WORLD EMPLOYMENT PROGRAMME RESEARCH

Working Paper

BASIC NEEDS AND DEVELOPMENT PROGRAMME

Towards Basic Needs Policies in Development Planning

by

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Preface

This is the first paper in the Sri Lanka project "A Socio-Economic Framework for Basic Needs Planning". The motivation for this paper is A. Hirchman's saying "The lack of understanding behind motivation is likely to make for a high incidence of mistakes and failures" (1963).

This paper conceptualises the government decision process of basic needs allocation. It suggests a framework according to which government can make its decisions and according to which such decisions can be judged. The distinction made in the paper between optimal versus efficient policies seemed to be quite useful in analysing past and future basic needs policies. In addition, the paper provides a better understanding of the effects that basic needs satisfaction have on different socio-economic groups and on individual's that differ by age, sex, background, etc.

The first operationalisation of the above conceptualisation is done in the Sri Lanka basic needs model. It will be the underlying theory in specifying several equations concerning government allocation and basic needs satisfaction. In addition, it is a guide in specifying the different possible scenarios and, in particular, the ones concerned with the way basic needs satisfaction can be achieved.

In addition, the model provides a framework to analyse the way basic needs policies were implemented in Sri Lanka in the past and possible ways to implement such policies in the future. This includes a possibility of constructing an optimisation model which will point out investment in human capital versus investment in material capital.
"Would you tell me, please, which way I ought to go from here?"

"That depends a good deal on where you want to go," said the cat. (Alice's Adventures in Wonderland)
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A. Introduction

Basic needs policies in development planning appear as a fairly controversial issue in the literature. This is not only because of their political implications but also because of their economic vagueness. This is particularly true in the area of policy design, and the way in which such policies were carried out.

The policy-maker has to decide on its basic need budget allocation to the different basic needs categories as well as to the different groups in the population.

As Streeten and others (1981) have pointed out, the cost of supplying a package of basic needs items, is less than the sum of the costs of the separate ingredients of such a package.

One can distinguish between input and output reinforcing mechanisms. At the input level, there is a place to combine projects aimed at satisfying more than one basic need — for example, health, nutrition and education. At the output level, there should be a consistency between the level of satisfaction of the different ingredients of basic needs. For example, it was pointed out in the literature (Leipziger, 1981) that literacy has an important impact on life expectancy and on infant mortality.

These enforcement mechanisms between the different elements of a basic needs package point to the need for a framework that will be able to advise on government allocation of its basic needs budget to different basic needs items as well as to different socio-economic groups in the population.

Unfortunately, the literature is rather poor as regards such models. This is due not only to the lack of knowledge, in which direction a lot of progress has been done in the last several years, but also because of the more fundamental question of whether basic needs targets should be determined by the policy-makers or whether they should be decided by the people themselves who may prefer television to education and circuses to bread.

1 Thanks to Jeffrey James, Rolph Van Der Hoeven, Gerry Rodgers, Mike Hopkins and Wouter Van Ginneken for comments on an earlier draft.

2 This research has been conducted as part of the project Socio-Economic Framework for Basic Needs Planning ILO/INT/79/07/NET.
The basic underlying assumption of the Paretian welfare theory is that "an individual should be considered the best judge of his economic welfare." The rejection of this value judgement (sometimes referred to in the literature as the "complete consumer sovereignty") gives rise to the second view that government (experts or any other institution) is a better judge of the individual's welfare.

Three main reasons justifying such government paternalism are often given: the protection of particular groups in society such as children and the insane; better information as well as better ways of utilising the knowledge possessed by the government; and that since individuals are typically short-sighted in their orientation they will tend to make the wrong decisions.

Empirical evidence suggests that in spite of sufficient income, people have to purchase basic needs items because malnutrition, bad sanitary conditions, etc., still persist. (What Rowntree referred to as "secondary poverty").

The scheme suggested below provides a mechanism to analyse government basic needs allocation rules as well as the consequences of these allocations, which reflect government preference as well as government paternalism, and the individual's choice.

The suggested new approach which derives its motivation from the Lancaster consumption theory (5), will assume that basic needs items can be seen as inputs to an individual production process in which the output is a collection of characteristics. Preference orderings on utilities are assumed to rank these characteristics and the ranking of basic needs items is done indirectly through the characteristics that they possess.

