

# SUBSISTENCE ACTIVITIES IN THE NATIONAL ACCOUNTS OF DEVELOPING COUNTRIES WITH SPECIAL REFERENCE TO LATIN AMERICA\*

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This paper presents some preliminary findings from a research study by the OECD Development Centre into the treatment of subsistence activities in national accounts. It summarizes the results of a questionnaire on country practices, and reports on the findings with respect to shares of non-monetary production in GDP, methods of estimation, and usefulness of the resulting estimates. Among the 48 developing countries covered, the share of non-monetary value added in total GDP ranges from over 40 percent for the poorer countries of Africa to 5 percent or less for the more advanced countries of Latin America and Southern Europe. In countries where rural living standards are much below those in urban areas, non-monetary activities may be very important to the well-being of a large number of people, even though they form only a small part of GDP, and it is still important to make realistic estimates for subsistence output. Agriculture is obviously the main item in non-monetary production, accounting often for over 80 percent of the total. Most countries use some kind of "producers' prices" for valuing agricultural output. Few countries now publish separate figures for non-monetary activities. For many countries, doing so would involve a considerable amount of extra work, but for a number of planning purposes it does seem important to distinguish subsistence activities separately.

## INTRODUCTION

### *Background*

1. The OECD Development Centre is currently studying the ways in which national accountants in developing countries deal with subsistence activities. As a first step a short questionnaire was sent to about 100 statistical offices in developing countries, mainly in order to establish the range of non-monetary activities covered. This was followed by more detailed enquiries to a number of countries to discover the basic data sources used and the methods of estimation for specific activities.

2. In this paper we use the data so far assembled to describe the range of subsistence activities presently covered in the national accounts, their importance in terms of their contribution to total GDP, and the methods used for imputing values to non-monetary activities. Finally, we discuss briefly the important question of the usefulness of subsistence estimates in the national accounts. So far as possible we have tried to put the emphasis on the countries of Latin America,

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but in practice much of the most interesting data refers to other regions—particularly sub-Saharan Africa.

### *Definitions*

3. By “developing countries” we mean the 150 or so which receive development aid from the members of the Development Assistance Committee (DAC) of the OECD. The DAC list differs from those used by other international agencies because it includes a number of countries in Southern Europe and excludes most developing countries of the “communist bloc,” notably North Korea, China, North Vietnam and Cuba. Receipt of development aid from a DAC member is clearly not an ideal test of being “developing,” and the DAC list includes some borderline cases like Greece and Israel while omitting other possible candidates such as Puerto Rico and Portugal. Despite its imperfections, however, the majority of countries on the list could count as “developing countries” by most common-sense standards—that is they have relatively low levels of average *per capita* product and substantial numbers of their citizens are at or near subsistence levels.

4. We use the terms “non-monetary” and “subsistence” interchangeably to describe production for own use carried out in the traditional sectors of the economies of developing countries. In describing an activity as “non-monetary,” we do not of course mean that no money changes hands during the production process. A farmer may buy window-frames or roofing-sheets to incorporate in a house he is building, or he may buy fertilizer and insecticide for his maize crop. The terms non-monetary and subsistence are used simply to indicate that the output of a particular activity is not sold, but is retained by the producer and his family for their own use. The “own use” may be a *final* one, such as consumption of own-produced crops or capital formation on the farm, or it may be an *intermediate* use as when a farmer sows a field with the grain he produced last season.

5. For the most part the non-monetary activities discussed below consist of the production for own consumption of crops and livestock by peasant farmers, but we consider also a number of other activities which are mainly, though not exclusively, related to primary production, and which are undertaken mostly in rural areas. These include food processing, storage and transport, manufacture of simple household articles, building and construction.

## COVERAGE OF SUBSISTENCE ACTIVITIES

### *Subsistence Activities in Industrialised and Developing Countries*

6. In the industrialised countries the main subsistence activity covered in the national accounts is the production of crops and livestock for consumption by the farm household. Some countries, such as Australia and Holland, include in addition imputations for own-produced seed and animal feedstuffs which are used up in the course of production, and occasionally estimates are made for other minor subsistence activities. Norway’s accounts include own-consumption of fish, and in West Germany estimates are made of the householders’ contribution to

building and maintenance work. In general, however, subsistence value-added represents an insignificant part of total GDP in the industrialised countries and their national accountants are almost exclusively concerned with measuring monetary flows.

7. In most developing countries, on the other hand, a sizeable part of primary output never reaches the market, and there are often a number of other goods and services which are consumed directly by the producers themselves, but which are the subject of monetary transactions in the industrialised countries. The need to include in the accounts all agricultural output whether monetised or not is generally accepted, but there has been considerable discussion about the desirability of imputing values to other non-monetary activities. Kuznets [1] has suggested that in order to compare the national product of industrial and pre-industrial societies, imputations should be made to cover religious services, recreational activities, and the “life-assurance” provided in many developing countries by the extended family system. Billington [2] recommended the inclusion of “rural household services” which were to be estimated as the difference between agricultural output valued at retail and producer prices and which represented the value-added by rural households in processing, storage, transport and distribution services (services which in large part are actually *avoided* by the subsistence consumer). Prest and Stewart [3] in their estimates for Nigeria imputed the value of housewives’ services in cooking and child-bearing, mainly on the grounds that the husband/wife relationship in Nigeria was essentially a commercial one.

