty years, planting has been small scale, and the plantations have been allocated to smallholders. Most of the plantation trees are reaching the end of their productive life. Trees take around eight years to reach production, and are most productive between 10 and 20 years. Efforts to introduce lower growing and more productive exotic species have not proved successful (Weightman 1989: 121-163 is the definitive source for coconuts in Vanuatu).

---

28 http://www.cropwatch.org/kava.htm discusses the history of the ban.
30 This does not include green coconuts for drinking and ‘navara’, sprouted coconuts used as a sweet, like icecream.
Table C.19: Coconut production household percentages 1984 — 2006: Provinces, Rural Vanuatu

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>95.6</td>
<td>93.4</td>
<td>92.0</td>
<td>70.7</td>
<td>45.0</td>
<td>81.0</td>
</tr>
<tr>
<td>1993</td>
<td>94.5</td>
<td>62.6</td>
<td>89.6</td>
<td>61.6</td>
<td>33.9</td>
<td>69.4</td>
</tr>
<tr>
<td>2006</td>
<td>89.2</td>
<td>65.6</td>
<td>68.9</td>
<td>61.4</td>
<td>57.8</td>
<td>69.8</td>
</tr>
</tbody>
</table>

(VNSO 1984: 14.9: Table 4, VNSO 1994: 37, VNSO 2007a: 42: Table 6.1)

To produce copra, a drying kiln is required, with wood-fired or diesel-fired driers, or the copra can be sun-dried, but this requires more manpower than most people are willing to provide to keep the rats, pigs, dogs and crabs away, so when copra is opportunistically produced, it requires a cash or equivalent investment. This cost is beyond most smallholders, who sell their copra ‘green’ to middlemen with driers, at a reduced price.

There have been a succession of attempts to convert coconut oil into bio-fuel, usually mixed with diesel, but the most serious has been that by UNELECO, the electricity provider who use it in their generators.\(^{31}\) Although it has some advocates (Cloon 2003 is typically enthusiastic), it is mostly regarded as a gimmick, rather than a serious bio-fuel contender. This is due principally to the massive investment needed to plant enough trees to make the enterprise viable, with no production, and no returns, for seven years while the trees reach bearing age!

Other livestock production

Although there are quite a number of goats and horses, and a small number of sheep on the islands, pigs and chickens are the most important livestock besides cattle. There are also large numbers of dogs, but although they are eaten, they are less important in the diet than chickens and eggs, and of no importance in custom. Pigs, on the other hand, are highly important — crucial in many custom ceremonies.

For rural people, pig and chicken ownership is widespread. Urban families also have chickens — all free-range of course. There was for a time a commercial chicken-raising enterprise in Port Vila, but that no longer operates. Chicken wings, imported from Australia, are widely consumed in Port Vila and beyond. The raising of pigs is officially banned in Port Vila, but that ban is universally ignored. Pigs are raised in wooden cages placed very close to the house in Port Vila. This may be due to the ban, but is more likely to be due to fear of theft. These cages are equivalent in lack of spaciousness to pens found in intensive piggeries in developed countries.

The specialised field of raising pigs for ceremonial use, including pseudo-hermaphroditic pigs, hairless pigs and the circular-tusked pigs commonly used in ceremonial display, is not dealt with here.\(^{32}\) Weightman (1989) has useful information on the commercial pig industry, but is wide of the mark on the origin of the commensal pigs.

Pigs arrived in the archipelago contemporaneously with humans. Shaw et al. (2008) attempt to infer human migration and settlement patterns in Oceania from pig DNA distributions, as Matisoo-Smith had done with rats (Matisoo-Smith and Robins 2004).


\(^{32}\) See Lum et al. 2006 and Farran 2004.
Table C.20: Pig ownership household averages 1984 — 2006: Provinces, Rural Vanuatu

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>2.6</td>
<td>2.9</td>
<td>2.1</td>
<td>4.7</td>
<td>4.6</td>
<td>3.3</td>
</tr>
<tr>
<td>1993</td>
<td>3.7</td>
<td>4.9</td>
<td>3.0</td>
<td>5.1</td>
<td>6.0</td>
<td>5.0</td>
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<tr>
<td>2006</td>
<td>2.1</td>
<td>3.7</td>
<td>1.6</td>
<td>2.7</td>
<td>3.2</td>
<td>2.6</td>
</tr>
</tbody>
</table>

(VNSO 1984: 14.11: Table 8, VNSO 1994: 138, VNSO 2007a: 74; Table 12.1)

Chickens are raised as 'free range' without exception, and wander around as they please.
They are also commensal animals of the first humans to settle the archipelago.
Recently, they have joined pigs and rats as commensal species being used to trace human
inhabitation in the Pacific (Storey et al. 2010).