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According to this approach, a single basic needs item, for example education, may have more than one characteristic ability to process information (skill capacity for higher aspiration, etc.). However, a combination of two basic needs items known as a basic needs package, for example, education and health, may possess additional characteristics that are different from the combination obtainable from the two items given separately. Furthermore, the same characteristics may be included among the joint outputs of different basic needs items. Such items may not be related in some of their characteristics, but may be related in others. For a suggested list of such characteristics for the four most agreeable and acceptable basic needs items see the following chart.

|          | Productivity | Change in the level of skill | Labour force participation | Change in value added | Change in consumption pattern | Change in mortality | Change in birth rate | Ability to process information | Mental and physical functioning ability | Ability to aspire | Desire to participate |
|----------|--------------|-----------------------------|---------------------------|-----------------------|-------------------------------|---------------------|----------------------|--------------------------------|--|------------------|
| Education| +            | +                           | +                         | +                     | +                             | +                   | +                    | +                              |                           | +                | +                |
| Nutrition| +            | +                           | +                         | +                     | +                             | +                   | +                    | +                              |                           | +                | +                |
| Housing  | +            | +                           | +                         | +                     | +                             | +                   | +                    | +                              |                           | +                | +                |
| Health   | +            | +                           | +                         | +                     | +                             | +                   | +                    | +                              |                           | +                | +                |
In this model, the same basic needs item may have different characteristics depending on whether it is being produced by the private sector or by the public sector. This can explain why there is a private demand for some basic needs items (for example, education and health) in spite of the fact that such basic needs items may be supplied free by the government.

Furthermore, the new approach will demonstrate the ways in which the contradiction between government decisions on basic needs allocation and individuals' preferences are being solved. Since some market transitions are possible, excess demand or excess capacity in some basic needs services may be revealed.

Finally, the satisfaction of basic needs has a static as well as dynamic connotation. The static aspect reflects the actual situation while the dynamic aspects represent the life history of the individual. Some actual items of basic needs satisfaction contribute to the accumulation effect while others represent only current consumption. This aspect which was hardly dealt with in an analytical way in the literature can be analysed here using the characteristic approach. This is because both current and history contribute to a given set of characteristics which may change over time.

B. Individuals' Production Function

For the purpose of illustration, the model will be discussed in a two-dimensional diagram which represents a situation of two characteristics \( z_1 \) and \( z_2 \) and two basic needs categories I and II. In addition, in order to simplify it is assumed that even if the quantity of the basic need item will change, the share of characteristics in this product will remain constant. This implies that each basic needs item can be represented by a straight ray from the origin (0).

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Now, let us assume that the government has a budget \( G \) that it wants to allocate to basic needs satisfaction and that, for the moment, the economy consists of identical individuals which will be represented by individual \( i \).

If the government will decide to allocate all of its basic needs budget to one category only, the maximum attainable set of characteristics, using the individual production function can be represented by point A. On the other hand, the government may decide to allocate all its basic needs resources to the second basic needs category. Using the individual production function the maximum attainable set of characteristics in this case can be represented by point B.

Suppose now (as is usually the case) that the government decides on sharing its basic needs budget among the two basic needs categories so that a "mixed strategy" (basic needs package) is applied. This can be represented by a ray started from the origin and bounded by the two basic needs categories (I and II), for example, process P.

As noted in the literature (for example, Streeten, Isenman, 1980), there are enforcement mechanisms between the satisfaction of different basic needs items and the maximum attainment set of characteristics according to process P will result in point C. This point, representing the mixed strategy, will be above the line AB connecting the two pure strategies I and II.

Different combinations of the two pure strategies will result in a point similar to C. The curve connecting all these points (ACB) can be called the individual production possibility frontier (IPPF). This frontier, (as is illustrated in the graph with one mixed strategy) indicates the maximum attainable set of characteristics by a representative individual \( i \) with a given budget \( G \), and a given technology.

We will analyse here some possible variations in the production possibility frontier.

(i) Change in the government's basic needs budget is likely to cause a shift in the individual's production possibility frontier.

