Report of
The Task Force on Projections
of
Minimum needs and
Effective consumption demand

Perspective Planning Division
Government of India
Planning Commission
New Delhi
January 1979

ACKNOWLEDGEMENT

On behalf of the Task Force on Projections of Minimum Needs and Effective Consumption Demands constituted by the Planning Commission. I express my gratitude to Prof. Raj Krishna, Member, Planning Commission, who in his inaugural address had very succinctly outlined the scope and objectives of initiating the construction of a Model of Private Consumption in the 1978-83 Plan in its proper perspective.

I am thankful to all the members of the Task Force whose active deliberations helped in the construction of the framework of the consumption model for 1978—83 Plan. Dr. Y. K. Alagh, Adviser, Perspective Planning Division and Chairman of the Task Force, provided overall guidance and coordination. Prof. R. Radhakrishna and Shri G. V. S. N. Murthy of the Sardar Patel Institute of Economic and Social Research, Ahmedabad and Dr. D. Coondoo of the Indian Statistical Institute, Calcutta, extended valuable cooperation and collaboration in providing inputs in formulating the consumption Model. Prof. S. D. Tendulkar, jointly with Prof. Radhakrishna, prepared suggestions for further work. Prof. D. B. Gupta helped in the formulation of minimum norms. Dr. Jayanta Roy, Consultant, Perspective Planning Division, edited the Report. I am grateful to all of them.

I am extremely grateful to my colleagues in the Perspective Planning Division of the Planning Commission who have helped and sincerely contributed to the preparation of this Report. Special mention must be made of Dr. B. M. Mahajan, Shri A. Chibber and Shri K. L. Datta. Dr. Mahajan assisted by S/Shri K. L. Datta and M. M. Gupta had completed the study on Poverty Line earlier started by Shri P. S. Sangwan. Dr. Mahajan in particular and Shri Rajaram Dasgupta had rendered considerable assistance in drafting this Report.

I am also thankful to the staff of the Computer Services Division of the Planning Commission for extending valuable assistance in programming work.

K. C. MAJUMDAR
Convenor

CONTENTS

CHAPTER 1
TASK FORCE—TERMS OF REFERENCE AND COMPOSITON

A number of useful research studies on consumer demand-behavioristic /effective, and normative — have been, and are being conducted both at the national an£ regional levels as well as for certain occupational groups etc., by research institutions, like the Indian Statistical Institute, Calcutta; Institute of Economic Growth, Delhi; Sardar Patel Institute of Economic and Social Research, Ahmedabad and by research workers in individual capacities.

1.1 Prof. N. S. lyengar developed a method of computing Engel "elasticities from concentration curves [Econometrica (I960)]. This paper specifying the assumption of lognormality of the distribution of the monthly per capita consumer expenditure and considering the Lorenz curve, foe aggregate consumption and/ r the specific concentration curve for commodity consumption, derives Engel elasticities for various, items of consumer expenditure.

1.2 The Indian Statistical Institute, Calcutta, estimated Engel curves, for various expenditure categories based on National Sample Survey (NSS) data from the 7th to 22nd Rounds. The work relating to regional comparison of food-grains consumption for major items of consumption for 15 major states for both quantity and value based on NSS data relating to 13th, 17th and 18th Rounds was also undertaken by the Institute. In addition, theInstitute developed constant elasticities for 101 items of consumption based on value data for 18th Round at the all-India level; for 80 items of consumption in case of West Bengal; for 45 items of consumption for major states and for certain specified items of consumption for occupational groups like cultivators, agricultural labourers, other agricultural and non-agricultural occupations for rural areas.

1.3 The Sardar Patel Institute of Economics and Social Research developed the Linear Expenditure System in the frame work of a total demand model for lower, middle and higher income groups of population as well as for all groups combined separately for rural and urban areas, based on the consumer expenditure data available from the 2nd to 20th Round of the NSS.

1.4 A, poverty line in the context. of India was first given by a distinguished working group set up by the Planning Commission Government of India, in July 1962. Later on poverty lines under different assumptions were estimated by Professors V. M. Dandekar and N. Rath[1*], A. Rudra[2†], P. Bardhan[3‡] and others.

1.5 In this. context, it was felt that if the results of these studies could be brought together at one place, it should; be possible to develop ideas to articulate a private consumption model — at 'national as well as regional levels for the next Five Year Plan. To this end, it was decided to set up a Task Force on Projections of Minimum Needs and Effective Consumption Demands to serve as a focal point.

1.6 The terms of reference of the Task Force are as follows —

"to examine theexisting structural studies on consumption patterns and standards of living and the: minimum needs with particular reference to the poorer, sections of the population for the nation! as a whole, arid its different regions separately by rural and urban areas; on the basis of the above studies, to forecast the national and regional structure and pattern of consumption levels and standards for the end of the Sixth Plan and subsequent perspective plan taking into consideration the basic minimum needs as wellas effective consumption demand".

1.7 The following is the composition of the Task Force: —

1. Dr. Y. K. Alagh — *Chairman*
   Adviser (PP) Planning Commission
   New Delhi.
2. Dr. D. Coondoo — *Member.*
   Economic Research Unit
   Indian Statistical Institute
   Calcutta— 700 035

---

[*] Dandekar V. M. and Rath N.- Poverty in India.

[†] Rudra A. 'Minimum Level of Living—A Statistical Examination' in *Poverty and Income Distribution in India* (ed) T.N. Srinivasan and P. K. Bardhan

[‡] Bardhan P. 'Incidence of Poverty in Rural India' in Poverty and Income Distribution in India (ed) T.N. Srinivasan & P.K. Bardhan

3. Dr. D. B. Gupta —*Member.*
   Institute of Economic Growth
   University Enclave
   Delhi— 110 007.

4. Prof. N. S. lyengar — *Member.*
   Department of Economics Osmania University
   Hyderabad— 500 007.

5. Dr. L. R. Jain — *Member.*
   Indian Statistical Institute
   7, S. J. S. Saasanwal Marg
   New Delhi— 110 029.

6. Shri G. V. S. N. Murty —*Member.*
   Sardar Patel Institute of Economic & Social Research
   Navrangpura, Ahmedabad—380009.

7. Prof. R. Radhakrishna —*Member.*
   Sardar Patel Institute of Economic & Social Research Navrangpura,
   Ahmedabad—380009.

8. Dr. S. D. Tandulkar —*Member.*
   Indian Statistical Institute
   7, S. J. S. Sansanwal Marg
   New Delhi— 110 029.

9. K. C, Majumdar* — *Member.*
   Director (PP) Planning Commission
   New Delhi— 110 001.

Prof. P. V. Sukhatme of the Maharashtra Association for the Cultivation of Science who was abroad at the time of constitution of -the Task Force, was subsequently included as Member of the Task Force on his return to India.

1.8 Chapter 2 sets out the recommendations of the Task Force. Chapter 3 discusses demand systems to formulate Private Consumption Model used in the Input-Output Model considered for the Five Years Plan, 1978— 83. Chapter 4 estimates commodity consumer demand targets for the normative and preferred versions of the 89 sector Input-Output Model separately for the terminal years of the new, Plan (1978 — 83) and the perspective period (1983—88). Chapter 5 deals, "with suggestions for further work.

1.9 A number of supporting Appendices relating to technical notes, and| detailed tables supplement and complement the material contained in the text of the report.

CHAPTER 2

METHODOLOGICAL FRAME-WORK

The Task Force held its first meeting during 8th to 10th August, 1977 in the Planning Commission, New Delhi, under the chairmanship of Prof. Raj Krishna, Member, Planning Commission, and the last meeting on 23rd April, 1979.

2.1.1 Prof. Raj Krishna, in his inaugural address, outlined the scope and objective of the Private Consumption Model for the new Plan. He underlined the importance of distinction between normative and effective/behaviouristic demand on the one hand and between demand for traded private and non-traded public goods on the other. Regarding the former, he emphasised that the model should postulate the minimum desirable normative consumption for the people below the poverty line, both in rural and urban areas. The Model should reflect effective demand for the people above the poverty line. Appreciating the difficulties encountered in estimating the demand for non-traded public goods and services like drinking water, sanitation, health and education, he nevertheless underscored the importance of measuring the demand for such goods. He stated that minimum needs particularly of non-traded public goods and services cannot strictly be defined in monetary terms unless certain minimum standards for these are accepted.

2.1.2 He felt that change in price structure does influence the demand for commodities and, as such, while making demand projections, attempt should be made to consider this factor as well. Furthermore, for the Approach Paper, one of the variants for demand projections could be based on the assumption of no change in income distribution.

2.2 Based on the consensus of opinion emerging out of the deliberations of this Meeting, two main decisions were taken with regard to the methodology of estimation of commodity wise private consumption effective/behaviouristic and normative, for the Sixth Plan: —

i) Linear Expenditure System (LES), which is a total demand system and possesses, *inter alia*, the property of additivity should be used to estimate consumer demand for broad groups of commodities. Disaggregative demands for individual commodities constituting each broad group should be worked out appropriately on the basis of best-fitting Engel curves, so as to add to a the group totals obtained on the basis of LES model, LES group totals thus serving as a control for estimating disaggregative demands with in the group. Alternatively, Fifth Five, Year Plan consumption model based on consumption proportions within each expenditure class — without, however, considering any re-distribution of expenditure could be used. It was decided that on the basis of the NSS time series of cross section data on consumer expenditure from various rounds upto 28th Round in 1973-74, LES parameters for as many broad groups of commodities as possible would be estimated by Shri G. V. S. N. Murty of the Sardar Patel Institute of Economic and Social Research, Dr. D. Coondoo of the Indian Statistical Institute, Calcutta, would furnish estimates of demand functions /Engel curve parameters on the basis of NSS consumer expenditure data for the 28th Round to workout disaggregative effective demand within various LES groups corresponding to the 89 input-output sectoral classification of the model to be used for the new plan. For this work, a Sub-group of the Task Force was formed, consisting of Dr. K.C. Majumdar, Shri Murty and Dr. Coondoo. It was aggreed that Shri Murty and Dr. Coondoo would work at Planning Commission in close collaboration and consultation with Dr. K. C. Majumdar, Chief (the then Director), Perspective Planning Division of the Planning Commission. The LES and Engel curve parameters would be estimated separately for the rural and urban areas and within each area separately for the population below the poverty line and above the poverty line.

ii) A paper giving estimates of minimum needs based on NSS data in physical terms for the 28th Round (1973-74) and other related studies would be prepared by Dr. D. B. Gupta of the Institute of Economic Growth, Delhi, in collaboration with the Perspective

Planning Division, Planning Commission. The calorie and the protein content of the per capita consumption of various food items by different expenditure classes would be estimated by the Perspective Planning Division on the suggestions made by Dr. D. B. Gupta. The per capita expenditure class, which satisfied the minimum calorie requirements on nutritional consideration, would provide the cut-off point delineating the poverty line. The per capita consumption of various goods and services pertaining to this expenditure class would constitute normative demand. One variant of the consumption model would be based on the assumption that the population below the poverty line will have the normative consumption and that above it the be-haviouristic one, separately for the rural and urban areas.

2.3 Following additional points also emerged in the course of the discussions : —

i) A sub-group of the Task Force comprising Dr. Tendulkar of the Indian Statistical Institute, New Delhi and Professor R. Radha krishna of Sardar Patel Institute of Economic and Social Research was constituted to prepare a paper surveying the existing literature on consumption function and demand projections;

ii) Need for adopting norms in respect of non-traded public goods like housing, primary education, drinking water, clothing and medicines was felt;

iii) Views should also be expressed on the distribution policy that should be adopted regarding food, sugar,clothing, housing, education, health and miscellaneous civic services; and

iv) Regional focus should be brought out in the estimation of demand for various essential commodities in the final report.

2.4 Certain additional studies were also suggested:—

(i) The scope of the LES should be widened to encompass more commodity groups preferably comparable with input-output classification using the latest NSS data and, in turn, its parameters reestimated;

(ii) LES be reestimated for various groups of expenditure classes taking into consideration the change in expenditure classes over different rounds due to price changes;

(iii) Estimation of different demand functions /Engel curves should be attempted for as many commodities as possible, using available data of the various NSS rounds and

(iv) Regional specific norms of minimum needs should be estimated both for essential traded private goods and non-traded public goods.

CHAPTER 3
DEMAND SYSTEMS

Introduction

This Chapter within die frame work delineated in Chapter 2 presents, the methodology to estimate targets of consumption for the 89 sectors of the input-output model embodied in the terminal year, 1982-83 of the New Five Year Flan (1978 — 83) and in the terminal! year, 1987-88 of the perspective period (1983 — 88). For this purpose, two types of demand systems, Normative and Effective, have been considered.

Normative Demand System

3.2 Normative Demand ensures a minimum per capita consumption of different goods and services particularly of food items that will satisfy a desirable nutritional requirements in terms of calories per person per day. This normative demand has been considered specially for the people below poverty line.

4.2.1 The question of defining the poverty line was first mooted by the Indian Labour Conference in 1957. A distinguished Working Group was set-up by the Planning Commission, Government of India, in July, 1962, to deliberate on the question of what should be regarded as the nationally desirable minimum level of consumer expenditure. The Working Group appears to have taken into account the recommendation of balanced diet made by the Nutrition Advisory Committee of the Indian Council of Medical Research in 1958, and came to the view that in order to provide the minimum nutritional diet in terms of calorie intake, and to allow for a modest degree of items other than food, the national minimum consumption expenditure per household of 5 persons should not be less than Rs.100 per month at 1960-61 prices, i.e., Rs.20 per capita per month. The Group suggested that for urban areas, the minimum should be raised to Rs.25 per capita in view of the higher cost of living there. By implication, this meant that the corresponding amount in the rural areas would work out to Rs.18.9.

3.2.2 In a study conducted by Dandekar and Rath in 1971, an intake of 2,250 calories per capita per day was assured as adequate under the Indian conditions both in rural and urban areas. On the basis of National Sample Survey data on consumer expenditure, the study revealed that an average annual per capita expenditure of Rs.170.8 or equivalently Rs.14.2 per capita per month at 1960-61 prices would suffice to meet these calorie requirements in the rural areas. The corresponding figures in the urban are were Rs.271.7 and Rs.22.6 at 1960-61 prices Referring to the recommendations of the Working group set up by the Planning Commission, it was observed by the authors that the rural mini mum determined by them was considerably be low that proposed by the Group, while the urban minimum determined by them was little above that recommended by the Group. In view of this they decided to revise their rural minimum slightly upwards to Rs.180 per annum or Rs.l5 per month. Similarly, they rounded off the urban minimum to Rs.270 per annum or Rs.22.5 per month, both at 1960-61 prices.

3.2.3 Reviewing the recommendations made by the Working Group that a per capita monthly consumer expenditure of Rs.20 (at 1960-61 prices) should be deemed to be a national minimum, Dandekar and Rath observed that the "basis of this determination is not known Apparently, the study group also did not make a distinction between rural and urban level costs" As far as Dandekar and Rath study is concerned their basis to arrive at the adequacy of 2250 calories per person per day both for rural and urban areas is not clearly spelt out* . They do not seem to have taken into account the fact that nutritional requirements in terms of calories are at least age, sex, and occupation-specific. And, as such, they are likely to vary sizeably between rural and urban areas especially because population in the former, proportionately speaking, is likely to be more engaged in manual activities.

3.2.4 The Perspective Planning Division, Planning Commission, has completed a study on the poverty line as a part of the work assigned to ii by the Task Force after allowing, to the extent available data permitted, for the fact that there are age, sex and occupational differentials in the daily calorie requirements of the population. To estimate daily per capita calorie requirements separately for rural and

* This seems to refer to the lower limit of the range of 2250 to 2300 calories per capita per day on the average at the retail [level indicated in P.V. Sukhatme's work: Feeding Indian Growing Millions] asia Publishing House, New York (1965) p.23.

urban areas, age-sex-activity specific calorie allowances recommended by the Nutrition Expert Group (1968) have been averaged by using estimated age-sex-occupational structure of population for 1982-83 as the weighting diagram.

Weighting Diagram

3.2.5 To allow for differentials in calorie needs of the population, the Nutrition Expert Group distinguished fourteen relatively homogeneous person categories comprising five for children formed on the basis of age (aged less than one year, 1 — 4 years, 4 — 7 years, 7 — 10 years and 10 — 13 years), three for adolescents in terms of sex and age (boys aged 13 — 16 years and 16 — 19 years and girls aged 13 — 19 years), and six for nineteen years or more men/women workers — three each for men and women engaged in heavy moderate and sedentary work respectively. To these fourteen, another two- one each for non working men and women were added to account for the whole of the population. In constructing the weighting diagrams for these sixteen mutually exclusive and exhaustive person categories, estimated age-sex structure of the population for 1982-83 derived from the population estimates (III projection) of the Expert Committee on population (1977) coupled with 1972 census occupational structure and participation rates based on usual activity status gleaned from the NSS employment data contained in the 27th Round (1972-73) is used. The age, sex, occupation specific distribution of the rural and urban population assumed in deriving the nutrition based poverty norms for the base year and the terminal year of the plan has been included in a separate paper being prepared by the Perspective Planning Division on statewise poverty estimates.

3.2.6 Estimation of non adult* population given by the conventional five year age groups is, of course, suitably regrouped to conform to non-conventional age groupings for different calorie allowances as have been recommended by the Expert Group. To this, the following intra group proportions based on single year smoothed age distribution of 1971 census consistent with the assumption of gradual declining fertility in the future have been adopted.

TABLE 1
Intra Group Proportions (1982-83)

Age Group (conventional)	Sub-group (non-conventional)	Intra group proportion
Less then five years	Less than one year	0.200
	One year but less than four years	0.605
	Four years but less than five years	0.195
Five year but less than ten years	Five years but less than seven years	0.413
	Seven years but less than ten years	0.587
Ten years but less than fifteen years	Ten years but less than thirteen years	0.620
	Thirteen years but less than fifteen years	0.380

In addition, the following assumptions have also been made: —

(i) Calorie requirements for workers aged fifteen but less than nineteen years is the same for men/ women workers. Accordingly, the worker's weight in the weighting diagram relates to adult workers i.e. those aged fifteen years or more. Similar remarks apply to adult non- workers also.

(ii) Heavy workers include persons engaged in cultivation, agricultural labour, mining and quarrying and construction;

(iii) Moderate workers include persons engaged in live-stock, forestry, fishing, hunting, plantations, orchards and allied activities, manufacturing, servicing and repairing (household and other non-household);

(iv) Sedentary workers include persons engaged in trade and commerce, transport, storage, communication and other allied services;

(v) Calories requirements for adult non-workers are the same as for sedentary workers.

* Less than fifteen years old.

Daily per person requirement of calorie of 2435 in rural areas and 2095 in urban areas are only average requirements The actual requirements will vary from person to person depending on factors such as age, sex, weight, height etc. and also for a person over time depending on physiological and physical needs

3.2.7 Apply the weighting diagram worked out within the above frame-work to the category-specific calorie norms as recommended by the Nutrition Expert Group and allowing for additional daily requirement of 300 calories on the average for a period of six months out of about nine months of pregnancy, in the case of a pregnant woman, the daily calorie requirements per person work out, on the average, to around 2435 in rural areas and to about 2095 in the urban areas.

