URBANIZATION AND THE URBAN POOR - VANUATU'S FOOD SECURITY CHALLENGE

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ABSTRACT

Local staples in towns of Vanuatu are beyond the reach of the urban poor who rely on imported rice which provides cheap calories. Diversity in food options is lost and the urban poor's food security is dependent on the price of rice. National food policy, emphasizing self sufficiency, has led to the introduction of a tariff on rice. While successful in containing rural demand, the tariff has failed to reverse the high urban price differential between rice and local substitutes and urban consumption patterns have remained unaltered. The tarriff has however, raised the cost of food to the already vulnerable urban poor. It is argued that rapid urbanization will increase demand for imported foods unless consumption habits change. Tariffs will not achieve this. Emphasis must be placed on reducing the cost of local foods relative to rice by improving their production, distribution, marketing, and widening food options and providing incentive to change of habits.

Key words: Food policy; tariffs, rice imports; Vanuatu

INTRODUCTION

Vanuatu comprises an archipelago of over eighty widely dispersed islands stretching across 800 kilometers of the South West Pacific. Of the total land mass of 12,190 square kilometers, approximately 41% is regarded as cultivable land. At present, less than one third of the potential arable area is thought to be under cultivation, including that under commercial plantations and fallow. With a population estimated at just 142,944 in 1989, with abundant land resoruces and a favourable climate, Vanuatu has the potential to be physically food self sufficient. In contrast to many other developing countries, food security at either the household or the national level, should not appear an immediate problem. Urbanization is, however, rapidly changing the distribution of national population, and with it food consumption patterns, in a way that fundamentally alters the determinants of food security. In these circumstances physical self sufficiency at national level provides no automatic assurance of food security. This paper therefore discusses food policy issues applicable not only for Vanuatu but for the whole Melanesian region and attempts a contribution to the debate on food security, food import and traditional food production for long term stability of the developing countries.

VANUATU'S CHANGING POPULATION

Between the first national census in 1967 and the third and most recent in 1989, the number of ni-Vanuatu residents in Vanuatu's two urban areas - Port Vila (the national capital) and Luganville - increased at an astounding annual rate of 7.6%. Rural population over the same period rose annually by 3%, in itself a rapid rate of growth. The proportion of ni-Vanuatu urbanized has thus risen from 6% of the total population in 1967 to 17% in 1989. Almost all of this increase can be attributed to net immigration from rural areas. Table 1 shows

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Vanuatu's urban expansion. The urbanization radically alters the determinants of household food security (HFS), the household's ability to secure food in sufficient quantity and quality to maintain good health. The generally good access to self produced food, that characterizes rural Vanuatu with the occasional aberration of tropical cyclone, ceases when households settle in towns. HFS then becomes dependent upon securing access to purchased rather than self produced food; a command on food resources predicated on the maintenance of access to income to buy food which is affordably priced. Any disruption to income or unfavorable movement in food prices can potentially compromise HFS.

In Vanuatu today, the urban poor who represent the largest proportion of a rapidly growing urban population, are a particularly vulnerable group. If their food security is to be improved, it is essential that the reasons for this vulnerability are fully appreciated. Only then can interventions be appropriately designed and targeted and an accommodation of their needs brought to national level food policies. To date, food policy has emphasized national self sufficiency but little, if any, regard has been shown to food security needs at the household level. Measures implemented in support of this national objective have been detrimental to the food needs of the urban poor.

Table 1. **Vanuatu's changing population, 1967 - 1987.**

	1967		1979		1989	
Rural/urban	Number	%	Number	%	Number	%
Rural	70,216	90.0	95,467	85.8	116,650	81.6
Urban						
Luganville	2,564	3.3	5,183	4.7	6,983	4.9
Port Vila	5,208	6.7	10,601	9.5	19,311	13.5
Total	7,772	10.0	15,784	14.2	26,294	18.4
Vanuatu	77,988	100.0	111,251	100.0	142,944	100.0

Source: National Planning and Statistics Office, Port Vila.