Table C.21: Chicken ownership household averages 1984 — 2006: Provinces, Rural Vanuatu

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>12.6</td>
<td>13.8</td>
<td>12.3</td>
<td>12.3</td>
<td>10.3</td>
<td>12.4</td>
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<tr>
<td>1993</td>
<td>16.3</td>
<td>15.0</td>
<td>16.0</td>
<td>14</td>
<td>11.0</td>
<td>14.0</td>
</tr>
<tr>
<td>2006</td>
<td>9.6</td>
<td>13.4</td>
<td>12.5</td>
<td>9.9</td>
<td>10.1</td>
<td>10.9</td>
</tr>
</tbody>
</table>

(VNSO 1984: 14.11: Table 9, VNSO 1994: 138, VNSO 2007a: 74; Table 12.1)

Wages and salary

Table C.22: Percentage households with wages and salary 1984 — 2006: Provinces, Rural, Urban and Vanuatu

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>7.5</td>
<td>3.5</td>
<td>2.0</td>
<td>2.4</td>
<td>7.0</td>
<td>4.0</td>
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<tr>
<td>1999</td>
<td>9.2</td>
<td>8.4</td>
<td>10.2</td>
<td>19.3</td>
<td>6.5</td>
<td>10.4</td>
</tr>
<tr>
<td>2006</td>
<td>5.3</td>
<td>4.2</td>
<td>5.4</td>
<td>10.9</td>
<td>5.0</td>
<td>5.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Port Vila</th>
<th>Luganville</th>
<th>Urban</th>
<th>Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>74.5</td>
<td>88.7</td>
<td>79.4</td>
<td>20.3</td>
</tr>
<tr>
<td>1979</td>
<td>76.0</td>
<td>83.1</td>
<td>77.7</td>
<td>13.5</td>
</tr>
<tr>
<td>1989</td>
<td>68.3</td>
<td>68.2</td>
<td>68.3</td>
<td>30.1</td>
</tr>
<tr>
<td>1999</td>
<td>53.3</td>
<td>39.9</td>
<td>50.0</td>
<td>18.1</td>
</tr>
<tr>
<td>2006</td>
<td>34.2</td>
<td>25.3</td>
<td>32.0</td>
<td>11.6</td>
</tr>
</tbody>
</table>


Wages and salary are more associated with the market economy than with subsistence
livelihoods, however there are sufficient numbers of rural people who earn wages and
salary for it to form a part of their financial capital.

Urban percentages show a steady decline over time, having more than halved since census-
taking began. This is a disturbing feature and will be dealt with in more detail later.
The rural percentages show no discernible trend, even if the over-trend results characteristic of the 1999 census are taken into consideration.

C.5 Social capital

Variable measures

- provenance
- church/custom adherence
- local language proficiency

Social capital is the most difficult of the five 'capitals' to quantify. The three variables chosen provide, at best, a limited measure of the benefits which accrue to individuals as a result of their social and cultural belonging. Local language proficiency is included as it shows cultural and social connectedness more accurately, perhaps, than provenance. Church or custom adherence are, paradoxically, often complementary in their provision of social capital.

Provenance

This measure has been selected to show numbers of people living where they were born, with their concomitant social rights of access and entitlement most certainly upheld.

Table C.23: Provenance percentage population 1967 — 1999: Provinces, Rural, Urban and Vanuatu

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>97.9</td>
<td>95.7</td>
<td>63.3</td>
<td>75.5</td>
<td>98.1</td>
<td>97.4</td>
</tr>
<tr>
<td>1979</td>
<td>86.3</td>
<td>92.4</td>
<td>70.3</td>
<td>57.6</td>
<td>96.4</td>
<td>n/a(87.8)</td>
</tr>
<tr>
<td>1989</td>
<td>89.9</td>
<td>92.1</td>
<td>89.7</td>
<td>80.1</td>
<td>95.1</td>
<td>90.4</td>
</tr>
<tr>
<td>1999</td>
<td>89.8</td>
<td>90.6</td>
<td>93.6</td>
<td>88.3</td>
<td>92.1</td>
<td>90.3</td>
</tr>
<tr>
<td>Urban</td>
<td>38.2</td>
<td>87.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanuatu</td>
<td>44.3</td>
<td>81.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>85.8</td>
<td>89.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


While there is great flexibility in according rights to strangers or immigrants in matters of land and position, these rights are of a lesser order than those accorded by aboriginality (Regenvanu 2009, Jolly 1997, Rodman 1995).