3.2.8 Calorie norms worked out above may be subject to bias attributable to a number of factors, some tending to push it upwards and other downwards. These estimates understate the 'true' calorie requirements to the extent additional allowances are actually needed by workers among children and adolescents below the age of fifteen years. On the contrary, to the extent workers do not work with full intensity, these estimates will tend to overstate the true calorie requirements, more so in rural areas where underemployment and disguised employment preponderate.

Poverty Line

3.2.9 To work out the monetary counterpart or equivalently, poverty lines of these norms, 28th Round (1973-74) NSS data relating to private consumption both in quantitative and value terms are used. Using appropriate conversion factors as given in Appendix 14 calorie content of food items of each monthly per capita expenditure class has been calculated separately for rural and urban areas.

Applying inverse linear interpolation method to the data on average per capita monthly expenditure and the associated calorie content of food items in the class separately for the rural and urban areas, it is estimated that, on the average, Rs.49.09 per capita per month satisfies a calorie requirements of 2435 per capita per day in the rural areas and Rs.56.64 per capita per month satisfies a calorie requirements of 2095 per capita per day in he urban areas respectively, both at 1973-74 prices. These poverty line work out to Rs.61.8 per capita per month in the rural areas and Rs.71.3 per capita per month in the urban area at 1976-77 prices.

Professor P. V. Sukhatme, however, emphasised that the above calorie requirement is the average and not the minimum required for biological existence taking into consideration that there is considerable variation in calorie requirement of individuals depending on age-sex and occupational structure. In view of this he strongly recommended that seventy five per cent of the above poverty lines can be considered as appropriate cut off point which has been rightly considered in the Draft 1978 — 83 Plan document. It has been found that calorie requirement at this modest poverty line is very close to that required for biological subsistence.

3.2.10 Pattern of Normative Demand Normative for different commodities has been defined as per capita consumption of different commodities and services of persons belonging to that expenditure class in which the poverty line lies. This normative demand has been the pattern -of 28th Round NSS data (1973-74) adjusted at 1976-77 prices. These have been grouped into 89 sectors of input output table and presented in Appendix 12.

Effective Demand System

3.3 Effective demand has been considered in two stages. In the first stage all commodities and services have been grouped into 1 3 categories and the demand of these 13 groups have been estimated by considering Linear Expenditure System (LES). In the second stage Engel/ Demand curves have been considered for estimating demand for different commodities and services included in each of the 13 LES groups. Within each LES groups, the total demand of various items in that group is adjusted to equal the LES estimate of the group demand. These LES arid Engel curve/Demand functions have been separately developed for people below poverty line and above poverty line, also in rural and urban areas separately.

Linear Expenditure System (LES)

3.3.1 Linear Expenditure System is a complete demand system which is derived from the additive utility function for commodities.

q_i ..... q_n given by

$$U\left(q_i. \ldots . . q_u \right) = \sum_{i=1}^{n} b_i \log (q_i — a_i) \qquad (1)$$

where

$$\sum_{i=1}^{n} b_i = 1 \text{ and } (q_i > a_i)$$

Maximising (1) subject to the budget constraint given by

$$\sum_{i=1}^{n} p_i q_i = c \qquad (2)$$

we obtain the complete demand system (3)

$$c_i. = p_i \quad q_i = aipi + bi \left(c — \sum_{i=1}^{n} a_i p_i \right) \qquad (3)$$

The fulfilment of the second order conditions of equilibrium requires that $b_i > o$ (i.e. no n inferior commodities or group) and $c > \sum_{i=1}^{n} a_i p_i$ Where d is monthly per capita expenditure incurred on i^{th} commodity and p_i is the price of the i^{th} commodity or equivalently index number for the i^{th} commodity group as the case may be, and c— monthly per capita total expenditure in curred on various commodities (or commodity groups), a_{pi} represents some sort of committed expenditure, while b_i is the proportion of i^{th} group in the remaining aggregate consumption.

3.3.2 The LES parameters are estimated by applying the Newton-Raphson method (Technical Appendix I) to time series of cross section data obtained from the 17th through 28th Round of the NSS (excluding the 18th, 26th and 27th Rounds) on household consumption expenditure, first for sixteen broad commodity groups at 1976-77 prices. The LES parameters for these groups are set out in Appendices 5.1, 5.2 and 5.3.To be compatible with 89 sector input-output classification, these sixteen LES groups had to be collapsed into thirteen groups. The parameter estimates for these groups are set out in Appendices 6.1 through 6.6.

Consumer Demand Functions — Engel Curves

33.3 In the second stage, the following Engel curves have been fitted by applying the single equation weighted least squares method, weights being proportion of people in each expenditure class to each of the 56 commodities or commodity groups for which cross section monthly household consumption data are available in the 28th Round of the NSS (1973-74):—

(i) Double Log (DL) : Log c_i — a + b log c

(ii) Semi log (SL) : c_i = a + b log c

(iii) Log Log Inverse (LLI) : Log c_i = a+b log c+d/c

(iv) Log Inverse (LI) : Log c_i = a+b/c

(v) Linear (L) : c_i— a + bc

(vi) Hyperbola (HYP) : c_i = a + b/c

where c_i = monthly household per capita expenditure on the i^{th} commodity;

and c = total monthly household per capita expenditure for all the commodities.

3.3.4 To begin with, the best-fitting Engel curves among these were chosen separately for each commodity on the basis of highest value of R^2 i.e. coefficients of determination correcting for degrees of freedom and form of the function. In good many cases, however, although the log inverse followed by log inverse were best-fitting, they could not be considered appropriate for the purpose of our estimation in as such as these were not amenable to integration over the range of total monthly per capita consumption expenditure normally obtaining hi the NSS data. Parameter estimates of the remaining four best-fitting Engel curves along with R^2 values are given in Appendices 9.1 through 9.4 and Appendix 10separately for population below and above the poverty line with rural and urban areas. In the case of such commodities where data were too inadequate to fit a demand function, aggregate consumption proportions were used so that in such case the demand is estimated by c_i = bic. The parameter estimates of the various demand functions have, however, been updated to 1976-77 prices by applying the appropriate correction factors indicated by the formulae contained in Technical Appendix 2.

The demand functions have been used for projection purposes after taking into consideration their expected values under the assumption that monthly per capita total consumption is log normally distributed. The expression for expected value along with the method of derivation are given in Technical Appendix 1.

Adjustment of parameters of LES and Engel/Demand Functions

3.3.5 Parameters of the LES and also of Engel/Demand functions had to be adjusted in such a way that the private consumption sector for 89 sector

input-output table of base year, 1977-78 at 1976-77 prices generated by these functions agree with that independently estimated commodity flow approach. The procedure adopted is briefly as follows: —

(i) The aggregate private consumption for the base year i.e.1973-74, is first broken up into rural and urban components, and then into two parts, for people below poverty line and for people above poverty line by assuming that monthly per capita private consumption in 1977-78 is log normally distributed with the same inequality parameter as given by the NSS data for 1973-74.

(ii) Using the monthly per capita total consumption obtained as in step (i), in the appropriate LES demand function, the IES estimate of the total private consumption for the thirteen groups is estimated.

The estimates of private consumption of various commodities and services belonging to each LES group are then estimated by their respective demand functions, and then these estimates have been prorata adjusted to the corresponding LES total. The commodity-wise estimates of private consumption has then been grouped into 89 sectors of the input-output table. These sectoral estimates of private consumption are then compared with those estimated by commodity flow method and suitably adjusted in such a way that percentage difference of two sets of estimates does not generally exceed 10 to 15 per cent. The private consumption vector of 89 sectors thus obtained is used for the base year input-output table and also for adjusting the parameters of LES and demand functions. For this purpose the private consumption of 89 sectors are first aggregated to 13 LES groups. Taking these final estimates of LES groups as row control, and the given rural and urban aggregated private consumption as column controls, estimates of the 13 LES groups into rural and urban consumption has been adjusted by RAS method.* Then using these rural and urban estimates their breakdown separately into lower and upper classes has been obtained in the similar way (Appendices 4.1 and 4.2).

The parameter a_i in equation (3) is then adjusted to

$$\bar{a}_i = a_i \bar{c}_i / c_i$$

where c_i is the original estimate by LES and $\bar{c}_i$ is the adjusted figure (Appendices 7.1 through 7.4)

The parameter b_i in equation (3) is then adjusted to

$$b_i = (\bar{c}_i - \bar{a}_i) \Big/ \sum_{i=1}^{n} (\bar{c}_i - \bar{a}_i)$$

where, $\sum_{i=1}^{n} \bar{c}_i = \sum_{i=1}^{n} c_i = c$

(iii) Within each LES group, parameter-estimates of the demand functions for rural and urban areas respectively have been adjusted in the first instance. For this purpose, estimates of demand for the rural and urban areas obtained by the respective demand functions for the different sectors comprising the each LES group have been first adjusted by RAS method, taking the sectoral private consumption as row control totals and rural-urban totals of the particular LES group as column control totals. RAS method has been used to ensure the consistency in he aggregate private consumption obtained through LES with that obtained independently through commodity flow approach. A similar approach has been followed to work out sectoral demand estimates within a LES group for people below and above the poverty line, separately for rural and urban areas.

Using these adjusted demand of each commodity, the corresponding parameters of the Engel Curves of the commodity have been adjusted as follows.

Let c_i be the original estimate and c_i be the adjusted estimate of demand estimate of the commodity. Then parameters are adjusted as follows.

(a) Double Log

$$a^1 = a + \log \left(\frac{\bar{c}_i}{c_i} \right)$$

$$b^1 = b$$

(b) Other Functions

$$a^1 = a \left(\frac{\bar{C}_i}{C_i} \right)$$

$$b^1 = b \left(\frac{\bar{C}_i}{C_i} \right)$$

* Details of RAS method have been discussed in "Byproportional Matrices and Input-Output Change", by M.Bachaarch Cambridge University Press, 1970.

CHAPTER 4

PROJECTION OF PRIVATE CONSUMPTION. BY INPUT-OUTPUT SECTORS

This chapter outlines procedure adopted to estimate the private consumption demand for the 89 sectors of the input-output model considered for the terminal year (1982-83) of the 6th Five Year Plan period, as well as for the terminal year (1987-88) of the perspective Period. Keeping in view the plan objective of reduction of poverty during the period, two alternative assumptions have been considered for the purpose. These are: —

1. All people below the poverty line may be raised to the poverty line and would have the pattern of consumption according to the normative sectoral demand. This will be termed as Variant I.

2. In the second alternative case, all people below the 75 per cent of poverty line (to be called modest poverty line) would have at least the modest poverty line consumption. It has been assumed that in the process of redistribution the average consumption for people between modest poverty line and poverty line remains the same as before redistribution of the people between modest poverty line ad the poverty line. In this case the private consumption of the people below the poverty line would be estimated by considering the effective demand system developed for people below poverty line. This will be termed as Variant II.

4.1.1. In both variants the private consumption available after meeting the demand for people below the poverty line would be assumed to be consumed by people above the poverty line, the sectoral demand of which will be estimated by the effective demand system developed for this class of population.

4.1.2. The variant II was also considered by assuming modest poverty line to be more than 75 per cent of the poverty line. But such cases were not found to be feasible due to supply constraints on some critical items like foodgrains.

4.2. The procedure adopted for estimating the private consumption vector in above two variants is discussed below: —

(i) The aggregate private consumption obtained from macro-economic projections through a macro-model is first divided into rural and urban components by using an independently estimated value of ratio of the per capita consumption in the urban area to that in the rural area. This ratio is based upon past data of NSS as well as the policy consideration that rural per capita income would grow faster than urban per capita income.

Following relations have been used for this purpose.

$$C = C_r + C_u \quad \text{.....(1)}$$

$$V_r = C_r/12P_r \quad \text{.....(2)}$$

$$V_u = C_u/12P_u \quad \text{.....(3)}$$

$$V_u = bV_r \quad \text{.....(4)}$$

where

C = total private consumption as given by the macro model;

C_r = total private consumption in rural areas;

C_u = total private consumption in urban areas;

V_r = monthly per capita total private consumption in rural areas;

V_u = monthly per capita total private consumption in urban areas;

P_r = population in rural areas;

P_u = population in urban areas; and

b = estimate of ratio of per capita consumption in urban areas to that in rural areas.

Table 1 presents values of b, P_r, P_u, V_r & V_u in different time periods.

TABLE 1

Year	b	C Rs. in million	P_r million	P_u million	V_r Rs.	V_u Rs.
1977-78	1.31	591070	495.2	133.8	73.46	96.24
1982-83	1.26	729430	537.2	154.8	83.01	104.60
1987-88	1.24	932810	577.7	177.5	97.44	120.82

(ii) *Population below poverty line.*

Percentage of population below poverty line or 75 per cent of poverty line in 1982-83 and 1987-88 has been derived under the assumption that monthly per capita consumption is log normally distributed with the same inequality parameter (standard deviation of log values of monthly per capita private consumption) as obtained from the NSS data of 1973-74. This is given by —

$$P_L = P.\ f\ (Z^*) \qquad (5)$$

where

P_L = Population below the poverty line;

P = total population;

$f\ (Z^*)$ = area under a normal curve (with zero mean and unit variance) up to Z*;

Z^* = $(\log C^* - M)/\lambda$;

C^* = poverty line;

λ = inequality parameter of lognormal distribution function;

M = log C— i A2 ; and

C = mean monthly per capita private consumption, which is V_r in case of rural areas and Vu in urban areas as in equation 2.4.

In case of 75% of poverty line of C* is to be replaced by 0.75C*.

(iii) *Variant I*

In this variant the normative consumption for population below poverty line for different sectors of input-output model is straightway given by-

$$C_{iL} = 12\ C_i^* * P_L \qquad (6)$$

where C_i^* is the normative consumption demand of sector i[1].

Aggregate consumption for population above the poverty line is given by —

$$C_a = 12\ (\ \overline{C}_i\ .P — C^* P_L\ ) \qquad (7)$$

[1] Sector-wise Norms are given in Appendix 12.

The mean monthly per capita consumption for population above the poverty line is then given by-

$$\overline{C}_a = C_a / 12(— P — P_L) \qquad (8)$$

This monthly per capita consumption $\overline{C}_a$ for people above poverty line is first broken down to 13 LES groups using $\overline{C}_a$.

The estimate of demand in each of the LES groups has been further broken down to the input-output sectors belonging to the corresponding LES groups using Demand functions/Engel curves finally adjusted parameter estimates given in Appendices 9.2. and through 9.4. For this purpose, in order that the expression given in Technical Appendix I are applicable, a psuedo-lognormal distribution has to be considered. This is because the people below the poverty line consume more according to normative demand than they would have consumed according to the lognormal distribution with mean C and inequality parameter A and in consequence there is an amount or redistribution of consumption among the two classes of population considered, which lowers the per capita consumption of people above poverty line.

It has been assumed that in the psuedo log-normal distribution the inequality parameter λ would not change, while there will be an implied change in the mean monthly per capita total consumption expenditure. This is obtained by the following expression such that the monthly per capita total consumption expenditure of the people above the poverty line is same as given by Equation (8).

$$C_s\ [1 - f\ (Z_s^* - \lambda)]\ /\ [1 - f\ (Z_s)] = C_a \qquad (9)$$

where,

$$Z_s = \log\ (C^* — M_s)/\lambda \qquad (10)$$

$$M_s = \log\ \overline{C}_s — \tfrac{1}{2}\ \lambda^2 \qquad (11)$$

C_g = mean monthly per capita total consumption of psuedo consumption distribution.

C^* = poverty line.

Equations (9), (10) & (11) have been solved iteratively for $\bar{C}_a$ using Newton Raphson's procedure. Consideration δ of psuedo lognormal distribution is merely to use $\bar{C}_a$ instead of $\bar{C}$ and M_s for M in the expressions for the demand functions given in Technical Appendix I. The estimates for demand of commodities in each LES groups are then aggregated into input-output sectors belonging to the corresponding LES group, and then adjusted prorata such that their total agrees with the estimate given by the same LES group.

Table 2 presents values of P_L, $P\text{-}P_L$, $\bar{C}_a$, $\bar{C}_s$ & M_s respectively for rural and urban areas corresponding to four sets of values of P and C for 1982-83 and 198 /-SB.

TABLE 2

Year	Areas	$\bar{C}$ (Rs.)	P_L (million)	$P\text{-}P_L$ (million)	$\bar{C}_a$ (Rs.)	$\bar{C}_s$ (Rs.)	M_s
1982-83	Rural	83.01	196.72	340.48	95.27	67.44	4-08681
	Urban	104.60	51.84	102.96	121.36	89.45	4.34370
1987-88	Rural	97.44	146.54	431.16	109.55	90.25	4.37807
	Urban	120.82	43.50	134.00	136.90	112.67	4.57465

The estimates of private consumption for the 89 sectors thus obtained separately for people below poverty line and for people _above poverty line are then combined. This has been done separately for rural and urban areas and finally rural and urban sectoral estimates have been combined to give private consumption vector of the input-output model used for projections in 1982-83 and 1987-88. The sectoral private consumption vectors for 1982-83 and 1987-88, thus obtained are presented in Appendices 13.1 and 13.2.

Variant II

As mentioned earlier consumer demand in variant II has been projected on the assumption that the consumption deficiency of the house hold below poverty line will be made at least upto the extent of 75 per cent. The poverty line being Rs.61.8 and Rs.71.3 in rural and urban areas respectively at 1976-77 prices, the modest poverty lines thus defined are Rs.46.4 per capita per month in rural areas and Rs.53.5 per capita per month in urban areas.

The mean monthly total consumption of people lying between the modest poverty line and the poverty line has been estimated in accordance with the lognormal distribution function. After meeting the demand of people below the poverty line in this way, the residual of total private consumption is then assumed to be available to people above the poverty line.

The private consumption of 89 input-output sectors is then estimated by the effective demand system separately for people below and above the poverty line. The mean monthly per capita consumption of people below the poverty line and above the poverty line are required for this purpose are estimated as follows:—

(a) Let P_{ML} = population below the modest poverty line.

P_L = Population below the poverty line.

$\bar{C}_L$ = mean monthly per capita consumption of population between modest poverty line and poverty line,

We have

$$\bar{C}_L = P.\bar{C}[f(Z^* - \lambda) - f(0.75Z^* - \lambda]/(P_L - P_{ML}) \quad (12)$$

Where

$\bar{C}$, Z* have already been defined while discussing variant I, and P_L and P_{ML} are obtained by virtue of expression (5) above.

The mean monthly per capita consumption of people above the poverty line is then obtained by-

$$\bar{C}_a = (\bar{C}P - \bar{C}_L P_L)/(P - P_L) \quad (13)$$

Using the above monthly per capita consumption, Ca & CL the appropriate LES demand functions the estimates of private consumption of people above poverty line and below poverty line has been obtained by 13 LES groups.