There are unfortunately little data available on income and expenditure patterns in urban Vanuatu. The only survey conducted to date was done by the National Planning and Statistics Office in 1985. While this may be some time ago, the basic pattern of household expenditure and some indication of income levels can be derived from it. These data, combined with more recent information on food prices, allow a reasonable discussion on urbanization and the changing determinants of household food security in Vanuatu.

THE VULNERABILITY OF THE URBAN POOR

Four main factors influence the vulnerable food security status of the urban poor - two related to income and two to the pattern of household expenditure.

1. Low income

Income acts as the most fundamental constraint to the amount (and quality) of food any household can buy. The 1985 survey indicated that the average annual income of the poorest half of urban households was just 41% of the level enjoyed by the 39% of households defined as "middle income" household; 17% of the average annual income of the 11% belonging to the "high income" households (Table 2).

3. High share of income and expenditure on food

Although poor households spend less in absolute terms on food than wealthy households, that expenditure accounts for a significantly greater proportion of their total spending and income (Table 2). Any general increase in the price of food therefore hits the poor proportionately harder. A 10% increase in food prices, for example, would require a low income household to dedicate an additional 4% of its income in order to maintain the same level of consumption; two and a half times the level required by a high income household.

The degree to which price movements (or reductions in income) affect HFS, is also dependent on the household's ability to reallocate expenditure away from non-food items and towards food, if and when required. The higher allocation of a poor household's income to food, limits the flexibility for such substitution union is already difficult given that much non-food expenditure is on essentials such as housing.

Table 2. **Urban household income and expenditure on food, 1985.**

	Proportion of urban households (%)	Average annual household income (Vatu)	Average annual expenditure on food (Vatu)	Household income spent on food (%)	Household expenditure devoted to food (%)
Low income	50%	326,000	125,093	38.3	42.7
Medium income	39%	797,000	181,405	22.7	35.3
High income	11%	1,865,000	294,678	15.8	29.8

Source: National Planning and Statistics Office, Port Vila.

2. Variability of income

Any disruption to the flow of income to the household will impair access to food. There are several ways in which this can occur: unemployment, short time working or sickness. Low income employment tends to be more casual than higher paid jobs. Therefore breaks in employment and periods of underemployment are likely to be more common amongst the poor.

4. Limited diversity of food options

Examination of household expenditure patterns

reveals a high concentration of spending by the urban poor on a very narrow range of commodities. In 1985, five foods - rice, bread, locally produced starches, canned fish and canned meat accounted for almost half of expenditure on food by low income groups. Rice alone accounted for over 15% of that expenditure and provided an estimated 28% of daily adult calarie needs. By contrast, the same five items accounted for less than 10% of the average high income household's food expenditure (see Table 3).

Table 3. **Pattern of urban household expenditure, 1985.**

	Low Income	Medium Income	High Income
	% of all expenditure on food		
Rice	15.7	12.7	2.7
Bread	14.6	11.4	3.3
Local starches	7.2	5	1.9
Canned fish	5.1	3.5	0.6
Canned meat	6.3	5.8	1.4
Total	48.9	38.4	9.9

Source: **National Planning and Statistics Office, Port Vila.**

This pattern of expenditure is not unique in Vanuatu. It is a feature found elsewhere in the Pacific, and frequently attributed to consumer preference based on convenience and taste factors. These "non-price" advantages, while important to urban consumers, notably for working women, are however only part of the story. For those with low income, rice provides cheap energy relative to other available traditional foods excepting Manioc. In terms of calories obtained per unit of expenditure, rice represents good value for money (Table 4).

The high relative price of local foods not only skews consumption patterns towards imported items but it also limits food options open to urban consumers. This reduced diversity jeopardizes HFS as opportunities for substitution with other foods become limited by the high price of local staples. The price differential that exists is such, that rice will remain relatively cheaper even following a substantial increase in its price.