Suppose there is an increase in the government's budget allocated to the satisfaction of basic needs from \( G \) to \( G_1 \). Now the Individual Production Possibility Frontier will move to \( A'C'B' \) (or with more than one combination to
A'C'B'). This new IPPF may not be parallel to the previous one due to returns to scale embodied in the production process which in general differs across different categories of basic needs (as is demonstrated in figure 1).

(ii) Change in the available technology to produce basic needs items may change the individual's production possibility frontier. A more efficient technology will result in an increase in production of basic needs items for the same government budget $G$. This in return will increase the output of characteristics. Also, as in the previous case, here the new IPPF is not necessarily parallel to the old one. Similarly, one can analyse change in prices of supplying basic needs items.

(iii) Now we will lose the hypothesis of one representative individual and we will examine what individual characteristics will make the production possibility frontier different.

The analysis will be made according to sex, age and occupation.

I. **Sex.** As was suggested in the literature,¹ malnutrition may have devastating effects on pregnant women and on the physical and mental health of the child after birth. If we define the set of characteristics to be mental and physical health and the basic needs item to be nutrition and health services we will see that for a given unit of such basic needs item the pregnant women production function will produce much more characteristics than any other group in the population. Along the same lines, one can show that the returns for education for mothers are higher than other groups in the population.² Such education will have several by-product effects. It will

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increase the mothers' ability to educate their children, to use contraceptives (and therefore fertility may be reduced), to use proper nutritional basket, to prepare the food without losing its nutritional content, etc.

II. Age. The literature is rich with studies \(^1\) pointing out the effects that malnutrition has on children's ability to process information, on performance at school and on their intellectual level (for example, I.Q.). However, some studies have indicated that the ability to process information is the highest for young children and, therefore, the returns to education for this age group, in terms of characteristics such as learning ability, knowledge, etc., are quite high. At the other extreme, one finds the aged for characteristics such as physical health, etc., an investment in nutrition, health services and housing may have higher output than other groups in the population.

Considering the above, one can point out that the individual's production possibility frontier will change with age. In babyhood, higher production of some characteristics may be achieved with good nutrition. In childhood, it will be education which will have the highest returns of characteristics. In adulthood, it may be either basic needs item (see next sub-section) which may have the highest return. This may depend on occupation, profession, etc. In later life, nutrition and health will have quite a high production of special welfare characteristics.

III. Occupation. Studies \(^2\) in several developed and less developed countries have indicated the effects that health services and nutrition may have on productivity of manual workers and other occupations.

These studies suggest that if productivity is one of the characteristics, a given unit of nutrition may yield the highest characteristics when it is given to manual workers as opposed to other professions.

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1. (See footnote 1 on previous page) and also Florencio Cecilia and Victor Smith, "Efficiency of food purchasing among Working Class Families in Colombia", Journal of the American Dietician Association, 55, No. 3, Sept. 1969, pp. 239-245.

IV. Socio-Economic Groups. A similar analysis may reveal that the individual's production function may differ across socio-economic groups. Such groups can be defined according to job status, level of education (which may be correlated to the former), income level, ownership of means of production, family structure, age, sex, sector in the economy (urban/rural), socio-economic background or a combination of more than one of the above.

Naturally, the production possibility frontier will differ across different socio-economic groups. However, given the criteria according to which the socio-economic groups were distinguished and based on the discussion before, one can derive such production possibility frontier for each group and order then according to the maximum output of some characteristics produced with a given unit of some basic needs items.

C. Preference Sets

The government which finances the basic needs programmes has a set of preferences defined in the same set of characteristics $z_1 z_2$. This set of preferences can be represented by a utility curve $U_G$ which is tangent to the individual production possibility frontier at point E. (See figure 2.) A basic needs package which maximises government preferences given its budget, the individual's production possibility frontier and the technology to produce the basic needs items.

Individuals, on the other hand, derive their utilities from the same set of characteristics.¹

This is represented in Graph 2 as $U_I$. The tangent between the individual utility curve $U_I$ and the individual's production possibility frontier (point D) defines the combination of basic needs items (given a budget constraint) that the individual would like to consume. Point D in general may differ from point E in which government utility curve is tangent to the individual production possibility frontier.

