Estimates of Food Consumption Expenditure from Household Surveys and National Accounts

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Debates on changing incidence of poverty inevitably converge to issues concerning the nature and acceptability of statistical evidence. In recent times, the Indian database for measurement of poverty have been questioned in both academic as well as policy circles. Questions relating to validity of the survey results on which the poverty measurements are based were raised when they did not show any decline in rural poverty during the 1990s despite higher rate of growth in the aggregate GDP. Again, when the survey results showed a sharp decline in incidence of poverty in 1999-2000 as compared to that in 1993-94 - from 37.3 per cent to 27.1 per cent in rural poverty incidence and from 32.4 per cent to 23.6 per cent in urban poverty incidence - a great deal of controversy was generated regarding comparability of the results, particularly because of a major deviation that was made in the survey methodology.

Poverty measurement in India

The measure of incidence of poverty used in India requires setting up a 'poverty line' based on established norms of food requirement. The Task Force on Projections of Minimum Needs and Effective Consumption Demand (1979) defined the poverty line as the per capita expenditure level at which the calorie norms - 2400 calories per capita per day for rural areas and 2100 calories per capita per day for urban areas – were met on the basis of all-India consumption basket of 1973-74. The 'poverty line' thus defined for 1973-74 was, till recently, updated for changes in price levels over time using the price deflator implicit in the constant- and current-price estimates of *private final consumption expenditure* (PFCE) of the National Accounts Statistics (NAS). At present, however, following the recommendations of the Expert Group on Proportion and Number of Poor (1993) separate deflators are used for rural and urban areas of different States. The State-specific consumer price index of selected commodity-groups for agricultural labourers was used as price deflators for the rural areas and State-specific retail price movement of consumer price index for the industrial workers for urban areas.

Having set the 'poverty line', the estimates of poverty-incidence is worked out from the distribution of population by per capita consumption expenditure estimated from the results of household surveys, as the proportion of the population having per capita consumption expenditure below the poverty line. The partly normative and partly behavioural measure of poverty used in India is based on the statistical data collected in the household surveys on consumption expenditure conducted by the National Sample Survey Organisation (NSSO). The NSSO's household survey on consumption expenditure of 1973-74 has provided the basis for establishing the 'poverty line', while the data to measure the incidence of poverty for the subsequent period are available from the following surveys on household consumption expenditure. Till recently, the Planning

Commission, the official agency responsible for estimating poverty-incidence, had been scaling up the NSSO-based distribution of population by level of consumption expenditure by a factor equal to the ratio of the PFCE from the NAS and the estimate of aggregate consumption expenditure based on NSSO survey results. The Expert Group on Proportion and Number of Poor (1993), however, found this procedure unacceptable and recommended exclusive use of NSSO-based distribution of population by level of consumption expenditure for estimation of 'head-count ratio'. The Planning Commission has adopted the procedure recommended by the Expert Group. Thus, the deflator-related issues apart, the acceptability of the measure of incidence of poverty in India, now, depends exclusively on the quality of the basic data collected by the NSSO from a large sample of households by canvassing a fairly detailed schedule of enquiry.

The Expert Group recommended against the use of PFCE aggregate to scale up the distribution of the population by level of consumption expenditure obtained from the (Household) Consumption Expenditure Surveys (HCES) of the NSSO, because of the following reasons:

(i) Not only the estimates of domestic consumption expenditure of the household sector derived from the NSSO fail to agree reasonably with the PFCE estimate of the NAS, but also the gap between the two sets of estimates is found to widen over time.

(ii) The PFCE estimate of the NAS is estimated indirectly depending upon the availability of the data on production of a sizeable segment of the economy and uses subjective judgements for deriving the estimates of private consumption.

(iii) The scaling up of the NSSO-based distribution was based on the assumption that the difference between the two estimates of aggregate consumption expenditure at the national level was uniformly distributed across the States as well as all sections of the population.

Estimates of PFCE of NAS ad Household Consumption Expenditure of NSSO

The CSO's estimate of *private final consumption expenditure* is derived following what is called the "commodity flow" approach. This approach consists of obtaining the quantum and value of different commodities flowing finally into the consumption process of the households and the private non-profit institutions serving households (NPISHs), from the quantum and value of the commodities produced and available during the accounting year. The national accounts statistics of India generally pertain to a financial year, extending from the beginning of April of one calendar year to the end of March of the next. The sum of all the commodity-wise estimates of value gives the aggregate estimate of PFCE, which in fact represents the value of goods and services consumed by the households and NPISHs.

The NSSO, on the other hand, employs the technique of survey sampling, in which the consumption expenditure of a random sample of households is ascertained directly by canvassing a well-designed schedule of enquiry whose coverage is broad enough to include every item of household consumption expenditure. But the surveys conducted for this purpose, called (Household) Consumption Expenditure Surveys, are required to cover only the households and not the NPISHs. Moreover, these surveys are usually carried out over a period of one year that generally correspond to an agricultural year, i.e. beginning of July of one calendar year to end of June of the next.

Widening Gap between NAS and NSS Estimates

Evidently, the two data sets are not strictly comparable; disagreement between the estimates is but expected. But, what appears to be a matter of serious concern is that the gap between the two sets of estimates has been widening progressively since the 1980s. A number of studies comparing the two sets of estimates conducted in the past reveal that the estimates for the individual years of 1950s, 1960s and 1970s were in fairly close agreement. Most of these studies pertain to the estimates for the individual years of 1950s and 1960s and contain comparisons at broad levels of aggregation. Only two of the latter studies (Minhas *et. al*., 1986, and Minhas, 1988) deal with the estimates for two years of the 1970s and contains a comprehensive disaggregated level comparison of the two sets of estimates.

