CHAPTER V
SOCIAL BENEFIT COST FRAMEWORK
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The commercial profitability analysis, based upon the difference between the earnings and costs at market prices serves as a poor guide for social welfare because the prices offered in the market for the inputs and outputs (a) often do not reflect the willingness to pay which may be substantially higher than the actual offerings in the market, (b) include the influence of unequal income distribution\(^1\) and (c) are unable to take into account the externalities.

The equilibrium market price of a resource is its "shadow price" in a perfectly competitive market. In this ideal world, the marginal social value assigned from the demand side by the users in the form of marginal consumer's willingness to pay would be exactly equal to the marginal social cost of supply to the producers. However, in the real world, because of the distortions\(^2\), on both the demand and supply side, there is little chance that, given the amount of resource presently available to the economy, the marginal social cost as seen from the supply side, and the marginal social value as seen from the demand side,

\(^2\) For a detailed discussion see A.K. Sen: General Criteria for Industrial Project Evaluation, UNCD/IPEB-9
would be equal. Therefore, it is necessary to evaluate the inputs and outputs at their respective shadow prices.

Mainly two approaches, i.e. Little-Mirrlees\(^2\) and UNIDO\(^4\) have been widely acclaimed and practised\(^5\). Though the two approaches may lead to similar conclusions under similar assumptions\(^6\) and the divergences between results generated by different methods may not be as significant as originally thought\(^7\), yet, the choice of one in preference to the other in project selection, is just not a matter of convenience, rather it reflects an act of faith in the validity of the assumptions made regarding the areas of control of the respective evaluators\(^8\).


4. UNIDO op.cit.

5. Other methods like Effective Rate of Protection and the Domestic Resource Cost Method designed specifically for developing countries, however, are not very suitable for project evaluation because of their inability to take into account the timings of the costs and benefits over the life of a project. For a detailed technical summary see Michael Bruno: Domestic Resource Costs and Effective Protection - Clarification and Synthesis, Journal of Political Economy, January/February, 1972.


The two approaches differ in their choice of respective numeraires and valuation procedures for goods and services. Whereas, the Manual considers the investment as a unit of measurement, the numeraire in UNIDO is the aggregative consumption. In UNIDO approach goods and services are valued in terms of shadow prices reflecting the national benefits and costs, whereas the Manual uses "World Prices" as "shadow prices". The UNIDO approach divides the outputs into consumers' goods, producers' goods, and the outputs consisting of foreign exchange. The estimation of the values of these outputs is obtained in terms of "shadow prices" reflected in consumers' "willingness to pay".

In OECD approach, goods are divided into three broad categories:

1. Traded goods and services
   (a) goods which are actually exported or imported
   (or their close substitutes actually exported or
   imported),
   (b) goods that would be exported or imported if
   the country followed policies that would have resulted
   in optimum industrial development;
2. Non-traded goods and services and
3. Unskilled labour
Though the estimation of "shadow prices" for fully traded goods is possible, it is difficult to find out which commodities would fall under 1.(b)\textsuperscript{9}. For non-traded goods Manual's recommendation is that these goods should be broken down into traded goods, unskilled labour and residuals. While traded goods would be valued at border prices, the residuals are to be further broken down and revalued by the same process. This process of calculation of the values of non-tradeables is highly cumbersome. "It will have to be done by solving a system of simultaneous equations with as many unknowns as there are types of non-tradeable inputs involved. This means assembling much more data at any one time than is necessary when the fully traded costs on each non-traded good can be calculated separately and there are fewer non-traded goods. If costs vary with the scale of production, this complicates the estimation of "shadow prices" even further. The levels of production required of each non-traded good will also have to be brought into simultaneous equation"\textsuperscript{10}.

Further, Vijay Joshi has raised a very valuable objection to the use of world prices as shadow prices even for a production which is similar to the products


fully traded near the ports but where the producer is at a considerable distance from the port. "The reason for this, he feels, "is that given the poorly integrated markets of less developed countries, the longer the chain of demands involved before the impact on trade, the greater the possibility that a project will change internal prices and that the full impact may not fall on trade. This point becomes more significant still, if we bear in mind the very inadequate and highly distorted transport system that prevail in less developed countries in which private unit transport costs vary with distances and the quantities in an economically irrational manner. A further reason for the existence of a number of separate local markets insufficiently linked with each other and to the world market, is the lack of information about trading possibilities.