¹ One can argue that in some cases the utility is derived from the basic need itself and not from the output characteristic. For example, level of education can be a source of utility and not the characteristics derived from this level of education.
A government's preferences and an individual's preferences will not necessarily coincide. The difference between the two will lead to an adjustment process. Two cases may be distinguished here. The first is when there is a shortage of demand for a basic needs good that is available free from the government. This excess capacity will not be used by the individual. Some examples may include schools that are not fully utilised, health institutions that are not being fully employed, etc. The other case is when the individual's demand for a specific basic need item exceeds the quantity supplied free (or subsidised) by the government. In this case the excess demand will be purchased through free market activities. This is the case for private education, private health and private housing services. (The problem of different quality of private and public basic needs items is reflected by the different characteristics in this approach.)

1 Sometimes this excess demand may be an element in developing black market activities.
(i) Change in Government Policies

Government basic needs policies can be conceptualised in terms of two variables. Firstly, the size of the government budget allocated to basic needs satisfaction and, secondly, the allocation of this budget among the different basic needs items.

For methodological reasons and without any loss of generality, the analysis will be separated into the two different variables. A policy that may contain the two ingredients will have a combined effect.

The first policy change is a change in government budget allocated to basic needs satisfaction and will have an effect on the individual's production function. An analysis of such a case can be found under section B (ii) above.

For the second policy change one could suppose that the government has changed its preference and instead of producing a package represented by $P_1$ it will produce a package represented by $P_2$. Note that there is no change in government budget allocated to basic needs.) In this case the individual production possibility frontier will change from ABC to ADC (see Figure 3).

Figure 3
If the representative individual has a utility curve $U_1$ then the change in government preferences without changing its basic needs allocation will result in an increase in the individual's utility from $U_1$ to $U_2$. Alternatively, the representative individual may have a utility curve of the second type $U_2$ and the change in government preferences will bring with it a decrease in the level of welfare from $U_1$ to $U_2$ even though the government did not change its basic needs budget.

(ii) Change in Individual's Utility Curve

The individual's utility curve will change as a result of an individual change in his/her time preferences according to his/her life cycle. When individuals are still young they are concerned mostly with the present (carefree youth). However, as time passes the individuals change their preferences and become concerned with long-term investments. Gradually, as the individuals get older they will shift their preferences from long-term to short-term ones up to the point when they get old and have quite short-term preferences.

If $z_1$ will represent short-term characteristics and $z_2$ long-term characteristics, individuals utility curve will shift from $U_{T_1}$ to $U_{T_2}$, $U_{T_3}$ and $U_{T_4}$.

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1 Individual preferences can change not only as a result of age. Variables such as change in location, change in marital status, etc., as additional factors that may influence such preferences.

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Figure 4
These changes in the shape of the individual's utility curve are independent of the changes that occur in the production possibility frontier over the individual's life cycle (see discussion in subsection B). However, the combined effect may shift the tangency point between the two curves. The direction and magnitude of the change may vary across different population groups. Similar analysis can be done in regard to changes in individual preferences as a result of change in marital status or as a result of a change in location, etc.

D. The Evolution of Basic Needs Satisfaction

As the level of basic needs satisfaction increases some human capital accumulation effect takes place. As a result, the individual's production function will change its shape over time. On the other hand, individual utility function may change as well as a result of this increased satisfaction.

As a result of the two, there will be a series of maximisation points which will define the individual optimal path given to a basic needs budget (which may change over time). This will give us at each point in time the optimal strategy according to the individual preference.

**Figure 5**
On the other hand, the government utility function may change over time as an increase in basic needs satisfaction takes place. This will result in an optimal government path $O_{G}$. The difference between $O_{I}$ and $O_{G}$ represent demand (or excess capacity) for the basic needs goods in the free market.

Changes in government budget allocated to the satisfaction of basic needs will result in changes in the optimal government and individual paths which will result in different demand in the private sector.