Understanding why traditional foods are so expensive in urban areas, not just in Vanuatu, but throughout Melanesia, has been the focus of much debate. In addition to the more obvious problems attributable to the bulkiness, perishability and high costs of transporting local staples, Melanesian food markets, as noted by Brookefield (1969), fail to conform to the basic tenets of neo-classical economic theory. They are frequently cited as being "inefficient", as evidenced by a lack of bargaining and the preference of vendors for taking unsold produce home rather than reducing prices to induce a sale. The result is a lack of accommodation between buyers, who go home unsatisfied, and producers who go less than fully rewarded. The market fails to "clear" in response to price signals - the key to the allocation of resources in the working of free and efficient markets.

Whether the emphasis of the explanation for high food prices lies with problems of infrastructure or results from the peculiarities of food markets, most observers would agree that it has little if anything to do with technical food production factors. Distribution and marketing aspects of the food system are far more improtant. Their effect has left the food security of poor urban households and therefore a significant and increasing proportion of Vanuatu's total population, largely dependent on the price of rice. Any increase in rice cost presents a threat to HFS. Furthermore, as rice is entirely imported, domestic prices are influenced by changes in world prices and exchange rates, so adding an international element to urban HFS.

Table 4. **Energy values of alternative foods, Port Vila 1980 - 1991.**

Year	Rice	Cooking Bananas	Yams	Sweet Potato	Taro	Manioc
			Kcals per constant 1980 vatu			
1980	61.3	35.6	19.3	33.9	36.1	76.1
1981	40.9	36.6	24.2	38.7	39.2	77.7
1982	57.1	45.1	24.8	42.8	36.0	77.9
1983	67.2	49.0	27.1	39.0	46.7	99.8
1984	70.2	41.2	25.9	37.1	42.4	87.7
1985	88.2	42.2	22.9	33.6	39.9	87.3
1986	84.2	43.3	26.4	38.7	51.7	89.1
1987	76.3	30.3	19.7	31.4	36.7	70.9
1988	72.1	27.1	19.0	32.1	29.4	64.9
1989	65.5	49.0	25.3	42.7	68.0	125.4
1990	72.3	57.6	30.7	37.6	69.6	129.5
1991	83.6	52.8	23.6	40.3	48.6	117.5
Average 1980-1991	69.90	42.48	24.07	37.33	45.36	91.98

Source: **Calculated from data supplied by the National Planning and Statistics Office, Port Vila.**

FOOD IMPORTS, FOOD POLICY AND HFS

For a country with such a rich agricultural potential and one physically capable of achieving self sufficiency, Vanuatu's food imports are remarkably high. Throughout the 1980s, annual average food imports amounted to a value equivalent to almost 20% of the value of total imports and 80% of the value of domestic exports. In three years during the 1980s, the value of food imports exceeded that of domestic exports (see Table 5).

Consumption of imported foods, despite the preceding discussion, is in fact neither a recent trend, nor a habit associated solely with urbanization. Malcolm (1951) showed that imported foods, notably rice, were already well established in both urban and rural diets more than forty years ago. More recent reviews of household expenditure patterns undertaken by the National Planning and Statistics Office in 1983 and 1984 indicate that rural, rather than urban consumption, has been the primary source of demand for imported foods. Estimated urban per capita consumption levels for imported items are generally higher than those in rural areas, but the predominance of rural ni-Vanuatu in the population (82% in 1989) means that the bulk of consumption has occurred in rural areas. To take the case of rice; in 1985, a year of particularly high imports, estimated rural consumption comprised more than 70% of total demand although per capita consumption was at 43 kg which was significantly less than the 78 kg estimated for urban areas.