Provenance is also a measure of cultural strength.

An important qualification to which attention has already been drawn must be kept in mind. People who are born and living in either of the two urban areas may or may not receive similar social rights of access or entitlement as those in rural areas. There is large
growth in provenance for the provinces of Sanma and Shefa, which hold the urban areas of Lugarville and Port Vila respectively.

The 1979 figure in brackets for rural Vanuatu is calculated. It represents an average for all rural areas of provenance (South Pacific Commission 1979: 56, Table 46)

Church and custom adherence

There is a small but influential Bahai community in Vanuatu and a small indigenous Muslim following, but Church adherence is mainly Christian. The full spectrum of Christianity is represented, from mainstream Catholic, Presbyterian and Anglicans through the Seventh Day Adventists and Assembly of God congregations to the self-styled 'churches' of Neil Thomas Ministry and Hillsong.

It is revealing that ni-Vanuatu name the contest between tradition and modernity as a battle between 'Skul' and 'Kastom', rather than 'Jyos' and 'Kastom'. Ni-Vanuatu see no real conflict between the practice of Christianity and the practice of custom. In fact there is an integration, even an indigenisation of Christian cosmology into much of the custom that is now practised (Douglas 2005 is the best account of this melange, but Jolly (1997) and Rodman (1987) also touch on it, as does Rio (2010)). Rather, they see the conflict with their ways arising from the secular activities of the churchmen — land alienation, social mores of clothing, eating habits and language, not to mention paternalism and disdain for a culture of which they (the missionaries) knew little at best. The Christian missionaries saw their secular role — education and the institution of a market economy through trade — as concomitant with their religious duties, thus 'skul', as instituted by the Presbyterian missionaries and the Catholic Marists, where those secular ideas were inculcated in the language of the colonisers, became the battleground — the praxis between the 'old' and the 'new'.

Table C.24: Church Adherence percentage population 1967 — 1999: Provinces, Rural, Urban and Vanuatu

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>93.7</td>
<td>97.1</td>
<td>82.0</td>
<td>96.5</td>
<td>30.7</td>
<td>80.9</td>
</tr>
<tr>
<td>1979</td>
<td>82.6</td>
<td>89.5</td>
<td>68.9</td>
<td>86.9</td>
<td>39.2</td>
<td>71.4</td>
</tr>
<tr>
<td>1989</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>77.2</td>
</tr>
<tr>
<td>1999</td>
<td>92.9</td>
<td>92.9</td>
<td>83.5</td>
<td>84.4</td>
<td>54.0</td>
<td>76.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Port Vila</th>
<th>Lugarville</th>
<th>Urban</th>
<th>Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>n/a</td>
<td>n/a</td>
<td>80.9</td>
</tr>
<tr>
<td>1979</td>
<td>n/a</td>
<td>n/a</td>
<td>76.5</td>
</tr>
<tr>
<td>1989</td>
<td>n/a</td>
<td>n/a</td>
<td>77.2</td>
</tr>
<tr>
<td>1999</td>
<td>84.3</td>
<td>79.5</td>
<td>83.1</td>
</tr>
</tbody>
</table>


The low 1967 percentage in Tafea province is almost entirely due to the reluctance of the Tannese to embrace Christianity and their willingness to embrace millenarian movements. The other islands of the province are almost entirely Christian — the Tannese marginally

---

*Church* can be rendered in many ways in bislama — jej, joi, jyoj are versions I am familiar with. I have chosen Jyos for linguistic reasons — it's the best phonetic approximation.
Catholic. Surprisingly, Tafea is also the only province where Christian affiliation has grown strongly over time.

Shefa province is the only area with a significant expatriate population, which may explain some of the decline over time in Church numbers. Alternatively, it could be a population wide decline.

Custom is full of meaning in terms of social capital, but it is shrouded in mystery and deliberate untruth. The 1979 percentages presented can be safely characterised as gross underestimates, as is borne out by the Census report (South Pacific Commission 1979: 87), which notes that the religion question was optional in 1979. In 1967 only 300 people chose not to answer the religion question, in 1979 more than 10,000 chose to remain silent. No-one is reluctant to admit Christian beliefs, but few people will admit to custom beliefs if asked by someone outside their community. This makes for some difficulty in arriving at an estimate of how many people actually are custom adherents.