In order to find out sectoral private consumption within each LES group, a procedure similar that considered under variant I is adopted after considering psuedo lognormal distribution separately for the two sections- above and below the

poverty line In order to find mean monthly per capita private consumption $\bar{C}s$ in the psuedo consumption distribution for upper section of the population, the expression given in (9) is applicable. The mean monthly per capita private consumption "Cabin the psuedo consumption distribution for the lower section of the population is, however, given by.

$$\bar{C}_L = \bar{C}_{sb}\ f\ (Z^{**}—\lambda)/f\ (Z^{**}) \qquad (14)$$

Where,

$Z^{**} = \log (C^*-M_{sb})/\lambda$

$M_{sb} = \log\ \bar{C}_{sb} —½\ \lambda^2$

M_{sb} and $\bar{C}_{sb}$ have been estimated by using Newton Raphson iterative procedure.

Table 3 presents the values of $\bar{C}_b$, $\bar{C}_{sb}$ and M_{sb} for 1982-83 and 1987-88, separately for rural and urban areas.

TABLE - 3

Year	Place	$\bar{C}_b$	$\bar{C}_{sb}$	$\bar{M}_{sb}$
1982-83	Rural	54.15017	314.75149	5.627321
	Urban	62.50575	503.26003	6.071338
1987-88	Rural	54.39899	332.44386	5.682000
	Urban	62.68799	524.41272	6.112510

Value of $\bar{C}_a$, $\bar{C}_s$ and Ms for upper section of people are given in Table 4

Year	Place	$\bar{C}_a$	$\bar{C}_{sb}$	$\bar{M}_{sb}$
1982-83	Rural	99.6796	74.923456	4.191996
	Urban	125.79335	96.354780	4.418268
1987-88	Rural	112.06196	93.906443	4.417828
	Urban	139.69225	116.58446	4.608847

The procedure of estimating sectoral private consumption in each LES groups, for lower and upper section of the population as well as rural and urban areas separately and finally for estimating the aggregate private consumption vector for the model after combining them is exactly same as discussed in variant I. Finally adjusted parameter-estimates of demand functions are given in Appendices 9.1 through 9.4. The private consumption demand targets for the 89 sectors of the input-output model corresponding to variant II is given in Appendices 13.1 and 13.2.

CHAPTER 5

RECOMMENDATIONS AND FUTURE DIRECTION OF WORK

Recommendation

During the course of discussions, the Task Force suggested the following recommendations:—

(a) To estimate the average calorie requirement for an individual separately for rural and urban areas taking into consideration the distribution of age, sex and activity.

(b) To estimate the poverty line corresponding to the calorie requirement using the NSS data of the 28th round (1973-74).

(c) To estimate commodity-wise private consumption effective/ behaviouristic and normative for the Sixth Plan 1978 — 83. It was recommended that the commodity-wise private consumption may be estimated by considering linear expenditure system (LES) for maximum number of groups of commodities and best fitting Engel curves within each LES group.

The Committee further recommended that the views expressed by Prof. N.S. lyengar in his letter to the convenor and there actions of Dr. R. Radha krishna be appended to the Report.

(d) As for calculating the calorie requirement, it is preferable to consider the minimum rather than average required for biological existence taking into consideration that there is considerable variation in calorie requirement. In view of this, it is recommended that 75 per cent of the poverty line may be considered as appropriate cut off point which has been rightly considered in the Draft 1978—83 Plan document.

Future Directions of Work

5.2. It was agreed that the following aspects may be taken up as tasks ahead for estimating the private consumption vector of the input-output model. These are:-

(i) Methodological framework of consumption model;

(ii) Concomitant data problems; and

(iii) Related operational issues.

5.3. *Methodological Framework*

This relates to normative as well as effective/ behaviouristic and other alternative aspects of the consumption model.

(i) *Normative Consumption*

5.3.1. In constructing the weighting diagram for determining the all-India calorie requirements separately for rural and urban areas, certain assumptions have been made. In this connection, it seems useful from operational angle to firm up some of these, particularly the one related to classification of workers as heavy, moderate and sedentary. To this end, a quick survey of existing literature on the subject, coupled with some exercises based on available data, may commend.

5.3.2. Since daily calorie requirements for the same person category are likely to vary over space because of climatic factors difference in body weights, etc., it appears desirable, at least in the long run, to develop regional calorie norms. Regions having formed, as much as possible, on the basis of homogeneity criterion consistent with similarity of climatic factors, uniformity of body weights, etc. As a corollary to this, a refinement to the procedure adopted at present to work out all-India calorie requirements seems in order. First over all region-level calorie requirements will have to be worked out and then an all-India figure arrived at by weighting these regional figures; the weights being the regional population figures.

5.3.3. A comparison of two series of private consumption expenditure one based on NSS household consumption expenditure-data and the other brought out by the CSO as a part of their National Accounts Statistics — shows that they differ perceptibly with the NSS series invariably tending to be on the low side. The reasons behind these differences and how to reconcile, them is obviously a matter for further research and investigation. In this connection, it may be added that if, for instance, in actuality food items are correctly reported and non-food items alone are under-reported, then evidently, poverty line as calculated by us is understated and so also the population below it. On the contrary, converse holds good if non-food items are correctly reported and food items are under-reported.

5.3.4. Food component of the poverty line could alternatively be obtained by L P model** resulting in a minimum cost balanced diet compatible with locally available food-stuffs and satisfying, as far as possible, local tastes and preferences. Minimum cost figures thus arrived at for various person categories could be aggregated into an overall region-level or all-India figure by using an appropriate weighting diagram. This, when added to the food component of the original poverty line, would result in an alternative poverty line estimate. This may be more realistic via-a-vis the original poverty line inasmuch as its food component is based on observational data rather than interview-based data which, in no small measure, may be affected by various biases and errors attributable to this method. In fact, norms for non-food component could also be suitably modified and moderated in the light of the observations made by various distinguished study groups in connection with their recommendations on minimum wage or need-based wage, etc., and allied materials available on the subject as well as through independent studies.

Effective Consumption

5.3.5. Effective/ behaviouristic demand in the present work has been analysed within the framework of L E S-cum-consumption functions model. In the ensuring discussion we will take up the LES followed by its integration with demand functions.

5.3.6. Leaving aside the limitations of the LES to satisfactorily handle price effects-cross as well as own-pragmatic considerations suggest that certain modifications could be introduced in it while largely retaining its original structure and simplicity to allow greater sophistication in income response. The simplest way to achieve it is, as already tried out by some researchers in the field, to introduce time trends in the LES parameters preferably in this only, to allow for steady changes in tastes and preferences.

5.3.7. To judge the relative performance of LES, it may be instructive to compare its results with those of alternative models.

5.3.8. The consumption model for demand projections is intended to capture essentially the inter-temporal variations in consumer behaviour which is essentially of a short-run nature. As against this parameter of LES estimated in the present work tend to be a 'mongrel' reflecting both the short-term and long-term consumption behaviours. This is because the time series- of cross section data used in the model not only include inter-temporal variations but inter-cross section variations also. Inter-temporal variations could probably be disentangled by using dummy variables for cross sections in the regression analysis.

Problem of Integration

5.3.9. Integration of demand functions with LES tantamounts to assuming that both the systems reflect the same behaviour pattern of the consumer. But, as is well known, cross section analysis relating to a single point of time essentially reflects long-term consumption behaviour. In a situation like this, it may be argued whether integration is at all warranted. A way out of these theoretical complications relating to specification and interpretation of the model, of course within the LES framework, may be to estimate LES on the basis of regression analysis using dummy variables applied to time series of cross section data on the one hand and estimating demand functions on time series data for finer classification of broad consumption estimates yielded by the LES on the other hand. As far as the latter is concerned, this will necessitate availability of house-hold consumption data in as much detail as contained in 28th Round of the NSS for a series of rounds.

(ii) *Data*

5.4.1. Natonal Sample Survey household consumption data are collected, both in value and quantity wherever relevant, at a fairly disaggregative level. In order that the data may be useful for the purpose of consumption model building, they should also be available both for the previous rounds and for the up-coming rounds in as detailed a manner as is the case with the 28th round of the NSS. In the case of States, in order to get tolerably realistic estimation of the model, the relevant tabulations would have to be based on Central sample data and State sample data combined to overcome the problem of small sample size. Wherever State sample is not collected, the same would have to be collected in future or Central sample would have to be of adequate size. As regards index number problem, the implicit deflator, if worked out regularly, based on National Sample Survey value and quantity data would probably resolve it. In the case of such items where only value figures are available, appropriate unit prices will also have to be collected or compiled.

** Some work in this area as a part of district level food and nutrition studies is being undertaken by Department of Food.

5.4.2. Closer examination and scrutiny of concepts, definitions, coverage and related aspects ' needs no emphasis to throw light on the disparity between the NSS and CSO series of private consumption expenditure. In this connection, surveys like Food and Nutrition studies being conducted by Food and Nutrition Board, Ministry of Agriculture and Irrigation, Department of Food, could provide an independent check on the two sets of data in question.

(iii) *Related Operational Issues*

5.5. This section broadly recapitulates area of further work: —

i) Preparation of a paper surveying the existing literature on consumption functions and demand projections;

ii) Discussion regarding the norms that should be adopted in respect of non-traded public goods like housing, primary education, drinking water and medicines. In this connection, Appendices 15.1 & 15.2 give certain norms and coefficients. This information has been gleaned from a recent note entitled 'Minimum Needs Programme and its Commodity Composition', prepared by the Perspective Planning Division;

iii) Views should be expressed on the distribution policy that should be adopted regarding food, sugar, clothing, housing, education, health and miscellaneous civil services in the final report;

iv) Regional focus in the estimation of demand for various essential commodities should be brought out; and

v) For estimation of private consumption : for the new plan model, studies comprising the following should be carried out: —

(a) re-estimation of the linear expenditure system considering more number of commodity groups preferably comparable with the input-output classification using the latest NSS data,

(b) estimation of linear expenditure system for different groups of expenditure classes taking into consideration the change in the expenditure classes over different rounds due to price changes,

(c) estimation of different Engle curves for as many number of commodities as possible using data of various NSS Rounds, and

(d) estimation of regional specific norms of minimum needs both for essential traded goods and non-traded public goods, and

(e) consideration of alternative consumption model.

Sd/-
Dr. Y. K. Alag
Adviser (PP),
Planning Commission.

Sd/-
Shri D. Goondoo,
Economic Research Unit,
Indian Statistical Institute,
203, Barrackpore Trunk Road,
Calcutta-700035.

Sd/-
Dir. D.B. Gupta,
Institute of Economic Growth,
University Enclave,
Delhi-110007.

Sd/-
Prof. N.S. lyengar,
Department of Economics,
Osmania University,
Hyderabad-500007;

Sd/-
Dr. L.R. Jain,
Indian Statistical Institute,
7, SJ.S. Sensanwal Marg,
New Delhi-110029.

Sd/-
Shri G.V.S.N. Murty,
Sardar Patel Institute of Economic & Social Research, Navrangpura,
Ahmedabad-380009.

Sd/-
Prof. R, Radhakrishna,
Sardar Patel Institute of Economic & Social Research, Navrangpura,
Ahmedabad-380009.

Sd/-
Prof. P.V. Sukhatme,
Maharashtra Association for Cultivation,
Poona-4.

Sd/-
Dr. S.D. Tandulkar,
Indian Statistical Institute
7, S.J.S. Sansanwal Marg,
New Delhi-110002.

Sd/-
Dr. K.C. Majumdar,
Jt. Adviser (PP),
Planning Commission.

APPENDIX 1

No. 4/3/77-PP

GOVERNMENT OF INDIA

PLANNING COMMISSION

Yojana Bhavan, Parliament Street New Delhi, the 30th July 1977

ORDER

It has been decided to constitute a Task Force on Projections of Minimum Needs and Effective Consumption Demands. The composition of the Task Force will be as follows: —

1. Dr. Y. K. Alagh,
   Adviser (PP)
   Planning Commission — *Chairman*
2. Shri D. Coondoo,
   Economic Research Unit — *Member*
   Indian Statistical Institute
   203, Barrackpore Trunk Road
   Calcutta-700035
3. Dr. D. B. Gupta,
   Institute of Economic Growth University Enclave,
   Delhi- 11 007— *Member*
4. Prof. N. S. lyengar
   Department of Economics Osmania University
   Hyderabad-500007 — *Member*
5. Dr. L. R. Jain
   Indian Statistical Institute
   7, S. J. S. Sensanwal Marg
   New Delhi- 11 0029— *Member*
6. Shri G. V. S. N. Murty t
   Sardar Patel Institute of Economic and Social Research, Navrangpura,
   Ahmedabad-3 80009— *Member.*
7. Prof. R. Radhakrishna
   Sardar Patel Institute of Economic and Social Research, Navrangpura
   Ahmedabad -380009— *Member*
8. Dr. S. D. Tandulkar,
   Indian Statistical Institute,
   7, S. J. S. Sansanwal Marg,
   New Delhi- 11 0029— *Member*
9. Dr. K. C. Majumdar,
   Director (PP),
   Planning Commission.

2. The terms of reference of the Task Force will be: "to examine the existing structure studies on consumption patterns and standards of living and the minimum needs with particular reference to the poorer sections of the population for the nation as a whole, and its different regions separately by rural and urban areas; on the basis of the above studies, to forecast the national and regional structure and pattern of consumption levels and standards for the end of the Sixth Plan and subsequent perspective plan taking into consideration the basic minimum needs as well as effective consumption demand".

3. The Task Force shall have the power to coopt other members and recommend appointment of short term consultants to the Planning Commission.

4. The Task Force is expected to submit an interim report by the end of October, 1977 and its final report by the end of May, 1978.

5. The headquarters of the Task Force would be New Delhi. The Task Force may undertake such field visits as may be considered necessary. The non-official members of the Task Force will with the approval of the competent authority, be entitled to claim TA/DA for their journeys proposed in connection with attending the meetings, as admissible to the First Grade Officers of the Central Government.

Sd/-
G. N. GUPTA
Director (Administration)

Chairman & Members of the Task Force

Copy for information to;

1. Deputy Chairman
2. Members
3. Advisers
4. Accounts-I Branch (3 copies).

APPENDIX 2

No. 4/3/77-PP
Government of India

PLANNING COMMISSION

Yojana Bhavan, Parliament Street, New Delhi, the 12nd October, 1977.

ORDER

It has been decided to include the following as member of the Task Force on Projections of Minimum Needs and Effective Consumption Demands constituted under Order No. 4/3/77-PP dt.30-7-77 with immediate effect.

Prof. P. V. Sukhatme
Maharashtra Association for the Cultivation of Science, Law College Road,
Poona-411004. — *Member*

Sd/-
R. P. GENOA
Under Secretary to the Govt. of India

Chairman & Members of the Task Force Copy for information to :

1. Deputy Chairman
2. Members (S)/(R)/(K).
3. Secretary
4. Advisers
5. Accounts I Branch (3)
6. Prof. P. V. Sukhatme,
Maharashtra Association for the Cultivation of Science, Law College Road,
Poona-411004.

APPENDIX 3

Private Consumption for 1977-78 *(at* 1976-77 *prices} for* 13 *LES Groups separately for Rural and Urban Areas balanced to the given Marginal Row and Column Control Totals*

(Rs. Million)

SI. No.	Commodity Group	Rural	Urban	Given Total
1	Cereals and cereal substitutes	120028.86	19416.55	139445.41
2	Pulses	9487.67	2119.66	11607.33
3	Milk and milk products	36461.29	12088.82	48550.11
4	Edible oils	13940.49	5015.68	18956.17
5	Meat, fish and eggs	17395.91	6617.57	24013.48
6	Other food products	60794.63	34725.99	95520.62
7	Sugar and gur	19062.65	4822.02	23884.67
8	Pan, tobacco and intoxicants	16139.30	4469.05	20608.35
9	Fuel and light	8397.29	2464.95	10862.24
10	Clothing	39850.18	8162.87	48013.05
11	Miscellaneous goods	64178.71	30114.60	94293.31
12	Rent and taxes	4195.01	19394.14	23589.15
13	Durable goods	26619.02	5107.09	31726.11
	Total	436551.01	154518.99	591070.00

APPENDIX 4.1

Private Consumption for 1977-78 (at 1976-77 prices') for people below and above the Poverty Line in Rural Areas

(Rs. Million)

SI. No.	Commodity group	Below to poverty line	Above to poverty line	Total
1	Cereals and cereal substitutes	50757.66	69271 . 17	120028.86
2	Pulses	3333.41	6154.25	9487.67
3	Milk and milk products	6365.87	30095.41	36461.29
4	Edible oils	4635.79	9304.70	13940.49
5	Meat, fish and eggs	5110.76	12285.14	17395.91
6	Other food products	20167.29	40627.33	60794.63
7	Sugar and gur	4484.59	14578.05	19062.65
8	Pan, tobacco and intoxicants	5151.04	10988.25	16139.30
9	Fuel and light	3113.47	5283.81	8397.29
10	Clothing	5478.67	34371.49	39850.18
11	Miscellaneous	9401.17	54777.52	64178.71
12	Rent and taxes	483.81	3711.19	4195.01
13	Durable goods	1821.45	24797.56	26619.02
	Total	120305.03	316245.98	436551.01

APPENDIX 4.2

*Private Consumption** for 1977-78 (at 1976-77 prices') for people below and above the Poverty Line in Urban Areas

(Rs. Million)

SI. No.	Commodity group	Below to poverty line	Above to. poverty line	Total
1	Cereals and cereal substitutes	7719.59	11696.91	19416.51
2	Pulses	685.86	1433.79	2119.66
3	Milk and milk products	2199.37	9889.44	12088.82
4	Edible oils	1377.06	3638.61	5015.68
5	Meat, fish and eggs	1482.19	5135.37	6617.57
6	Other food products	6751.22	27974.76	34725.99
7	Sugar and gur	1300.63	3521.38	4822.02
8	Pan, tobacco & intoxicants	1063.78	3405.26	4469.05
9	Fuel and light	685.95	1778.99	2464.95
10	Clothing	952.14	7210.72	8162.87
11	Miscellaneous	4447.20	25667.39	30114.60
12	Rent and taxes	2779.94	16614.19	19394.14
13	Durable goods	329.40	4777.68	5107.09
	Total	31774.37	122744.58	154518.99

*Balanced to the Urban Private Consumption as given in Appendix 3.

APPENDIX 5.1

LES Parameter for Rural and Urban Areas

SI. No.	Commodity group	Rural		Urban	
		a_i*	b_i	a_i*	b_i
1	Cereals and cereal substitutes	12.4509	0.1647	11.6438	0.0661
2	Pulses	0.4974	0.0275	0.8630	0.0173
3	Milk and milk products	— 1.2840	0.1060	—0.8786	0.1080
4	Edible oil	0.2361	0.0296	0.7562	0.0332
5	Meat, fish and eggs	0.0389	0.0262	0.0858	0.0343
6	Vegetables	0.4617	0.0219	0.5263	0.0315
7	Fruits and nuts	—0.1863	0.0156	—0.4425	0.0288
8	Sugar and gur	—0.0211	0.0357	0.7533	0.0207
9	Salt and prices	0.8449	0.0157	1.1668	0.0112
10	Beverages and refreshments . .	—0.6088	0.0357	2.9488	0.1271
11	Pan, tobacco and intoxicants	0.2752	0.0269	0.1900	0.0277
12	Fuel and light	1.9453	0.0289	1.8195	0.0383
13	Clothing	—3.9559	0.1527	—2.4354	0.0937
14	Miscellaneous goods	—4.2647	0.1840	—4.3536	0.2373
15	Rent and taxes	—0.1781	0.0059	—1.2888	0.0660
16	Durable goods	—4.9351	0.1228	—2.2581	0.0587

*a_i 's are at 1976-77 prices.