*Recommendations of the U.N. Statistical Office*

8. The former SNA [4], perhaps biased towards the needs and practices of the industrialized countries, placed fairly narrow limits on the kind of subsistence activities which were to be included in the national accounts. For *primary* producers, *i.e.* those engaged in agriculture and related activities and in mining and quarrying, only their primary production for own use was to be included. For *non-primary* producers all primary production for own-use was to be included *plus* production for own-use in the producer’s own trade. Chart I below shows the effect of these recommendations:

CHART I  
FORMER SNA RECOMMENDATIONS FOR TREATING NON-MONETARY ACTIVITIES

		Production		
		Primary	Non-Primary	
			In own trade	Other
Producers	Non-Primary	A	B	C
	Primary	D	E	F

9. All subsistence production falling in blocks A, B and D was to be included in the accounts, i.e. all primary production plus non-primary production by non-primary producers in their own trade. By definition no production can fall in block E (primary producers cannot have own trade non-primary production), and there would usually be relatively little output in Block C, but F could contain a substantial amount of production. In developing countries primary producers (which for practical purposes means peasant farmers) often build their own houses, dig their own wells, weave their own textiles, store their own crops, mill their own grain, and make their own furniture, but under the former SNA recommendations all these activities were to be excluded.

10. The present SNA [5] recommends a rather broader coverage of subsistence activities. Building and construction work is to be included in addition to primary production, and if they think it worthwhile and if data are available, countries may cover the home processing of primary commodities such as brewing beer, making furniture, and spinning or weaving textiles. Non-monetary production involving non-primary commodities may also be included provided that some part of the output is offered for sale. In terms of Chart I these recommendations mean that a substantial part of the production in blocks C and F may now be included in the national accounts.

### *Country Practices*

11. Table 1 shows the number of countries in each region which include estimates for various subsistence activities in their current GDP series. The table is based on information from the Development Centre enquiry. The questionnaire provided an "open-ended" list of subsistence activities and respondents were requested to tick items which they include in their accounts and add to it any others not mentioned. Countries which make separate estimates of non-monetary output could do this quite easily, but other countries may have had some difficulty in deciding whether or not their estimates for the output of a particular sector includes a non-monetary component. In Table 1 the 14 Latin American countries which completed the questionnaire are shown separately.

12. Non-monetary *primary* output is covered to some extent by virtually all developing countries. Only one country (Mauritius) omits subsistence crop production and only two (South Vietnam and Mauritius) omit livestock products. About two-thirds of all reporting countries include estimates for subsistence fishing and for forestry activities such as collecting firewood, building-poles, or thatching-materials. *Secondary* activities are less frequently included, although most countries cover own-account building work and over a third include some form of food processing and handicrafts. Transport is the only *tertiary* activity covered to a significant extent but water-porterage is included by some semi-arid countries in Africa and the Middle East.

13. As regards the 14 reporting countries from Latin America, all include estimates for non-monetary crop production. Most countries cover fruit and vegetables as well as the staple field crops although Mexico omits fruit and vegetables and Argentina makes no estimates for own-consumption of fruit. Costa Rica, Mexico and Venezuela apparently exclude own consumption of

TABLE 1  
NON-MONETARY ACTIVITIES COVERED IN THE NATIONAL ACCOUNTS OF 65 DEVELOPING COUNTRIES

	Primary					Secondary				Tertiary			Number of Developing Countries Reporting
	Crops <sup>(1)</sup>	Live-stock Products	Fishing	Forestry	Hunting	Food Process-ing <sup>(2)</sup>	Handi-crafts <sup>(3)</sup>	Building	Other Construc-tion <sup>(4)</sup>	Water Portage	Other Transport	Storage	
All developing countries reporting	64	63	41	44	22	25	28	42	11	6	15	2	65
Africa	29	29	21	23	15	15	13	22	6	4	4	1	30
Asia	18	17	11	14	3	9	11	11	4	2	8	1	18
Europe	3	3	2	2	2	0	0	1	0	0	0	0	3
America	14	14	7	5	2	1	4	8	1	0	3	0	14
Argentina	x	x	-	-	x	-	x	x	-	-	-	-	
Brazil	x	x	x	-	-	-	-	x	-	-	-	-	
Chile	x	x	-	-	-	-	-	-	-	-	-	-	
Costa Rica	x	x	-	-	-	-	-	-	-	-	-	-	
Dominican Republic	x	x	-	x	-	-	-	x	-	-	-	-	
Ecuador	x	x	x	-	-	-	-	-	-	-	-	-	
Guyana	x	x	x	-	-	-	-	x	-	-	-	-	
Haiti	x	x	x	x	-	-	x	x	-	-	x	-	
Jamaica	x	x	x	x	x	x	x	x	-	-	x	-	
Mexico	x	x	-	x	-	-	x	x	x	-	-	-	
Nicaragua	x	x	x	x	-	-	-	-	-	-	x	-	
Panama	x	x	x	-	-	-	-	-	-	-	-	-	
Peru	x	x	-	-	-	-	-	-	-	-	-	-	
Venezuela	x	x	-	-	-	-	-	x	-	-	-	-	