Custom adherence in Tafea province includes the many millenarian cult followers (Jon Frum and Prince Philip being the two main messianic figures among a panoply).

The very idea of custom adherence is problematical in definition. If the ceremonial aspects of custom are considered — the way-points on the life-journey: birth; the transition from child to adult; marriage; and death — then custom is strong throughout the country. But, even in our own secular society, we often 'dress' these same way-points with 'custom', perhaps because we have not yet found suitable replacements for the traditional methods of celebrating these 'rites of passage'.

If the way-point celebrations are treated as purely symbolic, is there other evidence of an enduring cosmology of custom? There is, but the evidence for it must be tempered by a recognition that 'pure' custom never existed, and thus there can be no narrow definition of the cosmology here discussed — it will be a mixture of accretions, interpretations and contestations, but which will nevertheless be accepted by most as 'kastom'.

Despite a reluctance to admit belief to outsiders most ni-Vanuatu do continue to believe strongly in the existence of a (non-Christian) supernatural world. Nakaimas was at the root of a serious outbreak of civil disturbance in Port Vila in 2007 which resulted in the deaths of three people and the burning of a large number of houses in the Blacksands area. Sympathetic magic or taboo breaking are still regarded by many as the only legitimate causes of death and traditional remedies for common ailments are widely used in the urban areas.

The Vanuatu Penal Code, section 151, states:

151. Witchcraft

No person shall practise witchcraft or sorcery with intent to cause harm or detriment to any other person.

Penalty: Imprisonment for 2 years

(http://www.paclii.org/vu/legis/consol_act/pc66/)

34I am thinking of marriage practices, which seem to require an ever more elaborate celebration to enact the rite which can be achieved in a civil ceremony in five minutes and at a moderate cost!

35Black magic.

36See http://www.bloomberg.com/apps/news? pid=newsarchive&sid=aiMnKk7Ls6VVM for an account, or google ‘blacksands riots 2007’ for other sources.

37See Figure A.3.
In Christian practice as well, there are frequent stories of everyday supernatural events, including resurrections, where people have died and then come back to life, often in Vila Central Hospital.\(^{38}\) Rio (2010) provides an interesting ethnographic approach to the incorporation of sorcery into modernity, via the Church and the State.

This could be characterised as simply a belief in the existence of the supernatural and not as cosmological adherence, but it adds a layer of meaning to the way-point ceremonies. The combination of the two strands of belief and the capacity for them — Christianity and custom — to sit side by side within ni-Vanuatu cosmology will have to serve to delimit custom adherence as a measure. Wider questions of the meaning and existence of culture will be left aside.

**Table C.25: Custom Adherence percentage population 1967 — 2009:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>5.0</td>
<td>2.7</td>
<td>14.8</td>
<td>0.6</td>
<td>69.2</td>
<td>14.9</td>
</tr>
<tr>
<td>1979</td>
<td>1.3</td>
<td>1.9</td>
<td>1.0</td>
<td>0.1</td>
<td>42.6</td>
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</tr>
<tr>
<td>1989</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>0.0</td>
<td>3.2</td>
<td>3.0</td>
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<td>2008</td>
<td>43.2</td>
<td>39.7</td>
<td>63.5</td>
<td>33.0</td>
<td>66.3</td>
<td>49.6</td>
</tr>
</tbody>
</table>

(health question)

<table>
<thead>
<tr>
<th>Year</th>
<th>Port Vila</th>
<th>Lagaville</th>
<th>Urban</th>
<th>Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>14.9</td>
</tr>
<tr>
<td>1979</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>7.6</td>
</tr>
<tr>
<td>1989</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>4.5</td>
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<tr>
<td>1999</td>
<td>0.5</td>
<td>8.9</td>
<td>2.8</td>
<td>5.5</td>
</tr>
<tr>
<td>2008</td>
<td>27.7</td>
<td>51.6</td>
<td>33.5</td>
<td>45.3</td>
</tr>
</tbody>
</table>

(health question)

In order to provide a clue to this ambivalence about declaring custom adherence, two measures are given in Table C.25: one is self-declared custom adherence, the other is inferred from positive answers (i.e. ‘yes’) given to a health question posed in the Multiple Indicator Cluster Survey in 2007:

Can HIV be transmitted by supernatural means?\(^{9}\)

(Shuaib and Rahman 2008: 114)

This provides a more realistic picture of continuing traditional cosmological beliefs, as does the reluctance of many participants to provide children's stool samples for medical analysis (Shuaib and Rahman 2008: 6). Stolen faecal matter is a powerful tool for supernaturally interfering with someone.\(^{39}\)

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\(^{38}\) I personally witnessed the telling of the story of a ‘resurrection’. The then Prime Minister, Edward Natapai, took a leading role in proclaiming the miracle, at Paron Memorial Church, Port Vila in 2005.