***Table 1*: Divergence between the NSS and NAS estimates of consumption expenditure for selected years**

(Rs. Crore)

Year	Source	Food	Non-food	Total
1957-58	NSS	6626	3241	9867
	NAS	6920	3461	10381
	% difference	*-4.25*	*-6.36*	*-4.95*
1960-61	NSS	8118	4130	12247
	NAS	8594	4302	12896
	% difference	*- 5.54*	*- 4.00*	*- 5.03*
1967-68	NSS	16373	5537	22695
	NAS	17238	9017	26255
	% difference	*- 5.02*	*- 16.55*	*-13.56*
1972-73	NSS	23420	9790	33210
	NAS	22214	12946	35160
	% difference	*5.43*	*-24.38*	*-5.55*
1977-78	NSS	36500	20030	56530
	NAS	38157	24923	63080
	% difference	*-4.34*	*-19.63*	*-10.38*
1983-84	NSS	69735	39996	109731
	NAS	85613	60471	146084
	% difference	-18.55	-33.86	-24.88
1987-88	NSS	106205	67560	173765
	NAS	122805	101256	224061
	% difference	-13.52	-33.28	-22.45
1993-94	NSS	224066	131704	355770
	NAS	315243	259529	574772
	% difference	-28.92	-49.25	-38.10

Notes:

1. % difference stands for (NSS – NAS) / NAS expressed in percentage.
2. The estimates for 1957-58 and 1960-61 are quoted from Srinivasan *et. al.* (1974), who in turn have used the estimates for 1957-58 compiled by Kansal and Saluja (1961) for the NAS estimates.
3. The estimates for 1972-73 and 1977-78 are quoted from Minhas *et. al.* (1986)
4. Sources for NAS estimates for 1983-84, 1987-88 and 1993-94 are the National Accounts Statistics of 1990, 1992 and 2000 respectively.

The NAS estimates of PFCE and the NSS estimates of household consumption expenditure for different years are compared in Table 1, to reveal how the divergence between the two estimates has grown progressively over the years. Until the 1970s, *Table 1* shows, the difference between the two estimates of total consumption expenditure was of the order of 13 per cent or less. that the divergence between the estimates of total consumption, which was about 10 per cent in 1977-78, had soared to a level of about 25 per cent by 1982-83, remained at almost the same level in 1987-88, and then mounted to as high as 38 per cent in 1993-94. So far as the expenditure on food consumption is concerned, the estimates from the two sources varied by only about 5 per cent, that too either way, till the 1970s. But during the following period the increment in the NAS estimate has been at a much faster rate than that in the NSS estimate. So much so, the difference between the NSS and NAS estimates rose to a level of 19 per cent by the 1980s and by 1993-94 the difference was about 29 per cent. Much in the same way, the divergence between the estimates of non-food consumption, which was of the order of 5 per cent till 1960-61, has grown manifold to a shade below 50 per cent in 1993-94. A divergence as wide as this is indeed unacceptable. It is necessary to mention here that the NSS estimates of all the years of 1970s, 1980s and 1990s given in the table are based on quinquennial surveys, which were conducted on a larger second-stage sample than the other years for which the estimates are available.

This paper presents the main findings of a recent study carried out jointly by the National Accounts Division of the CSO and Survey Design and Research Division of NSSO for a Study Group on Non-Sampling Errors. The study includes an analytical investigation for the underlying causes of the widening gap between the two sets of estimates, using the disaggregated item-level estimates from the HCES of NSSO (50^{th} Round) 1993-94, and the disaggregated item-level data used for compiling PFCE for the National Accounts Statistics.

Comparability of the Estimates

Much of the known causes of divergence between the two sets of estimates are inherent in the different approaches adopted by the two agencies. Apart from the differences in the coverage and reference time-frames that are apparent, comparability of the two sets of estimates are constrained by the differences in the concepts and methods of estimation inherent in the very approaches employed by the two agencies. The differences that are inherent in the methods of estimation used by the two agencies relate to the (i) coverage, (ii) reference time-frames, (iii) unmatched classification schemes, (iv) treatment of cooked meals, and (v) the notional components in the NAS estimate of PFCE. A number of studies taken up in the past have dealt with these causes. Particularly, Minhas (1988) provides a comprehensive account of the limitations of comparing the two sets of estimates. Nevertheless, the divergence between the two sets of estimates is too wide to be justified by the methodological differences.

Among the difference cited above, the notional components in the NAS estimate, however, accounts for a substantial part of the divergence between the two estimates. Only the rent on dwellings actually paid is included in the NSS estimate, while the NAS estimate includes all imputed rentals of owner-occupied dwellings. Other such notional component in the NAS estimate is the *Financial Intermediation Services Indirectly Measured* (FISIM). This is being included in PFCE since the 1980-81 series of national accounts. Thus, the NSS and NAS estimates of consumption do not suffer from non-comparability in this respect for the earlier years. Inclusion of these notional components in the NAS estimate of private consumption is, however, in strict adherence to the standards set by the internationally accepted system of national accounts. *Table 2* illustrates how these notional components of the NAS estimates affect the comparability. In the table, the figures given in col.(2) are the unadjusted NSS estimates, while those given in col.(7), called 'adjusted NSS estimates', are the NSS estimates including the notional components of rent and FISIM.