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Source: Development Centre enquiry.  
 (1) Staple food crops, fruit and vegetables.  
 (2) Husking and milling grain, pounding and drying root crops, preparation of fermented drinks.  
 (3) Textiles, furniture, household utensils.  
 (4) Land clearance and improvement, boreholes, wells, and road construction.

poultry meat—an important item in most developing countries. Half of the 14 countries cover subsistence fishing but only 5 include estimates for non-monetary forestry production. Building work (dwellings or farm buildings) is covered by 8 of the 14 countries but “handicrafts,” which covers production for own use of textiles, household utensils, and furniture, is included by only 4 countries. Mexico is the only one to make estimates for activities like land-clearance and well-boring which are classified under “other construction,” and Jamaica is the only one to cover value-added by “food processing.” This includes grain milling, pounding and drying root crops, and wine and beer-making, and these activities are covered by a majority of developing countries in other regions. Transport is the only tertiary activity covered by the Latin American countries. Haiti, Jamaica and Nicaragua include estimates for this item.

#### IMPORTANCE OF SUBSISTENCE ACTIVITIES

##### *Shares in Total GDP*

14. The Development Centre questionnaire sought information on the percentage contribution of non-monetary activities to total GDP for a recent year, and 48 developing countries were able to give some data on this. Countries which make explicit estimates for subsistence activities were obviously able to supply this quite easily but the majority of developing countries (including all reporting countries in Latin America) do not distinguish separately the non-monetary component of GDP, and in such cases respondents were asked to make a “best guess.” Some were able to indicate only a range for the probable share of non-monetary output and in these cases the mid-point of the estimated range has been used for the calculations in this section.

15. Table 2 gives a frequency distribution of the 48 countries according to the percentage shares of non-monetary output in GDP. The percentages range from over 40 percent for Ethiopia, Niger and Rwanda to around 2 percent for Argentina and Malta. Nearly 50 percent reported shares of non-monetary output of 15 percent or higher. For about a fifth the share lay between 10 and 14 percent, while the remaining 32 percent estimated the share of non-monetary activities at less than 10 percent. Of the eight Latin American countries which supplied information on this point, only one, the Dominican Republic, reported a share in excess of 10 percent. Ecuador and Nicaragua gave estimates of just under 10 percent while four countries estimated that non-monetary activities accounted for only about 2 percent of total GDP.

16. The eight reporting countries in Latin America are possibly not very representative of the region as a whole. However it seems feasible to get a rough idea of the importance of non-monetary activities for most countries in the region by using regression methods. Several factors may account for (or be associated with) the level of subsistence output in a given country. The two most obvious candidates are probably the “level of development”—as measured by per capita product for example—and the size of the agricultural sector. To explore the first of these relationships the non-monetary shares reported by the 48 developing countries were plotted against estimates of per capita GNP [6]. The graph showed

TABLE 2

FREQUENCY DISTRIBUTION OF 48 DEVELOPING COUNTRIES ACCORDING TO PERCENTAGE SHARE OF NON-MONETARY VALUE-ADDED IN TOTAL GDP

Non-monetary value-added as per cent of GDP(1)	Countries (Latin American countries in Italics)	Frequencies	
		Number	Percent
40% or more	Ethiopia, Niger, Rwanda	3	6
30 to 39%	Mali, Upper Volta, Malawi, Uganda	4	8
25 to 29%	Tanzania, Mauritania	2	4
20 to 14%	India, Korea, Malaysia, Dahomey, Botswana, Kenya, Sierra Leone, Togo, Angola, Mozambique	10	21
15 to 19%	Cameroon, Madagascar, S. Rhodesia, Swaziland, Taiwan	5	10
10 to 14%	Iran, Sri Lanka, Phillipines, Vietnam, Thailand, <i>Dominican Republic</i> , Ivory Coast, Zaire, Senegal	9	19
5 to 9%	Greece, Jordan, <i>Nicaragua</i> , <i>Venezuela</i> , Mauritius, Zambia, Hong Kong, <i>Ecuador</i>	8	17
Under 5%	Cyprus, Malta, <i>Mexico</i> , <i>Argentina</i> , <i>Guyana</i> , <i>Jamaica</i> , Iraq	7	15
Total		48	100

Source: Development Centre enquiry:

(1) GDP at factor cost for the most recent year available.

the expected negative relationship but it appeared to be strongly curvilinear. At high levels of per capita GNP, the non-monetary shares vary only slightly, while among the poorer countries, a small change *in per capita* GNP is associated with a relatively large change in non-monetary shares. This relationship can be best approximated by regressing the non-monetary shares on the reciprocal of *per capita* GNP. However, the regression line so estimated was not a particularly good fit and the coefficient of determination was only just over 0.60.