The evolution of the individual's production function over time depends on the returns to scale characteristics of the production function. It seemed reasonable to assume that in the beginning of the development process the production of characteristics will have increasing returns to scale, while later on it will have diminishing returns to scale. This is represented in Figure 5 by the shift from $T_{1}$ to $T_{2}$ and back to $T_{3}$. It also seemed plausible to assume that, at least for some basic needs items, the individual demand for basic needs items and the government's supply of such items will be quite similar. However, as the development process continues, we expect a gap to arise as the government may reduce its share in financing basic needs projects and the individual increase his demand for such items. This gap may narrow again as the country becomes a so-called "developed country" and the notion of a welfare state is applied by the government (in Figure 5 th shift of the tangent points A and B).

E. Extension to Different Socio-Economic Groups

Since the basic needs approach to development emphasises the social as well as the economic aspects of the development process, the effects of basic needs policies should be analysed in terms of their influence on different socio-economic groups in the economy. (See discussion in subsection B above.)

The analysis will start constructing the Production Possibility Frontier for the whole economy and then constructing the Government Grand Utility Curve. The possible consequences of government utility maximisation followed by a numerical example will conclude the analysis.

(i) Construction of the Grand Production Possibility Frontier

We will assume that there are $n$ socio-economic groups in the economy defined according to one of the criteria mentioned in subsection B and that the $j$th
group can be represented by a representative individual \( i_j \). As was discussed previously, the different socio-economic groups will have different production functions as well as different sets of preferences. In addition, the government may have a different set of preferences for each group and a weighting scheme between the groups.

We will further assume that the government has decided on its basic needs budget and there are \( m \) discrete possible allocation scenarios of this budget. These scenarios are mutually exclusive. Each scenario can be described by a vector \( s_k \) where the components of such a vector represent the share of the basic needs budget that is going to the \( j \)th socio-economic group. The \( m \) scenarios applied to the \( n \) socio-economic groups can be described in the following matrix.

**Chart 2**

| Socio-Economic Group | Scenario 1 | Scenario 2 | \( \ldots \) | Scenario \( k \) | \( \ldots \) | Scenario \( m \) |
|----------------------|------------|------------|----------------|----------------|\ldots |----------------|
|                      | \( g_{1k} \) | \( g_{2k} \) | \( \ldots \) | \( g_{jk} \) | \( \ldots \) | \( g_{nk} \) |
| \( \ldots \)        | \( \ldots \) | \( \ldots \) | \( \ldots \) | \( \ldots \) |\ldots | \( \ldots \) |
| \( n \)             | \( g_{1n} \) | \( g_{2n} \) | \( \ldots \) | \( g_{nk} \) | \( \ldots \) | \( g_{nn} \) |

where \( g_{jk} \) represents the share of the \( j \)th group in the basic needs budget according to scenario \( k \). According to this, \( \sum_{j=1}^{n} g_{jk} = G \) for each \( k \).
For each scenario one can construct a production possibility frontier for the whole economy. This will be illustrated below in the simple case of only two socio-economic groups and two basic needs items. First we will represent the two different production possibility frontiers for the two socio-economic groups.

**Figure 6**

ABC is the production possibility frontier of the representative individual of the first socio-economic group while DEF is the same for the second socio-economic group. As with the definition of PPF for one individual representative, the production possibility frontier for the whole economy as a whole can be defined as the maximum attainable characteristic basket that can be produced in the economy with a given budget. In our case, with two socio-economic groups and one possible basic needs package, the economy production possibility frontier can be represented by DGBC.
This illustrates that production along AGEF (as well as at any point between DGEC and the origin) is not efficient from the overall economy point of view. It does not mean that individuals do not have their own set of preferences which may well be of an inefficient point from the economy point of view.

In a similar way to section B, one can allow for more basic needs packages and thereby construct a production possibility frontier for the economy given a scenario \( S_k \). This is represented in our example by the curve \( DBC \).

We can now consider the \( m \) possible scenarios. Following the process before, for each scenario one can construct a production possibility frontier for the whole economy. Accordingly, five different possible curves for five different scenarios are presented in the figure below.

**Figure 7**

![Diagram of production possibilities](image-url)
One can define, The Grand Production Possibility Frontier for the economy as the outer envelope of all possible production processes. This is represented in the graph as the curve XYZW. Such a grand production possibility frontier will consist of groups for which one unit of input of basic needs will yield the highest output in terms of characteristics. Thus, the pregnant women and babies, with regard to nutrition; the mothers and children, with regard to education; the manual workers, with regard to nutrition and housing, and the elderly with regard to health, will be part of such a grand production possibility frontier.