APPENDIX 5.2

LES Parameters in the Urban Areas for People below and above the Poverty Line

SI. No.	Commodity Group	Below the Poverty line		Above the poverty line	
		a_i	b_i	a_i *	b_i
1	Cereals and cereal substitutes	7.8160	0.4776	25.0513	0.0949
2	Pulses	0.1718	0.0536	2.0952	0.0205
3	Milk and milk products	—0.1758	0.0724	3.8074	0.0948
4	Edible oil	0.2682	0.0399	1.3472	0.0270
5	Meat, fish and eggs	0.1674	0.0291	1.0327	0.0248
6	Vegetables	0.3822	0.0331	1.3523	0.0179
7	Fruits and nuts	0.0821	0.0078	0.1.382	0.0167
8	Sugar and gur	0.1337	0.0346	1.9432	0.0317
9	Salt and spices	0.6561	0.0316	1.7412	0.0134
10	Beverages & refreshments	0.3010	0.0213	0.1243	0.0395
11	Pan, tobacco and intoxicants	0.4516	0.0293	1.3374	0.0255
12	Fuel and light	1.7012	0.0476	4.0399	0.0227
13	Clothing	—0.0916	0.0492	—1.7253	0.1727
14	Miscellaneous goods	0.2417	0.0650	—0.3109	0.2178
15	Rent and taxes	—0.0097	0.0016	—0.1335	0.0069
16	Durable goods	—0.0305	0.0064	—8.3578	0.1731

*a_i 's are at 1976-77 prices.

APPENDIX 5.3

LES Parameters in the Urban 'Areas for people below and above the Poverty Line

SI. No.	Commodity Group	Below poverty line		Above poverty line	
		a_i *	b_i	a_i *	b_i
1	Cereals and cereal substitutes	6.3734	0.2590	20.9430	0.0071
2	Pulses	0.1824	0.0416	2.9387	0.0057
3	Milk and milk products	—1.1101	0.1138	6.7912	0.0860
4	Edible oil	0.0694	0.0568	4.1835	0.0153
5	Meat, fish and eggs	—0.0798	0.0404	2.1598	0.0286
6	Vegetables	0.1190	0.0487	2.5421	0.0207
7	Fruits and nuts	—0.0573	0.0159	0.1862	0.0318
8	Sugar and gur	0.1303	0.0393	3.1248	0.0109
9	Salt and spices	0.6357	0.0272	2.6609	0.0049
10	Beverages & refreshments	0.1501	0.0547	—0.5707	0.1480
11	Pan, tobacco and intoxicants	0.2758	0.0267	0.8975	0.0296
12	Fuel and light	1.1250	0.0584	4.7902	0.0301
13	Clothing	—0.5347	0.0433	—2.3538	0.1168
14	Miscellaneous goods	—0.4158	0.1273	—2.8809	0.2873
15	Rent and taxes	—0.3136	0.0391	—0.1898	0.0757
16	Durable goods	—0.1109	0.0077	—7.0532	0.1014

a_i 's are at 1976-77 prices

APPENDIX 6.1

LES Parameters for Rural Areas

SI. No.	Commodity group	a_i *	b_i
1	Cereals and cereal substitutes	12.4509	0.1647
2	Pulses	0.4974	0.0275
3	Milk and milk products	—1.2840	0.1060
4	Edible oils	0.2361	0.0296
5	Meat, fish and eggs	0.0389	0.0262
6	Other food products	0.5115	0.0889
7	Sugar and gur	—0.0211	0.0357
8	Pan, tobacco and intoxicants	0.2752	0.0269
9	Fuel and light	1.9453	0.0289
10	Clothing	—3.9559	0.1527
11	Miscellaneous	—4.2647	0.1840
12	Rent and taxes	-0.1.781	0.0059
13	Durable goods	-4.9351	0.1228

[1] The parameters for Group 6 have been calculated by are at 1976-77 prices aggregating the parameters of Groups 6, 7, 9, 10 of Appendix 5.1.

*a_i 's are at 1976-77 prices.

APPENDIX 6.2

LES Parameters for people below the Poverty Line in Rural Areas

SI. No	Commodity group	a_i *	b_i
1	Cereals and cereal substitutes	7.8160	0.4776
2	Pulses	0.1718	0.0536
3	Milk and milk products	—0.1758	0.0724
4	Edible oils	0.2682	0.0399
5	Meat, fish and eggs	0.1674	0.0291
6	Other food products[1]	1.4214	0.0938
7	Sugar and gur	0.1337	0.0346
8	Pan, tobacco and intoxicants	0.4516	0.0293
9	Fuel and light	1.7012	0.0476
10	Clothing	—0.0916	0.0492
11	Miscellaneous	0.2417	0.0650
12	Rent and taxes	—0.0097	0.0016
13	Durable goods	—0.0305	0.0064

[1]The parameters for Group 6 have been calculated by aggregating the parameters of Groups 6, 7, 9, 10 of Appendix 5.2.
*a_i 's are at 1976-77 prices.

APPENDIX 6.3

LES Parameters for people above Poverty Line in Rural Areas

SI. No.	Commodity Group	ai *	bi
1	Cereals and cereal substitutes	25.0513	0.0949
2	Pulses	2.0952	0.0205
3	Milk and milk products	3.8074	0.0948
4	Edible oils	1.3472	0.0270
5	Meat, fish and eggs	1.0327	0.0248
6	Other food products[1]	3.3560	0.0875
7	Sugar and gur	1.9432	0.0317
8	Pan, tobacco and intoxicants	1.3374	0.0255
9	Fuel and light	4.0399	0.0227
10	Clothing	—1 .7253	0.1727
11	Miscellaneous	—0.3109	0.2178
12	Rent and taxes	—0.1335	0.0069
13	Durable goods	—8.3578	0.1731

[1] The parameters for Group 6 have been calculated by aggregating the parameters of Groups 6, 7, 9, 10 of Appendix 5.1
*a_i 's are at 1976-77 prices.

APPENDIX 6.4 *LES*
Parameters for Urban Areas

SI. No.	Commodity Group	ai	bi
1.	Cereals and cereal substitutes	11.6438	0.0661
2	Pulses	0.8630	0.0173
3	Milk and milk products	—0.8786	0.1080
4	'Edible oils	0.7562	0.0332
5	Meat, fish and eggs	0.0859	0.0343
6	Other food products[1]	—1.6982	0.1986
7	Sugar and gur	0.7533	0.0207
8	Pan, tobacco & intoxicants	0.190Q	0.0277
9	Fuel and light	1.8195	0.0383
10	Clothing	—2.4354	0.0937
11	Miscellaneous	—4.3536	0.2373
12	Rent and taxes	—1.2888	0.0660
13	Durable goods	—2.2581	0.0587

[1]The parameters for Group 6 have been calculated by aggregating the parameters of Groups 6, 7, 9, 10 of Appendix 5.1.
NOTE : a_i 's are at_1976-77 prices.

APPENDIX 6.5
LES Parameters for people below the Poverty Line in Urban Areas

SI. No.	Commodity Group	a_i	b_i
1	Cereals and cereal substitutes	6.3734	0.2590
2	Pulses	0.1824	0.0416
3	Milk and milk products	—1.1101	0.1138
4	Edible oils	0.0694	0.0568
5	Meat, fish and eggs	—0.0798	0.0404
6	Other food products[1]	0.8475	0.1465
7	Sugar and gur	0.1303	0.0393
8	Pan, tobacco & intoxicants	0.2758	0.0267
9	Fuel and light	1.1250	0.0584
10	Clothing	—0.5347	0.0433
11	Miscellaneous	—0.4158	0.1273
12	Rent and taxes	—0.3136	0.0391
13	Durable goods	—0.1109	0.0077

[1] The parameters for Group 6 have been calculated by aggregating the parameters of Groups 6, 7, *9*, 10 of Appendix 5.3.
NOTE : a_i 's are at J 976-77 prices,

APPENDIX 6.6

LES Parameters for people above the Poverty Line in Urban Areas

SI. No.	Commodity Group	a_i	b_i
1	Cereals and cereal substitutes	20.9430	0.0071
2	Pulses	2.9387	0.0057
3	Milk and milk products	6.7912	0.0860
4	Edible oils	4.1835	0.0153
5	Meat, fish and eggs	2.1548	0.0286
6	Other food products[1]	4.8185	0.2054
7	Sugar and gur	3.1248	0.0109
8	Pan, tobacco & intoxicants	0.8975	0.0296
9	Fuel and light	4.7902	0.0301
10	Clothing	—2.3538	0.1168
11	Miscellaneous	—2.8809	0.2873
12	Rent and taxes	—0.18.98	0.0757
13	Durable goods	—7.0532	0.1014

[x]The parameters for Group 6 have been calculated by aggregating the parameters of Groups 6, 7, 9, 10 of Appendix 5.3.
NOTE : a; 's are at 1976-77 prices.

APPENDIX 7.1

Revised LES Parameters and monthly Per Capita Consumption Expenditure (ci) in Rural Area Corresponding to the balanced Rural Private Consumption**

SI. No.	Commodity Group	a_i	b_i	C_i
1	Cereals and cereal substitutes	10.4752	0.1252	20. ,1987
2	Pulses	0.3272	0.0163	1. ,5966
3	Milk & milk products	—1.2802	0.0955	6. ,1358
4	Edible oils	0.2394	0.0271	2, ,3459
5	Meat, fish & eggs	0.0606	0.0369	2. ,9274
6	Other food products	0.7753	0.1218	10 .2307
7	Sugar and gur	—0.0272	0.0417	3 .2079
8	Pan, tobacco & intoxicants	0.3456	0.0305	2 .7160
9	Fuel and light	0.6919	0.0093	1 .4131
10	Clothing	—3.9247	0.1369	6 .7061
11	Miscellaneous	—5.3266	0.2077	10 .8001
12	Rent and taxes	—0.5330	0.0160	0 .7060
13	Durable goods Total	—6.0040	0.1351	4 .4795
		—4.1805	1.0000	73 .4638

* As given in Appendix 3.

APPENDIX 7.2

Revised LES Parameters and monthly Per Capita Consumption Expenditure (C/) *for people below the Poverty Line in Rural Areas Corresponding to Balanced Rural Private Consumption**

SI. No.	Commodity Group	a_i	b_i	C_i (Rs.)
1	Cereals and cereal substitutes	6.5616	0.3647	18.5154
2	Pulses	0.1181	0.0335	1.2159
3	Milk & milk products	—0.2059	0.0771	2.3221
4	Edible oils	0.3108	0.0421	1.6910
5	Meat, fish & eggs	0.3015	0.0477	1 . 8643
6	Other food products	2.4790	0.1488	7.3566
7	Sugar and gur	0.1876	0.0442	1.6359
8	Pan, tobacco & intoxicants	0.6403	0.0378	1.8789
9	Fuel and light	0.6191	0.0158	1.1357
10	Clothing	—0.1119	0.0644	1.9985
11	Miscellaneous	0.3803	0.0930	3.4294
12	Rent and taxes	—0.0449	0.0068	0.1765
13	Durable goods	—0.1264	0.0241	0.6644
	Total	11.1093	1.0000	438.849

*As given in Appendix 4.1.

APPENDIX 7.3

*Revised LES Parameters and monthly Per Capita Consumption Expenditure (Ci) for people below the Poverty Line in Urban Areas Corresponding to Balanced Urban Private Consumption**

SI. No.	Commodity Group	a_i	b_i	C_i (Rs.)
1	Cereals and cereal substitutes	17.5677	0.0427	21.6412
2	Pulses	1.2025	0.0076	1.9227
3	Milk and milk products	3.7251	0.0595	9.4022
4	Edible oils	1.3055	0.0168	2.9069
5	Meat, fish & eggs	1.5539	0.0239	3.8380
6	Other food products	4.8895	0.0818	12.6925
7	Sugar and gur	2.2789	0.0239	4.5513
8	Pan, tobacco & intoxicants	1.5841	0.0194	3.4328
9	Fuel and light	1.2283	0.0044	1.6507
10	Clothing	—2.0944	0.1345	10.7381
11	Miscellaneous	—0.4087	0.1837	17.1132
12	Rent and taxes	—0.4792	0.0172	1.1594
13	Durable goods	—28.9378	0.3846	7.7471
	Total	3.4153	1.0000	98.7991

* As given in Appendix 44,

APPENDIX 7.4

Revised LES Parameters and monthly Per Capita Consumption Expenditure (CO *in Urban Areas corresponding to balanced Urban Private Consumption**

SI. No.	Commodity Group	a_i	b_i	C_i (Rs.)
1	Cereals and cereal substitutes	7.9866	0.0407	12.0930
2	Pulses	0.4689	0.0084	1.6280
3	Milk & milk products	—0.7430	0.0820	7.5292
4	Edible oils	0.6278	0.0247	3.1239
5	Meat, fish & eggs	0.1171	0.0397	4.1216
6	Other food products	—2.2548	0.2366	21.6280
7	Sugar and gur	0.8609	0.0212	3.0033
8	Pan, tobacco & intoxicants	0.1960	0.0256	2.7834
9	Fuel and light	0.5282	0.0100	1.5352
10	Clothing	—2.0462	0.0706	5.0840
11	Miscellaneous	—4.7645	0.2330	18.7560
12	Rent and taxes	—3.3201	0.1526	12.0791
13	Durable good	2.3485	0.0548	3.1808
	Total	—4.6916	1.0000	96.2375

*As given in Appendix 3.

APPENDIX 7.5

Revised LES Parameters and monthly Per Capita Consumption Expenditure (C/) *for people below the Poverty Line in Urban Areas Corresponding to Balanced Urban Private Consumption**

SI. No.	Commodity Groups	a_i	b_i	C_i (Rs.)
1	Cereals and cereal substitutes	4.0325	0.1735	12.2682
2.	Pulses	0.0875	0.0211	0.0900
3	Milk and milk products	—0.8419	0.0914	3.4953
4	Edible oils	0.0519	0.0450	2.1884
5	Meat, fish & eggs	—0.0963	0.0516	2.3555
6	Other food products	1.1076	0.2027	10.7292
7	Sugar and gur	0.1279	0.0408	2.0670
8	Pan, tobacco & intoxicants	0.2882	0.0295	1.6906
9	Fuel and light	0.3021	0.0166	1.0901
10	Clothing	—0.4929	0.0423	1.5132
11	Miscellaneous	—0.4913	0.1592	7.0676
12	Rent and taxes	—0.8390	0.1107	4.4180
13	Durable goods	—0.2104	0.0155	0.5235
	Total ..	3.0260	1.0000	*50.4960*

* As given in Appendix 4.2.

APPENDIX 7.6

Revised LES Parameters & Monthly Per Capita Private Consumption Expenditure (C7) For *People Above The Poverty Line In Urban Areas Corresponding To Balanced Urban Private Consumption**

SI. No.	Commodity Group	a_i	b_i	c (Rs.)
1	Cereals & cereal substitutes	11.5928	0.0035	11.9801
2	Pulses	1.2328	0.0021	1.4685
3	Milk and milk products	4.5054	0.0510	10.1289
4	Edible oils	2.7394	0.0090	3.7267
5	Meat, fish and eggs	2.2819	0.0270	5.?597
6	Other food products	5.5091	0.2099	28.6522
7	Sugar and gur	2.6841	0.0084	3 . 6066
8	Pan, tobacco & intoxicants	0.8207	0.0242	3.4877
9	Fuel and light	1.1253	0.0063	1 . 8221
10	Clothing	—1.8985	0.0842	7.3853
11	Miscellaneous	—2.9780	0.2655	26.2889
12	Rent and taxes	—0.4442	0.1584	17.0165
13	Durable goods . . Total	—11.7016	0.1505	4.8934
		15.4691	1 . 0000	125.7171

*As given in Appendix 4.2.

APPENDIX 8

71. *Commodity Groups*

SI. No	Name of the Sector	SI. No.	Name of the Sector
1	Paddy	18	Miscellaneous food products
2	Wheat	19	Sugar
3	Jowar	20	Gur and khandsari
4	Bajra	21	Hydrogenated oil (Vanaspati)
5	Other cereals	22	Edible oil other than hydrogenated oil
6	Pulses	23	Tea
7	Sugarcane	24	Coffee
8	Plantation	25	Other beverages
9	Vegetables	26	Tobacco manufacture
10	Fruits	27	Cotton textiles
11	Spices	28	Cotton textiles in handloom and. khadi
12	Milk and milk products	29	Woollen and silk fabrics
13	Meat and Egg	30	Art silk fabrics
14	Dung cake	31	Jute textiles
15	Forestry and logging	32	Readymade garments and made up textile goods
16	Fishing	33	Miscellaneous textile products
17	Coal and lignite	34	Carpet weaving

79-L/B(N)815PC— 4

APPENDIX 8-contd.