17. Abercrombie [7] has noted a fairly close relationship between the subsistence share of total agricultural output and the size of the agricultural labour force. Unfortunately, few developing countries publish labour force statistics but a related statistic, the share of agriculture in total GDP, is available for most developing countries. When this variable was plotted against the non-monetary shares for the 48 countries, a fairly close positive relationship was indicated. The relationship was again curvilinear and for countries with small agricultural sectors the non-monetary shares varied only slightly while for predominantly agricultural countries a small change in the shares of agriculture in GDP is associated with a relatively large change in non-monetary shares. A second-degree polynomial was found to give a reasonably good fit, and the following regression was calculated for 48 developing countries (standard deviations in brackets):

$$y = 7.493 - 0.297x + 0.016x^2 \quad r^2 0.734$$

(6.526) (3.849) (0.289) (0.004)

where  $y$  is non-monetary value-added as a percentage of GDP,  $x$  is value-added by agriculture, forestry and fishing as a percentage of GDP, and  $r^2$  is the coefficient of determination.

18. As can be seen the error of the estimate is quite large and over 25 percent of the variation in  $y$  remains unexplained. A result of this kind is perhaps to be expected in view of the differences in coverage of non-monetary activities from one country to another, and the very rough nature of some of the estimates of non-monetary shares. However, although the regression may not be a particularly good estimator for an individual developing country, it seems reasonable to use it to show the general importance of non-monetary activities for the Latin American region as a whole. Table 3 shows the estimated contribution of non-monetary activities to GDP for 23 Latin American countries. The non-monetary shares reported by the eight countries are also given for comparison.

19. For fourteen of the countries shown in Table 3, non-monetary value-added is estimated, on the basis of the regression, to account for less than 10 percent of GDP. In this group Argentina, Brazil, Chile, Jamaica, Mexico, Trinidad, Uruguay and Venezuela have the lowest shares. For the other nine countries, non-monetary activities are estimated to account for 10 percent or more of GDP, with Haiti, Honduras and Paraguay having the highest shares.

20. An examination of estimated and reported shares for the countries for which both sets of data are available suggests that the regression may tend to overstate the share of non-monetary output for Latin American countries, since except for the Dominican Republic the estimates based on the regression line are all higher than the (presumably) more accurate shares reported by the countries themselves. Most of the data used for calculating the regression line refer to

TABLE 3  
IMPORTANCE OF NON-MONETARY ACTIVITIES IN LATIN AMERICA

Country	Percentage Share of Non-monetary Activities in GDP		Percentage Share of Agriculture in GDP
	Reported by Countries	Estimated by Regression	
Argentina	2	6	11
Brazil	—	6	14
Chile	—	6	7
Jamaica	2	6	9
Mexico	2	6	12
Trinidad and Tobago	—	6	8
Uruguay	—	6	11
Venezuela	5	6	7
Peru	—	7	16
Barbados	—	8	19
Bolivia	—	8	19
Dominican Republic	13	9	22
Guyana	2	9	22
Panama	—	9	23
Costa Rica	—	10	24
Nicaragua	8	10	25
El Salvador	—	11	26
Colombia	—	12	28
Guatemala	—	12	29
Ecuador	8	14	31
Paraguay	—	15	33
Honduras	—	16	34
Haiti	—	35	52

Sources: Development Centre enquiry for shares reported by countries. See text for shares estimated by regression. *Yearbook of National Accounts Statistics, 1971*, New York, United Nations, 1973, for shares of agriculture in GDP.

countries in Africa and Asia, and it may be that there are important structural differences between countries in these regions and the countries of Latin America. On the other hand it is possible that some of the eight countries concerned have under-estimated the non-monetary component of GDP. Is there perhaps a tendency in some countries to emphasise the “modern” aspects of their economies and to play down the contribution of supposedly “primitive” subsistence activities? Are there sometimes cultural or political pressures to understate the size of the Indian population and its contribution to national product? These are questions which statisticians working in the region can best answer. Clearly the data in Table 3 need to be treated cautiously and perhaps all that one can say at this stage is that for a majority—at least 70 percent—of the countries in Latin America non-monetary activities probably account for less than a tenth of total GDP. Among the other 30 percent it is only in Haiti, Honduras, Paraguay and Ecuador that non-monetary activities make a substantial contribution to total product.

TABLE 4  
VALUE ADDED BY NON-MONETARY ACTIVITIES AS PERCENTAGE OF TOTAL NON-MONETARY VALUE-ADDED: TWELVE DEVELOPING COUNTRIES

	Country	Year	Primary Production			Secondary Production			Tertiary Production	Total Non-monetary	
			Crops	Live-stock	Other	Total	Build-ing	Other			Total
400	Botswana	1968/69	—	86	—	86	8	6	14	—	100
	Burundi	1965	—	89	6	95	—	5	5	—	100
	Dahomey	1967	60	13	8	81	—	19	19	—	100
	Ivory Coast	1968	83	9	5	97	—	3	3	—	100
	Kenya	1971	—	84	3	87	9	—	9	4	100
	Madagascar	1968	61	—	34	95	5	—	5	—	100
	Malawi	1969	81	5	4	89	4	7	10	1	100
	Mali	1970	39	—	45	84	—	16	16	—	100
	S. Rhodesia	1970	—	79	—	79	1	20	21	—	100
	Tanzania	1970	—	96	—	96	4	—	4	—	100
	Uganda	1969	—	91	8	99	1	—	1	—	100
	Upper Volta	1968	57	—	25	82	11	7	18	—	100

*Sources:* National accounts reports published by the countries concerned.