Because of the above difficulties, it is thought that the UNIDO approach would be more appropriate for our project and we have adopted this approach for social valuation of inputs and outputs. We have concentrated mainly on the estimation of three parameters, (a) the accounting price of investment, (b) the shadow price of foreign exchange, and (c) the shadow wage rate.

ACCOUNTING PRICE OF INVESTMENT:

There is consensus that India's saving-investment pattern is not socially optimal and in such conditions, savings have a higher value to the society than consumption. The accounting price of investment, $\bar{P}$, is a function of social rate of discount, $i$, the opportunity cost of capital $r$, and the rate of reinvestment (or share of savings from incremental income), $a$, which are expressed in the form

$$\bar{P} = \frac{(1-a)r}{i - ar}$$

Assuming two values i.e. 0.2 and 0.3 for $a$ and one value i.e. 0.15 for $r$, the range of accounting prices of investment has been calculated at different social rates of discount and presented in Table 5.1.

<table>
<thead>
<tr>
<th>$a$</th>
<th>0.2</th>
<th>0.3</th>
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</thead>
<tbody>
<tr>
<td>$r$</td>
<td>0.15</td>
<td>0.15</td>
</tr>
<tr>
<td>0.08</td>
<td>2.4</td>
<td>3.0</td>
</tr>
<tr>
<td>0.10</td>
<td>1.71</td>
<td>1.91</td>
</tr>
<tr>
<td>0.12</td>
<td>1.33</td>
<td>1.40</td>
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</table>


13. The assumptions regarding $a$ and $r$, are based on the most plausible values derived by John Bayer: Economic Framework for Project Analysis in India: Some Preliminary Estimates (mimeographed) Ford Foundation, New Delhi, 1972.

14. There are obvious difficulties in the selection of the social rate of discount—see UNIDO. The values 8 percent, 10 percent and 12 percent are usually taken as social rate of discounts for the social cost benefit analysis of Indian projects.
It is observed from the above table that the range of $P$, is rather too wide varying from 1.33 to 3.0. We will take all these values in our calculation.

**SHADOW PRICE OF FOREIGN EXCHANGE:**

As foreign exchange is a major constraint of development and most of the developing countries are facing persistent balance of payments deficits, the shadow price of foreign exchange usually exceeds its nominal price. The shadow or accounting price reflects the opportunity cost of a unit of foreign exchange, in terms of some foregone alternative, i.e., the contribution of a unit of foreign exchange to aggregate consumption. A unit of foreign exchange may permit us to expand our imports or to contract our exports, and whichever is more desirable of the two will be the relevant reward for earning an additional unit of foreign exchange. This desirability, however, will be judged not for its own sake, but through its impact on consumption opportunities to-day and in future.

The estimation of the shadow price of foreign exchange for India varies widely, depending upon the assumptions made and the methodology followed by the estimator. Instead of attempting to make any estimate here, we would try to find out the most likely estimates made and used for different projects in India. Further, we would take several likely values of the premium on foreign exchange and try to find out the sensitivity of the project.

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15. Saving is another constraint.
17. For details of different approaches to estimation see John Bayer op., cit.
A shadow price of 1.57, implying a premium of 57 percent was estimated in one study. Bayer has estimated a range of premium varying between 30 percent to 60 percent. We have used three values for the foreign exchange premium, i.e., 40 percent, 50 percent and 60 percent as alternative estimates.

**SHADOW WAGE RATE:**

There are two main considerations which one has to make in determining the shadow wage rate (SWR):

(a) the direct opportunity cost and

(b) the indirect cost due to the premium on investment vis-a-vis consumption.

The direct opportunity cost is equal to the marginal product of marginal worker foregone in the lowest productive sector due to his transfer to the new project, which, in turn, depends upon the existence (or otherwise) of the unemployed labourers and the period of transfer in question.

The direct opportunity cost would be equal to the market wage rate if the project work is taken up during the agricultural peak season when labour is fully employed.