\(^{39}\) On a bizarre note, this belief in faecal matter manipulation is thought by many — the author included — to be a major factor behind the wildly optimistic counts (in all censuses) of people claiming to have flush toilets.
Local language fluency

This measure has common elements with the first measure in this group, but local language proficiency can also be regarded as a measure of entitlement, separate from provenance. The inter-marriage which has become such a part of life in urban areas, where the man and woman are from different islands, or different language areas of the same island leaves the children of the marriage in jeopardy when it comes to their rights in either parents culture. If children are taught either or both parents local languages they gain social and cultural entry, but often they learn neither. They speak Bislama and a smattering of French or English, the languages of education (Nettle and Romaine 2000: 28 suggest a link between language diversity and biodiversity in their examination of language extinction).

Without fluency in the local language, children cannot learn the 'secrets' of their parents culture and cannot fully participate in the community of that language. (Vari-Bogiri 2008: 2, Tarisesci 2000).40

Table C.26: Local language fluency percentage population 1967 — 2009: Provinces, Rural, Urban and Vanuatu

<table>
<thead>
<tr>
<th>Year</th>
<th>Malampa</th>
<th>Penama</th>
<th>Sanma</th>
<th>Shefa</th>
<th>Tafea</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>97.1</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>82.6</td>
<td>94.2</td>
<td>73.5</td>
<td>75.4</td>
<td>95.5</td>
<td>85.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Port Vila</th>
<th>Laganville</th>
<th>Urban</th>
<th>Vanuatu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>n/a</td>
<td>n/a</td>
<td>82.2</td>
<td>94.3</td>
</tr>
<tr>
<td>1999</td>
<td>29.5</td>
<td>23.1</td>
<td>29.1</td>
<td>78.1</td>
</tr>
</tbody>
</table>


In some of the longer-term informal settlements in Port Vila, even children of a common language heritage do not learn or use their local language. In the Paamese Village (long-standing informal settlement) in Nambatri, a suburb of Port Vila (see map A.3), the children speak bislama almost exclusively, despite there being only one Paamese language, spoken by all the adults in the village (Haberkorn 1990, and personal experience walking through the village to and from work each day for twelve months).

It seems likely that the low values for Sanma and Shefa may include values for the urban populations of Laganville and Port Vila respectively. The values for urban populations are dramatically lower than the national average.

Interest in language in the censuses has often been directed at Bislama, English and French, and combinations of the same. Bislama is spoken universally in and around Port Vila and Laganville, but in rural areas on more remote islands there are fewer speakers. There have been some moves to institute local language primary schools, but the difficulty is always in finding written texts. Often the only written texts in a language are bible translations. Bible translators provide a serendipitous service by documenting languages as part of the translation process (Nettle and Romaine 2000: 7).

40This is a view which is held by the ni-Vanuatu themselves. A friend said 'If you have no language, you have no secrets'. She was a long-term resident of Port Vila, whose village was in North Efate. Her 'language' is Nakanamanga. (Elizabeth Andrews, pers. comm. 2007).

with septic tanks. If you admit to having a pit toilet your faecal matter is at greater risk of theft!
Appendix D

How the asset pentagon area was calculated

Figure D.1: Urban 'subsistence plus' Livelihood Asset Pentagons: Earlier and later datasets

Calculating the area of the pentagon

This example shows how the earlier and later pentagons for the urban subsistence plus livelihood were calculated. The rural pentagons were calculated using the same method.
1. Using the formula

\[ \text{area} = (\text{sidelength} \times \text{sidelength} \times \sin(72\text{degrees})) \div 2 \]

to calculate the pentagons

**Triangle S.F**

- later
  \[ a = (9.1 \times 9.4 \times 0.951) \div 2 = 40.67 \]

- earlier
  \[ a = (6.7 \times 9.1 \times 0.951) \div 2 = 28.99 \]

**Triangle F.N**

- later
  \[ a = (9.4 \times 4.8 \times 0.951) \div 2 = 21.46 \]