***Table 2*: Comparison between the NSS estimates and NAS estimates adjusted for rent on dwellings and FISIM**
(Rs. crore)

Year	Unadjusted NSS	NAS	% diff. Cols. (2) & (3)	Imputed rentals	FISIM	Adjusted NSS	% diff. Cols. (7) & (3)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1983-84	109731	146084	-24.88	10478	758	120967	-17.19
1987-88	173765	224061	-22.45	15416	1513	190694	-14.89
1993-94	355771	574772	-38.10	37297	11,801	404869	-29.59

Note: 1. % difference stands for (NSS – NAS) / NAS expressed in percentage.
2. Sources same as those for *Table 1*.

Comparison of Estimates of Food Consumption for 1993-94

As the classification schemes followed by the two agencies differ, the individual items have been regrouped suitably to make their estimates from the two sources comparable. For this purpose, the sub-groups like those of gram products, pulses product, cereal products, cereal substitutes, vegetables, vegetable products, and confectionery items have been regrouped suitably taking individual item-level estimates which are available from both the sources. The regrouping involves both the sets of estimates. For the present study, expenditure on pan, tobacco & beverages is included in the estimates of food consumption.

Table 3 gives the NAS and NSS estimates for the different food sub-groups made comparable by suitably regrouping the food items. The NAS and NSS estimates of quantity consumed are compared for the items for which quantity estimates are available from both the sources. For a valid comparison between the estimates of consumption expenditure (henceforth called 'value estimates') for the item-groups, the NAS value

estimates have been adjusted for prices to eliminate the effect of differential implicit prices in the divergence between the two sets of estimates. For the items for which quantity and value estimates are available from both the sources, the adjusted NAS value estimates are arrived at by evaluating the NAS quantity estimates at NSS implicit prices. For the other items, the adjusted NAS estimates are taken same as the unadjusted value.

***Table 3*: Comparison of NSS estimates with the unadjusted and price-adjusted NAS estimates for different item-groups of food consumption for 1993-94**

(Rs. Crore)

Item-group		Unadjusted NAS			Adjusted NAS	
	NSS estimate	NAS estimate	NSS - NAS	% difference	NAS	% difference
1. Cereals & Cereal Products	72188	77655	-5467	-7.04	77338	-6.66
2. Bread	560	554	6	1.08	554	1.08
3. Gram (Whole)	530	265	265	100.00	308	72.08
4. Pulses & pulses product	12665	11993	672	5.60	13430	-5.70
5. Cereal substitute (tapioca etc)	309	1024	-715	-69.82	1024	-69.82
6. Sugar and Gur	9956	19881	-9925	-49.92	19748	-49.58
7. Milk & milk products	33737	46594	-12857	-27.59	44714	-24.55
8. Edible oils & oilseeds	15674	23204	-7530	-32.45	20001	-21.63
9. Meat, egg & fish	11923	21737	-9814	-45.15	21153	-43.63
10. Fruits, vegetables & their products	28851	68036	-39185	-57.59	66839	-56.84
11. Salt	595	595	0	0.00	595	0.00
12. Spices	8015	8015	0	0.00	8015	0.00
13. Non-alcoholic Beverages	9156	6422	2734	42.57	6422	42.57
14. Processed / Other food	5910	5436	474	8.72	5436	8.72
15. Pan	1830	2988	-1158	-38.76	2988	-38.76
16. Tobacco	5877	12309	-6432	-52.25	12309	-52.25
17. Alcoholic beverages & other intoxicants	2525	2393	132	5.52	2393	5.52
18. Hotel & restaurant / cooked meals	3765	6142	-2377	-38.70	5589	-32.64
Food: Total	**224066**	**315243**	**-91177**	**-28.92**	**308856**	**-27.45**

Table 3 shows that the estimates for food total differ by over Rs. 91 thousand crore, the NSS estimate being smaller than the NAS estimate by about 29 per cent of the latter. The main contributor, it is seen, is the "fruits, vegetables and their products" item-group, which alone accounts for Rs. 39 thousand crore out of the Rs. 91 thousand crore difference between the estimates of food consumption. This is followed by the "milk & milk products" and "sugar & gur" item-groups, accounting for Rs. 13 thousand and Rs. 10 thousand crore respectively. The NSS estimates are higher than the NAS estimates for

only a few item-groups like 'pulses & pulses products', 'non-alcoholic beverages' and 'gram (whole)'. The differences between the estimates for such groups are much smaller in comparison. The estimates for the item-groups 'salt' and 'spices', it is seen, do not vary at all. This is because the NAS estimate for both the item-groups is directly taken from the HCES.

The divergence between the two sets of estimates of the major item-groups are discussed at a more disaggregated level, where that reveals more specific reasons for the divergence, in the following paragraphs. The attempt is to identify the items within the item-groups that are mainly responsible for the divergence between the two estimates for the item-groups.

Food grains

Since the sub-groups 'cereals & cereal products' and 'pulses & pulses products' have major shares in total consumption expenditure on food, it is necessary to undertake a disaggregated-level comparison of NAS and NSS estimates of cereals and pulses consumption. The following paragraphs contain a detailed comparison of the quantity and value estimates of consumption of individual constituents of food grains in 1993-94. Besides the cereals and pulses, food grains comprise cereals and pulses products and whole grams. Breads produced in bakeries, being principally a wheat product, are also included in this group of food items.