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20. Sen has shown that during peak agricultural period even the existence of disguised unemployment does not rule out the possibility of positive marginal productivity. Existence of surplus labour is not a sufficient condition for the presence of zero marginal productivity. If the dis-utility of effort for the family farm workers is constant in the relevant range, then the withdrawal of marginal worker even in the presence of positive marginal productivity may not lead to any fall in output. See A.K. Sen: Peasants and Dualism - With and Without surplus labour, Journal of Political Economy Vol. 74, 1966.
During slack season, if there is widespread unemployment and underemployment, there will be no fall in output elsewhere in the economy due to the transfer and consequently the direct opportunity cost would be equal to zero.

When labourers are employed in a new project, resources are transferred from the owners of capital to the wage earners, who, let us assume, consume the entire wage bill. As the accounting price of investment is more than unity, due to sub-optimality of savings, this transfer from capitalists, whose marginal saving propensities are very high, represents a cost to the society. This is the indirect cost. So the shadow wage rate, when (a) and (b) are taken into account, takes the form

$$W^* = M_P + \phi (\overline{P} - 1)w \quad \ldots \quad (1)$$

where, $M_P$ is the foregone marginal product of the marginal worker due to his transfer to the new project, $\overline{P}$, is the accounting price of investment and $\phi$, is the rate of saving from profit and $w$, is the project wage rate.

So far, it has been assumed that the labourers consume the entire amount of their new income. If a proportion of the increased income is saved, then this has to be properly accounted for in the SWR: If $Rs_f$, is

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21. While selecting a marginal saving ratio one may have to take into account the non-monetised savings as sometimes these play a very significant role in rural savings. See P.Pannikar, an Essay on Rural Savings in India, in T.Sukla (Ed.) Economics of Underdeveloped Agricultur Bombay, Asia publishing House, 1969. Also see. A.Rosental: Source of Use of Funds in Thai Agriculture, Economic Development and Cultural Change, Chicago, April, 1970.
the proportion of additional income saved by the wage earners then formulation (1) becomes

\[ W^* = M_p + (\Phi - Rsf) (P - 1)w \] ...

(2)

From the above formulation, it is clear that the accounting price of investment has to play a prominent role in deciding the value of SWR. As the accounting price of investment is higher than unity, it favours the projects where the income stream is captured by the groups or institutions with high marginal saving rates. Usually, such people, belong to the high income groups and capitalists than the poor people. Under such circumstances, the bias is to choose projects that favours the rich than the poor. If specifically, the accounting price of investment is very high, it is quite likely that the SWR may exceed the market wage rate.\(^\text{22}\)

**SHADOW WAGE RATE FOR GANJAM:**

As seasonality is a major factor in agricultural production, seasonal variation in employment plays a vital role in the determination of the SWR in the life of project. For the purpose of this study, it is necessary to study the period of the demand for labour for the dugwell project

\(^{22}\): See UNIDO op.cit, p.207.
and the labour supply situation in the relevant period in Ganjam district.

Labour is demanded for (1) well construction and (2) for irrigation and cultivation of crops near the well. As for (1) the demand of labour is concentrated mainly in the months of April and May, for during this period, digging is feasible up to the optimum depth depending upon the water requirement of different crops to be taken up near the well in late winter and summer and the draw down that can be imposed. So far as (2) is concerned, labourers are demanded in Kharif season of a drought year for the purpose of irrigation to save the Kharif crop and in the Rabi season for the Rabi crop taken up near the well. No study is available in which estimates of the total and seasonal unemployment of agricultural labourers and small and marginal farmers of the district of Ganjam has been made. In the absence of any such study we will assume that the unemployment estimates made for agricultural labourers in Orissa will also be applicable to that of Ganjam.

On the basis of available published data we have estimated the average number of days for which an agricultural labourer is employed in Orissa to be 239.25 days.23 Considering the number of days of employment wanted by the men and the women agricultural labourers in Orissa

23. See Appendix C
The above employment figures suggest that there is considerable unemployment among agricultural labourers in Orissa. In another study for a Marginal Farmers and Agricultural Labourers project in Orissa, it has been estimated that the marginal farmers and agricultural labourers remain unemployed for about 3 months in a year and get employment for 227 and 224 days respectively. These figures show that the estimates made by us are very close to them. However, the above estimates do not reflect the inter-seasonal variation in employment (unemployment) in Orissa, and there is no other study to throw light on this aspect. The study conducted for Cuttack district, which enjoys better rainfall and has got better irrigation facilities than Ganjam, shows the month-wise employment of on-farm and nonfarm activities by both family farm workers and attached farm labourers. It shows that the employment of the above two categories goes down progressively from January to May. The number


of days employed in the months of April and May is very low and for the latter the lowest. It, therefore, seems that the unemployment is widespread during the Rabi (including summer) season in rural Orissa. In the absence of any other estimate for Ganjam, we will assume that the pattern of unemployment will be same as that in the Cuttack District. Therefore, it can be said that the period of unemployment will be concentrated in the Rabi and the Rabi summer season and more pronounced in the latter.