SI. No.	Name of the Sector	SI. No.	Name of the Sector
35	Wood products	54	Electrical household goods
36	Paper, paper products and newsprint	55	Communication and electronic equipment
37	Printing and publishing	56	Other electrical machinery
38	Leather and leather products	57	Motor vehicles
39	Leather footwear	58	Motor cycles and bicycles
40	Rubber products	59	Watches and clocks
41	Plastics	60	Miscellaneous manufacturing industries
42	Petroleum products	61	Gas, electricity and water supply
43	Miscellaneous coal and petroleum products	62	Railways
44	Insecticides, Fungicides	63	Other transport
45	Soaps and glycerine	64	Communication
46	Cosmetics	65	Banking and insurance
47	Other chemicals	66	Real estate and ownership of dwellings
48	Other non-metallic mineral products	67	Consumer rent
49	Metal products	68	Education
50	Office, domestic and commercial equipment	69	Medicines
51	Other non-electrical machinery	70	Doctor, nurse, midwife
52	Electrical cables and wires	71	Other services
53	Batteries		

APPENDIX 9.1

Demand Function Parameters For People Below The Poverty Line in Rural Areas

Commodity Group	Input-Output Sector No.	LES Group	Demand Function No.	Parameters at 1973-74 prices		Parameters at 1976-77 prices and adjusted for LES Total for 1977-78	
				a_i	b_i	a_i	b_i
1	2	3	4	5	6	7	8
1	1	1	1	— .84866	0.88384	—1.036393	.883840
2	2	1	5	—1.75126	0.14853	—2.138065	.144032
3	3	1	1	—0.94533	0.50049	—1.234284	.500490
4	4	1	2	—2.08960	0.91993	—1.653515	.660927
5	5	1	1	0.96598	0.00682	.444230	.006820
6	6	2	5	—0.54081	0.05448	— .484206	.038739
7	7	7	7	0.00268	0.0	.001992	0.000000
8	10	4	7	—0.00205	0.0	.002326	0.000000
9	11	6	5	—0.04703	0.04713	— .097234	.075048
10	11	6	1	—5.34741	1.20883	—4.901424	1.208830
11	11	6	1	—2.73601	0.78666	—2.192794	0.78666
12	12	3	1	—10.58516	3.06148	—10.917261	3.061480
13	13	5	1	—6.72108	1.55410	—6.250798	1.554100
14	13	5	5	—0.10152	0.01152	— .232397	.020932
15	14	9	1	—1.37235	0.49599	—2.515075	.495990
16	15	5	5	—0.00709	0.01130	— .008244	.010896
17	16	9	1	—8.86927	1.43192	—8.841874	1.431920
18	20	6	5	0.10049	0.00473	.167194	.006242

APPENDIX *9.1—contd.*

1	2	3	4	5	6	7	8
19	21	7	1	—8.45839	2.07118	—8.724376	2.071180
20	22	7	1	—6.91487	1.79771	-6.741341	1.797710
21	23	4	7	0.0	0.0	0.000000	0.000000
22	24	4	1	—4.48536	1.32746	—4.571686	1.327460
23	25	6	1	—5.96904	1.36895	—5.958862	1.368950
24	25	6	1	—9.97205	1.74000	—10.047332	1.740000
25	26	6	6	0.18109	—1.60915	.447512	—5.006562
26	27	8	1	—3.17692	0.79214	—2.358961	.792140
27	28	10	1	—8.70433	2.27048	—8.653991	2.270480
28	29	10	2	—0.08894	0.05304	—.748304	.392356
29	30	10	7	0.0	0.0	0.000000	0.000000
30	31	10	7	0.0	0.0	0.000000	0.000000
31	32	10	7	0.0	0.0	0.000000	0.000000
32	33	10	2	—0.05917	0.03350	— .277588	.139029
33	34	10	7	0.0	0.0	0.000000	0.000000
34	35	10	7	0.00003	0.0	.000312	0.000000
35	36	13	7	0.0	0.0	0.000000	0.000000
36	37	11	7	0.0	0.0	0.000000	0.000000
37	38	11	7	0.00003	0.0	.000015	0.000000
38	39	13	7	0.0	0.0	0.000000	0.000000
39	40	13	7	0.00074	0.0	.001623	0.000000
40	41	13	7	0.0	0.0	0.000000	0.000000
41	42	11	7	0.0	0.0	0.000000	0.000000
42	43	9	5	0.09934	0.00773	.156193	.009649
43	44	9	7	0.0	0.0	0.000000	0.000000
44	48	11	7	0.0	0.0	0.000000	0.000000
45	50	11	1	—7.08724	1.56813	—7.658326	1.568130
46	51	11	1	—3.77767	0.12616	—5.402824	.726160
47	53	11	1	—7.37336	1.45987	—7.351514	1.459870
48	56	13	7	0.00185	0.0	.002654	0.000000
49	61	13	7	0.00023	0.0	.000559	0.000000
50	64	13	7	0.0	0.0	0.000000	0.000000
51	65	13	7	0.0	0.0	0.000000	0.000000
52	67	13	7	0.0	0.0	0.000000	0.000000
53	68	13	7	0.0	0.0	0.000000	0.000000
54	69	13	7	0.00002	0.0	0.000096	0.000000
55	70	13	7	0.0	0.0	0.000000	0.000000
56	71	13	7	0.0	0.0	0.000000	0.000000
57	74	13	7	0.0	0.0	0.000000	0.000000
58	75	13	7	0.0	0.0	0.000000	0.000000
59	77	11	7	0.0	0.0	0.000000	0.000000

APPENDIX *9.1—contd.*.

1	2	3	4	5	6	7	8
60	78	13	7	0.00397	0.0	0.010206	0.000000
61	80	9	7	0.0000	0.0000	0.000000	0.000000
62	81	11	7	0.0000	0.0000	0.000000	0.000000
63	82	11	1	—7.66071	1.69210	—6.820315	1.692100
64	83	11	7	0.0000	0.0000	0.000000	0.000000
65	85	11	7	0.0000	0.0000	0.000000	0.000000
66	86	12	7	0.00380	0.0	.002010	0.000000
67	86	12	7	0.00380	0.0	.002010	0.000000
68	87	11	7	0.00229	0.0	.007173	0.000000
69	88	11	1	—9.55463	2.31067	—8.923172	2.310670
70	88	11	7	0.0000	0.0000	0.000000	0.000000
71	89	11	1	—5.77799	1.30388	—4.846113	1.303880

N.B.:

1. For key to 71 commodity groups refer to Appendix 8.
2. For key to 89 input-output sectors refer to Appen. 11.
3. For key to 13 LES group numbers refer to Appen. 3.
4. D.F. No. Function/Engel Curves
   - 1 : Double log
   - 2 : Serrii log
   - 5 : Linear
   - 6 : Hyperbola
   - 7 : Proportion (Propensity)

APPENDIX 9.2

Demand Function Parameters For People Above The Poverty Line In Rural Areas.

Commodity	Input-Output Sector No.	LES Group	Demand Function No.	Parameters at 1973-74 price		Parameters at 1976-77 prices and adjusted for LES Totals for 1977-78 -A	
				a_i	b_i	a_i	b_i
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	1	1	1	0.78234	0.45555	.391045	.455550
2	2	1	1	—1.49159	0.79341	—1.776942	.793410
3	3	1	1	1.43443	—0.17832	.999613	— .178320
4	4	1	1	—0.55964	0.23879	—1.247467	.238790
5	5	1	1	0.09302	0.23810	— .784181	.238100
6	6	2	1	—2.53475	0.82459	—3.125398	. 824590
7	7	7	7	0.00203	0.0	.001627	0.000000
8	10	4	7	0.01191	0.0	.006738	0.000000
9	11	6	1	—2.05758	0.71884	—1.767885	.718840
10	11	6	1	—6.17276	1.45023	—6.051515	1.450230
11	11	6	1	—2.10833	0.61707	—1.795195	.617070
12	12	3	5	—2.52114	0.11986	—3.443398	.130019

APPENDIX *9.2—contd.*

1	***2***	**3**	**4**	***5***	**6**	**7**	**8**
13	13	5	*1*	—6.46045	1.51220	—6.246133	1. 51 2200
14	13	5	1	—3.54664	0.68627	—3.142103	. 686270
15	14	9	1	—1.36470	0.49517	—2.966948	.495170
16	15	5	1	—3.60108	0.78152	—3.894832	.781520
17	16	9	5	—0.02405	0.00135	— .021704	.000967
18	20	6	1	—7.18797	1.62957	—7.323257	1.629570
19	21	7	1	—6.21330	1.47320	—6.268431	1.473200
20	22	7	1	—3.36597	0.90184	—3.152575	.901840
21	23	4	5	—0.23785	0.00736	— .476416	.011692
22	24	4	2	—5.09645	1.76967	—3,398435	1.092669
23	25	6	1	—4.95675	1.11375	—5.156934	1.113750
24	25	6	5	—0.04889	0.00201	— .051717	.001684
25	26	6	5	—0.42759	0.01269	— .807340	.019030
26	27	8	1	—2.74878	0.67750	—1 . 866066	. 677500
27	28	10	1	—9.49520	2.52680	—10.128205	2.526800
28	29	10	2	—2.74170	0.76683	—11.563678	3.038524
29	30	10	5	—0.27672	0.00548	— .759627	.011934
30	31	10	5	—1.26608	0.02543	—1.885918	.031676
31	32	10	7	0.00099	0.0	.001249	0.000000
32	33	10	2	—2.39501	0.65314	—5.658727	1.451974
33	34	10	5	—0.18608	0.00381	— .317054	.006146
34	3S	10	7	0.00003	0.0	.000167	0.000000
35	36	13	1	—17.82039	3.36571	—17.718612	3.365710
36	37	11	7	0.00017	0.0	.000766	0.000000
37	38	11	2	—0.86001	0.23172	— .849543	.215524
38	39	13	7	0.00026	0.0	.000556	0.000000
39	40	13	5	—0.52872	0.01195	—2.013382	.036126
40	41	13	5	—0.16391	0.00437	— .424076	.008974
41	42	11	7	0.00130	0.0	.001590	0.000000
42	43	9	1	—3.67992	0.76000	—3.862112	. 760000
43	44	0	7	0.00008	0.0	.000144	0.000000
44	48	11	7	0.0000	0.0	0.000000	0.000000
45	50	11	5	—0.04076	0.00874	— .039243	.006683
46	51	11	1	—4.67217	0.96685	—6.180729	.966850
47	53	11	1	—4.94580	0.81287	—4.602910	.812870
48	56	13	1	—13.48766	2.33439	—13.120723	2 334390
49	61	13	5	—0.67520	0.01385	—2.949010	.048037
50	64	13	7	0.0000	0.0	0.000000	0.000000
51	65	13	7	0.00096	0.0	.001246	0.000000
52	67	13	7	0.0000	0.0	0.000000	0.000000
53	68	13	7	0.00012	0.0	.000189	0.000000

APPENDIX *9.2—concld.*

1	2	3	4	5	6	7	8
54	69	13	7	0.00019	0.0	.001250	0.000000
55	70	13	5	— 0.19849	0.00400	— .539859	.008622
56	71	13	7	0.0000	0.0	0.000000	0.000000
57	74	13	7	0.0000	0.0	0.000000	0.000000
58	75	13	5	—0.21407	0.00446	— .878898	.014540
59	77	11	7	0.00035	0.0	.001565	0.000000
60	78	13	1	—15.82965	3.36113	-15.116048	3.361130
61	80	9	5	—0.10665	0.00259	—0.427677	.008239
62	81	11	1	—14.41321	2.81725	—12.1796043	2.817250
63	82	11	1	—8.50258	1.93051	—7.545060	1.930510
64	83	11	7	0.0000	0.0	0.000000	0.000000
65	85	11	7	0.000	0.0	0.000000	0.000000
66	86	12	5	—0.57991	0.01108	—1.566496	.023773
67	86	1.2	5	—0.17912	0.00404	—.483852	.008668
68	87	11	5	—0.46310	0.01016	—2.169247	.037801
69	88	11	2	—1.82177	0.48084	—7.348525	1.828410
70	88	11	2	—1.82177	0.48084	—7.348525	1.828410
71	89	11	1	—7.68682	1.83131	—6.704388	1.831310

APPENDIX 9.3

Demand Function Parameters For People Below The Poverty Line In Urban Areas

Commodity Group	Input-Output Sector No.	LES Group	Demand Function No.	Parameter at 1973-74 prices		Parameters at 1976-77 prices and adjusted for LES Totals for 1977-78	
				a_i	b_i	a_i	b_i
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	1	1	1	—0.70398	0.76872	—1.165867	.768720
2	2	1	2	—10.18085	4.12832	—9.974748	3.699258
3	3	1	1	1.90234	—0.41538	1.547234	— .415380
4	4	1	1	-0.57216	0.02289	—1.209842	.022890
5	5	1	1	0.16532	—0.13399	— .668239	—.133990
6	6	2	1	—3.60779	1.09652	-4.218169	1.096520
7	7	7	7	0.00121	0.0	.000905	0.000000
8	10	4	7	0.01402	0.0	.008364	0.000000
9	11	6	5	—0.07930	0.05376	—.142830	.076911
10	11	6	1	—6.70371	1.62845	—6.490332	1.628450
11	11	6	1	—1.99063	0.60959	—1.542572	.609590
12	12	3	1	—6.80176	2.07799	—6.972682	2.077990
13	13	5	1	—4.91448	1.26639	—4.497135	1.266390
14	13	5	1	—4.67683	0.76252	—4.143435	.762520
15	14	9	1	—1.25133	0.44743	—3.451401	.447430

APPENDIX 9.3 *contd.*

1	2	3	4	5	6	7	8
16	15	5	1	-4.81876	1.05286	-4.991497	—1.052860
17	16	9	1	—7.58948	1.67332	—8.605277	1.673320
18	20	6	1	—4.65712	1.16874	—3.809982	1.168740
19	21	7	5	—0.29781	0.03431	— .381095	.034865
20	22	7	1	—3.90904	0.77960	—3.494723	.779600
21	23	4	5	—0.30878	0.01639	—.510487	.021520
22	24	4	1	—3.95540	1.20765	-4.573583	1.207650
2.3	25	6	1	-4.10542	1.10775	—4.182817	1.107750
24	25	6	5	—0.07758	0.00480	— .092669	.004552
25	26	6	1	—8.03605	1.53734	—7.495185	1.537340
26	27	8	1	—3.08476	0.72369	—2.305521	.723690
27	28	10	1	—9.44659	2.35439	—9.541978	2.354390
28	29	10	1	—8.01563	1.42996	—6.543203	1.429960
29	30	10	7	0.000	0.000	0.000000	0,000000
30	31	10	7	0.000	0.000	0.000000	0.000000
31	32	10	7	0.000	0.000	0.000000	0.000000
32	33	10	1	—11.86599	2.46315	—11.033539	2.463150
33	34	10	7	0.000	0.000	0.000000	0.000000
34	35	10	7	0.00003	0.0	.000257	0.000000
35	36	13	7	0.000	0.000	0.000000	0.000000
36	37	11	7	0.00035	0.0	.000696	0.000000
37	38	11	1	—14.46421	2.93929	—15.540289	2.939290
38	39	13	7	0.000	0.000	0.000000	0.000000
39	40	13	1	—10.80515	1.99547	—10.281483	1.995470
40	41	13	I	—11.89215	2.01499	—11.911943	2.014990
41	42	11	7	0.00019	0.0	.000186	0.000000
42	43	9	1	—5.01399	1.19174	—5.803639	1.191740
43	44	9	7	0.0000	0.0000	0.000000	0.000000
44	48	11	7	0.0000	0.00	0.000000	0.000000
45	50	11	1	—5.24078	1.25905	—6.075224	1.259050
46	51	11	1	-4. 82925	1.10815	—6.883964	1.108150
47	53	11	1	—6.41271	1.22329	—6.709381	1.223290
48	56	13	7	0.00033	0.0	.001101	0.000000
49	61	13	1	—12.92798	2.40005	—12.229625	2.400050
50	64	13	7	0.000	0.000	0.000000	0.000000
51	65	13	7	0.00	0.00	0.000000	0.000000
52	67	13	7	0.000	0.000	0.000000	0.000000
53	68	13	7	0.0000	0.0	0.000000	0.000000
54	69	13	7	0.00003	0.0	.000263	0.000000
55	70	13	7	0.00199	0.000	.001100	0.000000
56	71	13	7	0.0000	0.0000	0.000000	0.000000

APPENDIX 9.3 —*contd.*.

1	2	3	4	5	6	7	S
57	74	13	7	0.0000	0.0000	0.000000	0.000000
58	75	13	7	0.0000	0.0000	0.000000	0.000000
59	77	11	7	0.0000	0.0000	0.000000	0.000000
60	78	13	1	—11.10597	2.16498	—10.966574	2.607000
61	80	9	1	—8.09992	1.77465	—7.810388	1.774650
62	81	11	1	—12.45690	2.60700	—10.810388	1.774650
63	32	11	1	—7.68670	1.69420	—7.122611	1.694200
64	83	11	7	0.0000	0.00	0.000000	0.000000
65	85	11	7	0.026570	0.00	.037744	0.000000
66	86	12	7	0.0000	0.00	0.000000	0.000000
67	86	12	1	—7.31334	1.89261	-^5.994108	1.892610
68	87	11	1	—15.22482	3.54586	—14.348399	3.545860
69	88	11.	1	—7.98503	1.93343	—8.775784	1.933430
70	88	11	1	—13.67035	2.73448	—14,645604	2.734480
71	89	11	1	—4.85384	1.27090	—4.220779	1.270900

D.F. No.—Function Code for Engel Curves.
1 : Double Log
2 : Semi Log
5 : Linear
6 : Hyperbola
7 : Proportion (propensity)

APPENDIX 9.4

Demand Function Parameters For People Above The Poverty Line In Urban Areas

Commodity Group	Input-Output Sector No.	LES Group	Demand Function No.	Parameter at 1973-74 prices.		Parameters at 1976-77 prices and adjusted for LES Total for 1977-78 x	
				a_i	b_i	a_i	b_i
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	1	1	1	1.67831	0.17866	1.018710	.178660
2	2	1	2	—0.78922	1.82090	—.775788	1.168815
3	3	1	1	4.15136	—0.97571	3.591722	—.975710
4	4	1	1	4.59248	—1.25780	3.916145	—1.257800
5	5	1	1	0.16219	—0.14441	—1.002571	— .144410
6	6	2	2	—3.65021	1.48354	—1.907039	.708727
7	7	7	7	0.00087	0.0	.000532	0.000000
8	10	4	7	0.00342	0.0	.001509	0.000000
Q	11	6	1	—2.06382	0.78780	—1.940491	.787800
10	11	6	1	—6.60220	1.61910	—6.670331	1.619100
11	11	6	1	—1.13730	0.40032	—.924731	.400320
12	12	3	5	— .38364	0.1.0426	—.387545	.083651

APPENDIX 9.4— *contd.*

1	2	3	4	5	6	7	8
13	13	5	5	—0.14970	0.02441	— .255226	.033053
14	13	5	1	—1.04167	—0.14669	— .474311	— .146690
15	14	9	1	0.07895	0.11352	—2.801084	.113520
16	15	5	5	—0.00129	0.01170	— .001149	.008357
17	16	9	1	—4.45938	0.91071	-6.056400	.910710
18	20	6	1	—8.94454	2.25546	—8.631371	2.255460
19	21	7	1	—2.65523	0.78907	—2.798474	.789070
20	22	7	2	—0.19499	0.16497	— .342649	.242614
21	23	4	1	-4.54736	1.02823	—4.582337	1.028230
22	24	4	1	—1.83108	0.69737	—2.632663	. 697370
23	25	6	5	—0.00050	0.02661	—0.000448	0.017007
24	25	6	1	—7.82990	1.548200	—8.292416	1.548200
25	26	6	1	—7.55137	1.44225	—7.272285	1.442250
26	27	8	1	—4.58000	1.09353	—4.045021	1.093530
27	28	10	1	—7.08132	1.76835	—7.881085	1.768350
28	29	10	5	—0.13044	0.00443	— .341490	.009206
29	30	10	5	—0.41563	0.00689	— 1.554090	.020438
30	31	10	2	—15.94396	3.91966	—15.355161	3.572618
31	32	10	7	0.00040	0.0	. 000355	0.000000
32	33	10	1	—10.21339	2.06859	—10.129426	2.068590
33	34	10	2	—1.84293	0.45324	—5.335943	1.241946
34	35	10	7	.00003	0.0	.000111	0.000000
35	36	13	5	—0.58786	0.00905	—.160964	.001967
36	37	11	1	—13.05629	2.58607	-13.220140	2.586070
37	38	Jl	1	-12.39975	2.43412	—13.851964	2.434120
38	39	13	7	0.00236	0.0	.000576	0.000000
39	40	13	1	—13.00805	2.57190	—15.039459	2.571900
40	41	13	1	—12.31012	2.153290	—14.784069	2.153290
41	42	11	7	0.00620	0.0	.003813	0.000000
42	43	9	1	—4.61326	1.09985	—6.138601	1.099850
43	44	9	7	0.00144	0.0	.001073	0.000000
44	48	11	7	0.00260	0.0	.001513	0.000000
45	50	11	1	—3 . 82793	0.91506	—5.075629	.915060
46	51	11	1	—4.71165	1.08735	—7.254059	1.087350
47	53	11	1	—5.85271	1.08300	—6.609546	1.083000
48	56	13	7	0.00315	0.0	.000932	0.000000
49	61	13	1	—13.90109	2.70777	—15.695911	2.707770
50	64	13	7	0.00207	0.0	.001904	0.000000
51	65	13	7	0.00217	0.0	.000286	0.000000
52	67	13	7	0.00053	0.0	.006622	0.000000
53	68	13	7	0.00042	0.0	.000066	0.000000