(ii) Construction of the Government Grand Utility Curve

In a similar way, the government's set of preferences for the whole economy (Government Grand Utility Curve) can be constructed. In constructing this curve we assume that the government knows the production function of each socio-economic group and that its budget allocated to basic needs satisfaction has been decided already (for a change in the government budget see subsection B in this paper).

In maximising its utility function, the government may choose several alternatives which will determine the shape of its grand utility curve. It may want to increase basic needs satisfaction in the shortest possible time or maximise the number of people that are above a certain level of basic needs in a given period of time or to minimise the present value of absolute deprivation over time, or it may want to pursue a growth policy by increase in basic needs satisfaction, or it may want to maximise the welfare of the population during the period it is likely to remain in power, etc.

This Grand Utility Curve includes two components. Firstly, for each socio-economic group the government may have a different set of preferences. This is represented in our scheme by the different shape of each utility curve. In addition, the government, viewing the economy as a whole, may give preferences to some socio-economic groups versus others in allocating its basic needs budget. This difference in preferences is represented in our scheme as the distance between the utility curve at each point and the origin.

The combination of these two effects will define the Grand Utility Curve of the economy. Such a curve in a $z_1 z_2$ plane may have concave or convex characteristics. (See Graff, J.)
(iii) Efficiency versus optimality

Combining both the Grand Production Possibility Frontier and the Grand Utility Curve under a maximisation of the utility framework introduces the problem of efficiency versus optimality. From an efficiency point of view, the government should allocate its budget on one point along the Grand Production Possibility Frontier, (in figure 7 along XYZW). However, such an allocation may mean that one group (for example, the pregnant women) will get all government basic needs allocation, or it may be the case that all government basic needs budget will be allocated to only one basic needs item, for example, education. Such a situation would seem unreasonable from a socio-political point of view and only under rare conditions would it be acceptable to the government.

This implies, in fact, that government maximisation of utility process subject to the individual's production possibility frontier and a given budget may lead to an inefficient allocation of its resources (in terms of not being on the Grand Production Possibility Frontier) but to an optimal one from the government's point of view.

In our scheme this optimisation versus efficiency contradiction is represented in Figure 7.

The Grand Production Possibility Frontier is represented by curve XYZW. Every allocation along this curve represents an efficient allocation, for example, point A.¹

The curve KIJ represents a production possibility frontier with a different government allocation scheme (scenario number 4). The government maximisation process may lead to point B and C for example which, however, be inferior to point A in terms of the total number of characteristics. This implies that in our scheme $U^2 > U^1$.

¹ In the case that there is more than one tangent point between the Government Grand Utility Curve and the Grand Production Possibility Frontier the government will be indifferent between all these points. This is because all scenarios are mutually exclusive and all points are on the same government indifference curve.
The last assertion will be clarified using a numerical example.

Assuming that the government has a utility function of the form

\[ U_{ij} = \sum_{i=1}^{n} K_j a_{ij}^{0.5} b_{ij}^{0.5} \quad \text{for } i = 1, \ldots, n \text{ basic needs items} \]
\[ j = 1, \ldots, m \text{ socio-economic groups} \]

where \( U_{ij} \) is the utility of the \( i \)th basic needs item supply to the \( j \)th socio-economic group.

\[ a_{ij} \] is the number of A characteristics of the \( i \)th basic needs supply to the \( j \)th socio-economic group.

\[ b_{ij} \] is the number of B characteristics of the \( i \)th basic needs supply to the \( j \)th socio-economic group.

\[ K_j \] is the weight that the government assigns to the utility of the \( j \)th socio-economic group.

It can be easily shown\(^2\) that such an indifference curve is convex to the origin.

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1 Hendler, 1975.

2 Along any indifference curve for one basic need and for one socio-economic group

\[ \frac{dK_j}{K_j} = \frac{\frac{6^n}{a_j^{0.5}}}{\frac{6^n}{b_j^{0.5}}} \]

which implies that the slope is

\[ \frac{\partial a_j}{\partial b_j} - \frac{a_j}{b_j} \]
For the sake of simplicity, we will assume that there are only two socio-economic groups, 1 and 2, and two basic needs items, I and II, in the economy.