Therefore, employment of labourer for well construction in April and May, and for Rabi and Rabi summer cultivation, is not likely to lead to any fall in output and consequently the direct opportunity cost of labour is likely to be zero.

In chapter IV, it is found that the labour input per acre in Kharif is much higher in case of the farms irrigated from the wells than the farms without irrigation. It is necessary, therefore, to find out the labour requirement period during Kharif and see their impact on SWR.

The two main periods in Kharif season are the period of inter-culture and harvesting and usually even in traditional agriculture, scarcity of labour is felt during these periods. Therefore, one is tempted to think that higher labour utilisation in respect of beneficiary
farmers is likely to have a direct impact on labour market and likely to withdraw labour from the farms having no irrigation facility by offering slightly higher wages. 

The theories on adverse effect on output due to transfer of labour is based on the implicit assumption of the fixity of agricultural peak period, (that is the peak period is concentrated in a few days or few weeks of a particular month), but this assumption is highly static and in fact the peak period can be spread due to change in technology, thereby, making the static labour scarcity peak period to a labour surplus period and helping transfer of labour without any loss of production. Further, the peak period has to be considered from the point of view of distribution of rainfall and agricultural operation during any particular year. It is argued that during a drought year in which the rain is not only deficient but its distribution is uneven, the so-called peak period may be conspicuous by its absence for the following reasons:

1. (a) The inter-culture and transplantation operations may be either nonexistent in some dry farms or get delayed till adequate water is available thereby having no demand for labour at the time of inter-culture operation on irrigated farms:

27. The workers may like to oblige the beneficiaries of the well even without a higher wage to keep the latter in good humour so as to get some days employment either for them or for the members of their family during agriculturally off season in the latter's land. This preference is very much marked in the rural sector.

29. It is usually a rural side and so during bad rainfall year the low and low medium lands are cultivated, whereas the high and high medium lands are kept fallow.

30. It so happened in 1976 Kharif that when the Central Team visited Orissa to review the drought situation in mid-November, most of the drought affected patches in dry land areas were already harvested, whereas the area having irrigation facility, it was reported was to take 15 to 20 more days for harvesting. (Own survey of 4 villages in district of Dhenkanal during the visit of the Central Team and discussion with the Collector, Dhenkanal D.A.O., Dhenkanal and S.D.O. and B.D.O., Dhenkanal/Kamakhyanagar). Besides in many areas affected by drought there was no harvest and the cattle were allowed to graze as it was not thought, worthwhile even for the surplus family labour, to cut the crop for straw purpose.
that the increase in total demand for labour in Kharif in the drought year and in Babi (including summer) season is not likely to have any adverse impact on output. Therefore, the direct opportunity cost of labour is assumed to be zero here.

Therefore Equation (1) of the previous section still holds good for Ganjam.31

As pointed out earlier, Equation (1) assumes zero saving propensity of the recipients of the wage. However, if, the wage recipients save a portion of their wage earnings then equation (2) holds good.

31. In our model the workers do not move from agricultural sector to the urban sector. Rather their transfer, wherever done, is from one agricultural operation to other or from no occupation to some occupation in the same village. For this, we have not specifically included, the aspects of rural urban migration, the models used by Harris and Todaro, and Dixit. See J.R. Harris and M.P. Todaro, Migration, Unemployment and Development, American Economic Review Vol. 60, 1972 and A. Dixit: Short run Equilibrium and Shadow Price in a Dual Economy, Oxford Eco. Papers, Vol. 23, 1976.