Cereals and cereal products

Table 4 gives a comparison of the NSS and NAS estimates of consumption of cereals and its products for 1993-94. It also provides comparable estimates for the item 'gram (whole grain)' and 'bread'. Both the NAS and NSS value estimates for the items in the rice and wheat groups represent the expenditure actually incurred on the items. The quantity available from the Public Distribution System (PDS) is evaluated at the administered price in the NAS, while the cost actually paid by the households for the quantity obtained from the PDS are recorded in the HCES. Thus, the implicit prices that can be worked out from the NAS and NSS estimates of value and quantity given in the table represent the (weighted) average of the open-market and administered prices. The adjusted NAS value estimates too are given in the table alongside the unadjusted NAS estimates of value.

***Table 4*: Itemwise comparison between NAS and NSS estimates of quantity** (*000 tonnes*) **and value** (*Rs. crore*) **of consumption of Cereals, Pulses and their Products' for 1993-94**

Item	NSS		NAS		Difference (NSS - NAS)	NAS adjusted by NSS price	Adjusted difference
	Quantity	Value	Quantity	Value			
Rice & Rice products	71104	45584	71088*	45243	341	47209	-1625
Wheat & its products	48108	20867	46522@	20885	-18	20417	450

products							
Other cereals & their products	17536	5737	29808	11527	-5790	9713	-3976
Total Cereals	**136748**	**72188**	**147418**	**77655[#]**	**-5467**	**77338**	**-5150**
Pulses & Products: total	**--**	**12665**	**--**	**11993[$]**	**672**	**13430**	**-764**

Note: 1. * The NAS quantity figures quoted for rice products are in terms of quantity of rice used for production of the rice product.
2. @ The NAS quantity estimates of output for wheat products like *Suji* and *Maida* are taken directly from the ASI, for the study. The quantity and value of *atta*, given above, is derived from the estimates of NAS and the ASI results for *suji* and *maida*.
3. # Includes change in stocks.
4. $ Includes change in stocks.

The estimates of quantity of wheat product are not worked out separately in the NAS. To segregate the NAS estimate of quantity of wheat products, the estimates of *suji* and *maida* have been taken directly from the ASI. The estimate of quantity of *atta* has been obtained by deducting the ASI quantity estimates of *suji* and *maida* from the NAS estimate of total quantity of wheat products.

The following observations emerge from the estimates presented in *Table 4*:

i. The unadjusted NAS estimate of total cereals consumption is higher than the NSS estimate by Rs.5467 crore, which reduces by over three hundred crores once the NAS quantity estimates are evaluated at NSS implicit prices. The unadjusted NSS and NAS estimates for the major cereal items like rice & rice products, and wheat & its products compare closely both in terms of quantity and value. With the adjustments made for prices, however, the difference increases and the order relations are reversed. The adjusted difference still remains within acceptable limits.

ii. The NSS and NAS estimates also differ appreciably for the minor cereals and their products. A substantial part of the difference between the two sets of value estimates for these items may be attributed to the differential implicit prices. Adjustment for prices brings about a considerable reduction in the discrepancy between the estimates of value.

iii. The estimates for 'pulses & their product' do not differ much, though the implicit prices differ substantially. Adjustment for prices of the NAS estimates of value changes the direction of the gap between the estimates. In fact, the adjusted NAS estimate for ‘pulses and pulses products’ exceeds the NSS estimate.

Milk and Milk products

This item-group is only next to ‘fruits and vegetable’ group in its contribution towards the discrepancy between the estimates of food consumption. *Table 5* gives the comparable item-wise estimates for 1993-94, as available from the two sources. The NAS and NSS estimates of consumption of liquid milk, both in terms of quantity and value, compare closely with each other. However, while the NSS estimate of quantity is higher

by about 2 per cent, that for value is less by about 5 per cent than the respective NAS estimates. After adjustment for prices, the NSS estimate turns out to be higher than NAS estimate. It may be noted here that, unlike the years for which the earlier comparative studies were conducted, the NSS and NAS estimates of consumption of milk, both in liquid form and otherwise, are in principle comparable for 1993-94, so far as the method of data collection in the HCES and that of compilation of NAS are concerned.

Estimation of value of consumption of milk products poses a more serious problem. In fact, this sub-group alone contributes Rs. 12 thousand crore in an overall discrepancy of Rs. 91 thousand crore between the estimates for the 'food' group as a whole. The NSS estimate for 'milk products' (Rs. 3 thousand crore) is found to be only a fifth of that of the NAS estimate (Rs. 15 thousand crore).

The NAS estimate for milk products is arrived at as the sum of the ASI value estimate of output of dairy products[1], marked up by 20 per cent for 'trade and transport margin' (TTM), and the estimated value of production of butter and *lassi* in the unorganised sector. For the production in the organized segment, CSO takes the ASI estimate for only the enterprises falling in the NIC (1987) activity group 201, i.e. manufacturing of dairy products, which includes production of pasteurised and other forms of liquid milk apart from all kinds of milk products. Thus, the output of the enterprises falling in NIC 201 includes not just milk products but also liquid milk. It is seen from the detailed results of ASI 1994-95 (CSO 1998), that only a part (about 40 per cent) of the ASI estimate of output of NIC activity group 201 is actually milk product and the rest liquid milk. On the other hand, the present procedure altogether ignores intermediate consumption in the unorganised-sector enterprises like *halwais*, tea shops, hotels and restaurants.