This high level of food imports is viewed with great concern, primarily because of the foreign exchange

Table 5. **Vanuatu's food imports 1980 - 1990.**

Year	Food imports (millions of vatu)	Food imports as % of total imports (%)	Food imports as % of domestic exports (%)
1980	993	27.9	112.8
1981	1113	28.5	79.4
1982	1143	24.7	110.2
1983	1023	19.7	57.4
1984	1166	20.0	35.1
1985	1210	19.6	64.5
1986	1089	18.4	112.3
1987	1022	13.7	68.0
1988	1263	18.1	81.1
1989	1213	15.4	75.2
1990	1297	12.0	80.8
Average (1980-1990)	1139	19.8	79.7

Source: **National Planning and Statistics Office, Port Vila.**

costs. Increased self sufficiency, measured in terms of reduced imports, has consequently become the prime food policy objective, and figured prominently in Vanuatu's Second Development Plan. Amongst the strategies advocated in support of this objective, perhaps the most significant has been the imposition of a range of tariffs on imported foods in 1987. Table 6 highlights the rate of import duties which have been levied on a number of items important to the urban poor. In view of the vital dietary role of these foods such high rates of duty impose a serious burden on the urban poor and become a potential threat to HFS.

The degree to which a tariff will succeed in reducing the consumption of any good, depends upon the extent of the price rise it causes, and the price elasticity of demand for that good - the extent to which consumption responds to a change in price. Price elasticity of demand will vary between households with respect to the ease with which alternative goods can be substituted. In the case of food, this ease of substitution also determines the tariff's implications to HFS.

Table 6. **Prevailing rates of import duty on significant food items.**

	Rate of duty (%)
Rice	25
Flour	25
Canned fish	45

Note: **An additional 5% Service tax is levied on all items.**

Source: **Vanuatu Department of Customs.**

For rural households wth easy access to adequate home produced foods, substitution will be easy. Tariffs on items like rice and flour which are substitutes for home produced foods, can achieve the objective of dampening demand with no necessarily adverse impact on HFS in the rural areas.

The situation is very different in urban areas. The price elasticity for imported items, principally rice, is likely to be much lower, particularly given the limited range of food options available. substitution will be by necessity with another purchased food, and will only occur if the tariff succeeds in leaving imported items, principally rice, relatively more expensive. Given the extent of the present price advantage that rice offers, a very considerable increase in its price or tariff would be required to achieve this. The consequences for those on low and limited incomes of such a hike in basic food costs are self apparent.

In Vanuatu, tariffs have been set at a level below those required to reverse the existing structure of relative prices. Untaxed local foods remain relatively more expensive (see Table 2), so no inducement to substitution has been given. The tariffs have however required urban households to spend more to buy the same quantity of imported food. Those unable to meet this higher food bill are obliged to reallocate expenditure away from "less important" items (including presumably some foods), and towards obtaining basic calories.

If such a reallocation of expenditure cannot be made, and as discussed above the opportunity for the urban poor to do so is limited, reductions in food consumption may occur. Any suppression in urban demand for imported foods thus achieved, will not have been through the "substitution effect" initially intended, but rather by way of an "income effect". That is by reducing the physical amount of food the household is able to buy, in a manner analogous to that which would occur if income was itself reduced. The food security implication for households with limited incomes is once again all too readily apparent.

The dilemma for Vanuatu's policy makers, however, is that tariffs are an effective, and probably the only means of containing demand for imported foods: if the problems they present for the urban poor are pushed aside. To take the case of rice again, national per capita consumption appears to be significantly price sensitive, indicating that tariffs will dampen demand. This finding is consistent with the premise that the majority of rice, and with it most other imported foods are eaten in rural areas, where demand can be presumed to be relatively price elastic. This is illustrated by the regression equation presented below which expresses national per capita rice consumption between 1980 and 1990 and its price.

Annual per capita rice consumption (kg per year)
= 78.8 - 0.8 price per kg
(9.3) (5.1)

R2 = 0.75, F = 26.4; t values in parentheses.

As urbanization continues however, the proportion of imported foods eaten in urban areas will rise. Table 7 provides an indication of this for rice. Should urbanization continue at the pace seen in the last ten years, and per capita consumption in rural and urban areas remain at present estimated levels, total consumption will rise rapidly, and be increasingly led by urban demand, which will soon overtake rural consumption in terms of importance.