Further, so far as disutility of effort is concerned it is thought, since poverty is widespread and the rural income is very low and about 70 per cent of the people of the State is below the 'Poverty Line' there will be no private disutility of effort, at least in the relevant range, and if any, will be less than the utility derived from the increased income. For this reason, we have treated the disutility of effort to be zero. For a detailed discussion, see: Rural-Urban

While deciding about the rate of saving from wage income, a distinction has to be made between the wage going to the agricultural workers working as hired labourers and the wage accounted for the family labour. It is plausible to assume that agricultural labourers living substantially below the 'Poverty Line', consume the entire additional wage income accruing to them. Then, equation (1) still holds good for calculation for SWR for agricultural labourers.

There has been no study in respect of the marginal propensity to save of the rural income earners in the district of Ganjam. A study made by Dasgupta in Puri district, an adjacent district of Ganjam, shows that the marginal propensity to save (saving both in physical and financial terms), of the small farms in the size group of holding 0-4, acres equals 0.24. This result is quite in contrast with the All India result for 1960-61 found out by NCAER. The marginal propensity to save in this study

32. Empirical studies show that the non-cultivating families in Gujrat upto the annual income of Rs.1439 in 1950-51 were dis-saving @ 4 percent of the income. See Pamikar op.cit Table 7 p.392. Since the income of the Agricultural labour families is substantially below the above income levels*, the assumption of zero the marginal propensity to save may not be unreasonable.

* Deepak Lal has estimated that the average annual income of the agricultural labour households to be Rs.1025, at 1970-71 prices, which is substantially below the estimates of the income made above, for Gujrat. See Deepak Lal: Agricultural Growth, Real Wages and the Rural Poor in India, Economic and Political Weekly vol.XI No.26, June 26,1976.


for cultivators, "Self Employed Farmer" was 0.145. But the NCAER's is result seems to be on the lower size as they have admitted that, "Sample consumption expenditure tends to be over stated by the respondent". The extent of underestimation of the marginal saving propensities would depend upon the degree of overstatement of the consumer expenditure. In another study in Cuttack district, it was estimated that the average propensity to save of the marginal and small farmers, having land in the size group of 2-5 acres was about 0.10. It is expected that the marginal propensity to save will be higher than the average propensity. For our study, we have taken three values for Rsf, 0.0, 0.14 and 0.24, the latter two based on the findings of NCAER and Dasgupta respectively.

For the calculation of SWR we need to know the value of \( \phi \), the marginal saving propensity of the capitalist class. We have assumed two values, 0.3 and 0.4 as alternative values of \( \phi \), as estimated elsewhere to be the most plausible values for India.

The Shadow Wage Rates for family farm workers of the small farms, \( W^* \) and for the hired agricultural workers \( W^* \) are presented in Table 5.1.


TABLE 5.1
SHADOW WAGES FOR FAMILY FARM WORKERS AND HIRED WAGE LABOURERS IN GANJAM

<table>
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<th>Ref</th>
<th>0.0</th>
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<th>0.24</th>
</tr>
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<tbody>
<tr>
<td>( \bar{P} )</td>
<td>2.4</td>
<td>3.0</td>
<td>2.4</td>
</tr>
<tr>
<td>( \bar{Q} )</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>( W*lf )</td>
<td>0.42</td>
<td>0.80</td>
<td>0.22</td>
</tr>
<tr>
<td>( W*lh )</td>
<td>0.42</td>
<td>0.80</td>
<td>0.42</td>
</tr>
<tr>
<td>( \bar{P} )</td>
<td>1.71</td>
<td>1.91</td>
<td>1.71</td>
</tr>
<tr>
<td>( \bar{Q} )</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
</tr>
<tr>
<td>( W*lf )</td>
<td>0.21</td>
<td>0.36</td>
<td>0.11</td>
</tr>
<tr>
<td>( W*lh )</td>
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</tr>
<tr>
<td>( \bar{P} )</td>
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<tr>
<td>( \bar{Q} )</td>
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<tr>
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The values of the various estimates made for the accounting price of investment, shadow wage rates and the accounting price of foreign exchange will be used in the subsequent section for our empirical study.
From the selection of public projects, in many developing countries, it seems that the policy makers do attach some implicit weights to the benefits derived by the poor sections and regions. In recent literature more and more emphasis is being laid on the fact that the public investment projects should act as a means of effecting the distribution of income - intra and inter-regional.

