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2

**Agricultural Demand and
Food Security in India**

Yoginder K. Alagh

August 2010

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Foreword

I am indeed glad that the Institute has initiated the publication of Working Paper Series from this year reflecting the on-going research work of its faculty for wider circulation to the research community and feedback. This paper is second in the series on the coveted subject of *Agriculture Demand and Food Security in India* by the Eminent Professor Y.K. Alagh, the first being by Prof. Madhusudan Datta on *Service Sector Boom in India*. The present paper scholarly brings together and elaborates on the issues of food security in the context of Indian poor, based on current and projected demand and supply of food. It also discusses the problems and prospects of Indian Agriculture in an articulated manner.

N. C. Shah
Director

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Agricultural Demand and Food Security in India

Yoginder K. Alagh*

Introduction

Indian agriculture is already increasingly demand driven. This will accelerate in the future. Demand will depend largely on income growth and taste patterns, since population growth will play a moderate role as compared to earlier periods. It has been argued by the present author and others that agricultural diversification in India is basically driven by domestic demand, (Y.K. Alagh, Shastri Memorial Lecture, reprinted in ICAR, Agricultural Transformation in India, 1989/1995). The major impact of faster income growth was on domestic demand leading a process of demand diversification in a big way (Table 1). For example, the 1980s and 1990s record a much faster growth of agro-based consumption in the Indian demand basket. Per capita consumption of sugar went up from 6.2 in 1975-76 to 14.9 kgs./year and that level was not only much higher than in comparable countries, but also than in countries which have much higher levels of per capita income. Also, there was a very rapid increase in consumption of non-crop based commodities like eggs and milk. Egg consumption per capita went up from 15 to 30 per year in the period of 1975-98. India became the largest producer of milk in the World.

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Table 1 : Per Capita Consumption of Principal Agro Based Commodities

No.	Commodity	1955/56	1975/76	1990/91	1998-99
1	Foodgrains (per capita net (production: two year average of kgs ending with year)	155.6	158.0	180.6	176.7
2	Edible oil and vanaspati, kgs/yr	3.2	4.2	6.5	11.7
3	Sugar (kgs/yr)	5.0	6.2	12.5	14.9
4	Textiles (cotton equivalents) (metres/yr)	14.4	17.6	24.8	28.2
5	Tea (kgs/yr)	0.36	0.4	0.61	0.68
6	Milk (ltrs/mo)	4.7	4.6	6.3	7.5
7	Eggs (nos/yr)	5.3	15.5	26.0	30.4

Sources : 1. Y.K.Alagh, ICAR, 1995, for period 1955-1991

2. For 1998/99, *Economic Survey*, 2000-01, Vol.2, pages S-24, S-26

Expansion and diversification of the consumption basket was basically driven by a higher growth performance since the 1980s. The agro-based items of consumption are important in the demand baskets of different income groups. These consumer items are not for elite consumption alone. As people are better off, they eat more eggs, drink more milk and eat vegetable, fruit and cheese. This has happened in the Nineties and by now this diversification of the food basket is well known. The process is not smooth and the period of the East Asian meltdown for example saw a slow down (Table 2).

Table 2 : Production of Agro Goods in Ninth Plan

(mn. Tonnes/bales for cotton)

S. No.	Crop/Sector	1996/97	Highest 1997/99	Target Ninth Plan
1.	Food grains	199.44	205.91	234.00
2.	Oilseeds	24.38	25.21	30.00
3.	Sugarcane	277.56	309.31	338.0
4.	Cotton	14.23	12.18	15.70
5.	Fruits and Vegetables	141.00	122.00	179.00
6.	Milk	69.00	78.10	96.50
7.	Eggs (bn Nos.)	27.50	30.32	35.00
8.	Fish	5.35	5.80	7.00
9.	Tea	0.78	0.85	1.00

Source : Planning Commission, *Annual Plan, 2000/01*, p. 301

Production of cotton and fruits and vegetables went down and growth of eggs and fish decelerated. The East Asian slowdown seems to have led to a slowdown in the diversification of the agrarian economies of the NIE's. We developed a simple indicator of diversification' namely the change in the index of livestock production in a country divided by the index of agricultural production. According to the World Development Indicators, the long term annual GDP growth rate through 1997 was 7 to 8 % for Indonesia, Malaysia, Thailand and the Republic of Korea, respectively. In the period, 1984 to 1994, the incremental livestock to agricultural production ratio was 2.12, 2.18, 2.59 and 2.56 respectively for these countries. The GDP growth of these countries went down to 4.7%, 2.9%, 0.3% and 4.4% and the incremental livestock to agricultural production ratio went down to minus 1.79, 1.01, minus 1.61 and minus 0.72 in these countries, from

1994 to 1999. On the other hand countries like China which grew at around 8% since 1980 and where the growth did not decelerate, had the incremental livestock to agricultural production ratio of 1.82 in the earlier period and 1.59 in the later period suggesting that the momentum of diversification and widespread agricultural growth was kept up. Data on vegetable and fruit production is available only for the Nineties (FAOSTAT), and the incremental vegetable to cereal production ratio is minus 1.14 in Indonesia, minus 2.58 in Malaysia, minus 0.3 in Thailand and 1.43 in South Korea from 1994 to 1999 (M.Alagh and Y.K.Alagh, 2003; also Y.K.Alagh, 2005, in FAO, 2005).

The underlying long term trends, however are in terms of growth of agricultural demand and diversification of the demand basket with non foodgrains growing faster than grains and non crop based agriculture like animal husbandry growing even faster. Within crops demand of tree crops grows faster. These trends have exhibited themselves again in the recovery of the agricultural economy in the period 04/05 to 07/08, although numerical precision in short period growth rates is not advisable. The underlying trends are driven by the growth of the economy, urbanization since demand patterns differ between rural and urban areas, income distribution since the rich consume differently than the poor and of course population growth. It is to these factors that we now turn.

The major factors influencing the level of demand of a good are.

- (1) population: its size, distribution by age, rural/urban mix, etc.
- (2) income and its distribution,
- (3) prices and availability of other commodities and services
- (4) tastes and preferences.

These factors are sometimes called determinants of demand (See Tomek and Robinson, 1972, p.14).

Population

For the purpose of this study UN projections given by the UNU/IAS have been used. (Table 3). These have also been used by the FAO in their latest food demand projections for India in 2008, which estimate that a population of 1.0 billion in 2000 will go up to 1.2 billion in 2015 (FAO, 2003,2008;also see N.Alexandratos, 1995).

Table 3 : UN Population Projections

Year (1)	Population (million) (2)
2000	1012.66
2005	1087.46
2010	1152.16
2015	1211.67
2020	1271.17

Source: Mukherji, et.al, 2001;also see (FAO, 2003,2008 and N.Alexandratos, 1995)

As compared to these figures, recently some FAO publications have used slightly higher projections as the following estimates show:

Population (billions)	1.0 (2000)	1.2 (2015)	1.4 (2030)
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Source: F.A.O., 2006 as quoted in F.A.O., 2008, p.24.

The Eleventh Plan's population numbers are close to these trends. The Plan does not have a separate population projection exercise but in one of its sections the numbers given are the following:

2011/12	1208 million
2016/17	1283 million

Source: GOI, 2008, Eleventh Plan, Vol.1, p.75

The details of recent population projections and changes in them need discussion to show that there is a level of tentativeness about population

projections. This is particularly so since unfortunately this is an area of little interest in the recent planning literature. In a book on 'Futures' it is important to understand this at the outset. There is no one predetermined 'future'. We can only try to narrow down differences and explain what we use. For large countries, attention to detail is necessary, since differences can have substantial impact and this in turn can influence substantive issues and judgements. In earlier work according to Planning Commission estimates population figures were expected to go up from 856 million in 1991/92 to 938 million in 1996/97, showing an annual average growth rate of 1.8%. If the growth rate remained around 2%, this figure would go up to 955 million. (See Alagh, 1995 and Kumar, Saxena, Alagh and Mitra, 2000) According to indications then it had been argued that the actual figure would be in between these two figures since the death rate had fallen below even the 2000 target, but the birth rate was below target, hence population growth would be around 1.9%. If the population growth rate further declined, as postulated by the Planning Commission in the second half of the last decade of the last century, the estimated population would be around 1016 million in 2000/01 and in any case will be below the rate of around 2% as estimated by the earlier UN projections, of around 1042 million in that year. These developments were taken into account by the UN and the 1998 revised population projections of the UN estimated India's population in 2000/01 at 101.37 million. As of March 2001, the Census estimate of the population was 102.7 million persons. If India was able to achieve a population growth rate of around 1.6% in the decade 2000/01 to 2010/2011, its population would reach 1171 million, if the Planning Commission projections then were used as a base. Even if this target was exceeded the figure would be less than 1224 million as estimated by the UN earlier. The revised UN projections are now 115.22 million. For the year 2020/21, the UN projections are now 127.22 million. Many projection exercises use these different numbers and come out with alternative views.