- earlier
  \[ a = (9.1 \times 4.2 \times 0.951) \div 2 = 18.17 \]

**Triangle N.P**

- later
  \[ a = (4.8 \times 8.6 \times 0.951) \div 2 = 19.62 \]

- earlier
  \[ a = (4.2 \times 8.6 \times 0.951) \div 2 = 17.18 \]

**Triangle P.H**

- later
  \[ a = (8.6 \times 9.0 \times 0.951) \div 2 = 36.80 \]

- earlier
  \[ a = (8.6 \times 8.2 \times 0.951) \div 2 = 33.53 \]

**Triangle H.S**

- later
  \[ a = (9.0 \times 9.1 \times 0.951) \div 2 = 38.94 \]

- earlier
  \[ a = (8.2 \times 6.7 \times 0.951) \div 2 = 26.12 \]

2. Summing these results gives the area of pentagon SFNPH

- later pentagon
  \[ a = 40.67 + 21.46 + 19.62 + 36.80 + 38.94 = 157.51 \]

- earlier pentagon
  \[ a = 28.99 + 18.17 + 17.18 + 33.53 + 26.12 = 123.99 \]
Appendix E

Port Vila market survey report: 6 November, 2009

Port Vila market house operates six days a week, closing Saturday afternoon to Monday morning. Stall holders usually sleep overnight in their stalls. If you want to buy something at night, you have to wake someone up.

Table E.1: Port Vila Market Survey: 6 November 2009, 10am. to 11.30am.

<table>
<thead>
<tr>
<th>Item</th>
<th>Measure</th>
<th>Range (VUV)</th>
<th>Total</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>root crops</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>taro</td>
<td>basket</td>
<td>500</td>
<td>21</td>
<td>Fiji taro (coco yam)</td>
</tr>
<tr>
<td>kumala</td>
<td>basket</td>
<td>500</td>
<td>41</td>
<td>sweet potato</td>
</tr>
<tr>
<td>yam</td>
<td>basket</td>
<td>600</td>
<td>10</td>
<td>mostly wild yam</td>
</tr>
<tr>
<td>manioc</td>
<td>basket</td>
<td>400</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>breadfruit</td>
<td>basket</td>
<td>600</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>water taro</td>
<td>unit</td>
<td>150-500</td>
<td>&lt;40</td>
<td>from Pentecost</td>
</tr>
<tr>
<td><strong>other local staples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dry coconut</td>
<td>bundle</td>
<td>100-150</td>
<td>363</td>
<td>approx. ten</td>
</tr>
<tr>
<td>banana</td>
<td>bunch</td>
<td>500</td>
<td>39</td>
<td>'sweet banana'</td>
</tr>
<tr>
<td>plantain</td>
<td>bunch</td>
<td>500</td>
<td>102</td>
<td>cooking banana</td>
</tr>
<tr>
<td>island cabbage</td>
<td>bundle</td>
<td>200</td>
<td>2</td>
<td>greens still arriving</td>
</tr>
<tr>
<td><strong>fruit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pineapple</td>
<td>unit</td>
<td>200-400</td>
<td>&gt;500</td>
<td>very seasonal</td>
</tr>
<tr>
<td>pawpaw</td>
<td>unit</td>
<td>50-150</td>
<td>&gt;500</td>
<td></td>
</tr>
<tr>
<td>mango</td>
<td>unit</td>
<td>20-70</td>
<td>&gt;1000</td>
<td>very seasonal</td>
</tr>
<tr>
<td>sour sop</td>
<td>unit</td>
<td>50-100</td>
<td>&gt;150</td>
<td></td>
</tr>
<tr>
<td>banana</td>
<td>hand</td>
<td>100-200</td>
<td>&gt;300</td>
<td>sweet banana</td>
</tr>
<tr>
<td>watermelon</td>
<td>unit</td>
<td>100-500</td>
<td>&gt;600</td>
<td>small to very big</td>
</tr>
<tr>
<td>lime</td>
<td>bag</td>
<td>200</td>
<td>1</td>
<td>20x30cm plastic</td>
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</table>

contd. next page...
Table E.1 — contd.