Those who argue against the principle of assigning distributional weights are of the opinion that the efficient allocation of resources should be the main objective of the public production and equitable distribution should be made through appropriate transfers.

The above argument rests on Hicks-Kaldor criterion i.e., the project should be undertaken if the gainers can compensate the losers. This would be a sound argument only if there would be no adverse impact on the incentives to produce output in the face of transfers between people. This is unfortunately not true. In a recent paper Diamond and Mirrlees have argued that even without the transfers


social welfare maximisation requires that the production 
efficiency may be preserved, given some assumptions, 
including constant return to scale, but "assuming that ...
there would be no political difficulty in having a tax rate
say, on 1000 percent on some commodities if the optimisation 
exercise requires this. Here the question arises, though
it would be theoretically possible for the planner to
advise the policy maker to resort to the above course of 
action, whether it would be politically feasible to do so.

Further, the efficiency argument is based on the
implicit assumption that there are no limits on the extent
to which the means of redistribution can be used. In a
situation in which the Governments in developing countries
are unable to raise taxes in order to have desired level
of savings, it is too much for the economists to expect
that they would be able to use taxation very effectively
to redistribute income as between regions and classes.
Joshi has grave doubts about the efficacy of widely
differing tax rates for the same commodities as between
different states of a country having a federal structure.

Besides the society may not always be neutral to
the means of income distribution. It may not be satisfied
merely by the distribution of income already earned by
the poorer regions and sections, but may, as well, like to

and Shadow Wages, in Cost-Benefit Analysis, Ed.R.Layard 
p.152
42. Vijay Joshi: The Rationale and Relevance of the 
Little Mirrlees Criterion, Bulletin Oxford University 
Institute of Economics and Statistics, Vol.34 Feb.,1972, No.1,
redistribute productive assets of economic development, thus generating further income. Thus "the size of the economic pie and its divisions may not be the only factor for concern to the community, the method of slicing the pie may also be relevant." The Government may be prepared to forego some potential output and consumption in the interest not only of attaining the better distribution of consumption but also employing a more accepted means of attaining it.

Once it is accepted that income distribution aspects should be taken into account in project choice, the problem then arises of selecting appropriate income redistribution weights to be attached to the consumption (income) of different regions and sections. It is suggested by some that it should be left to the policy makers and the planners should cross-question the policy makers in the attempt to derive such weights.

The difficulty in this approach is that such democratically or bureaucratically determined weights vary frequently according to the strength of the political party in power and the exigencies of the state. A serious problem may arise if the weights, instead of being derived by

discussion, leads to infighting among different political
groups and regional and other pressure groups. The
project planner faces difficulties in such a situation
to have a consistent choice of projects.

Alternatively others have suggested to derive such
weights from past choices of projects or from explicit
Government action. These methods have to assume that
the past choices were made by some consistent implicit
valuation function. Lal questions the above assumption
as well as the assumption that the Governments always
optimise. If the Government's decisions were always
consistent and the Governments always optimise, then
there would be no need to derive explicit distributional
weights for project choice.

S.A. Marglin suggested an approach in which total
consumption is maximised subject to some minimum consumption
being given to particular sections or regions or the
consumption of latter maximised subject to minimum aggregate
consumption. But the derivation of the weight under this
approach can only be 'expost'. Roskill Commission on the
Third London Airport were of the view that the costs and

46. E.J. Mishan: Flexibility and Consistency in Project
47. B.A. Weisbrod: Dervying and Implicit set of Governmental Weights for Income Classes in Cost-Benefit Analysis, ed. R. Layard.
48. Deepak Lal: On estimating income distribution weights for Project Analysis, IBRD Staff working paper No. 130
benefits of different groups in the society might be clearly specified and the decision to be taken regarding the weights should be left to the policy makers. This approach may not lead to any definite result about the weight for the economy as a whole.

The indirect way of assigning weights from the subsidies given to particular region or section, derived by Mishra and Bayer suffers from the defect of deciding the weights in a federal country in which the rates of subsidies differ for different types of projects even for the same groups or regions during a particular period.