The Report of the Technical Group on Population Projections, of the National Commission on Population Projection, (Government of India, Census of India, 2006) gives the following lower order numbers:

Year	Population (in million)
2010	117.67
2015	125.40
2020	132.62
2025	138.90

Source : GOI, Census of India, 2006, p.68

As compared to these estimates India's most experienced demographer, Marie Bhat estimated that the growth rate of population would go down to 1.52% annual in the decade 2001-11 to 1.25% annual in the decade 2011-21. (Table 4). This would imply a population level of 1202.98 million by 2010 and 1.345.38 million by 2020, which is higher than the UN and National Commission on Population/Census of India projections. The demographer Tim Dyson who has been working on India's demography in his Standard projection estimates India's population at 1271 million in 2020 and his High projection is close to Marie Bhat's figures (T. Dyson, 2003a, 2003b).

**Table 4 : Estimates and Projected Total Fertility Rate,
Expectation of Life at Birth, Growth Rate of Total Population
India 1941 to 2021**

Decade	TFR	e_0	Pop.Gr.
1941-51	6.0	32	1.27
1951-61	6.5	37	1.96
1961-71	6.5	43	2.20
1971-81	5.1	49	2.20
1981-91	4.3	54	2.14
1991-01	3.6	60	1.93
2001-11	3.1	62	1.52
2011-21	2.5	65	1.25

Source : Bhat (1998, 2000).

While the present book uses UN projections, these alternate estimates suggest that population and therefore future demand projections have a degree of uncertainty to them. However, it has to be noted that India's population is now seen as an asset for its growth process discussed later (Y.K. Alagh, 2006b)

Behavioural Factors

Given the level and growth of population, tastes and preferences will be a major determinant of demand. Also per capita income will be determined by income growth. Given the taste patterns, relative prices will determine demand. These factors will vary by the distribution of income since they will be different for the rich and the poor and in rural and urban areas (This section relies heavily on Munish Alagh, 2006).

Increases in demand both for food in the aggregate and for individual products are closely linked to the rate of population growth. The age distribution of the population also influences total demand as well as the demand for different commodities. A teenage population obviously consumes more calories than one made up of a high proportion of persons over sixty-five. Milk producers would gain relative to those selling soft drinks during the early stages of a population boom, but as the population grows older, suppliers of the latter gain relative to the former. Changes in the regional distribution of the population or the proportion living in urban areas likewise may influence the demand for certain types of food. For instance, rural families tend to consume more milk and grain than those living in urban areas. A shift in the demand for commodities such as meat and vegetables also may occur as a result of changes in the caste composition of the population. Inferior cereals and gur are among the commodities for which demand is likely to decline as incomes rise.

It is possible to increase the demand for grains, sugar and edible oil by transferring income to families near or below the poverty line without changing the total or average level of income. The Indian tradition of scholarship on food demand is strongly determined by income distribution, poverty and food security considerations. (For recent examples see S.

Mahendra Dev, K.P.Kannan and N. Ramachandran, 2004). While the proportion of the population below the poverty line has gone down, income distribution has remained largely constant in India.

Income elasticity of demand is a measure of the responsiveness of quantity to changes in income, other factors held constant. In general, the quantity of a commodity (other than an inferior product) purchased rises with increases in income, but at a decreasing rate. The relationship between total income and the quantity purchased or the amount spent on a particular food or commodity group is sometimes referred to as an Engel curve. It is sometimes called a Consumption, or Engel function. The income elasticity for food in the aggregate, as well as for many individual food products, is thought to decrease as incomes increase. It may be interpreted as the percentage change in quantity corresponding to a one per cent change in income, other factors held constant. This is consistent with the idea that as income increases a consumer buys more of most products and when income decreases the opposite occurs.

For the mathematically inclined reader, the best fitting Engel Curves are estimated from the following kind of alternative specifications:

Double Log: $\log D_i = a + b \log Y$

Semi Log: $D_i = a + b \log Y$

Linear $D_i = a + bY$

where D_i = monthly household per capita expenditure on the i^{th} commodity and Y = total monthly household per capita expenditure for all commodities.

Table 5 gives estimates for the urban rich and rural poor in the Seventies in India and some estimates of income (expenditure) elasticities from Complete Demand Systems for the Nineties.

**Table 5 : Income Elasticities in India for Agro Products
Structure and Changes**

S. No.	Commodity 1	Engel Curve Specification ¹ 2	Estimate for Seventies 3		Estimate for Nineties ² 4	
			a.Urban Non-Poor	b. Rural Poor	a.Urban Non-poor	b.Rural Poor
1.	Paddy		0.18	0.88		
2.	Wheat	3b.Semi Log	0.15	1.82		
3.	Jowar		0.97	0.51		
4.	Bajra	3b. Semi Log	1.26	0.92		
5.	Other cereals		0.14	0.01	0.14	0.46 ³
6.	Pulses	3a. Semi Log				
		3b.Linear	1.48	0.06	0.33	1.40
7.	Vegetables	3b. Linear	0.79	0.05		
8.	Fruits		1.62	1.21	0.88	1.04 ⁴
9.	Spices		0.40	0.79		
10.	Milk and Products	3a. Linear	0.10	3.06	0.97	2.36
11.	Meat and eggs	3a. Linear	0.02	1.55	0.69	1.39
12.	Sugar		0.79	2.07	0.73	1.47
13.	Gur	3a. Semi Log	0.17	1.80		
14.	Vanaspati				1.03	neg
15.	Edible oil		0.70	1.33	0.64	1.13
16.	Tea	3a. Linear	0.03	1.37		
17.	Coffee		1.55	1.74		

- Note:** 1. Unless otherwise specified the estimates are elasticities from double-log functions. In other cases the estimates are slope coefficients of the specified functions.
 2. The estimates are from Complete Demand Systems. The Rural Poor are the category "moderately poor" and the Urban Non-Poor, similarly so in the non-poor.
 3. refers to all cereals
 4. refers to fruits and vegetables

Source: Munish Alagh, 2006, p.59 (For the Seventies the estimates are derived from NSS monthly household consumption data from the 28th round 1973/74. See Government of India, PPD, Planning Commission, 1979. For the Nineties, the estimates are from C.Ravi 2001)

Table 5 gives well behaved estimates. Estimates of elasticities can be directly read only for the double log function. The income elasticities are high for cereals for the poor and low for the non-poor. They are negative for inferior cereals for the non poor. Other cereals were an inferior product for the non-poor in the Seventies and have a low expenditure elasticity in the Nineties for the same group. The elasticity was low for the poor in the Seventies and is less than 0.5 for the same group in the Nineties. For paddy and so on we do not have comparable estimates for the two decades, but the estimates are plausible.

Table 5 gives another feature. For commodities like milk and milk products, eggs and meat, edible oil and sugar, the estimates of expenditure elasticities were high for poor households, in some cases above 2, but were below 1 although not very low for the non- poor. There is a large literature on the declining consumption share of grains by poor households in India and its impact on poverty estimates.

