Development patterns and the international order

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DEVELOPMENT PATTERNS AND THE INTERNATIONAL ORDER

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1. Introduction

The concept of basic needs is today at the center of many discussions about development and the international order. Some international organizations are rethinking their prior evaluation of development policies based largely on aggregate economic output. The composition and distribution of this output, in particular, the welfare of the very poor, are increasingly brought onto the agenda.[1]

The general concept is certainly not new.[2] However, a feeling has prevailed among social scientists and economists in the North[3] that the concept had not been satisfactorily articulated in a formal way. What was desired was a formulation of basic needs strategy that could satisfy the following criteria. First, that it be amenable as a useful analytic tool, i.e., a tool of modelling and measurement of economic reality, and second, as a practical tool for the evaluation of policies of development and questions of international order.

The purpose of this article is to address these questions using as a basis the Bariloche Model. This model studies development strategies oriented towards the satisfaction of basic needs of the population of different regions of the world, and it does so for the first time in the context of large scale econometric development modelling.[4]

I will discuss the results of the model and then analyze further the implications of the basic needs

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1. For example in 1977 the World Bank has stated that it is considering reshaping its development aid policy to emphasize projects that improve human requirements of the very poor. (New York Times, June 6, 1977). The principle of satisfaction of basic needs as a development goal has also been endorsed in the last 12 months by the International Labor Office World Employment Conference, and by the Secretary General of the United Nations in public communications. In an address to the O.E.C.D. (Paris, June 3, 1977) Cyrus Vance, U.S. Secretary of State, stated: "An important part of that declaration (of North-South relations) stresses increased attention to the basic human needs of all the peoples of the world. The old agenda for economic development and many of the old issues for negotiation are no longer enough. We need more focus on that part of the world population that lacks essential food, water, shelter, and health care, as well as employment and education. We must direct our efforts to meet more effectively the needs of the poorest peoples in the developing world."
2. Theoretical and empirical studies on the question came together for the first time around 1870–1890 in the work of two members of the Royal Statistical Society of Britain, Booth and Rowntree, who tried to set a scale of what is an acceptable standard of living and make it operational, see Philip Abrams *The Origins of British Sociology*.
3. As is by now usual the word North refers to the countries within the northern hemisphere which are at present most developed; the United States of America, parts of Europe; and Japan.
4. See for instance [4] and [2].

approach to develop policies, and to implications for the international economic order.

2. The Need for Alternative Theory and Statistics of Development

The term basic needs, as used in the Bariloche Model, refers to minimum requirements of food, housing and education that allow a human being to effectively participate in society.[5] The Bariloche model studies possible strategies of economic development towards the goal of satisfaction of basic needs of the population of different regions of the world. Hence, it does not concentrate on gross national product (GNP) measures of growth.[6] Also, it does not simply project present trends into the future, but also analyzes feasible alternative paths of development towards its goal.

Within the North, many social scientists have found themselves somewhat at a loss with respect to the concept of basic needs. It did not quite fit the stereotype of the quantifiable and amenable to data object mostly studied by their social sciences. However, as shown in the Bariloche Model and other recent works [4], [2], the criterion of basic needs satisfaction can be as amenable to rigorous theoretical and numerical analysis as any other concept used in econometrics, such as for instance those of production functions, capital stocks, etc. If anything, the handicaps of the analysis did not arise because of the nature of the object itself, but because of the characteristics of the present body of statistics being collected in most countries of the world. These statistics do not contain adequate measurements of income distributions, do not distinguish the composition of the economic product in some important ways (such as for instance luxury good from goods of a basic type consumed by most of the lower income groups) do not measure the satisfaction of minimum needs of the population, etc. Since these statistics in turn were designed with a certain theoretical framework of development in mind, based mostly on the value of aggregate economic output at market prices, we have come full circle. What is or is not observable is largely determined by the existent observations and underlying theories. And what is or not observable determines to a large extent what theories may be constructed. Hence, existent theories and observations condition our understanding of reality and our intellectual work. By pointing out the need of a different set of data, focused on composition and distribution of the product, the Bariloche Model also pointed towards what should be observed, what data should be collected.

Some economists in the North find it hard to

5. These minimum standards are physical, and also cultural and economically determined. The level of activities of an individual, and her/his physical size also affect the minimum requirements.

6. Western type economic development based on a form of industrial growth and best measured by GNP statistics is not necessarily a prerequisite, neither is it sufficient for the satisfaction of basic needs. In the case of freedom from hunger this was pointed out by a panel of experts on agriculture and nutrition convened by the National Research Council and supported by the National Science Foundation in the U.S., in a 192 page report to President Carter, released June 23, 1977. As pointed out by this panel, countries like Sri Lanka, South Korea, Taiwan and China with low income per capita and different political structures, have largely solved the problem; for example Sri Lanka, South Korea and China have per capita incomes of less than 400 US Dollars a year.

distinguish between 'needs' and 'wants'. Indeed, for the developed world, less than one fourth of humankind, these differences are blurred. However, most economists within the third world, or with third world experience, do not have problems understanding what is meant, say, by survival values of nutrition in a certain area, etc. At the risk of sounding simplistic, I would say that at the core of the intellectual differences seems to lie a difference of realities. Indeed, the reality of the third world imposes itself so strongly that its social scientists, by and large, are shaped by it.