In this case, the utility of the first socio-economic group can be represented by

\[ U_1 = K_1(U_{1I} + U_{1II}) \]

and for the second socio-economic group as

\[ U_2 = K_2(U_{2I} + U_{2II}) \]

and the total utility of the government can be written as

\[ U = K_1U_1 + K_2U_2 = K_1(U_{1I} + U_{1II}) + K_2(U_{2I} + U_{2II}) \].

Assume now that the total characteristics of group 1 can be written as

\[ a_1 = 1I_1 + 4II_1 \]

and

\[ b_1 = 4I_1 + 1II_1 \]

where \( I_1 \) = the number of basic needs units of the I type supplied to the first group

and \( II_1 \) = the number of basic needs units of the II type supplied to the first group.

In a similar way, the total characteristics of group 2 can be written as

\[ a_2 = 1I_2 + 9II_2 \]

\[ b_2 = 9I_2 + 1II_2 \]

It is assumed here, for the sake of simplicity, that there are no enforcement mechanisms in producing the two basic needs items (the PPF will be a straight line).
The difference between the coefficients for the two groups reflects the different individual's production possibility frontiers. For example, the second group may be pregnant women, and the first one the rest of the population. The first basic needs item may be nutrition while the first one may be nutrition.

We will suppose now that the government budget allocated to basic needs is G and, for the sake of simplicity, we will further assume that the price of the two basic needs items is equal and given. According to this price, the government can produce either ten units of I or ten units of II or any other combination of I and II that will sum up to ten units.

We will further assume that in its utility function the government weighs the utility of the first group as double the utility of the second group. (This may be a result of political considerations, for example.) In this case, \( K_1 = \frac{2}{3} \) while \( K_2 = \frac{1}{3} \).

Figure 8

![Figure 8: Diagram showing the production possibility frontier and utility function for nutrition and education](image-url)
We will analyse several possible government basic needs allocations. This can be done according to the following table.

<table>
<thead>
<tr>
<th>socio-economic group</th>
<th>basic needs item</th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>I_1</td>
<td>I_2</td>
<td>I</td>
</tr>
<tr>
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<tr>
<td></td>
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<td>2</td>
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As can be seen from the graph, efficiency requires that the government will allocate all its basic needs to the second socio-economic group. This should be somewhere on the line AB. Suppose that the government utility curve is tangent to the economy production possibility frontier at point A. This point implies that the whole of the government's basic needs allocation is directed towards the second socio-economic group and is given to the first basic needs item (nutrition).

In this case I_2 = 10 and I_1 = II_1 = II_2 = 0 and the government utility can be calculated as

\[ U^1 = K_2 U_2 = K_2 U_2 = \frac{1}{3} \times 10 \times 90 = 10. \]

Suppose now that the government has decided upon the following allocation which is represented by point D on the graph:

\[ I_1 = 6, \quad II_1 = 2. \]

This allocation assumes 80 per cent of the government budget to the first socio-economic group and about 70 per cent to the second basic needs item. This is represented in Figure 8 by point D.
In this case the government utility can be calculated as

\[
U^2 = K_1 (u_{11} + u_{111}) + K_2 (u_{21} + u_{211}) =
\]

\[
= \frac{2}{3} \left[ (1 \times 1)^{0.5} \times (4 \times 1)^{0.5} + (4 \times 6)^{0.5} \times (1 \times 6)^{0.5} \right]
+ \frac{1}{3} \left[ (1 \times 1)^{0.5} \times (1 \times 9)^{0.5} + (2 \times 1)^{0.5} \times (2 \times 9)^{0.5} \right] = 12.33.
\]

We can see that government maximisation of utility consideration will make it choose point D over point A, and thus prefer optimality over efficiency.

F. Possible Obstacles to Pareto Efficiency

1. Illustration in the model

Several possible obstacles may prevent the economy from reaching Pareto efficiency. Two types of inefficiency may be distinguished. Firstly, when the inefficiency results in a sub-optimal point on the production possibility frontier and, secondly, when the inefficiencies result in a sub-optimal and sub-efficient point inside the production possibility frontier. Although we will discuss only a limited number of cases here it may, however, be applied to more cases.