<table>
<thead>
<tr>
<th>Item</th>
<th>Measure</th>
<th>Range (VUV)</th>
<th>Total</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lettuce</td>
<td>string</td>
<td>200</td>
<td>&gt;300</td>
<td>approx. ten in string</td>
</tr>
<tr>
<td>spring onion</td>
<td>bunch</td>
<td>100</td>
<td>5</td>
<td>still arriving</td>
</tr>
<tr>
<td>bean</td>
<td>bag</td>
<td>200</td>
<td>40</td>
<td>snake &amp; small beans</td>
</tr>
<tr>
<td>tomato</td>
<td>small bag</td>
<td>400</td>
<td>&gt;50</td>
<td>seasonal</td>
</tr>
<tr>
<td>carrot</td>
<td>bunch</td>
<td>100</td>
<td>&gt;100</td>
<td>approx. five</td>
</tr>
<tr>
<td>taro leaf</td>
<td>bunch</td>
<td>100</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>water cress</td>
<td>bunch</td>
<td>150</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>pumpkin leaf</td>
<td>bunch</td>
<td>150</td>
<td>100</td>
<td>leaves and runners</td>
</tr>
<tr>
<td>shushut</td>
<td>bag</td>
<td>250</td>
<td>20</td>
<td>choko</td>
</tr>
<tr>
<td>chili</td>
<td>bag</td>
<td>100</td>
<td>&lt;10</td>
<td></td>
</tr>
<tr>
<td>capsicum</td>
<td>bag</td>
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<td>30</td>
<td></td>
</tr>
<tr>
<td>capsicum</td>
<td>unit</td>
<td>30</td>
<td>&gt;200</td>
<td>larger sizes</td>
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<td>cucumber</td>
<td>unit</td>
<td>100</td>
<td>&gt;200</td>
<td></td>
</tr>
<tr>
<td>pumpkin</td>
<td>unit</td>
<td>400</td>
<td>&gt;500</td>
<td></td>
</tr>
<tr>
<td>cabbage</td>
<td>unit</td>
<td>200</td>
<td>&gt;500</td>
<td>Savoy</td>
</tr>
<tr>
<td>eggplant</td>
<td>unit</td>
<td>100-150</td>
<td>&gt;100</td>
<td>aubergine</td>
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<tr>
<td><strong>sundry items</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>laplap leaf</td>
<td>bundle</td>
<td>150-200</td>
<td>80</td>
<td>for wrapping food</td>
</tr>
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<td>bundle</td>
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<td>100</td>
<td>mud crab</td>
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<td>snail</td>
<td>small basket</td>
<td>200</td>
<td>5</td>
<td>green sea snail</td>
</tr>
<tr>
<td>pig</td>
<td>unit</td>
<td>1500</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>chicken</td>
<td>unit</td>
<td>500</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>kava</td>
<td>unit</td>
<td>5000</td>
<td>1</td>
<td>huge root bundle</td>
</tr>
<tr>
<td>navara</td>
<td>bunch</td>
<td>400</td>
<td>10</td>
<td>sprouted coconut</td>
</tr>
<tr>
<td>ngangae nut</td>
<td>stick</td>
<td>100</td>
<td>plenty</td>
<td>approx. 20</td>
</tr>
<tr>
<td>firewood</td>
<td>bundle</td>
<td>250-300</td>
<td>140</td>
<td>leucaena mainly</td>
</tr>
<tr>
<td>charcoal</td>
<td>bag</td>
<td>300</td>
<td>&gt;50</td>
<td>frying and boiling</td>
</tr>
<tr>
<td>kato</td>
<td>unit</td>
<td>20</td>
<td>plenty</td>
<td>fried dough</td>
</tr>
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<td>meals</td>
<td>unit</td>
<td>200-400</td>
<td>plenty</td>
<td>meat and rice</td>
</tr>
<tr>
<td>raw peanut</td>
<td>bunch</td>
<td>200</td>
<td>&gt;200</td>
<td>groundnut</td>
</tr>
<tr>
<td>cooked peanut</td>
<td>small bag</td>
<td>200</td>
<td>plenty</td>
<td></td>
</tr>
</tbody>
</table>

Prices for laplap and other stone-cooked foods brought in were not included, but range from VUV200 — VUV400. There are usually twenty or so vendors, with around twenty portions for sale. There were no fish for sale at the usual place, and I ignored plants, flowers, trochus shells and small craft items. I am surprised that I didn’t record any bok choy or pak choy (known locally as ‘white boon’ or ‘green boon’).\(^1\). I think I must have missed it. There were no flying foxes for sale, nor were there coconut crabs — an endangered species, but these are regularly sold. Flying foxes are usually VUV1000 a pair, and coconut crabs VUV3000-5000 each, depending on size.

Roadside markets are generally similar in price to the market, despite the advantage of not having to pay fees.