Income Growth and Distribution of Income

There has been by now global acceptance that India has been growing fast in the last two and a half decades and that in fact the Eighties were a period of equally good if not better performance. This change in mind set of economists working outside India is good, even though belated, for some Indian economists have been writing for over a decade and a half that India is growing fast and that its reform started in the Eighties (Y.K.Alagh, 1991, WIDER Studies in Development Economics). We said "There are therefore two characteristics of growth in recent years. It is higher. It is more stable. The characterization of the economy as a gamble in the monsoons needs change." (Y.K.Alagh, IJLE,1996) But now the World accepts it. (Rodericks and Subrahmanian.2004)

According to the ISI Calcutta, in the UN project sponsored by the present author (Y.K.Alagh, UNU 2000, 2001, 2006a) a one percent increase in real inputs led to a 3.8% increase in output in the eighties and a slightly lower increase in the nineties. This has now to go up to five percent so

that the dream of a 8% growth is achieved. As the projections contained below show, factor productivity has to go up to around 5.1 if growth rates of around 8.4% annual are to be achieved. We must save more, work harder and reform more to take on the World. Our trade in two decades must double as share of World Trade. This will take India to be the third largest economy of the World by 2020, rather than trudge along at the present pace, which will mean the fifth place and a have been of History. The Economic Survey, 2003 says that growth became a habit from 1979, but this implies that raising it is difficult, since habits don't easily change.

To put it in a somewhat stylized manner :

India will grow between 6 to 8% annual and will become the third or fifth largest economy of the World in this period. (For a model based on which these projections are derived after some modifications taking into account recent experience see V.Pandit, 2004 and Y.K.Alagh, 2000) The investment rate and productivity growth will be the drivers. For example around a third of India's GDP growth in 97/03 is technology driven. Trade will also matter-will become around 4% of World Trade.

Table 6 : Growth of Output, Factors of Production and TFP in India: 1970-2000

(Percentage)

Period	GDP	Capital	Labour	TFP
1970-80	2.60	3.59	1.98	0.49
1980-90	5.67	4.41	1.13	4.21
1990-00	5.73	5.97	1.82	3.68
2000-10	7.54	4.97	2.69	4.62
2010-20	9.24	4.04	3.49	5.69

Source: Y.K.Alagh, UNU, 2000 and Y.K.Alagh, 2006a.

The Drivers will be:

Investment

Technology and Productivity: Knowledge

Trade and Competition

Productivity growth analysis Scenarios indicate that in order to sustain a high growth of the economy of the order of 8 to 9 per cent as given in the so called Scenario C the TFP has to grow by 5 per cent or more. Trade and Competition will give the edge. Some estimates suggest that trade shares of around 4% of World Trade will be needed. Frugality needs investment rates going up. These economic preconditions will have to be fulfilled if the positive projections are to be achieved. (See D. Nachane, 2006).

We now examine demand projections for agricultural commodities, beginning with the critical sector of foodgrains. A simple, but robust projection of food demand was included in a study sponsored by the United Nations for the Johannesburg Conference on RIO After 10 (UNU, 2001/02). The UN University released this report on a strategic framework for sustainable development for large developing countries, namely China, India, and Indonesia to environment ministers attending the fourth Global Preparatory Meeting for the World Summit on Sustainable Development. PrepCom IV, held in Bali in June 01, was the last stop on the road to the Johannesburg Summit on RIO Plus 10. The aim of the UNU report, published in 2002, was to provide an overview of trends, established policies and new policy directions related to critical socio-economic and environmental issues identified in Agenda 21, focusing on three large developing countries – China, India and Indonesia. The summary of the Indian study contained projections for basic needs beginning with food (Yoginder.K.Alagh, 2001). The food projections were done by the ISI Kolkota (See Robin Mukherjee, Manabendhu Chattopadhyay and Chiranjib Neogi, 2001).

This study assumed that foodgrain requirement norm was 2250 calories

daily per capita, a norm recommended by FAO as well as by the National Commission on Agriculture. This implied a per capita requirement of 186 Kg. per year. This would give a monthly consumption of 16.5 kgs per capita. As against this Mukherjee, et.al. estimated that per capita consumption of foodgrains fell from 14.4 kgs/per capita in 1987/88 to 12.5 kgs/per capita in rural areas in 1998/99 and 11.2 kgs to 10.4 kgs in urban areas respectively (Mukherjee, et.al., 2001, Table 21).

Projected foodgrain production figures were obtained by extrapolating linear trend growth from 1971 to 1999. The projected figures of net foodgrain production were obtained by excluding the amount used for cattle feed, seeds and waste from gross foodgrain production. Comparisons of projected net foodgrain production figures with those of foodgrain requirement calculated, for the projected population (Table 3) showed that there would be an additional requirement of foodgrain production of the order of 8 to 9 million tones, falling to around 6 million tones by 2020 (Table 7).

Table 7 : Projected Foodgrain Requirements and Production during 2000 to 2020

Year	Population	Foodgrain	(mn.tonnes) Net foodgrain
	(million)	requirement	Production
(1)	(2)	(3)	(4)
2000	1012.66	188.5	179.7
2005	1087.46	202.3	192.5
2010	1152.16	214.3	205.1
2015	1211.67	225.7	217.9
2020	1271.17	236.6	230.6

Source: Robin Mukherjee, Manabendhu Chattopadhyay and Chiranjib Neogi, 2001.

These estimates are based on 'need' calculations; in this case meeting a predetermined per capita consumption requirement in physical terms like kgs/per person. There is an established tradition in Indian agricultural policy making to follow such methods and it has its origin in the food deficiency ship to mouth period with a major focus on self reliant policy making for grains. (See Y.K.Alagh, 2004, Ch 2 for description of policy making in that period). An updated version of a 'foodgrain first' projection by two distinguished agricultural scientists is as follows;

Crop	Demand in 2020 (mn. Tonnes)	
	Low Income Growth	High Income Growth
Foodgrains	256	253

Source : R.S.Paroda and Praduman Kumar, 2000 & F.A.O., 2008

Note: Low Income Growth is per capita income growth of 3.5% and High Income growth is 5.5%.

An alternative estimate is prepared using the best fitting Engel curves given in Table 5 above. This is done separately for rural and urban areas. Given the population projections and these behavioural estimates the requirements for human consumption is worked out. To that seed, feed and wastage figures are added and total demand is worked out. The Projections are as presented in Table 7.

The foodgrain requirement figures given in Table 5 are much higher than in Table 7. These differences arise because in the figures in Table 5 per capita consumption of grains is taken from absolute standards and population growth multiplied by the difference between existing and normative consumption gives high demand figures. The figures in Table 7 are based on behavioural propensities to consume. Table 5 shows that as per capita income grows by one percent foodgrain consumption grows by around a fifth of one percent and not proportionately and that leads to the much lower figures in Table 7. Growth of cereal demand between 2020 and 2030 is 13% over the decade. On the other hand growth of demand of fruits and vegetables, eggs, chicken and milk is much higher. The decadal growth figures for potatoes is twenty four percent, thirty percent for vegetables, forty percent for milk, two hundred percent for

eggs and two hundred and fifty percent for chicken. Demand for beef, mutton and pork also goes up but given religious reasons the absolute figures are low. The low growth of cereal demand is compensated by very high demand growth of non cereal based and non crop based agricultural goods. There are these two perspectives on the relative importance of grains in India's agricultural demand projections.

These perspectives also determine the projections made by different scholars. One set of scholars follow a tradition of econometric modeling which became known after it was adopted in the modeling work done when India's poverty line was defined in a Task Force of the Indian Planning Commission (Government of India, Planning Commission, PPD, 1979). This Task Force was chaired by the present author and this work was done under the supervision of R. Radhakrishna. It was based on the behavioral assumptions of demand theory in economics. The following quote illustrates the approach:

"Effective demand has been considered in two stages. In the first stage all commodities and services have been grouped into 13 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 and Engel curve/ Demand functions have been separately developed for people below poverty line and above poverty line, also in rural and urban area separately." (*ibid.*, p.11).