APPENDIX *9.4 —contd...*

1	2	3	4	5	6	7	8
54	69	13	5	—0.20392	0.00359	— .208158	.002908
55	70	13	5	—0.05787	0.00120	— .003571	.000058
56	71	13	7	0.006	0.00	.006258	0.000000
57	74	13	1	—21.11791	4.13101	—20.648012	4.131010
58	75	13	1	—12.44239	2.21337	—13.831938	2.213370
59	77	11	7	0.00053	0.0	.001110	0.000000
60	78	13	1	—13.89996	2.87731	—15.462991	2.877310
61	80	9	1	—6.99850	1.50778	— 7.404360	1.507780
62	81	11	1	—10.23351	2.06554	—9.110959	2.065540
63	82	11	1	—8.59352	1.93192	—8.576666	1.931920
64	83	1.1	1	-14.43659	2.73548	—13.142950	2.735480
65	85	12	7	0.02657	0.0	.023066	0.000000
66	86	12	7	0.0	0.0	0.000000	0.000000
67	86	12	5	—2.24463	0.06595	—8.799331	.205350
68	87	11	5	—1.72356	0.03629	—5.725872	.095758
69	88	11	1	—6.83491	1.66095	—8.055390	1.660950
70	88	11	1	— 12.05539	2.32756	—13.429410	2.327560
71	89	11	1	— 6.64792	1.72261	—6.611374	1.722610

APPENDIX 10

Bar Square Values For The Demand Functions

Commodity Group No.	Rural		Urban	
	Below the Poverty Line	Above the Poverty Line	Below the Poverty Line	Above the Poverty Line
(0)	**(1)**	**(2)**	**(3)**	**(4)**
1	0.998	0.791	0.918	0.757
2	0.986	0.926	0.967	0.760
3	0.581	0.582	'0.533	0.908
4	0.974	0.369	0.033	0.339
5	0.003	0.695	0.117	0.201
6	0.996	0.949	0.991	0.908
7	—	—	—	—
8	—	—	—	—
9	0.995	0.981	0.998	0.928
10	0.920	0.967	0.991	0.943
11	0.981	0.986	0.952	0.976
12	0.997	0.968	0.995	0.938
13	0.991	0.979	0.987	0.986
14	0.983	0.907	0.853	0.202
15	0.986	0.990	0.957	0.531
16	0.909	0.909	0.940	0.914
17	0.567	0.882	0.957	0.516
18	0.716	0.970	0.913	0.847
19	0.994	0.902	0.994	0.897
20	0.994	0.959	0.935	0.697
21	—	0.975	0.966	0.851
22	0.989	0.987	0.945	0.880
23	0.912	0.991	0.993	0.943
24	0.817	0.951	0.970	0.891
25	0.645	0.943	0.871	0.983
26	0.977	0.984	0.976	0.990
27	0.997	0.722	0.993	0.947
28	0.401	0.940	0.843	0.870
29	—	0.839	—	0.990
30	—	0.893	—	0.742
31	—	—	—	—
32	0.203	0.843	0.956	0.902
33	—	0.951	—	0.888

(0)	**(1)**	**(2)**	**(3)**	**(4)**
34	_		_	_
35	—	0.839	—	0.904
36	—	—	—	0.838
37	—	0.875	0.976	0.927
38	—	—	..__	—
39	—	0.969	0.993	0.919
40	—	0.966	0.854	0.839
41	—	—	—	—
42	0.987	0.977	0.996	0.951
43	—	—	—	—
44	—	— .	— ,	—
45	0.995	0.960	0.987	0-921
46	0.973	0.998	0.985	0.968
47	0.969	0.984	0.978	0.939
48	—	0.839	—	—
49	—	0.844	0.968	0.897
50	—	—	—	— .
51	—	—	—	—
52	—	—	— .	—
53	—	—	—	—
54	—	—	— ,	0.992
55	—	0.711	—	0.967
56	—	—	—	—
57	— .	—	—	0.994
58	—	0.768	—	0.907
59	—	—	—	—
60	— i	0.970	0.944	0.963
61	— .	0.975	0.982	0.909
62	—	0.958	0.962	0.954
63	0.935	0.901	0.991	0.876
64	—	—	—	0.979
65	—	—	—	—
66	—	0.761	— .	—
67	—	0.950	0.987	0.988
68	. —	0.907	0.982	0.990
69	0.952	0.648	0.997	0.881
70	—	0.648	0.944	0.904
71	0.978	0.871	0.986	0.987

APPENDIX 11

Sector Classification of Input-Output Table

Sector No.	Name of Sector	Composition of Sectors
(0)	**(1)**	**(2)**
1	Rice and products	Paddy, rice milling
2	Wheat and products	Wheat, flour milling
3	Jowar and products	Jowar, products
4	Bajra and products	Bajra, products
5	Other cereals	Mazie, Gjam and other cereals
6	Pulses	Milled & Unmilled tur, urd, moong, matar, masur & black gram dal and flour.
7	Sugarcane	Sugarcane
8	Jute	Raw jute
9	Cotton	Raw cotton
10	Plantations	Tea plantation, coffee plantation, rubber plantation, coconut, copra, tobacco plantation
11	Other crops	Groundnut, potato, seasamum, rape and mustard, linseed, castor mesta, sanhemp, dry chillies, black pepper, dry giner, turmeric, indigo, opium, sweet potato, topioca, banana, cashewnut, areca-nut, cardamom citrus fruits, grapes, mangoes, other fibres, other oilseeds other sugars, other dyes and tanning materials other drugs and narcotics, other condiments and spices other fruits and veg &-tables, fodder, miscellaneous food and non-food crops.
12	Milk and milk products	Milk consumed as such, ghee, butter, lassi.
13	Other Animal Husbandry	Agricultural & transport animal services by bullocks, camels, horses donk eys and poneys etc. Production of raw hides and skins, hair, wool, eggs, honey, raw-silk, bones, horns and hoofs, dung , increment in livestock, hunting and trapping.
14	Forestry and logging	Planting replanting, conservation of forests, production of fuel including charcoal, felling and cutting of tress and preparation of rough, hewing shaping of poles, blocks etc. and transportation of logs up to the permanent lines of transport industrial wood (timber, match and pulp-wood) bamboo, sandal wood, gathering of uncultivated materials such as gums, lacs, resings, forest grown, fruits, nuts, herbs, barks, grass cane.
15	Fishing	Rearing and catching of fish, sea weeds, shells, pearls , sponges etc. fish curing viz. salting and sundrying offish.
16	Coal and lignite	Coal and lignite mining.
17	Petroleum and natural gas	Crude petroleum, nautral gas.
18	Iron ore	Iron ore mining.
19	Other minerals	Manganese ore mining Bauxite mining, Copper ore mining, Chro-mite mining Lead & Zinc ores, gold ores silver ores, Ilmenite and Rutile, Limes tone mining, Mica mining Dolamite mining, Apatite, asbestos, barytes chinaclay gypsum, Kyanite magnesite, dia-mong, calcite, ochre, garnet, graphite, feldspar, fireclay, flourite quartz and silica sillimanite, steatite, minor minerals, salt mining and quarrying, chemical stone quarrying, clay and sand pits and chemical and fertiliser mineral mining, precious and semi precious stone mining etc.

APPENDIX *11—contd.*

(0)	(1)	(2)
20	Miscellaneous food products	Slaughtering, preparation preservation of meat, milk food & manufacture of dairy products. Manufacture of dairy products. Manufacture of fruits juice, jams, jellies, pickles etc., canning and bottling of fruits and vegetables. Canning, preservaing & processing of fish, crustacean and similar foods. Grinding & processing of cereals manually. Manufacture of bread biscuits cakes etc. Common salt cocoa, chocolate and sugar confectionary etc. Cashewnut drying shelling, roasting etc. Ice, starch processed from maize, tapioca, tamarind etc. Malted food, corn, wheat and oat flakes, multi purpose food, frying of rice, dal and gram, edible corn flour, curry powder animal food, instant coffee, scented and processed supari, papads, sago and sago products etc.
21	Sugar	Sugar, raw sugar, molasses.
22	Gur and Khandsari	Boora, candy and cane gur, Khandsari.
23	Vanaspati	Hydrogenated oils, vanaspati ghee.
24	Edible oils	Edible oils such as linseed oil, mustard oil, sesamum oil, coconut oil, groundnut oil, cotton seed oil, mowrah oil etc.
25	Tea and Coffee	Blended and unblended black tea leaf grade dust and waste, coffee curing, roasting and grinding.
26	Other Beverages	Distilling, rectifying and blending of spirits, still wines, beer, malt liquor, country liquor etc. Soft drinks and carbonated beverages, soda water bottled sweet water.
27	Tobacoo manufactures	Bidi, cigarette, cigars and cheroots, smoking tobacco, Zarda, chewing tobacco, snuff, graded, redried, undried, stripped and packed tobacco, scraps and steins.
28.	Cotton textiles	Cotton ginning, cleaning and pressing. Finished cotton textile in mills, printing, dyeing and bleaching of cotton textiles.
29.	Cotton textiles (handloom & khadi)	Weaving & finishing of cotton textile in handloom, khandi.
30.	Woollen & silk textiles	Wool baling and pressing and woollen textiles, Silk fabrics.
31.	Art silk fabrics	Fabrics of art silk and synthetic fibres.
32	Jute textiles	Jute pressing and jut textiles.
33.	Ready made garments	Cotton, woollen and synthetic fibres knitting in mills. Ready made garments, clothing and tailoring (tailoring job works), made-up textile goods.
34	Miscellaneous textile products	Thread & thread bail making, Jute, cotton, hemp sisal, nylon rope, cordage and twines, webbing, narrow embroidery work and laces, umbrella manufacture, artificial leather and oil cloth, tarpaulins, tents, sails and other made-up canvas goods. Coir yarn and coir products, gas mantles and other textiles viz. bandage, gauge, dressing cloth etc.
35	Carpet Weaving	Carpet Weaving.
36	Wood products	Plywood and their products, Sawing & planning of wood, containers made of wood cane, bamboo, reed, jounery and general wood working, cork and Cork products and miscellaneous wood, bamboo grass products, wooden furniture and fixtures, bamboo, cane furniture and fixtures.
37	Paper, paper products and Newsprint	Pulp-wood pulp, mechanical, chemical including dissolving pulp, paper writing printing and wrapping, paper board and straw board, hard board including fibre board and chip board, paper for packing including corrugated paper, kraft paper, paper bags, paper containers etc. newsprint.
38	Printing & publishing	Letter press and lithographic printing and book binding, other printing included photography (maps, greeting cards, calenders photo mounts etc.).
39	Leather & leather products	Tannery & leather finishing, hide leather products except footwear and other wearing apparel, fur products.
40	Leather footwear	Manufacture and repair of leather footwear.

APPENDIX ll—contd.

(0)	(1)	(2)
41	Rubber products	Rubber tyres and tubes for motor vehicles, tractors, aircraft-scooters, motor cycles and cycles manufacture of rubber foot wear. Rubber surgical and medical equipment including prophylactics, baloons, miscellaneous industrial and domestic goods.
42	Plastics	Synthetic resins and plastic materials, plastic products manufacture celluloid and its articles and synthetic rubber.
43	Petroleum products	Products of petroleum refineries.
44	Mis. Coal & petroleum products	Coke and other miscellaneous products of petroleum and coal.
45	Inorganic heavy chemicals	Inorganic heavy chemicals.
46	Organic heavy chemicals	Organic heavy chemicals.
•17	Chemical kruti/.t:r-;	Inorganic organic and. mixed fertilizer^ including manures.
48 49	Insecticides fungicides & pesticides Drugs pharmaceuticais	Insecticides, fungicides and weedicides. Drugs and pharmaceuticais including drug intermediaries.
50	Saps and glycerines	Soaps and glycerine.
51	Cosmetics	Perfumes, cosmetics and toilet preparations, non-edible vegetable oils including solvent extracted oils.
52	Manmade fibres	Man made fibres including regenerated cellulose rayon, nylon • etc.
53	Other chemicals	Paints, varnishes and lacquers dye-stuffs including dye-stuffs intermediaries turpentine and resin, matches, explosives including gun powder and safety fuses, fire works fine chemicals glue and gelatine, lac including shellac. Waxes and polishes, textiles auxiliaries and other chemical products.
54	Refractories	Fire bricks, refractories furnace lining bricks etc. Tiles
55	Cement	Cement (Hydraulic).
56	Other non-metallic mineral products	Glass-holloware, glass wool, miscellaneous glassware, sheet and plate glass, laboratory glassware, optical glass earthen ware and pottery, chinaware and pottery, sanitary ware and white-ware, insulators, mica products, stone dressing and crushing, asbestos, Cement, hume pipes and other cement and concrete products (including reinforced products) insulating board grinding wheels and abrasives miscellaneous non-metallic mineral products (lime, asbestos, etc.) slate products.
57	Iron and steel	Iron and steel (metal), alloy and special steel and ferro alloys.
58	Castings and forgoings	Iron and steel castings and forgings.
59	Iron & steel structures	Iron and steel structurals, iron and steel pipes.
60	Non-ferrous metals	Aluminium, copper, zinc etc. and alloys.
61	Meial products	Safes and vaults, metal containers and steel trunks, sanitary and plumbing fixtures and fittings of metal, stoves hurricane, lanterns welded products, enamelling japanning and acquering, galvanising, planting and polishing metal products, structural metal products weights, other metal products, repair of general non-electric machinery, repair of miscellaneous enterprises, metal furniture and fixtures, hand tools and small tools, bolts, nuts, hails screws springs chains etc. and other metal fittings for shoes, leather, wearing apparel etc. cutlery, locks, type founding razor blades.
62	Tractors & agricultural implements	Tractors and other agricultural machinery, equipments and im plements.
63	Machine tools	Machine tools.
64	Office, domestic and commercial equipments	Computing and accounting machines, calculating machines, typewriters and duplicators.

APPENDIX 11—*contd.*

(0)	(1)	(2)
65	Other non-electrical machinery	Construction and earth moving machinery prime movers, boilers and steam generating plants such as diesel engines. Rice, dal and flour mill machinery, oil mill machinery, sugar machinery, tea machinery, textile machinery (such as spinning frames, carding machines, powerlooms etc. including textile accessories), jute machinery, paper machinery chemical machinery, mining machinery, cement machinery, refrigeration plants for industrial use air conditioners and refrigerators, fire fighting equipment and appliances incl. fire engines, conveying equipment and bucket elevators, derricks centrifugal etc. ari and sas compressors and vacuum pumps (excl. electrical furnaces) ball, roller and tapered bearings, speed and reduction units, weighing machines. Miscellaneous non-electrical machinery (metallurgical machinery filteration and distillation equipment, mixers and reactors, washing machines, arms and ammunition, Sewing and knitting machines.
66	Electric motors	Electric motors.
67	Electric cables and wires	Electric-cables and wires.
68	Batteries	Storage batteries, dry cells.
69	Electrical household goods	Electrical fans, electrical lamps, fluorescent tubes, miniature lamps etc., household appliances such as electrical irons, heaters etc.
70	Communication & electronic equipments	Wireless Communication apparatus, radio receivers including amplifying and public address equipments, telephones, telegraph equipment, electronic computer, control instruments, Components and accessories.
71	Other electrical machinery	Equipment for generation, transmission and distribution of electricity including transformers, miscellaneous electrical machinery including electrical furnaces, signalling equipment, lighting equipment and fittings, X-ray apparatus and tubes etc., electrical repair.
72	Ships and boats	Ships and other vessels drawn by power, boat building.
73	Rail equipments	Railway locomotives, railway rolling stock.
74	Motor Vehicles	Motor cars, buses, trucks, jeeps, automobile auxiliaries, other motor vehicles, repair of motor vehicles.
75	Motor cycles & bicycles	Motor cycles, scooters and bicycles and repair.
76	Other transport equipment	Tramway works, aircraft, other transport equipment such as carts trailers and other material hauling equipment.
77	Watches and clocks	Manufacture & repair of watches & clocks.
78	Miscellaneous manufacturing industries	Scientific instruments and surgical instruments, Mathematical turveying and drawing instruments, water, steam and electricity meters, indicating, recording and regulating devices for pressure, temperature rate of flow, weights, levels etc., photographic and optical goods like lenses camera, projectors, arc lamps etc., jewellery, mints, games and sports goods, musical instruments, fountain pen, pen and pencil making, button making, broom and brushes, sign and advertising displays, toys, bones, ivory, horns, hoofs, claws and similar products, other manufacturing industries.
79	Construction	New construction and repair of residential buildings factory establishments, roads, bridges, multi-purpose power projects, reclamation of land, bunding, other land improvement, digging of wells, development of other irrigation resources.
80	Electricity, gas and water supply	Generation, transmission and distribution of electricity, public lighting, manufacture and distribution of coal gas, water gas etc., collection, purification and distribution of water.
81	Railways	Government railways, private railways services incidental to this transport.
82	Other transport	Buses, tramways trucks, taxis, auto-rickshaws, bullock, buffalo horse and other animal drawn carts, cycle, handpulled rickshaw and coolies, shipping, transport by boat, steamer ferry etc. by canal or rivers and unorganised water transport by sea; air transport and services incidental to these transport.

APPENDIX 11 — contd.

(0)	(1)	(2)
83	Communications	Postal, telephones, telegraph services rendered by postal and telephone department and overseas communication services.
84	Trade, storage & warehouses	Warehousing, cold storage, other storage, repositories, and safe deposits-when such services are offered as independent service, wholesale and retail trade.
85	Banking and insurance	Commercial banks banking department of RBI, other financial companies industrial development and financial corporations post office saving bank, cumulative deposit accounts, national saving certificates, cooperative credit societies, Life insurance corporation, postal life insurance and non-life insurance.
86	Real estate & ownership of dwellings	Activities of all types of dealers such as operators developers and agents connected with real estate, residential houses.
87	Education	Education and research.
88	Medical health	Medical and health services.
89	Other services	Services rendered by hotels, boarding houses, eating houses, cafes, restaurants, canteens etc., religious, legal recreation and entertainment, domestic laundry, cleaning and dyeing, barbers and beauty shops and other personal services, sanitary services etc., wrapping, packing and filling of articles and repair of wooden furniture, public administration and defence.