(i) The government may not perceive or may be misinformed about the individual's production possibility frontier. Such misperception, as the analysis below shows, may lead to a misallocation of resources among the different basic needs items as well as to a reduction in the government utility.

Figure 9
The "real" production possibility frontier of the individual can be described in the illustrated simple case by ABC (figure 9). Suppose now that because of misinformation, misperception, etc., the government is led to, or decides to believe that the individual's production possibility frontier is A'B'C', more efficient in I and less efficient in II. The maximisation of government utility which results in D in the "real" case will result in D' in the second case.

This shift from D to D' implies a decline in the government utility (from U to U') as well as a shift in government allocation of its budget towards the first basic needs item. The analysis can be extended to include several socio-economic groups. In such a case there will be a misallocation of resources not only among the basic needs items but also among the different socio-economic groups.

This misinformation or misperception may be a result of political pressures on different groups in the economy. Such groups, because of self-interest, may stress the importance of one basic need over the other, or one socio-economic group over the other, and the contribution that such a suggested allocation may have in the economy. These political pressures may, of course, influence the government utility function as well.

A similar result may be reached when the government, itself, imagines the advantages or characteristics that in reality do not exist.

(ii) The individuals may not operate to their full "capacity". It may be a result of individual psychology or political environment which may lead to such obstacles. (James, J., forthcoming 1983.) In this case the production possibility frontier is not reached and the individual production is done in a sub-optimal state. This in turn may lead to misallocation of the government budget.

Such inefficiencies in production may be higher for some basic needs than for others which is also the case regarding some characteristics versus others.
(iii) Dependence within the household can create externalities in the production process which may result in inefficiencies. This is because the production of characteristics by one household member has an effect on the production process of another household member.

(iv) Finally, one should note that, as our framework demonstrates, for the government to reach an efficient point (under its scheme of utility maximisation), it should have fairly extensive information and knowledge of the effects that the satisfaction of the different basic needs items have on the different socio-economic groups. In addition, the government has to perform a fairly complex series of calculations in order to find its optimal allocation.

These requirements in the development world may not be feasible. It may be the lack of knowledge, technology, capacity or ability which in practice prevent a government from reaching an optimal-efficient path.

2. Some Empirical Evidence: The Case of Sri Lanka

The Sri Lanka case study provides us with some evidence of the misallocation of government basic needs expenditures. Most of the social programmes in the 1950s and 1960s were given to anyone regardless of his/her level of income. The rich together with the poor enjoyed subsidised food, free education and health services. It is a clear case of government's optimisation of its utility versus overall efficiency considerations.

In addition, one can point out that almost no advantage was taken of the enforcement mechanism between the different aspects of basic needs on the

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1 Isenman (1980) estimated that an average of two per cent of GDP could be saved each year if only the ration programme would have been restricted to the poorest part of the population. See Isenman, Paul: "Basic Needs: the Case of Sri Lanka", World Development, Vol. 8, pp. 237-258, 1980.
input level. Almost no attempt was made to combine projects aimed at satisfying more than one basic need — for example, health, nutrition and education. Also, there was no consistency between the level of satisfaction of the different ingredients of basic needs. (Gutkind, 1982) For example, the effects of literacy on life expectancy and on infant mortality or investment in education while the highest unemployment rate was among educated people. The last few assertions emphasise the inefficient process along which basic needs policies were implemented in Sri Lanka.

Conclusions

This paper presents a simple framework of analysing government decisions in the allocation of its budget among different basic needs categories and different socio-economic groups. The model presented in this paper assumes that the satisfaction of basic needs can be seen as an input to an individual production function of which its output can be described as characteristics which affect other individual patterns of behaviour.

It was shown that individual preference and government preference may differ so that excess capacity or private demand will be generated by the individual.

Change in government basic needs policies may harm some individuals in society while others may benefit from it.

Possible obstacles to obtaining Pareto efficiency have been examined. However, the model can and should be further extended to provide better understanding of investment in human capital. Possible extensions of the model may include government decision-making processes as regards expenditure on basic needs and on other items; or an analysis of investment in human capital as opposed to investment in material capital.
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