A set of scholars has recently argued that India's Poverty Line is not based on Demand and Welfare theory and is therefore analytically deficient. The argument goes back to scholars like C.H. Shah who argued that poverty line baskets were ignoring the 'taste' patterns of poor people and if this was taken into account the cut off points would be higher. This kind of argument has been used many times, including in World Bank

studies (For an authoritative review see K.L. Datta's recent ICRIER paper, K.L. Datta, 2006). S. Subramanian (2005), in one of the better laid out arguments of this genre, has computed some interesting numbers, assuming that the underlying consumer behaviour pattern is a Utility function of a Cobb Douglas type and there are two goods, Food and Non-Food and a budget line. With the usual elementary text book manipulations, he shows that a calorifically fixed basket of goods would not be consistent with consumer optimization as prices and income change. Alternately the income required to meet the consumption of the fixed calorie norm 'optimally' would be higher than the Poverty Line. Leaving aside trivial objections like Cobb Douglas type of demand functions are over some ranges inconsistent with well behaved demand surfaces (H.Wold, 1953, pp.105-108) or the oxymoronic nature of statements like the *optimality of fixed norms*, (emphasis added), some of the critics, World Bank studies and others miss out the essential point that the original Poverty Line in India was identified (in a strict econometric sense) in well behaved demand and welfare theory terms. Actually instead of ignoring demand studies, the 1979 Task Force was based on one of the more detailed demand and income distribution studies and developed the income and price response of both poor and rich households separately in rural and urban areas. This work started a tradition of econometric investigation of some policy significance which has continued. C. Ravi (1998) whose work gives recent lower order grain demand estimates follows this tradition since he is a student of R. Radhakrishna (See R. Radhakrishna and C.Ravi,1990).

The other perspective is in the work of agencies like IFFPRI by experts like G.S.Bhalla, and P.Hazell and J.Kerr (1997, 1999). They estimate grain demand from the Engel Curve elasticities described above. But the other assumption that distinguishes their work is to assume that the demand for feed would be as in China since this demand is low in India.

The estimates derived by the work of scholars like C.Ravi (2001) is given in the projections of The National Commission on Integrated Water Resources Development (NCIWRDP, 1998), which used his elasticities

and assumed alternative growth paths of income and population. The Foodgrain Projections for 2025 (Table 8) are as follows:

Table 8 : NCIWRDP Foodgrain Projections

Population (in millions)	Per Capita Income Growth (annual rate of growth)	Foodgrain Demand	Feed Demand (million tones)	Total (million tones)
1370	4.0	277	11	288
1370	4.5	287	12	299
1370	5.0	298	14	312
1313	4.0	269	11	280

G.S.Bhalla and Peter Hazell (IFFPRI, 1997) find that feed demand is 'low' in India as compared to other countries like China. In fact this is a feature of India's taste patterns. The argument that India will consume a lot of meat when it grows richer is false since rich households in India consume much less meat as compared to their counterparts in other countries. In fact in 1975 the US Think Tank, The Hudson Institute had argued that India will not be able to feed itself since it will not have the land and water to meet meat demand. It was shown that if Indians as they grow rich consume as rich Indians did then this outcome did not follow even with the available technologies then. However undeterred by these taste pattern arguments Bhalla and Hazell project huge demands of grains. Their projections of foodgrain demand in 2020 are as follows:

Indian Feed Coefficients 278 to 370 million tones

Chinese Feed Coefficients 375 to 616 million tones

In a later projection they have moderated these numbers to 325 million tones (Bhalla, Hazell and Kerr, 1999). P.C.Bansil (1998) and K.N.Murthy (1998) have convincingly argued that these projections are on the high

side since they do not capture the diversification of the food basket away from grains with rising incomes. Also the feed assumptions of the IFFPRI model are absurd since they do not capture inter country and inter cultural differences in food tastes and structure of animal husbandry industry. The IFFPRI Bhalla Hazell argument on Indian food demand particularly of meat determined by 'global (metropolitan) styles of living' or a kind of Macdonald Global Taste Standard is particularly weak.

P.C.Bansil points out that Bhalla and Hazel have erroneously rejected P.Kumar's work (*op.cit.*, Paroda and Kumar) because it is better founded in consumer behaviour derived from A Food Characteristic Demand System. In this system energy, variety and tastes of individual food are additive in the utility space and the utility of one food depends the level of consumption of every other food. Once the consumption of cereals is stabilized, the income calorie elasticity is zero. Bansil notes that poverty rates were going down, the percentage of households reporting eating two square meals a day was going up and the average consumption of cereals had exceeded the ICMR norm of 165 kgs of cereals a day. He also systematically demolishes the Bhalla Hazel feed projections. K.N.Murthy a student of R. Radhakrishna shows that since the Bhalla Hazel projections are based on a log inverse Engel curve, the elasticity of demand varies with the level of income, which is a reasonable specification for food demand, But Bhalla and Hazel only use the mean level constant elasticity for projections over a very long period which leads to very significant upwards biases. Murthy shows that 'BPH have overpredicted the aggregate cereal demand by 20 million tonnes (14 percent) by 1993-94 itself." (K.N.Murthy, 1998, p.2944) and "BPH have overpredicted the aggregate demand for cereals in India by 80 million tonnes, a staggering 42 percent error in the year 2020." (*Ibid.*, p.2944)

The different studies assume that the trend of poverty removal will continue and with fast growth in per capita income of around 5% annual in per capita income, poverty proportions fall in a significant manner and are less than 10% by 2025. However the important point to note which is underlined in the behavioral studies of demand is that a reduction of the

Table 9 : Asia 2020
Poverty Removal and Malnutrition Amelioration

S. No	Region	Per Capita Food Availability (per capita K.Cal/day)					Eliminating Malnutrition (0-5yrs) Mn. Nos				
		1970	1993	2010	2020		A	B	C	D	E
	0	1	2	3	4	5	6	7	8	9	10
1	India	2083	2397	2559	2764	3201	213	250	59	31	neg ¹
2	Other S. Asia	2184	2370	2510	2719	3201	72	64	83	41	neg
3	PRC	2019	2680	2913	2913	3535	364	263	17	0.4	neg
4	South East Asia	1945	2525	2626	2626	3193	74	90	13	4	neg
5	Developing Asia	2045	2488	2646	2642	3275	722	669	113	45	neg

Source : ADB, 2000 based on work by IFPRI

Note : 1 neg is negligible

population below the poverty line also leads to the diversification of the food basket and not just an increase in cereal demand as the introductory section of this chapter brings out. In fact the ADB has modeled that a strategy of diversified agricultural growth reduces poverty and malnutrition faster (See Table 9).

The Different Scenarios on which the estimates are prepared are as follows

- A = Low Investment : Weak Reform
- B = High Investment : Strong Reform
- C = Eliminating Malnutrition
- D = Baseline for Malnutrition
- E = Eliminating Malnutrition

Rural poverty is very high in the region, consisting of 669 million persons in the Nineties, out of which 266 million are in the PRC and 250 million in India, according to IFPRI studies used by ADB. IFPRI's global IMPACT model, projects a Business as Usual Scenario of "Low Investment Weak

Reform”, and preferred Scenario of “High Investment Strong Reforms”, Diversification policies are a central component of differences in the two scenarios

Scenario	Name		
A	Low Investment Weak Reform	0	-10%
B	High Investment Strong Reform	5%	10%

These kind of results emerge because reform leads to faster agricultural and rural growth which is based on widespread and diversified agricultural growth and also diversified agricultural growth generates rural incomes and employment which reduces malnutrition. These impacts can be empirically measured when behavioural demand studies are available since then price response of both poor and rich households separately in rural and urban areas can be measured. Income supplementation and public distribution policies working through pricing and dual markets (an open market and a rationing system) can be integrated quantitatively into commodity market and parastatal policies specifically aimed at households below the poverty line. The late D.T. Lakadawala (1977) and the present author (Y.K.Alagh, 1994) have written about this extensively. Price elasticities of rich and poor Indians in rural and urban areas attracted Lakadawala immensely for, price theory, common sense and a concern for the poor were his forte up to the last day of his life. These price elasticities were estimated from the work of the 1979 Task Force. Given these estimates, the target of public distribution, it is possible to derive the open market share which would give the producer a price required to ensure long-run supply for an efficient firm. These elasticities it may be noted are complete demand system variants of partial demand curve estimates used by S.Subramanian (*op.cit.*, p. 60). To argue that the Indian poverty literature is theory deficient is therefore non sequiter. Also there was considerable global recognition of this work (See the paper by Y.K.Alagh, et.al, in, the well-known feschtrift to Jan Tinbergen edited by Cohen, Cornillise, Teekens and Thorbecke, 1984).