APPENDIX 12

Sector-wise Norms For Per Capita Monthly Consumption Corresponding To The Poverty Line At 1976-77 *Prices*

Sector No.	Rural	Urban	Sector No.	Rural	Urban
1	16.4339	15.2705	*25*	1.2951	2.0380
2	7.583,4	8.6690	26	0.3589	0.2215
3	2.4818	1.8755	27	1.0483	0.9894
4	1.4223	0.7236	28	1.8943	1.0485
5	3.0042	0.9304	29	0.3008	0.1476
6	1.8471	2.9093	30	0.0263	0.0147
7	0.1590	0.0443	31	0.0263	0.1329
8	0.0000	0.0000	32	0.0000	0.0000
9	0.0000	0.0000	33	0.1527	0.1624
10	0.2711	0.0295	34	0.0138	0.0147
11	5.2457	7.2217	35	0.0000	0.0000
12	4.0122	5.4938	36	0.0140	0.0000
13	1.5682	2.3334	37	0.0000	0.0590
14	2.4628	2.4072	38	0.0664	0.0590
15	0.4256	0.7088	39	0.0000	0.0000
16	0.0570	0.4430	40	0.0963	0.0738
17	0.000	0.0000	41	0.0509	0.0295
18	0.000	0.0000	42	0.0000	0.0000
19	0.000	0.0000	43	0.9688	0.9747
20	0.6790	1.2848	44	0.0000	0.0009
21	0.8629	2.0971	45	0.0000	o-oooo
22	1.0461	0.5316	46	0.0000	0.0000
23	0.1254	0.8122	47	0.0000	0.0000
24	1.8197	3.2785	48	0.0000	0.0018

APPENDIX 12 — *contd...*

Sector No.	Rural	Urban	Sector No.	Rural	Urban
49	0.0000	0.0000	70	0.0294	0.0000
50	0.6737	1.1519	71	0.0000	0.0000
51	0.6443	0.9008	72	0.0000	0.0000
52	0.0000	0.0000	73	0.0000	0.0000
53	0.2088	0.1772	74	0.0000	0.0000
54	0.0000	0.0000	75	0.0153	0.0000
55	0.0000	0.0000	76	0.0000	0.0000
56	0.0140	0.0147	77	0.0001	0.0001
57	0.0000	0.0000	78	0.0566	0.0886
58	0.0000	0.0000	79	0.0000	0.0000
59	0.0000	0.0000	80	0.0114	0.4873
6C	0.0000	0.0000	81	0.0706	0.1624
61	0.0294	0.0443	82	0.5237	0.4873
62	0.0000	0.0000	83	0.0000	0.0886
63	0.0000	0.0000	84	0.0000	0.0000
64	0.0000	0.0000	85	0.0000	0.0000
65	0.0000	0.0010	86	0.0283	1.7131
66	0.0000	0.0000	87	0.0566	0.3987
67	0.0147	0.0000	88	0.8508	0.9747
68	0.0000	0.0002	89	0.7358	1.5654
69	0.0147	0.0147	Poverty Line	61.8	71.3

.APPENDIX 13.1 *Sector-wise Private Consumption For The Two Variants For* (1982-83) *at Purchasers*[9] *Price (Rs. million)*

Sector No.	Variant I	Variant 11	Sector No.	Variant I	Variant 11
1	**2**	**3**	**1**	**2**	**3**
1	104344.09	89320.00	19	0.00	0.00
2	54916.08	49012.91	20	21664.57	23464.34
3	12518.47	10843.30	21	13440.30	12920.67
4	7471.28	6129.78	22	14645.24	15751.34
5	13426.61	9555.11	23	5236.76	5126.58
6	15719.61	14215.18	24	15200.17	14568.38
7	1132.04	1002.30	25	12126.99	10576.34
8	0.00	0.00	26	6093.79	9407.70
9	0.00	0.00	27	21015.33	25030.88
10	3549.17	3557.66	28	29348.03	30741.21
11	69651.66	76295.24	29	10916.73	12251.62
12	62685.24	61357.05	30	2860.87	3000.16
13	2261.1.42	23756.00	31	6518.09	6789.53
14	9480.63	3611.50	32	563.18	558.31
15	5676.92	5921.26	33	5491.81	6046.06
16	940.45	747.03	34	1466.09	15808.04
17	0.00	0.00	35	85.13	131.45
18	0.00	0.00	36	720.44	909 91
			37	1146.96	1214.14

APPENDIX *13.1—contd.*

1	2	3	1	2	3
38	906.82	779.97	65	491.26	559.72
39	284.34	319.50	66	0.00	0.00
40	5788.48	7022 . 65	67	1001.07	1030.04
41	1784.94	1986.95	68	77.99	88.41
42	1229.81	1241.53	69	668.24	734.46
43	6227.01	5162.44	70	1138.47	1368.18
44	224.19	224 99	71	913.25	973.42
45	0.00	0.00	72	0.00	0.00
46	0.00	0..00	73	0.00	0.00
47	0.00	0.00	74	1851.13	2369.02
48	233.77	235 .07	75	2011.28	2434.95
49	0.00	0.00	76	0.00	0.00
50	5480.72	4003.73	77	804.62	803 . 85
51	2966.84	1125.77	78	8362,04	12653.27
52	0.00	0.00	79	o'.oo	0.00
53	2629.53	2616.54	80	2971.06	3131.27
54	0.00	0.00	81	9756.10	11130.14
55	0.00	0.00	82	20951.44	23123.24
56	558.87	1034.55	83	1936.52	2079.69
57	0.00	0.00	84	0.00	0.00
58	0.00	0.00	85	3546.48	5132.88
59	0.00	0.00	86	25793 . 87	29995 .25
60	0.00	0.00	87	13934.43	15118.70
61	6370.94	7912.41	88	11662.73	12757.63
62	0.00	0.00	89	33929.76	37662.69
63	0.00	0.00	Total	729430.00	729430.00
64	277.85	296.16			

APPENDIX 13.2

Sectorwise Private Consumption For the Two Variants For 1987-88 *at Purchasers' Price (Rs. million}*

Sector No.	Variant I	Variant II	Sector No.	Variant I	Variant II
1	**2**	**3**	**1**	**2**	**3**
1	109479.70	97915.84	15	6748.08	6927.14
2	60556.81	55987.77	16	1043.25	888.52
3	11893.31	10612.81	17	0.00	0.00
4	7462.38	6448.66	18	0.00	0.00
5	12999.57	10089.91	19	0.00	0.00
6	17534.15	16336.18	20	32746.82	34285.03
7	1280.90	1184.77	21	16945.91	16546.34
8	0.00	0.00	22	17643.89	18489.93
9	0.00	0.00	23	7138.90	7054.54
10	4491.39	4528.73	24	16545.20	15983.80
11	83719.91	.88780.34	25	14119.11	12934.76
12	79082.91	78079.19	26	8425.77	8652.03
13	28478.58	29356.59	27	27242.05	30316.64
14	8231.03	3738.42	28	43478.69	44623.06

79-L/B(N)815PC— 5

APPENDIX *3.2-contd...*

1	2	3	1	2	3
29	13454.65	14475.31	60	0.00	0.00
30	4473.03	4554.15	61	13720.18	14635.88
31	9849.60	9975.60	62	0.00	0.00
32	699.66	697.94	63	0.00	0.00
33	7217.23	7644.99	64	419.49	423.59
34	1288.67	2207.43	65	854.41	881.54
35	107.00	143.14	66	0.00	0.00
36	1905.64	2083.83	67	1484.82	1473.25
37	1826.01	1888.00	68	134.70	138.74
38	1167.53	1069.39	69	1132.63	1153.57
39	479.79	493.11	70	2403.52	2536.61
40	11696.38	12392.47	71	1378.78	1392.27
41	3374.91	3454.61	72	0.00	0.00
42	1599.42	1609.95	73	0.00	0.00
43	6480.70	5664.70	74	5040.18	5583.31
44	296.11	296.76	75	4274.41	4511.95
45	0.00	0.00	76	0.00	0.00
46	0.00	0.00	77	1027.04	1027.73
47	0.00	0.00	78	23377.59	27112.88
48	314.45	315.32	79	0.00	0.00
49	0.00	0.00	80	4185.81	4291.32
50	5852.13	4709.96	81	16596.83	17932.23
31	2729.84	1311.38	82	30227.00	31870.80
52	0. 00	0.00	83	3448.16	3587.62
53	2979.03	2973.5	84	0.00	0.00
54	0.00	0.00	85	4779.23	6055.46
55	0.00	0.00	86	38107.19	41545.11
56	1098.85	1447.35	87	20644.71	21429.45
57	0.00	0.00	88	14555.21	15310.29
58	0.00	0.00	89	47939.10	50747.71
59	0.00	0.00	Total	932810.00	932810.00

APPENDIX 14

Caloric Content Per Unit Quantity of Food (Edible Portion Only)

Food item	Unit	No. of calories per unit
1	**2**	**3**
Rice and its products	Kg.	3400
Wheat and its products	Kg.	3460
Jowar and its products	Kg.	3490
Bajra and its products	Kg.	3032
Maize and its products	Kg.	3420
Ragi and its products	Kg.	3280
Parley and its products	Kg.	
Small rnillets and its products	Kg.	261
Gram and its products	Kg.	3600
Cereal substitutes	Kg.	1100

Food item	Unit	No. of calories per unit
1	**2**	**3**
Pulses		
Arhar	Kg.	3350
Gram. (spilt grain)	Kg.	3720
Moong	Kg.	3480
Masur	Kg.	3430
Urd	Kg.	3470
Khesari	Kg.	3450
Pea	Kg.	3200
Soyabean	Kg.	4320
Other pulses	Kg.	3400
Pulse products	Kg.	3400

APPENDIX 14 *contd.*

1	2	3
Milk and Products		
Milk (liquid)	Kg.	1000
Baby food	Kg.	3570
Milk (condensed, powdered)	Kg.	4960
Ghee	Kg.	8750
Butter	Kg.	7290
Curd	Kg.	600
Other milk products	Re.	607
Edible Oils		
Vanaspati	Kg.	9000
Mustard oil	Kg.	9000
Coconut oil	Kg.	9000
Ginegelly oil	Kg.	9000
Groundnut oil	Kg.	9000
Linseed oil	Kg.	9000
Refined oil	Kg.	9000
Edible oil (others)	Kg.	9000
Oil seed	Kg.	5410
Meat, Egg & Fish		
Goat meat	Kg.	1180
Mutton	Kg.	1940
Beef	Kg.	1140
Pork	Kg.	1140
Buffalo meat	Kg.	860
Other meat	Kg.	900
Poultry	No.	709
Other birds	No.	709
Egg	No.	100
Fish (fresh)	Kg.	1050
Fish (dry)	Kg.	3000
Vegetables		
Potato	Kg.	970
Onion	Kg.	540
Tomato	Kg.	200
Brinjal	Kg.	218
Cabage	Kg.	238
Cauliflower	Kg.	310
Root vegetables	Kg.	600
Leafy vegetables	Kg.	550
Other vegetables	Re.	469

1	2	3
Fresh Fruits		
Banana	No.	84
Orange, Lemon	No.	50
Mango	No.	135
Coconut	No.	888
Guava	No.	53
Pineapple	No.	460
Grapes	Kg.	600
Other fresh fruits	Re.	1000
Dry Fruits and Nuts		
Coconut Copra	Kg.	6620
Ground nut	Kg.	5490
Cashew nut	Kg.	5960
Dates	Kg.	1440
Raisin (kismis manaka)	Kg.	3050
Other dry fruits a.n.4 nuts	Kg.	2500
Sugar		
Sugar	Kg.	3980
Gur (cane)	Kg.	3830
Khandsari	Kg.	3980
Sugar candy	Kg.	3980
Sugar (others)	Kg.	3500
Spices		
Turmeric	Gm.	3.49
Black pepper	Gm.	3.04
Pepper, dry chillies	Gm.	2.46
Green chillies	Gm.	0.29
Garlic	Gm.	1.23
Tamarind	Gm.	1.98
Ginger	Gm.	0.54
Curry powder	Gm.	0.80
Other spices	Gm.	0.60
Beverages, Refreshments		
Tea	Cups	27
Coffee	Cups	40
Biscuits, confectionaries	Kg.	2450
Bread	Kg.	2450
Salted refreshments	Re,	382
Prepared sweets	Re.	315
Cooked meals	No.	1200
Pickles	Gm.	4.00
Sauce	Gm.	0.60
Jam, jelly	Gm.	2.50
Processed food (others)	Re.	382

Extracts from NSS 26th Round (July 1971-June 1972) Report No.258-A.

APPENDIX 15.1

Norms Under The Minimum Needs Programmes As Adopted Earlier And In The Current Exercise

Programme/Project	Earlier norms (by end of Fifth Plan)	Current norms (by end of the coming decade of Planning)
1	2	3
Elementary Education	To cover 97% of children in age group 6-11 and 47% in the age group 11-14.	100% coverage for all children in the age group 6-14.
Adult Education	—	Coverage of all those in age group 15-35.
Health	Establishment of one PHC per each community development block. Establishment of one sub-centre for every 10,000 population. Provision of drugs @ Rs. 12000 per annum for each PHC and Rs. 2000 per annum for each sub-centre.	One PHC for every 35000 population. One sub-centre for every 5000 population. Drugs @ Rs. 50,000 per annum for each PHC, and Rs. 7000 per annum for each sub-centre.
Rural water supply	Coverage of all the problem villages.	Coverage of all left over problem villages within next five years,
Rural Roads	Linking up of villages with a population of 1 500 or more.	Linking up of villages with a population of 1000 or more.
Rural electrification	Assistance to only those States which have not reached a 40% coverage by the end of the Fourth Plan.	Coverage of at least 50% of villages in each State and Union territory.
Houses for landless rural labour households.	Provision of nearly 4 million house sites.	Provision of housing facilities to all rural landless labour households.

APPENDIX 15.2

Values of Coefficients Assumed to prepare Programme Project.

Programme/Project	Value of Coefficients Assumed	Remarks
1	2	3
1. Elementary Education	teacher pupil ratio 1:46 Unit cost of employing a teacher-Rs.5300p.a. teacher cost to be 40% of total cost. non-teacher cost to be 10% of total cost. cost of building to be 10% of total cost.	Personal discussion with Education Division.
2. Adult Education	unit cost of making a pupil literature-Rs. 70. addition of 20 % of cost for handling of programme by the central and State Administrations, another 20% is added to the total cost worked out for follow up actions.	Personal discussion with Education Division & Ministry of Education. *Documents used* (i) National Adult Education Programme an Outline. (ii) Interim Report of the Working Group on Adult Education.
3. Health Programmes	One PHC for 33000 population and one sub-centre for 5000 population, the unit cost assumed per PHC is : Rs.60,000 per year for staff and equipment. Rs.50,000 per year for drugs and Rs.2 lakh as non-recurring cost the unit cost assumed per sub-centre is : Rs.15000 per year and staff and equipment Rs.7000 per year for drugs, and Rs.15000 as non-recurring cost.	

APPENDIX *15.2—contd.*

1	2	3
3. Health Programmes — *contd.*	It is assumed that half of the patients would get free consultation only and they shall have to pay for the drugs and the other half is assumed target everything free. Currently drugs & consultation are given free to all the patients. Administrative difficulties have all the times been advanced for not. charging the patients for drugs. Incase administratively it is found that the programme cannot be put through then corresponding costs shall have to be raised.	
4. Rural Water Supply	Statewise per village cost of providing safe drinking water has been worked out by, the engineers of the Works and Housing Ministry. These unit costs have been worked out taking into account various factors effecting the supply such as the terrain, availability of canals, the depth of underground water etc. These statewise norms (in Rs. lakhs) have been made use of and are:	Personal discussions with officers of Housing, Urban Development and Water Supply Division and Ministry of Works and Housing-.
	Andhra Pradesh 0.162 — Rajasthan 0.792 Assam 0.276 — Sikkim N.A. Bihar 0.106 — Tamil Nadu 0.085 Gujarat 0.119 — Tripura 0.080 Haryana 1.700 — U.P. 0.620 Himachal Pradesh 0.481 — West Bengal 0.052 Jammu & Kashmir 1.975 — A & N islands 0.563 Karnataka 0.400 — Arunachal Pradesh 0.264 Kerala 1.777 — Chandigarh — Madbya Pradesh 0.193 — Dadra & Nagar Haveli 4.790 Manipur 2.125 — Delhi 0.805 Meghalaya 2.382 — Goa, Daman & Diu 0.672 Nagaland 2.308 — Lakshadweep — Orissa 0.079 — Mizoram 7.853 Punjab 1.430 Maharashtra 0.218 Pondicherry 1.740	
5. Rural Roads	Linking all the villages, with a population of 1000 or more, by rural roads is envisaged, a distance of 2.5 km; of road per village has been assumed as against the current average* of less than 2 km. The higher figure Has been assumed to be covered to account for the spares location of smaller villages envisaged to be covered. unit cost of constructing- a kilometer of road is Rs.1.37 lakh (Rs.1.63 lakh per km. for blacked top and Rs.1.11 lakh per km. for non blacked top), half of the distance of roads to: be constructed is assumed to be with blacked top and the other half without it.	Personal discussions with officers of Transport and Communication Division and Ministry of Transport and Communication,
6. Rural Electrification	Coverage of at least 50 per cent of villages, wherever it is not so, in each State and Union Territory. Unit cost of providing electricity is Rs. one lakh per village	Personal discussions with-officers of Power & Energy Division $ Rural Electrification Directorate.
7. Houses for Rural Landless Labour Households	Provision of housing facilities to all[1] rural landless labour households, house sites to be given free by the community an investment of Rs. 2000 for .construction of each dwelling unit.	*Document used* Progress of Rural Electrification as on 30th September, 1977. Personal discussion with officers of Housing, Urban Development and Water Supply Division and NSSO.