Table 7. **Possible future rice consumption in Vanuatu.**

Year	Total consumption	Urban consumption	Urban contribution to total
	(tonnes)	(tonnes)	(%)
1980	4132	1229	30
2000	8428	3996	47
2010	13541	8085	60
2020	23073	16357	71
2030	41358	33091	80

Assumptions:

1. The rural ni-Vanuatu population continues to increase at an annual rate of 2.1%, and the urban ni-Vanuatu population at 7.3% per annum. These were the rates recorded between the 1979 and the 1989 census.

2. Annual urban per capita consumption remains at the level of 78 kg per capita estimated by the 1985 Family Income and Expenditure Survey, and rural consumption remains at the estimated 1980 to 1990 average level of 30.4 kg.

3. Consumption of non ni-Vanuatu is omitted.

In these circumstances, not only will the adverse HFS impact of tariffs impinge on an ever greater number of households, but they will become progressively less efficacious in achieving their national objective. This will inevitably be the case unless realistic opportunities for substitution with local foods are available, or tariffs are set at levels sufficient to reverse the price ratio of local to imported staples for urban consumers, with absolutely no regard for equity, welfare or HFS.

Reviewing the food policy in Vanuatu reveals that it has been primarily directed at a national level objective - reducing food imports. HFS concerns of the urban poor have never figured in policy formulation. Similarly, no consideration has been given to assessing the impact of tariffs, the main thrust of that policy, on HFS, or to assessing their long run effectiveness in view of changing population distribution.

STRATEGIES FOR ENHANCING URBAN HFS

Continuing urbanization will require Vanuatu's policy makers to turn their attention towards meeting a growing HFS challenge. Four approaches can be identified, the mechanics and merits of each are discussed below.

1. Improving household purchasing power through transfer payments

Improving the incomes of poor urban households through the direct use of transfer (welfare) payments, either tied or untied to food, would clearly improve HFS. However, untied cash payments require extensive administration to avoid fraud, or leakage of benefit to those to whom it is not intended. Furthermore, as such direct income transfers do not reduce the price of food relative to the items, they do not necessarily encourage additional food consumption.

The use of food-tied income supplements, for example food stamps, would ensure both a greater targeting of benefits, and probably also achieve increased food consumption. However, in addition to the administrative requirements of such schemes and the incentive they give to urban migration - the fundamental cause of Vanuatu's food problems - more philosophically perhaps, they come close to institutionalizing poverty, food insecurity, and import dependency in a country in which this is surely not necessary. Simply improving incomes does nothing to address the expenditure side aspects of the HFS problem. Households will remain dependent on imported foods, and hence vulnerable to changes in their prices, unless supplementation of income is sufficiently responsive to protect them. It would seem that improving household purchasing power through welfare payments was not in the long term interest of national food policy.

2. Subsidizing food prices

Subsidization of specific food items, such as rice, would improve the HFS of the urban poor by reducing the cost of acquiring food. It would also provide a means of insulating households from rising food costs. However, it represents a symptomatic treatment rather than a cure of the basic problem that the limited diversity of food options in urban areas caused by the high relative price of traditional staples.

In practical terms, a subsidy would present the authorities with a new fiscal burden, almost certain to rise with increasing urbanization, and fluctuating with changes in international prices and exchange rates. Furthermore, the benefits provided would accrue to all consumers: rich and poor, rural and urban, not just the urban poor. General subsidies are not only an expensive way of assisting the poor, they are also inefficient.

3. Reducing dependency upon purchased foods

Urban HFS could be improved by reducing the household's dependency upon purchased foods.

Increasing home production represents the most direct approach to achieving this. Consumption of home produced food releases part of the income resource presently committed to food, and so improves the household's ability to reallocate expenditure towards food in the event of price rises. Income so released is also available for the purchase of "additional" food; although it may not be spent on this. The greatest benefit will be achieved if the household produces foods which account for the largest proportion of expenditure, i.e. starches.