Apart from the theory, these approaches had considerable policy impact.

Dual pricing systems are still used in Indian policies and go back to this work. For example;

‘It would be desirable to adopt a system of dual pricing in respect of selected goods of mass consumption. The rationale of such a policy is derived from the fact that price elasticity in respect of essential commodities - cereals, pulses, edible oils - is relatively higher for persons below the poverty line both in urban and rural areas.’ (Planning Commission, 1980, p.129)

Table 10 : Own Price Elasticities of Agro-Products in India

S.	Commodity	Seventies		Nineties	
		Rural Poor	Urban Non-Poor	Rural Poor	Urban Non-Poor
0	1	2	3	4	5
1.	Cereals	-0.73	-0.04	-0.53	-0.10
2.	Pulses	-0.83	-0.19	-2.57	-0.86
3.	Edible Oil	-0.63	-0.19	-0.79	-0.42
4.	Sugar	-0.84	-0.33	-0.94	-0.29

Source : Planning Commission, 1979.

Apart from in India these estimates and concepts were used in the larger policy literature. For example Lance Taylor in a fairly widely quoted paper described an MPS (Multifaceted Price System) as a ‘transition from an administered towards a market regime.’ (L. Taylor, 1993, p.7) He gave the Polish and Indian examples of ‘it’s homely virtues are perhaps becoming more evident.’ (*Ibid.*, p.7) and the Indians for transitional regimes ‘developing effective multi-tiered pricing systems for their nationalised firms and even in agriculture (Alagh,1991).’

In the political economy literature Ashutosh Varshney was to use these estimates extensively as the following quote shows.

‘Higher food prices hurt the poor in the short run. Higher food prices benefit those who have a surplus to sell in the market. It is typically the

rich peasantry, and in some parts of the country the middle peasantry, which can produce a surplus. The small peasant may sell after the harvest but only to buy greater quantities subsequently in the off-season. He is therefore a net buyer of foodgrains; higher food prices hurt him. The landless peasant is also hurt, as the rise in food prices depresses the real value of his wages. In comparison to the poor, the food consumption of the rich is relatively unaffected by prices. In 1977, India's Planning Commission estimated the price elasticities of demand for selected items in the urban and rural areas (Table 5.1). A 10 percent increase in the price of cereals (wheat, rice, and coarse grains) it was found, reduces the already-low food consumption of those below the poverty line

Table 5.1 : Price elasticities for selected items

	Cereals	Pulses	Sugar
<i>Rural</i>			
For those below the poverty line	-0.73	-0.83	-0.84
For those above the poverty line	-0.30	-0.44	-0.63
<i>Urban</i>			
For those below the poverty line	-0.66	-0.87	-0.91
For those above the poverty line	-0.04	-0.19	-0.33

Note: The minus sign indicates the movement of consumption in the reverse direction: the higher the price, the smaller the consumption.

Source : Planning Commission, Perspective Planning Division, 1977, *Studies on the Structure of the Indian Economy and Planning for Development*, as quoted in Y. K. Alagh, "Notes on Sectoral Price Policies in the Indian Institutional Context," a paper presented at the Institute of Economic Growth Silver Jubilee Seminar, New Delhi, April-May 1984. (Ashutosh Varshney, 1998, p.122)

Varshney in his work published in 1998 was to place these estimates in the larger context of the political economy discourse on policy support to farmers and food consumption of poor agriculturists as his referencing in ff. 24 shows which was as follows:

'24 Ashok Mitra. *Terms of Trade and Class Relations*. London: Frank Casso 1977 and Delhi: Rupa, 1979. M. L. Dantwala, 1986. "Technology, Growth and Equity in Agriculture." in John Mellor and Gunwant Desai, eds., *Agricultural Change and Rural Poverty, Variations on a Theme by Dharm Narain*, published for the International Food Policy Research Institute. Baltimore: Johns Hopkins University Press. and Delhi: Oxford University Press; and "Agricultural Policy in India," in C. H. Shah, ed. . *Agricultural Development of India*, Delhi: Orient Longman. 1979. Alain de Janvry and K. Subba Rao. 1987, *Agricultural Price Policy and Income Distribution in India*, Delhi: Oxford University Press: K. Subbarao, 1985, "Incentive Policies and India's Agricultural Development: Some Aspects of Regional and Social Equity," *Indian Journal of Agricultural Economics*, vol. 15, no. 4 (October-December). John Mellor, 1986. in Mellor and Desai; and Dharn Narain, *Studies on Indian Agriculture*, ed. K. N. Raj, Arnartya Sen. and C. H. Hanumantha Rao, Delhi: Oxford University Press. 1988.' (Ashutosh Varshney, 1998, p.122)

Food Security

The kind of estimates ADB and IFPRI have modeled (Table 9 above) has its origin in the Indian work on poverty removal and in fact the first model of this type was worked out by R.Radhakrishna in the early Nineties for the ADB which showed that if these economy level interactions were ignored a cheap food policy (in those days Rs. 2/kg. rice in Andhra could actually make the poor worse off: See R.Radhakrishna and S.Indrakant, 1988). However recently food security has been given an immediate focus in policy by the welcome inclusion of abolition of hunger as an objective by the UPA Government in its short run policy agenda. This has led to two kinds of pressures on food demand exercises. The first is to raise the bar on poverty levels by the State Governments and some agencies of the Government of India from the Planning Commission's poverty estimates as discussed above. The other is to follow recent global work which tends to argue that almost the entire Indian population is poor.

The Poverty Line and Prices as Statistical Estimates

The critics of the Poverty Line were correct in stating that the 1979 Poverty Line cannot be taken as a Lakshman Rekha not to be reexamined and was in the technical work never seen as so. The original 1979 Task Force was very clear on this and was also very sensitive to price corrections. It saw the point now common that price approximations can ravage poverty numbers and so refused to give State level correction factors (B.M. Mahajan's detailed work in the PPD was circulated for comment, but not officially owned up).

The Normative Poverty Line was to be reevaluated. It wasn't. The Lakdawala Expert Group (Planning Commission, 1993), however did not do the work it was primarily set up for. On a factual clarification, the "Expert Group" was set up at the initiative of the present author, as a member of the Planning Commission and Prof. Lakdawala was its Chairman. Its report is called the Lakdawala Report, but that is a misnomer, because Prof. Lakdawala died before it was finalized and the report does not carry his signature. In fact he had very substantial reservations on some of the suggestions made.

The empirical results of the Expert Group have been subjected to considerable discussion. They come out with the somewhat strange result that rural poverty in India was less than urban poverty in 1987-88, a drought year. These kind of oddities continue in the method. For example, the poverty ratios for the year 1999-0 released by the Planning Commission also show that urban poverty is higher in 9 states (Andhra Pradesh, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu). According to the Group in 1987-8 in some of the worst hit States in the drought year, rural poverty was much lower than urban poverty. Also States, which had high industrial growth rates and where the structure of the labour force was transformed, urban poverty rates were higher than rural poverty rates (For more details see, Y.K. Alagh, 2004, pp.160-171). The late D.T. Lakdawala was deeply disturbed by these deficiencies.

The fact that poverty estimates are affected very highly by price adjustments at the State level and not so much by consumption differences has been documented by the data mining exercise of S.Gangopadhyaya and Amaresh Dube. In fact when the price indices are Purchasing Power Parity prices for defining poverty lines instead of price indices for each class in rural and urban areas you get the result that almost the entire Indian population is below the Poverty Line. For example Shaohua Chen and Martin Ravallion estimate that, while the \$1 a day was consistent with the Indian poverty line, the population below the poverty line in India as now estimated is as in Table 11.