APPENDIX 16.1

Price deflators used in different rounds of NSS (base 11th Round) in estimating LES parametres—Rural India

	NSS Year & Rounds No.									
Commodity Sl. No.	61—62 17	63— 64 18	64-65 19	65—66 20	66-67 21	67—68 22	68—69 23	69—70 24	70—71 25	73—74 26
1	1.00	1.169284	1.40489	1.54986	1.85652	2.07237	1.94072	2.03079	1.95203	3.15540
2	1.00	1.498145	2.04092	1.92325	3.05682	3.13850	2.24202	2.31003	2.58436	3.01715
3	1.00	1.113057	1.30326	1.47207	1.64076	l.92132	2.01595	2.08296	2,21038	3.08458
4	1.00	1.040084	1.39103	1.66264	2.01641	1.75497	1.77848	2.13284	2.27724	3.83584
5	1.00	1.340990	1.63707	1.99133	2.20377	2.36737	2.26629	2.18471	2.41780	5.11809
6	1.00	1.065460	1.35503	1.19158	1.73621	1.43346	1.64649	1.68892	1.5745	9.39981
7	1.00	1.143661	1.35392	1.53690	1,80743	1.93380	1.98273	2.0645	2.18327	3.30406
8	1.00	1.594370	1.51252	1.37063	1.92837	3.22822	2.52851	1.69099	1.92195	3.04987
9	1.00	1.178150	1.13037	1.43491	2.09650	1.58649	1.89731	3.30482	2.88539	3.55229
10	1.00	1.057781	1.07063	1.11081	1.16054	1.21423	1.20765	1.16174	1.40040	1.57734
11	1.00	1.161642	1.22462	1.23550	1.26966	1.46421	1.73219	1.73533	1.73553	2.15526
12	1.00	1.173821	1.20745	1.28866	1.36074	1.46135	1.52651	1.57088	1.60570	1.99901
13	1.00	1.100489	1.12848	1.19017	1.25768	1.29265	1.31650	1.38696	1.55539	2.02445
14	1.00	1.093773	1.16535	1.62270	1.3928	1.47353	1.48579	1.55242	1.62897	2.27439
15	1.00	1.122700	1.24580	2.02570	1.55180	1.67010	1.66570	1.74330	1.82220	2.77930
16	1.00	1.052447	1.05697	1.09896	1.15775	1.17472	1.17506	1.19304	1.21993	1.48490

N.B.-—Price indices have bean assumed to be the same for both expenditure classes above and below poverty line.

APPENDIX 16.2

Price deflators used in different rounds of NSS (base 11th Round) in estimating LES parameters—Urban India

Commodity Sl. No.	61—62 17	63—64 18	64—65 19	65—66 20	66—67 21	67—68 22	68—69 23	69—70 24	70—71 25	73—74 26
1	1.00	1.167015	1.37932	1.50997	1.83224	2.05884	1.96729	2.05119	1.99620	3.04432
2	1.00	1.295402	2.03490	1.91965	2.30479	3.12874	2.23868	2.30748	2.58353	3.90817
3	1.00	1.117833	1.30861	1.47745	1.64349	1.93449	2.02784	2.09687	2.22690	3.09263
4	1.00	1.015076	1.31478	1.63111	1.99914	1.65341	1.73791	2.11025	2.20626	3.68946
5	1.00	1.302160	1.56616	1.88487	2.7925	2.22518	2.13809	2.08815	2.29659	4.67351
6	1.00	1.068630	1.33658	1.18907	1.75422	1.37844	1.72136	1.67531	1.56005	2.46808
7	1.00	1.147814	1.35.800	1.53262	1.79632	1.91508	1.96124	2,02201	2.11277	3.24885
8	1.00	1.308131	1.32538	1.28883	1.55697	2.16468	1.94129	1.61461	1.70828	2.52600
9	1.00	1.180754	1.16622	1.49514	2.13360	2.66273	1.99296	3.39702	2.95205	3.71381
10	1.00	1.059462	1.07604	1.11841	1.17151	1.22505	1.22370	1.18079	1.42069	1.59386
11	1.00	1.184229	1.22286	1.22486	1.26456	1.46329	1.63029	1.72423	1.79402	2.18160
12	1.00	1.173944	1.20506	1.28591	1.35108	1.44747	1.50912	1.55378	1.58646	1.98188
13	1.00	1.110584	1.13752	1.20436	1.27358	1.30390	1.32491	1.39602	1.65734	2.08329
14	1.00	1.090606	1.15060	1.53716	1.355047	1.42476	1.44391	1.50728	1.51624	2.17665
15	1.00	1.122700	1.24580	2.02570	1.55180	1.6701	1.66570	1.74330	1.82220	2.77930
16	1.00	1.045055	1.05412	1.11126	1.17679	1.20274	1.22223	1.24696	1.25797	1.58825

N.B.-Price indices have been assumed to be the same for both expenditure classes above and below poverty line.

TECHNICAL APPENDIX

Engel Curves I Demand functions

In the consumption model, the following five demand function forms have been used. Log Inverse and Log log Inverse forms could not be used as they were not integrable over the range of the log normal distribution for estimating the expected values

i) Double Log (DL) Log C_i=a+b log c_2 f(c)=ac^b
ii) Semi Log (SL) f(c)=c_i=a+b log c
iii) Linear (L) f(c)= c_i = a+b/c
iv) Hyperbola (HYP) f(c) = c_i =a+b/c
v) Propensity (Proportion) (P) f(c)=c_i=a.c

where

c = monthly per capita total consumption expenditure.

c_i = monthly per capita expenditure on commodity i.

a,b = parameters of the estimated demand functions.

Best fitting Engel Curves among these were chosen separately for each commodity on the basis of highest value of corrected R^{-2} obtained by applying the single equation weighted least square method, the freights being the percentages of population in different expenditure classes.

Another two functions viz., log inverse and log log inverse, though found to be best in case of some commodities could not be used as the mathematical expressions for their expected values could not be explicitly obtained under log normal distribution.

On the assumption that c is log normally distributed with parameters M&λ, the following formula for each demand function form has been used to estimate the expected value of monthly per capita expenditure on commodity i, corresponding to the above demand functions.

$$(I)\ E(c_i)=\int_n^m f(c)\,d\wedge(c/M,\lambda^2)/\int_n^m d\wedge(c/M,\lambda^2)$$

where

$\wedge$ (C/M, λ^2) is log normal distribution with parameters

M & λ where λ is same as that of 1973-74

and

$M=\log C-\lambda^2/2$

Using (I) the expression for the expected value of commodity consumption have been derived and given below for each of the above types of demand functions.

(i) Double log

$$E(c_i)=e^{a+bM+b^2\lambda^2/2}\left[(\phi(m'-b\lambda))-\phi(n'-b\lambda)\right]\Big/\left[\phi(m')-\phi(n')\right]$$

(ii) Semi log

$$E(c_i)=(a+bM)\left[(\phi(m')-\phi(n')\right]-b\lambda\left[\phi(m')-\phi(n')\right]\Big/\left[\phi(m')-\phi(n')\right]$$

(iii) Linear

$$E(c_i)=\left[a(\phi(m')-\phi(n')\right)+be^{M+\lambda^2/2}(\phi(m'-\lambda)-\phi(n'-\lambda)\right]\Big/\left[\phi(m')-\phi(n')\right]$$

(iv) Hyperbola

$$E(c_i)=\left[a(\phi(m')-\phi(n')\right)+be^{-M+\lambda^2/2}(\phi(m'+\lambda)-\phi(n'+\lambda)\right]\Big/\left[\phi(m')-\phi(n')\right]$$

(v) Propensity

$$E(c_i)=ae^{M+\lambda^2/2}\left[\phi(m'-\lambda)-\phi(n'-\lambda)\right]\Big/\left[\phi(m')-\phi(n')\right]$$

where,

f = Ordinate of Standard normal curve

=area under the standard normal curve

m' = (log m-M)/ λ

n' = (log n-M)/ λ

Case (i) For Population below the poverty line

In the above generalised formulae, the range of integration is form r to c* (the poverty line). is the threshold value of monthly per capital consumption expenditure at which consumption of commodity i starts.

Substitute c*' for m' in the numerator,

r' for n' in the numerator.

c*' for m' in the denominator.

-oo for n' in the denominator,

where

c*' = (Log c*-M)/λ

r' = (Log r-M)/λ

The threshold values under the various functional forms are :

(a) DL r = o
(b) SL r = $e^{-a/b}$ (b>o)
(c) L r= - a/b (b>o, if a>o, take r=o)
(d) HYP r = -b/a (b<o)
(e) P r = o

if r > c* the E (c_i) = 0.0 for population below the poverty line.

Case (it) For population above the poverty line

If c* > r.

then,

substitute oo for m both in 'the numerator and denominator

c*' for n' both in the numerator and deno-m nator

If r > c*, then,

substitute

oo for m' both in the numerator and denominator

r' for n' in the numerator

and c*' for n' in the denominator .

2.0 Linear Expenditure System (LES)

Since the system of equations of the LES are linear in variables but-non-linear in, the, parameters, the following; non-linear estimation procedure based .on Newton-Raphson method, has been used for estimating the LES parameters:

Under the usual assumption of ordinary Least Squares Method, LES parameter estimates have been 'obtained by minimising the sum of squares:

$$(1)\quad SST=\sum_{t=1}^{T}\sum_{i=1}^{n}(c^t_i-p^t_ia_i-b_i(c^t-\sum_{j=1}^{n}\overset{t}{P}_j a_j))^2$$

where n is the number of commodities/commodity groups and T is the number of data points. To this end, let f(0) = SST, where is the vector of the parameters a and b. Making Taylor's series expansion for f (θ) around a particular value. θ_0 of θ, let

(2) $f(\theta) = f(\theta_o)+h(F')\theta_o-1/2\ h'\ (S)(\theta_o\ h+ ....$

where (F) θ_o and (S) θ_o are first and second derivative vector and matrix respectively of f(θ) at θ_o and h=θ—θ_o (F' and h' are the corresponding transpose vectors).

Minimisation of f(θ) and hence of SST with respect to *q* under the assumption that the higher order terms (>2) of S terms of order higher than (2) are negligible, leads to the following first iterative solution :

(3) $q_1 = q_o - (S^{-1})\ q_o\ (F)q_o$

Analogous to the above second iterative solution is

(4) $q_2 = q_1 - (S^{-1})\ q_1\ (F)q_1$

and in general, the solution is

(5) $q_n = q_{n-1} - (S^{-1})\ q_{n-1}\ (F)q_{n-1}$

The iterative procedure ends up as as the desired degree of convergence is attained.

For the purpose of estimating these parameters NSS data for the rounds Nos.17-25 and 28 have been utilised. The price indices required for the purpose are given in Appendices 16.1 and 16.2.

3.0 Estimation of inequality parameter (A) of Lognormal distribution Lorenz ratio of lognormal distribution is given by

L=2 f $(\lambda / \sqrt{2})$ -1, where

L is lorenz ratio,

λ is the inequality parameter.

and $f(x)$ is the normal distribution, function with zero mean and unit variance.

From given NSS data, lorenz ratio has first been estimated using usual procedure. Then consulting 'Normal Table' the value of A was obtained. Values of A were 0.49894 and 0.54730 in rural and urban areas respectively.

TECHNICAL APPENDIX 2

Price Adjustment of Demand Function Parameters From 1973-74 *prices to* 1976-77 *prices*

A. *Double Log*

a'=a— b (log PC) + log PCi

b'=b B.

B. *Semi Log*

a' = a; PCi— b.PCi (Log PC)

b'=-b. PCi

C. *Linear and Propertons*

a' -a. PCi

b'=b.PCi/PC

D. *Hyperbola*

a'=a. PCi

b'=b. PCi PC

a*, b' = Parameters at 1976-77 prices,

a, b = Parameters at 1973-74 prices

PCi = Price Relative of Commodity i for 1976-77 vis-a-vis 1973-74.

PC = Overall Consumer Price Index in 1976-77 vis-awis 1973-74;

In case of LES parameters the price adjustment is not necessary if appropriate-price, indices are used in LES functions.

ANNEXURE I

I(a) **Comments** of Prof. N. S. **lyeugar**

Indian Statistical Institute

Bangalore Centre

Dr. K. C. Majumdar.
Chief (PP)
Planning Commission
Yojana Bhavan,
Parliament Street,
New Delhi-1 10001

31, Church Street,
Bangalore 560001.
19 April 1979

Dear Dr. Majumdar

Your letter 4/3/77-FP of March 13, 1979 has just arrived from Hyderabad, where it first want during my absence. Since I am attending your meeting on 23 April 1979, I shall make a few comments of a methodological nature at the meeting itself.

I am not too happy with the methodology of demand projections used in the report. I notice that individual commodities have been aggregated first into a smaller number of composite items, and a linear expenditure system is then hypothesised for the composite items ; this is a simple version of the more general model of Richard Stone, where time elements are also incorporated. The composite items are then split up into individual items by using one or more forms of Engel Curves. There is a real difficulty in appreciating the techniques followed here. For purposes of combining individual items into composite items, simple aggregation has been used to generate data, but the Engel curves actually used for individual items are not additive.

A more satisfactory formulation would be as follows. Let a constant level of living below which a certain proportion p of households are assumed to live ; this number is pre-determined by one or more considerations, involving value judgments and an accurate knowledge of prices and products. The proportion, p, can be estimated from the ogive of the distribution of x, income or its proxy, total outlay, given in NSS reports. The NSS also provides information for computing the specific concentration curves and the Lorenz curve, which in turn will enable one to compute the cumulative proportions, q_0 arid Q_{i0} (1=1,2....), corresponding to p_0 where q_c proportion of aggregate total outlay spent by the 'poor' and Q_{ic} = proportion of aggregate expenditure on an item 'i' incurred by the same 'poor', the poor being understood as the set of households having x< c.

Let g(x)— E(y/x) represent the conditional means of y for given x. This function represents the Engel. Curve of the given commodity in a strict sense. For items T let it be represented by gi (x). The following relationships hold :

$$E(x)/x \leq c) = q_c \quad E(_{X1})/P_c$$

$$E(Yi/x \leq c) = Q_{ic} \quad E(yi)/P_{ic}$$

P_c, q_c, and Q_{ic} are readily available in empirical specific concentration curves and the Lorenz curve. Parametric forms for $E(x/x \leq c)$ and $E(yi/x \leq c)$ can be found if suitable assumptions can be made about the distribution of x and g(x) for different items. Suitable policy instruments can be devised in terms of those parameters.

Another point that often bothers me is; when the joint distribution of (x, Y_1, Y_2.....) can be assumed (e.g. joint lognormality), the Engel Curves are all once for all assumed. It does not make sense to think of different forms and use R_2 to choose the best form.

I hope to learn from the discussions at the meeting. As on previous occasions, may I request you to arrange payment of TA (airfare) immediately after the meeting in Delhi itself?

Hoping to see you, and with regards,

Yours sincerely,
Sd/- NS lyengar

I(b) Comments on the Remarks of: Prof. lyengar by Dr. R. Radhakrishtia

I do not see much justification either on theoretical or on empirical considerations in the remarks made by lyengar on the methodology ' adopted for demand projections, and his remarks appear to be rather misplaced in emphasis. Surprisingly his "more satisfactory formulation" is nothing but a simple and restrictive version of the formulation adopted by the, Task Force. For a proper appraisal of his remarks, it would be helpful to recapitulate the methodology as it appears lyengar is not fully familiar with the Task Force's formulation.

In its initial meetings the Task Force decided to make the demand projections on the basis of a Complete Demand Model which satisfies the theoretical properties viz., adding-up homogeneity, Slutskly-symmetry and convexity and chose the most popular Linear Expenditure System (LES). There is considerable empirical support for this choice. The most recent is the research of Parks (1969), Pollack and Wales (1969), Yoshihara (1969), Coldberger and Gameletses (1970), Deaton (1974-1975), Lliich, Powell and Williams (1975) Radhakrishna and Murthy (1978), and Radhakrishna, Murthy and Shah (1979). Incidentally the last study has brought out the superiority of LES over Indirect Addilog and Quadratic Utility Functions in describing the consumption patterns of India. The. LES usually fulfils all the theoretical properties and gives a reasonably good fit. What is more, it aggregates perfectly over individuals in a group, given that each group member has the same utility functions — a property violated by most of the other demand models.

The simple version of LES has been selected because the extensive studies carried out at Sardar Patel Institute have shown that it gives reasonably good fit when the range of expenditure variation is not very large. One could have introduced little more flexibility by introducing time trends (linear or quadratic or cubic or nth degree polinominal !) but the number of parameters increases enormously. The studies at Sardar Patel Institute on mean level time series models with 4 to 9 commodity groups, where the time trend version of LES has an added advantage of handling the non-linearities, reveal no appreciable differences in the results given by the alternative versions of LES. Also, comparable NSS data with the required commodity grouping are available for a short period and some conceptional problems arise while estimating the alternative versions of LES as the data are time series of cross-section and the hypotheses are mostly developed for mean level models.

Keeping in view the requirements of the income redistribution policies, the Task Force decided to. stratify the NSS expenditure classes into two groups : one containing the classes below the poverty line and the other containing the rest, and lit LES separately for each group. This also overcomes the limitation of Linear Engel Curves implied by LES. Taking into consideration the availability of data and also the fact that the additive utility' specification implied by "LES is unrealistic at a disaggregated level of commodity grouping, the Task Force decided to estimate LES with 16 commodity groups. I emphasize here that the data consideration act as a constraint for enlarging the number of commodity groups. By integrating the LES with two parameter log-normal distribution, which has been hypothesized for the expenditure distribution, it will be possible to make demand projections under alternative assumptions about the expenditure distribution. This is exactly what the Task Force has done. In the above formulation ,if one considers Engel Curves in place of Complete Demand Models, the procedure will coincide with the one suggested by lyengar. It is obvious that the Task Force's formulation is more flexible and superior. I really fail to see violation of any theoretical property one should worry about.

Let me now turn to the prediction of individual items within a group. It is well known that one should estimate sub-group models and use them to allocate the group expenditure to their components. (See in this connection Deaton (1975)]. However, the available data do not permit, us to estimate the sub-group models. The only alternative we are left with is to use some budget proportions. The Task Force has not adopted the conventional procedure of using the same proportion across all expenditure groups as it involves the very unrealistic assumption of homothetic partial indifference surfaces for subgroups and instead it has allowed the budget proportions to vary across the expenditure groups. The proportions are based on Engle Curves. Since the group expenditures given by LES are taken as group controls and the group expenditures are then allocated to their specific components by means of proportion, the adding up property is automatically fulfilled.

The formulation based on Engel Curves suggested by lyengar is no doubt preferred in 1950s but it is not preferred any longer. The formulation ignores the variations in prices. Even in price-exogenous (fixed price) planning models, in order to make projections using Engel Curves, the price structure of the base period should be the same as that of the family budget survey. Incidentally, lyengar's procedure is no different from the one the Task Force has adopted while arriving at the budget proportions needed for splitting the group expenditures.

Coming to his last point, I may draw his attention to the fact that in the Task Force formulation, only the total expenditure is assumed to be distributed as log-normal.

ANNEXURE II

Expected Value of Demand by the other two forms

(A) Log-inverse: $\log C_1 = a+b/C$

$$E(c_i) = \left[\sum_{r=0}^{\infty} \frac{b^r}{r_!} e^{\,a-rM + r^2 \lambda^2/2} \left[\phi(m' + r\lambda) - \phi(n' + r\lambda) \right] \right] \Big/ D$$

(B) Log—Log—inverse : $\log G_i = a+b \log C+d/c$

$$E(C_i) = \left[\sum_{r=0}^{\infty} \frac{d^r}{r} e^{\,a + (b-r)M + (b-r)^2\lambda^2/2} \left[\phi\left(m'-\lambda(b-r)\right) - \left(\phi(n'-\lambda(b-r)) \right) \right] \right] \Big/ D,$$

where

$D = f(m') - (n')$

$m' = (\log m - M) / \lambda$

$n' = (\log n - M)/A$

$E(C_i)$ = expected value of the monthly per capita demand of commodity C_i.

C = monthly per capita total consumption.

M and λ^2 are mean and variance of the log normal distribution function.