Misra, Patnaik and Sundaram, instead, want to calculate the redistribution weights endogenously by fixing the critical values of such weights for which the net present value would be equal to zero. The above procedure is mainly concerned with the critical value of redistribution weight above which the society will reject a project. If this exercise is done for selection of various projects, the critical value of redistribution weights for

particular groups will vary from project to project even in the same period for the same region and there would be no conclusive recommendation about the society's choice for a consistent redistribution weight. The switching value procedure is not likely to lead to any definite conclusion about the marginal weights. "It is only after repeated application of this procedure for a large set of projects and project variants, that one will, it is hoped, be able to converge to the values of these national weights that reflect the policy maker's judgement."

Foster has suggested another method in which gains and losses are weighted by the ratio of the average personal income to the individual's income so that

\[ L_1 = \frac{Y^a}{Y_1}, \quad L_2 = \frac{Y^a}{Y_2}, \quad \text{etc.}, \]

where \( Y^a \) is the per capita income of the country. The above approach involves an explicit value judgement about equity. But the acceptance or rejection of this value judgement depends on the policy maker. However, \( Y^a \) can also be taken as the critically accepted "poverty line" to derive such distributional weights.


More recently Lal has derived inter and intra regional weights based on the constant elasticity of the social utility function;

$$U'C = K/C^e,$$

where $U'C$ is the marginal utility, $C$, is the income (consumption) assuming that all incomes are consumed and, $e$, is the constant parameter ($-e$ is the elasticity of marginal utility) and $K$, is the social value attached to the utility accruing to particular income group in a particular region. If due to a project in a region, $z$, the income increases, from $Pcy$, the pre project income to $Cy$, post project income, and the increased income accrues to group $Y$ then the increased proportion $\mu$ can be represented by

$$\mu = \frac{(Cy - Pcy)}{Pcy}$$

and the intra regional weights are to be given by

$$\Delta Rz = \frac{Cz}{(e-1)} \frac{Cz^* (e-1)}{Cy (e-1)} \left[ \frac{1 - P (e-1)}{p(e-1)} \right]$$

where $Cz$ is the arithmetic mean regional income in region $z$, $Cz^* (e-1)$ is the harmonic mean income of degree $(e-1)$ in region $z$ and $Cy$ is the new income level of the income group $Y$, in the region. The said value of the additional income when inter and intra regional income distribution are taken into account is given by

57. Deepak Lal (48) op.cit., also see For a detailed discussion and use of the redistribution of weights, Deepak Lal "Men or Machines" - A Philippines Case Study of Labour - Capital Substitution in Road Construction, Appendix B.IV, ILO, Sept. 1974, pp 194-203.
where $\bar{C}_R$ is the arithmetic mean of the mean interregional incomes, $C_R^*$ is the harmonic mean of the interregional incomes. The above formulation suffers from the usual defects of the constant elasticity function.

However, the author is of the opinion that it may not invalidate the deviation of a fairly rough and ready redistribution weight. The analysis made by Lal makes the discussion of the value parameters explicit, and insists on a systematic and consistent incorporation into project analysis of these judgements once they are agreed upon.58

We have attempted in Appendix D to derive the inter and intra regional weights for different income groups in Orissa on the formulations made by Lal. However we have not used them in our analysis because of the following reasons:

(a) The distribution weights to be attached to the income (consumption) of different groups or regions, depend essentially on value judgement of the policy makers. A particular form of utility function based on the value judgement of the planner may not necessarily coincide with the value judgement of the policy makers?

58. Deepak Lal (48) op., cit., p.18.
(b) The redistribution weight so derived may not serve the purpose if there are large changes in the income of the beneficiary groups from year to year. In that case the "weaker section" may, after a particular point, become stronger. In such a situation, it may be necessary to find out the time path of the income distribution, both inter and intra regional. This, in turn, will depend upon the detailed prospective planning for each income group, which has not been attempted, by the Planning Board in Orissa and it is beyond the scope of this study to attempt such an analysis.

Though there is general agreement that the redistribution weights are to be attached to the benefits (cost) derived by different groups and regions, there is yet to be a consensus about the use of any particular method to derive such weights. However, there is consensus that the consumption of the people below the minimum of living standard should be attached weights more than unity.

We have not made any specific attempt to use any redistribution weights for the people below the poverty line. However, since our beneficiaries belong to the category of small farmers and agricultural labourers, the benefits derived by them will increase when redistribution weights are attached.