Table 11 : Estimates of India's Population below Poverty Lines by Chen and Ravallion

(in million)

S.No	Year	Poverty Norm \$2 a day	Poverty Norm US\$2.5 a day
1	1990	701.6	766.5
2.	1993	735.0	808.9
3.	1996	757.1	841.1
4.	1999	782.8	875.2
5.	2002	813.1	911.4
6	2005	827.7	938.0

Source: Shaohua Chen and Martin Ravallion, 2008 pp. 34-5.

The present author had worked as a student on the original Purchasing Power Parity Estimates for Irving Kravis was his teacher and knows that PPP estimates for the country, even adjusted for rural/urban price differences do not capture the consumption pattern of the poor. The work that R.Radhakrishna and A Sarma (1975) did at the Sardar Patel Institute in the late Sixties of estimating separately for the rich and poor in rural and urban areas in India price indices gives robust results of a kind not seen elsewhere. It gave the Indian poverty estimates a robustness which

earlier norms like Rs.20 per month don't. Incidentally there is no record available of the calculations behind this norm.

The Expert Group did not make any serious comment on an issue which refuses to fade away the discrepancy between National Account (NAS) and National Sample Survey (NSS) estimates of per capita consumption expenditure, apart from relying only on the latter. This is a serious matter and goes back to ideological differences on statistics and economy level accounting. The issue which has origins in controversies on the plan models and strategies of the Fifth plan, has been raised recently by Surjit Bhalla's work on poverty using NAS and NSS estimates for poverty numbers. (S.Bhalla, 2003. 2004) One of the most careful analyses of such differences by M.Mukherjee in 1972 concluded that "without an intensive study of the discrepancy between the two sources of consumption data, it is not possible to conclude in favour of either". The arguments of that classic study are still valid but were not discussed at by the Expert Group. This is particularly so when the Expert Group recognized that "NAS based estimates are higher by a very large factor for commodity groups like sugar, edible oils, clothing and footwear, durable consumer goods and rent, fuel and power" and that "NSS based estimates of cereals are higher than NAS based estimates". In the 1980s cereal consumption was not rising but sugar, etc. consumption was rising very fast along with aggregate calorie consumption per capita. K.L. Datta (Annexure D, pp. 96-1010) has gone back to M.Mukherji's scientific position and pointed out that recent work on the NSS estimates has tried to quantify errors, but similar work has not been done on NAS estimates and the jury is still out.

Alternative Approaches

Events have however, overtaken economic statistics controversies on poverty in India. Policy makers found it impossible to work with odd results like urban poverty is more than in rural areas or that poverty in

advanced regions is more than in poor regions. Planning Commission and other studies have shown that poverty estimates are very sensitive to price data variation and this feature, overlooked by the Expert group led to unusable results at the State levels. The Department of Rural Development undertook independent studies of Below Poverty Line populations. Also scholars like R. Radhakrishna came out with devastating findings on deprivation levels in specific age groups and sections of the population like women (R.Radhakrishna and Shovan Ray, ed., 2006). A number of interesting efforts have been made at the State level to develop online identification of poor households in States like Gujarat, Kerala and others. We briefly describe the Gujarat effort more on account of familiarity, rather than any other reason.

The Gujarat Rural Development Department with help from an IRMA Consultant created a dynamic below Poverty Line (BPL) list on the basis of 13 score based socio economic indicators. These parameters take into account the multi dimensional nature of poverty. They are- operational land holding, type of house, average clothing available, food security, access to sanitation facilities, ownership of consumer durables, literacy status, household labour force, means of livelihood, status of children, type of indebtedness, reason for migration and nature of assistance preferred. The entire rural population of 6.8 million households across 18056 villages of Gujarat was surveyed. About 20,000 people were involved in the survey process.

Survey form was condensed without any data loss into a single page. The form had all the 13 indicators and the surveying official had to enter the relevant scores. '0' is the lowest score for an indicator, while '4' is the highest. A household can have a total score ranging from '0' to '52', with the latter score indicating the position of least vulnerability. The information collected was converted into usable data base through

pecially designed software for this purpose. Manual data entry was avoided to ensure accuracy and forms were scanned for processing the information. After scanning 10 % of forms were cross checked through random selection to ensure the credibility of the new BPL list. Not only this, to further make sure the reliability of this exercise, the list was displayed at every gram panchayat for appeal by the public.

This web based database is user friendly and has been created in a manner that maximum information can be generated within seconds. A query module facilitates the generation of village wise name wise information of the beneficiary in any combination of 13 parameters. This database can be utilized by all other government departments, concerned with social and economic empowerment of the poor, in selection of beneficiaries as it has taken into consideration almost all aspects of basic human needs. It facilitates better programme design and greater efficiency in service delivery and brings transparency in functioning. This entire information can be accessed at www.ruraldev.gujarat.gov.in.

These kind of efforts are a commendable beginning and yet they need design and validation at a national level. The indicators have to emerge from a goals exercise, which needs nation level cogitation, fighting and validation. These goals then need relationships with instruments and programmes. Finally there has to be a matching with scarcities not only of available resources, but also of the more basic non-renewable kind as well as delivery capabilities. Otherwise the exercises will remain sporadic acts of activism. The effort the Expert Group was asked to do needs to be undertaken, a decade and a half later. While current dominant development thinking does not emphasise it, this exercise will have to unequivocally define the rights of **sections** of the population. There will have to be a much greater emphasis on the rights of individuals and groups, including participatory forms of decision making. These are not just questions of resource use, but also of governance and in fact will be

resource conserving if well designed and implemented. Systems will demand greater fairness and self-restraint in the use of Government Power. Related will be demands on transparency and right to information. There will have to be a response to the demand for protecting vulnerable groups, either the historically underprivileged, or the victims of marketisation, concerns for human rights and particularly of specific groups such as women, children, the minorities, the adivasis, the mentally and physically challenged. Living as we were in 1976 in the memory of ship to mouth food supplies, the concerns of emerging India in this century could not be visualized and it is futile to paste them on a tattered 1979 Poverty Line. Experience since 1991 is that reform by stealth fails in substantial measure. Recognising it by now requires that we articulate the space of different sections of our people in a definable and contestable manner in the design of reform. Like me you are doubly blessed for this generation has to again reinvent the desirable future.

It is not going to be automatic or easy. The 1979 Poverty Line has endured, not only on account of the persistence of a few statisticians, but because Governments resist attempts at creating new rights and activists will not accept less. So the last accepted truce continues. For five decades the Ahmedabad textile workers got an old consumer Price DA linked wage, because Gandhiji had worked out a truce between the Majoor Mahajan led by Anusuya Sarabhai and the mill owners by her brother Ambalal Sarabhai and nobody dared to disturb it. Apart from courage, we will need to remember that social progress may need a degree of joint movement towards mutually conceived and engineered social goals. In that sense an exercise to build a vision in an honest manner can be a mobilization mechanism and can uncover strengths not known earlier. Reform has also to be a social compact in a country which has by now almost a century of history of permanent rebellion. This is important for macro management and also for long term growth, but here the plea is only for a non-trivial effort to envision the future together.

Since this was written the Official Poverty Line was revised by the Tendulkar Committee. (GOI, 2009) We decided to keep the initial draft intact and introduce a discussion of the Tendulkar Poverty Line as an addendum, since many of the issues remain and some of the historical advantages of the poverty literature have been accentuated in recent discussions. (See Y.K.Alagh, 2010, for a more elaborate discussion). We must at the beginning of this discussion make our stand clear that we have been arguing for two decades that it is high time to develop an alternate vision of poverty and entitlements from that contained in the existing poverty line developed by a Task Force we chaired in the Seventies. (For a recent summary description of that effort and its place in India's planning models and thinking see K.Parikh,K.L.Datta and A.S.Sachdeva 2010, p.267, ff.15, p.268,ff.16, pp.270-271, 273,278: also see Y.K.Alagh, 1995, Sankhya, Series A). But the direction the debate was taking until the Tendulkar Committee as we saw above was bewildering to say the least, with critiques of the so called Official Poverty Line by scholars who apparently had never read the published document from which it emerged, as also more recently proposals of poverty proportions ranging from ninety percent to twenty percent of the population and little discussion of the first principles to which they belong. A framework of alternate reasoning was important because otherwise the earlier poverty line grounded in considerable work would not change.