A recently performed survey by the Vanuatu Department of Agriculture, reveals that the overwhelming majority of Port Vila's residents already practice this food security strategy. Of a representative sample of 8% of households, over 80% actively produce food. Food Production is very intensive and does concentrate on starches, particularly manioc and plantain, although a surprising range of crops, and even livestock, is produced.

Unfortunately, urban food production is not without its problems. Most households have no tenure rights to the land they utilize and so face possible eviction. Municipal authorities are in some instances unhappy about the presence of food gardens in urban areas. They are claimed to be unsightly, a health risk and to lack formal planning permission. Producers face problems of theft. While the intensive cropping systems practiced, frequently without any or adquate fallowing, deplete soil fertility. Crop yields are unlikely to be sustained should this practice continue. Nevertheless, urban food production is a logical household strategy to enhance food security which the Vanuatu Department of Agriculture has recognized and is supporting through the appointment of an agricultural extension officer specifically for urban areas.

4. Increasing diversity of food options

Widening food options in order to lower dependency on a narrow range of foods, means improving the availability of cheap local produce in markets by encouraging the production and marketing of food from the hinterland of urban areas. An increase in food production is not in itself sufficient but food must also be marketed at prices attractive to consumers.

In addition to any positive impact on urban HFS, improving the diversity of food options also makes a more constructive contribution towards achieving national food self sufficiency than the present reliance on tariffs. Clearly, the extent to which urban consumption of local food can be increased, depends upon the degree to which changes in consumer preference towards imported foods are determined by changes in relative prices alone, and how much by non-price factors such as taste and convenience. Whatever the case, it is clear that unless the price of local foods relative to imports can be reduced, and then by a process of levelling down rather than the levelling up which has been attempted to date, urban consumers will never be offered a choice in their consumption habits. In this case, Vanuatu's continued and growing dependency upon food imports will certainly be confirmed.

While intrinsically appealing, the approach is far from straight forward. The marketing and distribution problems leading to the existing pattern of high prices do not denote an environment immediately conducive to the development of a more commercially orientated food sector. However, recent reviews of market trends, such as those of Joughin (1988) suggest that a dynamic and developing level of commercial activity can, and has developed in Melanesia, with a positive impact on urban food prices.

Review of the four strategies above, suggests that the most viable approaches are those which in fact promote and improve the local production and marketing of foods. A greater compatibility car exist, and indeed will have to be encouraged, given the rapidly changing distribution of Vanuatu's popu-

lation, between meeting the needs of urban HFS and the national food objective of self sufficiency.

CONSLUSIONS

Rapid urbanization presents Vanuatu with a gamut of problems. Attention has, however, tended to focus on the challenge of providing adequate social infrastructure of housing, health, sanitation, water and education. Little, if any, regard has been given to the food needs of the urban poor, despite this being their most basic requirement. Policy makers have yet perhaps to appreciate the existence, no matter how paradoxical it may appear of food insecurity in a country so richly endowed with agricultural potential.

A number of conclusions can be drawn from this brief review. Firstly, urbanization has fundamentally changed the determinants of HFS for the increasing number of ni-Vanuatu who live in towns. Rural food security assured by good access to an abundant agricultural resource has, for urban ni-Vanuatu, been replaced with a dependency upon the ability to buy adequate food.

Secondly, the vulnerability of HFS in urban areas varies with respect to economic status. Poor households are clearly the most at risk. Their vulnerability, in part due to low and insecure incomes, is heightened by an acute dependency upon a very narrow range of mostly imported foods. Diversity in food options, a key element of food security, is absent in urban Vanuatu. This must be reestablished if urban HFS is to be enhanced.

Thirdly, food systems are not simply about food production. They are a more complex integration of production, distribution, marketing and consumption. In Vanuatu, it is an issue of marketing and distribution, rather than technical food production factors that thave determined the structure of relative food prices in favor of imported goods. In this context, the capability to achieve national food self sufficiency provides no guarantee of food security, either for the household, or ultimately given the pace of urbanization, for the nation. An appreciation of the multi-factorial and interrelated nature of food systems is central to the successful formulation of initiatives in the food sector.