\(^1\)Balama ‘boon’ = bone
Appendix F

Food Resilience Index data tables
### 1990/91 data

<table>
<thead>
<tr>
<th>Country</th>
<th>Agricultural land/capita</th>
<th>Food Self-sufficiency</th>
<th>Urban Subsistence</th>
</tr>
</thead>
<tbody>
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<td>Angola</td>
<td>5.51</td>
<td>38.07</td>
<td>6.00</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>1.44</td>
<td>13.93</td>
<td>2.03</td>
</tr>
<tr>
<td>Benin</td>
<td>0.66</td>
<td>37.57</td>
<td>5.42</td>
</tr>
<tr>
<td>Burundi</td>
<td>0.39</td>
<td>12.73</td>
<td>7.00</td>
</tr>
<tr>
<td>Chad</td>
<td>8.10</td>
<td>20.83</td>
<td>2.52</td>
</tr>
<tr>
<td>Comoros*</td>
<td>0.34</td>
<td>27.27</td>
<td>5.05</td>
</tr>
<tr>
<td>Central African Rep.</td>
<td>1.73</td>
<td>38.14</td>
<td>7.00</td>
</tr>
<tr>
<td>Eritrea</td>
<td>25.00</td>
<td>15.79</td>
<td>1.48</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>0.68</td>
<td>13.16</td>
<td>2.23</td>
</tr>
<tr>
<td>Gambia</td>
<td>0.06</td>
<td>37.73</td>
<td>2.04</td>
</tr>
<tr>
<td>DRep Congo (Zaire in 19)</td>
<td>0.58</td>
<td>29.10</td>
<td>7.00</td>
</tr>
<tr>
<td>Guinea</td>
<td>2.29</td>
<td>38.43</td>
<td>2.94</td>
</tr>
<tr>
<td>Djibouti</td>
<td>3.04</td>
<td>81.09</td>
<td>2.00</td>
</tr>
<tr>
<td>Guinea-Bissau*</td>
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<td>29.97</td>
<td>2.49</td>
</tr>
<tr>
<td>Eq. Guinea</td>
<td>0.86</td>
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<td>7.00</td>
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<td>Lesotho</td>
<td>1.51</td>
<td>16.99</td>
<td>2.23</td>
</tr>
<tr>
<td>Liberia</td>
<td>1.21</td>
<td>57.02</td>
<td>3.74</td>
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<td>Madagascar</td>
<td>1.87</td>
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<td>0.58</td>
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<td>Mali</td>
<td>4.49</td>
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<td>2.01</td>
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<tr>
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<td>1.03</td>
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<td>21.07</td>
<td>5.25</td>
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<td>Niger</td>
<td>5.08</td>
<td>15.45</td>
<td>1.10</td>
</tr>
<tr>
<td>Rwanda</td>
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<td>6.00</td>
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<td>Sao Tome &amp; Principe*</td>
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<td>41.67</td>
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<td>39.89</td>
<td>2.05</td>
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<td>1.00</td>
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<td>2.20</td>
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<td>2.05</td>
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<td>0.91</td>
<td>28.27</td>
<td>3.68</td>
</tr>
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<td>0.73</td>
<td>12.71</td>
<td>4.00</td>
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<td>1.37</td>
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<td>3.74</td>
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<td>2.73</td>
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<td>16.90</td>
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<td>0.09</td>
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<td>2.05</td>
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<td>Bhutan#</td>
<td>1.09</td>
<td>7.27</td>
<td>2.35</td>
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<td>Cambodia</td>
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<td>2.03</td>
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<td>Kiribati*</td>
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<td>42.86</td>
<td>7.00</td>
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<td>15.69</td>
<td>2.09</td>
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<td>0.29</td>
<td>24.91</td>
<td>2.02</td>
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<td>12.50</td>
<td>7.00</td>
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<td>7.00</td>
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<td>Yemen</td>
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# = Landlocked LDC * = Small Island Developing State

max = 25.00  min = 0.03  median = 1.21  range = 24.97

max - median = 23.79

260

Figure E1: Food Resilience Index 1990 raw data
### 2005 data

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* = Landlocked LDC  = = Small Island Developing State

**max** = 19.16

**min** = 0.02

**median** = 0.83

**range** = 19.15

**max - median** = 18.33

Figure E.2: Food Resilience Index 2005 raw data
**Figure E.3: Food Resilience Index 1990 relative data**

Scores relative to maximum value of 10

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