### *Importance of Individual Subsistence Activities*

21. Table 4 shows the percentage share of various sorts of activities within total non-monetary value-added. This information is available only for developing countries which publish separate figures on non-monetary activities in their national accounts. Few countries do this and Table 4 covers only twelve developing countries in Africa.

22. Primary production is by far the most important activity and accounts for more than 90 percent of total subsistence value-added in over half of the countries covered. Crop production accounts for the major part of primary output in all countries except Mali where livestock production is about equally important. "Other" primary production, which consists of forestry, fishing, and hunting, accounts for about 5 percent of total non-monetary output in most countries for which data are available.

23. The high shares recorded by Southern Rhodesia and Mali for "other" secondary production consists mainly of value-added by grain-milling and other food processing. Subsistence building, which covers dwelling and farm buildings, is a fairly important activity and accounts for 5 percent or more in half of the countries which cover this activity. Under "tertiary production" the 4 percent share shown for Kenya consists of water-porterage, and the 1 percent for Malawi is value-added by crop-storage on the farm.

### METHODS OF ESTIMATION

24. In this section we consider first the estimating procedures used by countries which make separate estimates for the non-monetary component of GDP. Secondly we look at some of the problems of selecting appropriate prices for valuing non-monetary output.

#### *Distinguishing Subsistence Output*

25. For items like staple food crops, vegetables and fruit, the usual approach is to estimate per head consumption of each item and apply these figures to the estimated rural or "subsistence" population of the base-year. The figures for per head consumption may be obtained from agricultural surveys in which the farmer is asked to estimate what part of his total output he intends to retain for his own use. More often, and probably better, the estimates are based on food consumption or nutrition surveys where the interviewers measure the amounts of own-produced foods used in a sample of meals. In either case a rough credibility check is usually made by calculating the calory and protein content of the estimated diet. The base year estimates are then extrapolated using the population growth rate and often the per head consumption figures are varied slightly from year to year depending on harvest conditions. Estimates of intermediate consumption, usually quite small and invariably obtained by some simple rule of thumb, are then deducted to obtain value-added.

26. For livestock products similar procedures are applied, and the starting point is generally an estimate of per head consumption from own production of meat, milk, eggs, and skins. Consistency checks are usually made with data on the

size of the national herd, reproduction and take-off rates, milk and egg yields, and rough estimates of the trade in hides and skins.

27. Firewood is the main forestry product in most developing countries. Some countries estimate the quantity of firewood collected by each rural household for its own use. This may be based on a household budget survey but often the statistical office makes its own informed guess. Other countries use data from forestry agencies on the total quantities foraged for own-use by households.

28. The other main items of primary output are fishing and hunting. Fisheries departments are usually responsible for estimating the total catch, and estimated sales are then deducted to obtain the non-monetary component. Most countries which include subsistence hunting estimate the quantities of game meat consumed per head of the rural population.

29. Estimates for non-monetary building refer mainly to the construction of dwellings. Most countries start by estimating the total amount of building work using data on average household size and the expected life of rural dwellings. In some cases all building work in the rural sector is apparently assumed to be non-monetary, while in other cases data from household budget surveys are used to estimate the volume of commercial building work. The base year housing stock is generally assumed to grow in line with the population. Some countries assume that both increase at the same rate, while others more realistically assume that the housing stock grows only about half as fast as population. Many of the materials used for housebuilding, such as thatch, mud, poles and bricks, are supplied by the housebuilder himself and usually only purchased inputs like roofing sheets, glass, and window frames, are deducted to get value-added.

30. Estimates for subsistence grain milling and other food processing are based on crop consumption data after deducting the quantities estimated to have been milled commercially. Little information is available on estimation procedures for other activities. Subsistence production of furniture, textiles, and household utensils is sometimes estimated on the basis of the numbers of each item consumed per household. Value added by crop storage is usually measured in terms of depreciation of storage buildings. Water portorage seems to be generally estimated on the basis of "time spent" and activities like land clearance and irrigation work appear to be covered in a similar fashion.

#### *Valuation of Subsistence Output*

31. Some authors have questioned whether it can ever be right to attach monetary values to unexchanged production. Frankel [8] has argued that assigning a money value to, say, maize grown by a farmer for his own consumption will almost always be a meaningless operation because we do not know the "value of maize" in relation to the system of values in the subsistence society to which the farmer belongs. Similarly Barkay [9] writes, "As the subsistence sector is, by definition, differently motivated from the market economy we could ask if a common denominator can be found so long as the scale of values and the whole outlook of the subsistence population are so different from the market economy." Some investigators have tried to get around the problem by expressing subsistence output in non-monetary units. In his studies of subsistence farming in China, Buck [10] converted all subsistence food production into grain equivalents. O'Loughlin

and Ewusi [11] suggested that it was doubtful whether “any market price is relevant to goods and services when the greater part of production does not enter into a monetary market” and “labour time” may be the only common unit of currency for many subsistence activities.

32. Those who have questioned the legitimacy of putting money values on subsistence output seem often to have been thinking of societies where there were scarcely any monetary transactions, or of subsistence activities which appear to have no counterpart in the modern world. In practice, however, most national accountants in developing countries seem to have felt that they should try to put some sort of cash value on non-monetary activities, and to have believed that the commercial instinct was sufficiently widespread for the attempt to be feasible, but there has been considerable discussion about what kind of values should be used. This has largely centred on the choice between retail or producer prices.