***Table 5*: Itemwise comparison between NAS and NSS estimates of quantity and value** (*Rs. crore*) **of consumption of 'milk & milk products' for 1993-94**

ITEM	NSS		NAS		Difference (NSS - NAS)	NAS Adjusted by NSS price	Adjusted difference
	Quantity	Value	Quantity	Value			
Liquid Milk (000 Ltrs.)	45439	31059	44661	32407	-1348	30528	532
Milk product (from	--		--	7950	-7950	7950	-7950
Butter & Lassi	--		--	7178	-7178	7178	-7178
Milk products: Total	--	2678	--	15128	-12450	15128	-12450
Milk & Milk Products	**--**	**33737**	**--**	**46594**	**-12857**	**44714**	**-10977**

The NAS estimate of value for 'milk & milk products' are net of government final consumption and changes in stock, which are included in the estimates of the individual components.

[1] This represents the production of dairy products in the organised segment of the economy.

Edible oil and Oilseeds

For the study, the estimates of edible oils for 1993-94 available from the two sources have been re-grouped to make the estimates comparable. For this purpose, the oils used less commonly have been clubbed together in the 'others' category for the NSS estimates. The comparable estimates thus arrived at from the two sources are presented in *Table 6*. The estimates of oilseeds consumption are also given in the table.

It is seen that the NSS estimate of consumption expenditure of 'edible oils and oilseeds' for 1993-94 is lower than the NAS estimate by 32 per cent. *However,* for the two most commonly used edible oils, mustard oil and groundnut oil, the estimates from the two sources are fairly close to each other. The major part of the big difference between the estimates for the group as a whole is caused by *vanaspati* and oilseeds. In the earlier study (Minhas *et. al.*, 1986) too it was found that the estimates for the edible oils other than *vanaspati* differed little in the year 1972-73, though for the year 1977-78 the difference was substantial.

For the NAS estimates, the CSO uses the estimates of oilseeds production available from the Directorate of Economics and Statistics, Ministry of Agriculture (DESAg) and those of edible oils production from Ministry of Food and Civil Supplies. These estimates of edible oils are in fact derived on the basis of certain assumptions on utilisation of oilseeds for different purposes like seed, feed, waste etc. and oil extraction rates.

***Table 6*: Itemwise comparison between NAS and NSS estimates of quantity** (*000 tonnes*) **and value** (*Rs. Crore*) **of consumption of 'Edible Oils and Oilseeds' for 1993-94**

Item	NSS		NAS		Difference (NSS - NAS)	NAS adjusted by NSS price	Adjusted difference
	Quantity	Value	Quantity	Value			
Vanaspati	411	1533	919	3526	-1994	3322	-1790
Mustard Oil	1785	5558	1584	5249	308	4882	676
Groundnut Oil	1645	6125	1445	5420	705	5303	822
Coconut Oil	108	462	347	1948	-1486	1275	-812
Gingelly (*Til*) Oil	108	363	101	482	-119	326	36
Linseed Oil: total	80	173	22	98	75	45	127
Edible Oil (Others)	411	1429	497	2091	-662	1339	90
Edible Oils: Total	**--**	**15642**		**18814**	**-3173**	**16493**	**-851**
Oilseeds	--	33	--	3508	-3475	3508	-3475
Edible oil and oilseeds	**--**	**15674**	**--**	**23204**	**-7530**	**20001**	**-4327**

Note: 1. The NSS estimate for the group 'other edible oils' includes those for Margarine, 'Refined oil', Palm oil and Rapeseed Oil.

2. NAS estimate for the entire group "Edible oils and oilseeds" include imports and change in stock which are not shown separately in the table.

For deriving the NAS estimates, varying ratios of intermediate consumption are used for the edible oils, but for *vanaspati* no adjustment is made for its use in other industries. This appears to be an important reason for the difference between the estimates of *vanaspati* consumption, since it is used extensively in commercial establishments like *halwais*, hotels and restaurants. As for the edible oils other than *vanaspati*, though the estimates for the entire sub-group compare closely, the estimates for individual oils are found to differ substantially in some cases. The difference is most pronounced for coconut oil. The estimates of both quantity and value differ widely. In particular, the NSS estimate of value is only a fourth of that of the NAS estimate. This is mainly due to the varying prices implicit in the two sets of estimates. The gap between the two estimates of 'edible oils: total' reduces substantially by adjusting the NAS estimates for prices.

The difference in the estimates of consumption is most pronounced for the oilseeds. The NSS estimate is found to be less than 1 per cent of that of the NAS. It may be noted that groundnuts used as such are not included here. Notwithstanding the possibility of underreporting in the NSS, the NAS estimate for oilseeds is based on the assumption that the entire amount of oilseeds retained by the producers is consumed as oilseeds.

Meat, fish and egg

This is another item-group of food items for which the estimates for 1993-94 from the two sources vary widely. The value estimates for this item-group differ by about Rs. 10 thousand crores, the NSS estimate being lower than the NAS estimate by as much as 45 per cent. *Table 7* gives the comparable NSS and NAS estimates of consumption of individual items of the item-group for 1993-94. For the meat sub-group, the table shows, the estimates from the two sources are fairly close to each other. The NAS estimate exceeds the NSS estimates by only about four hundred crore, even as the NSS estimate is higher than the NAS estimate for 'goat meat and mutton'. It is seen that the NSS estimates both in terms of value and quantity are higher than the NAS estimates, though the combined implicit price is higher in the NAS. Thus, the gap between the two value estimates widens when the NAS value estimate is adjusted for prices.