The Lakdawala Expert Group was set up for this purpose (Planning Commission, 1993). It however, did not do the work it was primarily set up for. On a factual clarification, the "Expert Group " was set up two decades ago at the initiative of the present author, as a member of the Planning Commission and Prof. Lakdawala was its Chairman. Its report is called the Lakdawala Report, but that as we showed above is a misnomer, because Prof. Lakdawala died before it was finalized and the report does not carry his signature. In fact he had very substantial

reservations on some of the suggestions made (Y.K. Alagh, 2004). As we saw the 1979 Task Force was based on one of the more detailed demand and income distribution studies and developed the income and price response of both poor and rich households separately in rural and urban areas. This work started a tradition of econometric investigation of some policy significance which has continued. Its use in plan models has been referred to above; see reference to K.S. Parikh, ed. 2010, p.1 above). Also as we saw income supplementation and public distribution policies working through pricing and dual markets (an open market and a rationing system) could be integrated quantitatively into commodity market and parastatal policies specifically aimed at households below the poverty line.

These controversies have been placed in context by the excellent work of the Tendulkar Committee (Planning Commission, 2009). At long last the background preparation for a more focused strategy of poverty removal is there. The Tendulkar Committee report is available for discussion. It is a good report, the kind we should have seen in the early Nineties. The work done by R. Radhakrishna and S. Sengupta under the care of Prof. Suresh Tendulkar, presents excellent technical backup for a larger consultation and policy focused process. The Tendulkar Group has moved over from a calorie determined poverty line to a food expenditure determined line. They are happy with the existing urban poverty ratio or head count ratio of 25.7% derived from the 1977 Task Force as adapted for price adjustment from time to time. They now suggest this should be the National Poverty Line and the expenditure required to meet this goal should be the poverty line for both rural and of course urban areas. The exercise is fascinating, both for policy and in theory. We are all critical of the Official Poverty Line, but they 'found it desirable in the interest of continuity to situate it in some generally acceptable aspect of the present exercise.' (GOI, 2009, p.5). Like Banquo's ghost the 1977 Alagh Task Force casts its shadow, possibly since both Tendulkar and Radhakrishna

were its members. The poverty ratio for urban areas derived from that method now drives the new system. That ratio was derived from calorie norms. Now the argument is turned on its head and the same ratio in turn determines the required food expenditure determined poverty line basket. That basket is also suggested for rural areas. Viewed in a causal sense, the urban poverty ratio in 1979 came from calorie requirements and the Poverty Line basket. Now the ratio determines the basket for both rural and urban areas.

As a detour in logic the parallels are there in the Mahalonobis system where a given rate of investment in capital goods drove the system or Nobel laureate Oliver Williamson where firms drive the market and not the other way around. These kind of systems are also associated with causal chain analysis as pioneered by Herman Wold (H.Wold, 1953). The two crucial features of a recursive system are a triangular B matrix. As an illustration consider the model

$$y_{1t} = d_{11}X_t$$

$$y_{2t} = b_{21}y_{1t} + d_{21}X_t$$

and so

$$y_{1t} = -d_{11}x_t$$

$$y_{2t} = (b_{21}d_{11} - d_{21})x_t$$

In the Official Poverty Line, calorie requirements determine Household Expenditure requirements, which in the second equation determine the poverty line. In the Tendulkar Poverty Line the urban expenditure requirements determine the Poverty Line and so the arrows go back.

Public policy is not an exercise in logic or causal chain systems and the Tendulkar report has many advantages. For one thing it shifts the emphasis from calories to food demand. The 1979 Task Force was in its logical

structure permitting this in its complete demand systems but the focus then was on grains. That structure of reasoning with price elasticities separately for the rich and poor led to dual pricing. The Tendulkar Committee framework provides the food purchasing power and framework lets the poor substitute, between food items.

It works in a framework that the State will now not have the full responsibility for education and health needs or for that matter drinking water for the poor. Here The Tendulkar Committee is one sided in stating that 'the earlier poverty lines assumed that basic social services of health and education would be supplied by the State'. It does not clarify that the 1979 Task Force stated that the State must have a Basic Needs Plan and give it the highest priority, in terms of pro poor priorities in expenditure.

The Tendulkar Report has a concept of inclusive growth where the State does not take on itself such pro poor responsibilities but provides for a concept of income supplements for private expenditures for them. It shows that with these supplements the new poverty line would correspond to standards which would lead to physical nutrition norms, like nutrition for basic metabolic needs and others being met on an average, in fact exceeded. Statistically this part of the report, overlaying averages of nutrition norms with food expenditure is tentative, but its early hours yet, the approach is creative and more can and I am sure will be done. A more serious issue is that if expenditures on education and health are included in the poverty line calculations how do we account for the public expenditures on them/ or are we happy with double counting. These are complex questions needing the consideration they will get.

The political economy preferences are just below the surface. Tendulkar and Radhakrishna refer many times to the 1979 Task Force, in fact these are the largest number of references, but with the current allergy to anything that happened before 1992, do not list it in their references. That credit goes to the World Bank. More important will the present standard dividing the poor and the rich poor and that too based on the 1979 Line in urban areas be acceptable as a norm? On the one hand

Saxena wants more and the Gandhians will have their own say. But these are expected and the important issue is to get along with the job.

In superb terse sections based on Radhakrishna's presidential address to the Indian Econometric Society, the point the present author has been making that following nutrition norms do not require policy to go overboard is underlined by the Tendulkar Committee. The relation between income growth, diversification of food intake away from cereals, calories and food demand is handled in an extremely competent manner and in fact an intake of 1700 calories justified. First the facts. In a recent piece the present author argued;

"The Tendulkar Report we have reported earlier has two merits and one shortcoming. It gives up the old official poverty line. But not wholly so and the new line is the urban line in the old poverty line sometimes called the Alagh Poverty Line since in the late seventies it was laid down by a Task Force of the Planning Commission I chaired and this is mandated as the new poverty line for both rural and urban areas. I have been wanting this for two decades since India has moved on from the Seventies but all efforts and committees would not do it. Tendulkar says he has but does it only a part of the way. There is an advantage in the method suggested. Some indicators of malnutrition map on very elegantly as a statistical distribution on to the new Tendulkar expenditure poverty line, again seen as a distribution. (emphasis added). The old line went from calories required depending on sex, work status and so on to the poverty line. The emphasis then was on grain although some calories came from non grains also. Now non grains are important and the objective at least is food and food as Tendulkar brings out is not just grains any more. Tendulkar and Radhakrishna are very good at this since they were a part of the earlier exercises on all this. Its great merit is that if we go from the political arguments of kilos of grain and rupees per kilo to severely undernourished mothers and the girl child, we have the tools to do so and in his individual capacity Abhijt Sen showed so in a recent meeting in Patna." (Y.K. Alagh, 2010a.)

There are many debatable issues. I will only note two. In the excellent technical note to the BPL report K.L.Datta has explained at length the complexity of the relationship between calorie consumption and poverty and Sainath the issue that some facilities have to be universally provided. Saxena takes on the issue of entitlements head on and Tendulkar side steps it.

Living as we were in 1976 in the memory of ship to mouth food supplies, the concerns of emerging India in this century could not be visualized and it is futile to paste them on a tattered 1979 Poverty Line. Experience since 1991 is that reform by stealth fails in substantial measure. The Tendulkar Committee has made us cross that rubicon. Recognising it by now requires that we articulate the space of different sections of our people in a definable and contestable manner in the design of reform. This generation is doubly blessed for it has to again reinvent the desirable future.

My argument is that the very poor should be selectively defined and targeted, but the growth process should be built around entitlements. Design of policy should provide incentives for widespread growth and these would include State determined incentives. There should also be disincentives for those who erode widespread growth processes by undermining institutions or synergies on a mass scale. But due humility requires that one states this as a view, subject to the churning around taking place.