33. The proponents of retail prices have mostly argued that the satisfaction obtainable from a kilogramme of rice or a litre of milk is the same whether it is own-produced or bought for cash. Benham [12] recommended valuation at retail prices prevailing in nearby markets because “that is what the neighbours of the producers have to pay,” and Prest and Stewart [3] suggested that if any lower price were used “we must specifically state that the needs of subsistence farmers are being judged to be lower than those of people buying food in markets.”

34. In favour of producer prices, it is argued that the prices at which the farmer could sell his output if he so wishes more truly represents the cost to the farmer of his decision to consume it himself, rather than the price at which, having sold it, he would have to buy it back. The revised SNA recommends valuation at producer prices so as to furnish a measure of the income foregone, or the costs incurred in consuming the commodities, and to assign the proper weight to the output as compared to marketed products. Another point is that retail prices include transport and marketing costs which by definition the subsistence producer avoids. Does the national accountant have any business imputing values to activities which might have taken place in a different, more specialised society, but which clearly did not occur in the one he is concerned with? An interesting compromise was suggested by Billington [2] whereby non-monetary output would be valued at producer prices in the production account and at retail prices on the expenditure side with the difference shown as value-added by “rural household services.” This approach was used in the early national accounts of at least two developing countries, Malawi and Southern Rhodesia, but now seems to be entirely out of fashion.

35. For some subsistence activities, of course, neither producer nor retail prices are available, and rough estimates of depreciation or labour costs are often the only way of valuing activities like building, land-clearance, transport, and storage. However, as we have seen agricultural output is easily the largest part of total non-monetary production and so it is of particular interest to examine the conventions used for valuing subsistence agriculture. Virtually all developing countries replying to the Development Centre questionnaire claimed to use some form of “producer prices,” but more detailed enquiries to about twenty of them revealed considerable disagreement as to what exactly this means. In fact it is by no means self-evident how a “producer price” should be determined.

### *Difficulties in Measuring Producer Prices*

36. The first problem is to choose the appropriate “stage” in the marketing process. A farmer may sell his output in a number of ways. He may sell it at the farm-gate or at a market some distance away, and he may sell it to a trader or to a final consumer. Usually of course different products are customarily sold in different ways. In Malawi for example, rice and groundnuts are mostly sold at licensed buying centres established near the main production areas, fruit and green vegetables are sold in retail markets by members of the farm household, while sweet potatoes and cassava may be sold at the farm to traders. The prices obtained could be described respectively as producer’s wholesale prices, retail market prices, and ex-farm prices, yet all could with some justification be termed “producer prices,” since in each case the producer is the direct recipient of the proceeds from the sale. Moreover, even though in the first two examples the prices will include some marketing costs, they may be said to reflect income foregone by the farmer, because unless he is prepared to incur some transport and distribution expenses he could never sell certain crops at all.

37. The view that “producer prices” means simply the price that a producer obtains when he sells his output, regardless of where or on what basis (retail or wholesale) he sells it, has the important advantage of simplicity, and the majority of developing countries do apparently define producer prices in this way for valuing subsistence output. Jamaica uses the prices offered at Produce Board buying centres for bananas, citrus fruit and coconuts; Singapore uses producer’s selling prices at retail markets for fish, poultry and green vegetables; Brazil uses farmers’ selling prices at wholesale markets in the main regional centres for maize, beans and cassava.

38. Other countries try to eliminate all transport and distribution costs from their producer prices. They argue that a farmer’s principal activity is farming rather than transporting or selling his produce, and that in any event marketing expenses are not involved when a household consumes its own production and should therefore be excluded from the valuation of subsistence output. Prices which exclude all marketing expenses are usually called “ex-farm” or “farm-gate” prices and are used even for items which in practice are never sold at the farm-gate. Burundi, Sudan and Southern Rhodesia apparently deduct estimated transport and distribution costs to obtain an ex-farm valuation. Since in practice the producers never pay these costs, their calculation is fairly arbitrary, but there seems to be general agreement that 10 percent is about the right amount to take off.

39. The second set of problems in defining producer prices concerns the places and times at which they are to be measured. The problem of *where* to collect prices is relatively straight-forward, since it seems clear that producer prices are those prevailing at the points of production. Thus if a national average producer price is to be calculated, prices prevailing in different parts of the country should be weighted by the quantities produced in each area. Ivory Coast attempts to do this and weights the different area prices by the estimated quantities grown in each area. More often a rather crude weighting system is used, and in India, Taiwan, and Nigeria for example a simple average is calculated for the prices in the main producing centres only. This is equivalent to giving a weight of unity to the prices

in these areas, and a zero weight to all others. In some developing countries, different area prices are apparently given equal weights. Thus in Malawi and Ghana, for example, the statistical services have set up price collection units in a number of centres throughout the country, and a simple average is calculated from all the prices available, even if some of them relate to negligible quantities of production.