***Table 7*: Itemwise comparison between NAS and NSS estimates of quantity** (*000 tonnes*) **and value** (*Rs. crore*) **of consumption of 'Meat, Egg And Fish' item-group for 1993-94**

Item	NSS		NAS		Difference (NSS - NAS)	NAS adjusted by NSS price	Adjusted difference
	Quantity	Value	Quantity	Value			
Goat meat *plus* mutton	794	4201	703	3803	398	3781	420
Beef	246	503	286	633	-130	585	-82
Pork	80	208	150	546	-338	389	-182

Buffalo Meat	246	302	331	643	-341	407	-104
Other Meat	--	51	--		51		51
Meat: total	**--**	**5265**	**--**	**5625**	**- 360**	**5162**	**103**
Other Meat (byproduct)	--		--	1422	-1422	1422	-1422
Chicken	--	994	--	4133	-3139	4133	-3139
Other Birds(No)	--	48	--	499	-450	499	-450
Eggs & egg products	--	1146		2487	-1341	2487	-1341
Fish	--	4437	--	7450	-3013	7450	-3013
Meat Egg Fish : total	**--**	**11923**		**21737**	**-9814**	**21153**	**-9229**

The problem evidently is in the rest of the items of this item-group. The NSS estimate for 'chicken' is only about a fourth of that of the NAS estimate, that for eggs & egg products is only about half and for fish about 60 per cent. The sub-group 'other meat products' comprises glands, other poultry killed and other meat product in the NAS. In the NSS survey no data is collected separately for these items. The expenditure on these items is embodied in the expenditure on meat. In the NAS, this sub-group contributes about Rs.1422 crore and is a major factor for the discrepancy between the two sets of estimates.

Fruits and Vegetables

In terms of magnitude, the divergence between the NAS and NSS estimates of consumption expenditure is the widest for "fruits and vegetables and their products" among the item-groups of food consumption. Of the inter-agency difference of about Rs. 91 thousand crore in the estimates of consumption of all food items in 1993-94, about Rs. 39 thousand crore owes to the difference between the estimates for this item-group. Consistent with the observations made in the earlier studies (Minhas *et. al.*, 1988; Srinivasan *et. al.*, 1974) on the estimates for 1957-58, 1972-73 and 1977-78, the NSS estimate for this sub-group is found to be considerably lower than the corresponding NAS estimate for 1993-94.

***Table 8*: Itemwise comparison between NAS and NSS estimates of quantity** (*000 tonnes*) **and value** (*Rs.* crore) **of consumption of 'fruits & vegetables and their products' for 1993-94**

Item	NSS		NAS		Difference (NSS - NAS)	NAS adjusted by NSS price	Adjusted difference
	Quantity	Value	Quantity	Value			
Potato	12983	4290	11840	4698	-408	3907	383
Onion	5274	2588	3555	2132	456	1746	843

sweet potato	188	48	--	487	-439	487	-439
other vegetables	--	13823	--	8044	5779	8044	5779
Flowers	--	286	--	1093	-807	1093	-807
Kitchen garden	--		--	1396	-1396	1396	-1396
total vegetables	--	21035	--	17850	3185	16673	4362
Banana	--	1720	--	4067	-2347	4067	-2347
Coconut	3871	1523	8118	3299	-1776	3190	-1667
Mango	823	692	3638	3115	-2423	3060	-2368
Grapes	195	327	482	689	-362	809	-482
Copra	108	296	--	660	-364	660	-364
Groundnut	354	609	1892	3232	-2623	3256	-2647
Cashewnut	--	101	57	1343	-1242	1343	-1242
Other fruits	--	2191	--	31673	-29482	31673	-29482
Total fruits (dry & fresh)	--	7459	--	48078	-40619	48057	-40598
total fruits & vegetables	**--**	**28494**	**--**	**65928**	**- 37434**	**64731**	**- 36237**
fruits & vegetable products	--	357	--	2108	-1751	2108	-1751
Fruits & vegetables and their products	**--**	**28851**	**--**	**68037**	**- 39186**	**66839**	**- 37988**

Note: The category 'other fruits and vegetables', other than horticulture, classified in the NAS has been distributed to 'other vegetables' and 'other fruits' of the table in proportion to the value of their gross value of output. The NAS estimate for the item-group "other fruits" includes that for the "horticulture crops not elsewhere covered".

The different classification schemes used by the two agencies render the NAS and NSS estimates of expenditure on fruits and vegetables directly non-comparable. In order to make them comparable, the item-wise estimates for 1993-94 available from both the sources have been suitably re-grouped. The items of fruits and vegetables for which separate estimates are available from the two agencies have been reclassified into comparable groups. The redefined group consists of "fruits & vegetable (including their products)" group, and the items potato, sweet potato and sugarcane for chewing appearing in the classification scheme of the NAS. The NAS estimate for this group includes fruit products like pickles, sauce, jam and jelly. The estimates for these items are usually put in the 'miscellaneous food products' by the NSSO. The NSS estimates for these items have been added to its estimates of fruits(fresh), fruits(dry), and vegetables to arrive at a comparable estimate. Further, the estimated consumption of green coconut, which is classified under 'non-alcoholic beverages' by the NSSO, has also been included in the NSS estimate, as it is included in the NAS estimate of fruit consumption. It may also be noted that, to make the NSS estimate comparable with the NAS estimate for the 'vegetable' group, which includes consumption of floriculture produce, the NSS estimate

for consumption of flowers has been included in this group. The NAS estimate also includes consumption of the produce of the kitchen gardens, since kitchen gardens are used mostly for growing of vegetables. *Table 8* presents an item-by-item comparison between the estimates of quantities and values of consumption, to the extent the classification schemes adopted by the two agencies permit.