Fourthly, policy makers need to carefully consider the possible impact at the household level of measures implemented in response to national food policy objectives. It should be recognized that a single policy measure such as tariff, is unlikely to have a common influence on all households. Its implications for food security will also vary according to socio-economic status i.e. urban/rural and rich/poor. Households are not all the same. Perhaps more fundamentally, it should be appreciated that policies implemented in support of national objectives can conflict with the needs of individual households.

There are no easy approaches to improving the situation of urban HFS in Vanuatu. The present extent of the problem, and its likely future development, will require policy makers to accord the matter serious consideration. They will certainly need to adopt a more analytical approach than has been the case up until now. Food policy analysis has been little in evidence, leading to the adoption of reactive policy measures which carry an inequitable burden for the most food vulnerable, and fail to address the fundamental causes for the malaise they seek to remedy. The key to improving policy lies in understanding the food system, from production to household consumption.

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"Moran and Brown (1956) showed" or "Various workers" (Miller and Smith 1956; Adams et al. 1960; Wilson 1978, 1979a;) found ..." The term *et al.* should be used when there are more than two authors. The letters a,b,c, should be used to distinguish several papers by the same author in one year.

All references in the bibliography should be given in full and in alphabetical order. For a journal the reference should include surname and initials of all authors, (year), title of paper, full title of the journal, volume, (part) and full page numbers. For a book the reference should include authors surname and initials, (year), title of chapter and page numbers if appropriate, full title of book, publisher and city and total page number. Conference proceedings should include the year and place of the conference. The title of the journal or book is underlined to be printed in italics. Examples are:

BOWETT, C.M. and SMITH, L.N. (1950). Measurement of phosphorus. *Methods of Soil Analysis.* Ed. C.A. Lack. Department of Primary Industry, Port Moresby. 400 pp.

SANDERS, A.J. (1940). Plant responses to molybdenum. *Papua New Guinea Agricultural Journal,* 48 (4): 981-995.

TROBEN, M.M. (1973). Genetic fine structure in *Drosophila*. *Department of Primary Industry Research Bulletin* No. 102, pp. 196-197.

Internal reports, communications and memoranda are not valid references. The criteria for valid publications (in the scientific world) are that publications are distributed widely among those interested in the subject and are available to the international public in major libraries and from the publisher. This therefore excludes reports circulated only within a department and to a few outsiders and conference documents available only to those who attended the conference and the like.

Work that has not been accepted for publication (unpublished data) and personal communications are not included in the list of references but may be referred to in the text. References cited in an appendix should be included in the list of references at the end of the paper.

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12. Review of papers - All papers will be submitted to suitable professional referees. Major changes will be referred to the author for consideration. Minor editorial changes will be made without consultatioin but will be presented to the author(s) at proof stage. The final decision to accept or reject a paper, rests with the Editor-in-Chief.

13. Offprints - Twenty five free off-prints are given to the author. Where there are several authors, the senior author will be sent the offprints. Extra offrints may be ordered at the time the galley proofs are returned to the editor. Costs will be determined at the time of printing.

14. Recognised abbreviations in this journal are:

g	- gram
kg	- kilogram
t	- tonne
l	- litre
ml	- millilitre
ha	- hectare
mm	- millimetre
cm	- centimetre
m	- metre
a.s.l	- above sea level
yr	- year
wk	- week
h	- hour
min	- minute
s	- second
K	- kina
n.a.	- not applicable or not available
n.r.	- not recorded
var	- variance
s.d.	- standard deviation
s.e.m.	- standard error of mean
s.e.d.	- standard error of difference
d.f.	- degrees of freedom

Levels of significance;

n.s.	- not significant
*	- $0.01 \leq p < 0.05$
**	- $0.001 \leq p < 0.01$
***	- $p < 0.001$

Either kg/ha or $kg.ha^{-1}$ is acceptable, but large combinations of units should be in the form $kg.ha^{-1}$ to avoid possible mathematical ambiguity.

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