40. As regards the *time* when producer prices should be recorded, it is less obvious how the national accountant should proceed. To calculate an annual average from prices collected at different periods, should the weighing pattern depend on the time when the goods are sold, or on the time when they are produced? For crops which are harvested throughout the year, as may be the case with some fruits and vegetables in equatorial regions, the selling and producing periods may coincide. In many developing countries however staple food crops like maize, rice and beans are produced—that is harvested—over a period of only a few weeks, although the farmer may sell off his surplus production throughout the year.

41. Country practices again vary. India and Ghana calculate an annual average price using prices during the peak marketing periods only. Since these coincide with the harvesting periods, these countries are implicitly weighting by time of production. Taiwan and Brazil on the other hand calculate annual averages from prices collected each month throughout the year, and seem therefore to be weighting according to the time when the producer sells. Generally speaking, prices will be higher outside the harvesting period since they will always include storage costs and sometimes a “windfall profit” element as well and the choice between the two methods can have a considerable effect on the calculation of producer prices.

42. Finally, there often seem to be doubts as to whether the prices at which farmers *sell* their crops are always the appropriate ones for valuing the unexchanged portion of their output. Sometimes these problems arise from marketing arrangements peculiar to individual countries. In West Africa for example where private traders are the main suppliers of agricultural credit, the prices at which the farmer sells to the trader reflect a substantial interest charge. In Haiti the “pratik” system, whereby a trader establishes a network of most-favoured suppliers and customers, means that two separate price levels prevail at any one time. A more important problem, and one common to a number of countries, arises from the operation of official “produce boards.” These exist in many developing countries and often have some kind of statutory monopsony powers. Some boards are concerned only with “cash crops” like tobacco or coffee which are mainly exported, but in many cases they deal in crops such as maize or rice which are also important subsistence items. Many developing countries, including Brazil, Kenya, Sierra Leone and Malawi use produce board buying prices for valuing some part (often a substantial one) of non-monetary output. It is easy to see why they do so, since the prices are accurately known and cost nothing to collect.

43. Usually produce boards follow a pricing policy designed to protect domestic producers from fluctuations in world prices. Surpluses are allowed to accumulate in some years to offset deficits in others, and taking one year with another, the board aims only to cover its costs. In effect then, the scheduled buying

prices depend on the board's guess—made normally at the beginning of the season—about future movements in world prices. It is of course true that all traders make guesses about the future, but in the more usual market situation prices depend on the combined wisdom of numerous individual traders, and since they cannot afford to be wrong for long, prices vary from day to day as traders revise their views of future trends. In general, however, produce boards keep the same buying price throughout the season, and may in addition be able to go consistently against the market for two or three years at a time. The produce board prices may be the right ones to use for valuing crops that the farmer actually sells to the board, and when the board takes a wrong view of future prices, there will be offsetting changes in the operating surplus of the produce board on the one hand, and the farmers' operating surplus on the other. For subsistence output, however, valuation by produce board prices seems rather artificial.

44. Sometimes there is the additional problem that produce boards set their buying prices some way below world price levels in order to generate surpluses which eventually become part of government current revenue. In such cases it could reasonably be argued that the surplus so generated is a direct tax on producers, and the board is effectively offering net of tax prices to the farmer. Within the production account for the nation this may not matter very much as regards that part of farm output which is actually sold to the board. Farmers' incomes from sales to the board will be understated because they are calculated on a net of tax basis, but the operating surplus of the produce board will be overstated by an identical amount. However, the use of a net of tax price will clearly understate the non-marketed part of the farmer's output.

#### USEFULNESS OF SUBSISTENCE ESTIMATES

45. As we have seen, virtually all developing countries cover production for own use of the main agricultural commodities, and most include estimates for certain secondary and tertiary activities as well. Granted then that it is widely accepted that non-monetary activities should be included in the accounts, the question arises as to whether the estimates for subsistence output have any special interest in themselves and should for this reason be shown separately in the national accounts.

46. On this, there seems some divergence of views between the compilers and the users of national accounts. Prest and Stewart [3] in their early estimates for Nigeria reported that they could find no possible justification for separating the non-monetary component. An ECA Working Group [13] which studied the treatment of subsistence activities in national accounts recommended that no attempt be made to show non-monetary activities separately from monetary transactions, and so far as can be ascertained at the OECD Development Centre only a dozen out of 150 developing countries do in fact distinguish between subsistence and other transactions in their accounts.

47. On the other hand, those interested in actually making use of national accounts have generally taken the view that non-monetary activities should be itemised separately. A common argument hinges on the belief that subsistence estimates are likely to be less reliable than monetary estimates. Barkay [9] writes,

“Good figures should never be mixed with guesstimates as is unfortunately done in many cases in national accounting, not only because the components are at least as important for planning purposes as the aggregates, but also because the reliability of the totals cannot properly be judged if the two kinds of figures are not segregated.” In many cases of course it is simply not true that non-monetary estimates are less accurate. Often the same sources are used, particularly for the agricultural sector, and the monetary and non-monetary data may be equally reliable or unreliable. Usually however the basic data for the monetary estimates probably are rather better, since for practical reasons monetary transactions are more amenable to statistical investigation.

48. Another argument which is sometimes used in favour of separation is that the decline of the subsistence sector is a useful indicator of economic development. This does not in practice seem a very weighty argument since the countries which show separate figures for subsistence activities usually base their estimates on assumptions of constant non-monetary output (or consumption) per head of the rural population, and the published statistics showing the development over time of subsistence output reflect this assumption rather than any observed event in the real world. So far no developing country has managed to measure empirically subsistence output on a national basis for more than a single year.