At a policy level the relevance of these ideas was shown in a piece written in May 2010,

“At a practical level the recent discussions of the National Advisory Council of the Chairperson of the UPA has endorsed arguments of the author that a dual pricing policy should be followed in the food security legislation and that the nutritionally deprived in the 150 backward districts should be the target.” As the present author argued recently.

But the plus point of the Tendulkar poverty report is that on the old 'official' or 'Alagh' urban poverty line they have mapped the distribution of nutrition, actually its inverse, namely malnutrition. The first thing to note is that we are talking of a distribution and not a number or a unique poverty line. If all malnourished persons are the target you get one number, if only women are you get another. If you are bothered about as you should be of severely malnourished women you get another. So it goes on. Actually I worry about the severely malnourished girl child in the areas called the geography of hunger in India, where my then boss, Rajiv Gandhi would push me. For the country as a whole my worry could be as low as a sixth, but for some areas that cohort will be three out of four. The Tendulkar Committee has given us a powerful tool to work with. We have the money. Soniaji has the will. Now lets do it.

We will of course make mistakes. To begin with all such estimates are stochastic in nature and only the charlatans and some politicians are always sure. But corresponding to market signals, India's vibrant democracy will tell us where we are wrong. Everybody will want free food. Who doesn't, but once its known its not given our people are realistic enough to accept that and those who are entitled under the nourishment, no malnutrition rules, will demand it and NGOs will press. Groups like Akshaya patra and social leaders like Gopal in AP who has been working with a bag of grain employment scheme for rural development will lead the way. Anyway the watchdog NAC is there. The subsidy has to go according to need as the Planning Commission says. Areas and population cohorts of severe malnutrition or what is called chronic deprivation will need a special focus. The correlates of these distributions are known but will be finessed with praxis.

The really deserving must get food free. Here the Planning Commission seems to suggest some market elements and that is wrong. It will frighten away the really deserving and market logic can be carried too far. The Commission talks of need. It must operationalise that.

Beyond that they are right. Actually the idea that the above poverty line population is entitled to grain from the PDS at an MSP plus price is a googly, if there ever was one. The average Indian housewife is clever enough to stay away from the ration shop at an MSP plus price. Thank you the local baniaji is alright. Why pay the FCI cost also. But if the demands are unreasonable it is legitimate to give a non operative solution as an answer to a non problem. The upper caste Indian philosophical mind strikes again. A double negative strikes as a solution again. One can conjure an adverse global situation where the APL population may have to buy from the ration shop at an 'economic price' or MSP plus handling costs. But that will be seldom. An extra public policy rule using market principles which nobody ever uses never hurt anybody. Its not Occam's razor but public policy as I always say is not an exercise in causal chain logic but in getting the best option practically possible." (Y.K.Alagh, 2010b)

The Very Poor and Empowerment of Many

The argument now is that the very poor should be selectively defined and targeted, but the growth process should be built around entitlements. Design of policy should provide incentives for widespread growth and these would include State determined incentives. There should also be disincentives for those who erode widespread growth processes by undermining institutions or synergies on a mass scale. Another approach is conceptually taken by the N.C.Saxena Committee (GOI, MORD, 2009a). It uses a set of deprivation points for entitlements.

When subsidies are available, everybody is a claimant. With limited resources promised largesse can be dysfunctional. The Meena Gujjar episode pushed thoughtful Indians to the brink of concern. It is not easy to react to such events with sensibility. The idea that it is only a law and order problem is infantile. It is difficult to fathom the terrible potential of large communities on hostile rampage to each other. This is particularly so when they are as large, as civilized, as disciplined and as important in the social fabric as the Gujjars and Meenas. I went to college in Jaipur, have worked half my life in North India and vouchsafe for that. Now that the events are behind us, we should share experience around such problem,

in the hope that we will all think and if any solutions suggest, work towards staying decisively away from the brink.

These are substantially rural and semi urban communities. It would be naïve to link up their attitudes to their economic condition in a mechanical fashion and yet widespread growth does create an environment in which violent protest is unlikely. The slowing of agricultural and rural growth as a background is not irrelevant. In the early nineties of the last century when the OBC issue was raised there were alternate visions at debate, one which talked of widespread agro based and rural growth and focused on limited positive affirmation and the other so called radical one which ignored growth and widened only the distribution frame. We will come back to this. But it is time to realize that a mechanical emphasis on GDP growth can have severe social consequences.

It is difficult to recognize that actual distributional outcomes need patient design and sweeping schemes generally fail. JNU designed a scheme of Deprivation Points in admissions in the mid nineties. Tens of thousand children apply for around a thousand places in a transparent and intensively competitive test. Reservation for the SC and ST children was there. The idea was to accommodate poor OBC candidates. The University placed resources with the Student's Union for an extensive debate to develop a workable system. In early discussions it was agreed that the system must actually serve its objectives and not permit cheating or just be sloganeering. Incidentally some of the participants included Dr. Thorat, and Sarva Shri Yechuri and Karat, both JNU Student Union Presidents in their days. Ultimately a system of deprivation points was designed. Points were given on the basis of the location of the college of the last degree, advantage given to those who graduate from the poorest quarter of Districts in India, sex, and BPL status. If you were a girl OBC, graduating from Bastar and your dad was BPL you got nine deprivation points. A non BPL OBC boy from Delhi got three. In the first year, only five children made it on this count. It is not easy to actually help the poor in a big way. Real social change is gradual, since five out of a thousand is half of one percent. But those five made it.

In the OBC debate in Parliament, it was argued by the then leader of the opposition in 1991, that the OBC's are the farmers, the herdsmen, the tree growers and of like professions in India. A broad based scheme of agricultural and rural growth based on the resource endowments of the regions they live in with an emphasis on value added and employment would help them, more than access to nonexistent and declining Government jobs. Some of us believed in this passionately and got it argued in Parliament, but were destined to lose our leader and the game and the country fell in the trap of a leadership which explicitly argued that growth was not an objective and in any case did not believe in strategies, for backward regions, since decentralization was all that was needed. As the jobs kept on falling, the pressure became shriller. There was another more compelling reason. By now global research was showing that expanding the affirmation base was not a plus plus equitable game, because the sections just above the poor knew best how to take the benefits away from the poor. But concern for equality was becoming passe in the globalizer's mind set. To argue that only the poor should be the target in a poor society, of redistribution was not fashionable any more. Neither was the idea that growth based on your own resources in the back of the beyond was necessary or possible in a big way, in a liberalizing world. It would be good to get back again to the World where the intense redistribution focus is on the poor and the process of growth is designed for the needy who are not that poor. The argument now is for a newer scheme of entitlements as compared to that which emerges from the Poverty Line we recommended in another era, now gone.

Finally we have a personal radical belief not very amenable to reason. Caste brings out the worst in the culture of which we are an integral part. It is inequitable because it excludes. All cultures exclude. However the caste system justifies exclusion. There is no shame in it. India has the dubious distinction of an ideology which aims at making the exploited accept exploitation as the condition of man. As the French anthropologist Dumont described in half admiration- Homo Heirarchus- the only society which justified the hierarchy of man, by birth. It has to change. Social scientists and economists who cant see the writing on the wall are out of date.

It is therefore not necessary to change the projections contained in Table 7 made by the UN which include diversification away from grains and are lower for cereals and foodgrains as compared to the IFFPRI and other Normative projections. However the non foodgrain projections of the FAO/UN are much higher than those of the High Foodgrain Indian Projections. For example while the Paroda-Kumar Projections referred to above estimate edible oil demand at 11.4 million tonnes in 2020 (*Ibid.*, Paroda and Kumar, 2000) our estimate is 19 million tonnes. Similarly for potatoes the Paroda estimate is 30 million tonnes, but the FAO/UN estimate is 40 million tonnes and sugar the relevant numbers are 33.7 and 42 million tonnes. Our projections from the UN Alagh model (Y.K.Alagh, 2000, 2001, 2006) are as follows (Table 12):

Table 12 : Agricultural Projections for India 2020

Commodity	2020 (mn.tonnes)
Foodgrains	225
Edible Oil	19
Sugar	42
Potato	40
Fruits and Vegetables	176
Milk	128
Meat	6
Eggs	5
Fish	14

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