The item-specific estimates from the two sources reveal that the big difference between the estimates for this group owes chiefly to the diverging estimates of fruit consumption. For the 'fruit' sub-group, as a whole, the NSS estimate falls shorter than the NAS estimate by a long way. In sharp contrast, for the 'vegetable' group, not only is the difference between the NSS and NAS estimates smaller but also the former is higher than the latter.

Item-wise comparison within the vegetable group shows that the NSS estimate of quantity of potato consumed, though higher, compare closely with that of the NAS, even as the implicit prices in the NAS estimates are higher than that in NSS estimates by about 20 per cent. In case of onion consumption, the NSS estimates of both quantity and value are substantially higher than those of the NAS.

For the NAS, the National Horticulture Board (NHB) is the main source for the production and price data for the fruits not covered in area and production statistics of the DESAg. The NHB compiles data on area, production and productivity through the State Horticulture Boards (SHB). It has, however, been noticed that there is a sizeable divergence between the figures the SHBs supply to the DES and those to the NHB. The primary data on prices of these fruits are collected by the NHB through 33 Market Information Centres spread over the wholesale markets of the country. But the price data the NBH thus collects relate to wholesale prices rather than the prices representing the first point of sale.

There is a possibility that the reporting of fruits suffers severely from recall lapse in the HCES. Fruits consumed outside home, whether purchased or collected free, are most likely not captured in the HCES. As an evidence one can take the example of banana, for which the production estimate used for deriving the NAS estimate is based on the data available from regular crop reporting scheme and thus is expected to be fairly reliable. But even for this fruit crop, the NSS consumption estimate is less than half of the NAS estimate. Apprehending the possibility of non-reporting of fruits consumption, a set of probing question: 'whether some specific fruits were consumed by any member of household' was introduced in the schedule of enquiry of the HCES, 43rd round. This was included in the HCES of the 50th round as well. There was, however, hardly any improvement in the NSS estimate of fruits consumption owing to introduction of these questions. Thus, on the one hand the NAS estimate of fruits consumption appears to be on the higher side, while on the other the NSS estimate seems to suffer from under-estimation.

Cooked meals and Hotels &Restaurant

. The NAS estimate for hotel & restaurant includes the accommodation charges in addition to the value of food served by the hotels and restaurants. This estimate has been adjusted by netting out the estimated accommodation charges for comparison. The results of the Enterprise Survey on hotel and restaurants, 1993-94, published by the CSO (1999b) reveal that only about 9 per cent of the total receipts of hotels and restaurants were for accommodation charges and the rest largely for food served. The adjusted NAS figure in *Table 3* represents the value of food served in hotels and restaurants. Moreover, the NAS estimate for hotels and restaurants includes not only meals served to the consumers but also a variety of other food items like tea, snacks and beverages. The NSSO, on the other hand, does not provide any estimate of consumption for this item-group as such. Instead it provides separate estimates of value of "cooked meals", snacks, beverages and "other processed food" purchased by the households. But, the entire value of the snacks, beverages and "other processed food" consumed by the households cannot be attributed to the restaurants. Thus the comparison between the NAS estimate for 'hotels and restaurants' and the NSS estimate of purchased 'cooked meals', is severely constrained by the difference in coverage. However, if the estimates for 'hotels & restaurants', 'non-alcoholic beverages' and ' processed / other food' are all considered together, the estimates from the two sources are found to agree fairly well.

Other Food Items

The item-groups 'salt', 'spices' and 'pan', for which the NAS estimates are based on the NSS estimates, tobacco', for which the estimates differ little, and those like 'beverages and intoxicants' and 'tobacco', for which the respondents are known to be reluctant in reporting consumption, are excluded from the discussion. We also refrain from discussing the divergence between the estimates for the items like 'sugar & *gur*', though it is rather wide, as the detailed analysis at further disaggregated level do not reveal any specific reason for the divergence.

Comparison of Estimates of Non-Food Consumption for 1993-94

Private final consumption expenditure other than that on 'food, pan, tobacco and intoxicants' is referred to as 'non-food consumption' through out the study. Services and manufactured goods, in national accounting, are further classified according to their nature and use. In the HCES, household non-food consumer goods and services, other than fuel and 'clothing and footwear' are, by convention, classified into 'durable goods' and 'miscellaneous goods and services'. Using the detailed and disaggregated item-level NAS and NSS estimates for 1993-94, the individual items have been appropriately regrouped into comparable item-groups.

Apparently, the NSS estimate for non-food consumption is only about a half of the NAS estimate (*Table 1*). But, the NAS estimate includes two important components of consumption that cannot be obtained directly from the reported consumption of the

households, and are thus called 'notional' in the study. The NAS estimate of 'gross rent' includes the notional element of imputed rent of owner-occupied dwellings and FISIM embodied in the banking services. Evidently, a valid comparison between the two sets of estimates requires adjustment of the NSS estimate for the notional elements that are not included in the NSS-based estimate of aggregate consumption.