49. Other arguments for separating monetary and non-monetary activities concern the possibility that subsistence aggregates may behave differently from their monetary counterparts. Ady [14] points out that the identity of income and consumption for subsistence producers will obscure the logic of the basic Engel relationship. She argues in addition that the multiplier loses some of its force when analysing own-account capital formation since this is often “financed” by working longer hours without pay and thus “adds to national capital and productivity without generating any immediate increases of home demand.” Abercrombie [7] suggests that since subsistence farmers are both producers and consumers, they may react perversely to changes in the prices at which they can sell their produce. They may have in mind a cash “target income” which they need to make essential purchases and may therefore reduce their sales when prices are high and sell more in response to price falls.

50. Ultimately of course the decision as to whether non-monetary activities should be shown separately and if so whether the distinction should be preserved throughout the accounting framework or in certain tables only, should depend on the use made of the national accounts. The revised SNA recommends showing the subsistence/monetary breakdown only for gross output by kind of economic activity, but there could well be occasions when users, particularly development planners, would wish to see subsistence items distinguished in tables showing consumption, value-added and capital formation.

## SUMMARY AND CONCLUSIONS

51. In many developing countries a substantial part of the productive effort of the population is devoted to the production for own-use of goods and services which are elsewhere produced on a commercial basis, and in these circumstances

it seems clear that the national accountant should make some attempt to measure non-monetary output. The failure to do so would mean that the national accounts provide only a partial picture of the country's total resources and the uses to which they are put. In addition if the accounts are confined to monetary transactions, there is a danger that growth of the economy will be overstated as production becomes more specialised and formerly unexchanged output enters the monetary sector.

52. Virtually all developing countries include estimates for subsistence agriculture in their national accounts. Two-thirds cover forestry, fishing, and building activities and about a further third include estimates for hunting, food-processing and handicrafts. A small number cover other subsistence activities like land clearance, drilling bore-holes, transport, and food storage. The countries of Latin America cover broadly the same range of activities as developing countries in other regions, although only one of the fourteen replying to the Development Centre questionnaire makes estimates for basic food processing in the home—such as grain-milling, pounding and drying cassava, and beer or wine-making. Of course the fact that a particular item is included in the accounts does not mean that the estimates made for it are realistic ones. In the absence of published statistics showing the output of individual non-monetary activities, only the national accountants who make the estimates can judge their credibility.

53. Data on 48 developing countries show that the share of non-monetary value-added in total GDP ranges from over 40 percent for the poorer countries of Africa to 5 percent or less for the more advanced countries of Latin America and southern Europe. Regression estimates for 23 Latin American countries suggest that non-monetary activities account for 10 percent or more of GDP in nine countries and are particularly important in Haiti, Honduras, Ecuador, and Paraguay. Obviously the share of non-monetary output in total GDP is a rather crude measure of "importance." In countries where rural living standards are much below those in urban areas, non-monetary activities may be very important to the well-being of large numbers of people, even though they form only a small part of total GDP. This may apply to countries like Brazil, Venezuela, and Peru; even though their non-monetary shares in overall GDP are probably fairly small, it is still important to make realistic estimates for subsistence output.

54. Within total non-monetary production subsistence agriculture is obviously the main item and for twelve African countries which publish separate estimates for subsistence output, agriculture accounts for over 80 percent of the total. Countries which calculate the subsistence component of agriculture separately usually start with an estimate of own-consumption of each item per head of the rural population. The best way to measure this is probably by means of food consumption surveys where each item is weighed at the time the meal is prepared. These are expensive surveys and cannot usually be justified except at five or ten-year intervals, and for the "intercensal" years most countries extrapolate base year figures by the estimated growth of the rural population. Sometimes the base-year figures for per head consumption are varied to take account of unusual harvest conditions. A further refinement, which may be desirable, would be to adjust the per head consumption figures for changes in the age structure of the

population, since in countries where the population is growing rapidly, the “head” to which the consumption estimates refer will be getting younger. At present no developing countries appear to do this.

55. For valuing subsistence agriculture most countries use some kind of “producer price,” although there is some disagreement as to what this really means. Country practices vary as regards the weighting of prices by region and over time, and as regards the “stage” of the marketing process. In general the simplest solution may be to define a “producer price” as the price received directly by the farmer regardless of where he sells it or whether he sells it retail or wholesale. However, there may be some difficulties with produce board prices and if “free market” prices are also available these may be preferable. When a national average producer price is required, the best solution may be to take a simple average of the prices prevailing in the *principal* growing areas during the *peak* marketing season.

56. Less than a tenth of developing countries at present show separate figures for non-monetary activities. For many countries the separation of non-monetary output would involve a considerable amount of extra work which could only be justified if there is a genuine demand for the additional detail by the users of national accounts. However, for a number of planning purposes it seems important to distinguish subsistence activities separately. The revised SNA recommends that the monetary/non-monetary breakdown be shown only for gross output, but there seem no obvious reasons why the same detail should not be given for value-added, capital formation, and private consumption.

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