Having adjusted the NSS estimates for the items house rent and banking services by replacing them by the NAS estimates (*Table 9*), and reclassifying accommodation charges of the hotels in 'Misc. goods & services' of the NAS estimate, it is seen that the NSS estimate for non-food adjusted for the notional elements is less than the NAS estimate by only Rs. 79 thousand crore, which is 30.48 per cent of the latter. The difference between the estimates for total consumption expenditure reduces from Rs. 219 thousand crore to Rs.170 thousand crore, i.e. from 38.10 per cent to 29.56 per cent, as a result of the adjustment.

***Table 9*: Comparison of NAS and NSS estimates of different items of non-food consumption for 1993-94 adjusted for the notional elements**

(Rs. Crore)

Item-group	Adjusted NSS	NAS	NSS - NAS	% difference
1. Clothing & footwear	21382	34999	-13617	-38.91
2. Gross (house) rent & water charges	*45476*	*46854*	*-1378*	*-2.94*
3. Fuel & power	24527	21385	3142	14.69
4. Furniture, furnishings, appliances & services	6055	17610	-11555	-65.62
5. Medical care & health services	18221	19543	- 1322	- 6.76
6. Transport equipment & operational cost	7178	24592	-17414	-70.81
7. Transport services	8450	36143	-27693	-76.62
8. Communication	1048	4258	-3210	-75.39
9. Recreation, Education & Cultural services	11811	17626	-5815	-32.99
10. Misc. goods & services	*36655*	*37072*	*-417*	*-1.12*
Total non-food	**180803**	**260082**	***-79279***	***-30.48***
Total consumption expenditure	**404869**	**574772**	**-169903**	**-29.56**

Comparison of individual item-groups reveals that for all item-groups, except 'fuel and light', the NAS estimate is much higher than the NSS estimate. The two item-groups that account for the major part of the divergence between the NAS and the adjusted NSS estimates are the 'transport services' and 'transport equipment & operational cost'. Together they account for Rs. 45 thousand crore out of a total difference of Rs. 79 thousand crore for the non-food consumption, i.e. about 57 per cent of the excess of NAS estimate over the NSS estimate. The two item-groups 'clothing and footwear' and 'furniture, furnishings, appliances & services' also contribute substantial amounts of about Rs. 14 thousand crore and Rs. 12 thousand crore respectively towards the divergence between the two estimates. Apart from the item-groups for which

estimates have been adjusted or the NAS estimate is based on the NSS estimate, for most of the item-groups the estimates from the two sources differ by about 70 per cent. Only for 'clothing & footwear' and 'recreation, education and cultural services' the difference between the estimates, though still large, is not as wide — the NSS estimate is less than the NAS estimate by 39 and 33 per cent respectively.

Concluding Remarks

Comparison between the item-wise estimates from the two sources help identify a multiplicity of underlying factors responsible for the wide divergence between the two sets of estimates. It also leaves differences between estimates for some of the item-groups unreconciled, thereby demarcating the relatively weak areas of the statistical system. That some items are being under-reported in the HCES appears to be quite a conceivable possibility, though it requires to be substantiated by adequate evidences. Some errors are also possibly inherent in the NAS estimates as they depend on an assortment of direct and indirect estimates of output along with various rates and ratios, some of which are based on the results of studies carried out in distant past.

The study reveals that the estimates of consumption expenditure on food differ by about 29 per cent, the NSS estimate being smaller than the NAS estimate. However, this divergence between the aggregate estimates of expenditure on food consumption owes principally to the divergence between the estimates for a few specific sub-groups of food items. The major contributors towards the divergence between the estimates of expenditure on food are the 'fruits', 'milk products', 'chicken', 'eggs' and 'fish', minor cereals and their products, '*vanaspati*', oilseeds and the sub-group 'tobacco'. The other significant difference between the NAS and NSS estimates is in the sub-group 'sugar and *gur*'. These items together account for 27 percentage points.

What is more significant in the context of poverty studies is that the NAS and NSS estimates for the important sub-groups of food items like major cereals, more commonly used pulses and edible oils, liquid milk and vegetables do not differ much. The gaps between the NSS and NAS estimates for these sub-groups are so narrow that they could as well be attributed to the differences in coverage, sampling errors and those relating to differences in reference time-frames.

As for the estimates of expenditure on non-food consumption, four item-groups, viz. 'transport services', 'transport equipment & operational cost', 'clothing and footwear' and 'furniture, furnishings, appliances & services', account for Rs. 70 thousand crores out of a total difference of Rs. 79 thousand crore for the non-food consumption.

Except for 'minor cereals and their products', the NAS estimates for all the food item-groups that account for a large part of the divergence appear to suffer from some limitations. Apart from the possibility that errors are inherent in these estimates of the NAS, any shortfall in the NSS estimates for these items is not expected to affect poverty measurement seriously, since these are the items that account for only a minor part of the consumption expenditure of the vulnerable sections of the population. The same is also

most likely true for the non-food item groups ‘transport services’ and ‘transport equipment & operational cost’. The high order of divergence between the estimates from the two sources for these groups of food and non-food items, therefore, is not enough to render the NSSO data on household consumption expenditure unfit for measurement of poverty incidence.

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