However, little theory has been constructed that adequately encompasses development problems with a third world perspective. This is in part due to historical circumstances, and is reinforced by the implied structure of intellectual communication, and by the characteristics of production of economic modelling. These have biased in the past the focus of analysis towards the North; for example, most econometric work is produced and read in the North, largely by Northern scientists. If there is no theory to study such development problems, it is not because the problems don't exist or are not amenable to scientific, quantifiable analysis. If there is no theory, it should be constructed. If there is no data, it should be collected.

This discussion about the different approaches to development is not purely academic. A point I want to make here, that is further developed in Section 4, is that they may have nontrivial consequences. As long as we keep on measuring and observing underdevelopment with the present restricted criteria used in the North, we shall be missing important problems and opportunities facing humankind as a whole and we shall be missing a historical opportunity to move towards an international order that most of us would consider better.

I shall first discuss the Bariloche Model, which was a spearhead of efforts to rethink development. Indeed, a distinction should be made between the origins of the model and its impact on helping reshape current development thinking—the latter may prove to be more important. I shall then go on to extend the analysis along the lines hinted above, to the relationship between the structure of domestic distribution, development and the economic relations between the developed and underdeveloped world.

3. The Bariloche Model and Its Results

The idea of building this model emerged at a meeting sponsored by the Club of Rome and the Instituto Universitario de Pesquisas de Rio de Janeiro, Brasil, in 1970. The meeting was held to analyze and discuss the results of the Limits to Growth report.[7] The scenarios of this report suggested that the world was headed towards economic catastrophe because of the contradictions generated by unplanned and unbounded population as well as consumption growth on an finite planet. The scenarios of the Limits to Growth were particularly disturbing for the poorer countries for whom they implied the need of stopping economic development in order not to deplete finite resources or self-destruct with environmental poisons. From the point if view of the third world,

7. This model was carried out by an MIT research team, directed by Dennis Meadows and sponsored by the Club of Rome, published in *The Limits to Growth*, 1972.

given the publicity that these results had, there was the danger that they would help establish currents of opinion against its claims to development and a more equal participation in the world economy. For, if those views were to be accepted or internalized by public opinion and mythology, their development could be viewed as a danger for the availability of resources, or for the environment of the planet. These ideas could in fact be telling the third world to 'stay in its place, for the sake of the planet's survival.'

But third world scientists were well aware that 85 percent of the world's resources were actually being used by less than 20 percent of the world's population, and that this 20 percent was in the North. Similar figures were valid for pollution. We were also aware that even though what is now considered earth's nonrenewable resources are limited, the conclusions of the Limits to Growth model were not necessarily correct. In addition, we were also aware that a choice between death by environmental poisoning or depletion, on the one hand, and death by malnutrition and economic deprivation on the other is not a choice at all.

A committee sponsored by Latin American scientists outlined the general aims of the project, that was carried out in Fundacion Bariloche, Bariloche, Argentina.[8] A small part of this project was sponsored by the Club of Rome, and most of the research was supported by the International Development Research Center of Ottawa, Canada. The idea was to produce a world model to examine alternative possibilities for the future with a Latin American and, more generally, a perspective from the point of view of the majority of the people of the third world. The research was carried out by a team of experts on food, economics, education, health, pollution, population and computation. In the following, I shall describe the economic structure of the model on which the different aspects fitted,[9] and then briefly summarize the findings and conclusions of the model. For a full account of the theoretical structure of the model and related work, see [2] and [4].

The study of the Bariloche team was completed in a period of about four years. It was geared to

8. A research foundation in Bariloche, Rio Negro, Argentina supported by private and government funds.
9. I was responsible for the economic structure of the model.

The complete project team consisted of:
Amilcar O. Herrera (Director) (Nonrenewable Resources, Pollution)
Hugo D. Scolnik (Deputy Director) (Demography, Computation)
Graciela Chichilnisky (Economics, Mathematics)
Adolfo Chorni (Health)
Gilberto C. Gallopin (Food, Pollution)
Isabel Gomez (Food)
Christian F. Gravenhorst (Assistant to the Director)
Jorge E. Hardoy (Housing and Urbanization)
Diana Mosovich (Housing and Urbanization)
Enrique Oteiza (Education)
Rafael Pastoriza (Computation)
Victor H. Ponce (Pollution)
Gilda L. de Romero Brest (Education)
Juan V. Santiere (Economic Data)
Abraam Sonis (Health)
Juan V. Sourrouille (Economic Data)
Carlos E. Suarez (Education)
Luis Talavera (Computation, Demography)
Gregorio Weinberg (Editorial Advisor)

Consultant Committee consisted of:
Helio Jaguaribe, Carlos A. Mallmann, Enrique Oteiza, Jorge Sabato and Osvaldo Sunkel

explore the existence of alternative development strategies for the third world consistent with the availability of natural resources and a variety of environmental factors. The model, in particular, was to answer certain specific questions: Is it physically viable for different regions of the world to attain adequate standards of living in view of the limitation of their natural resources and the negative environmental effects of industrial production of goods and services? If so, under what conditions on the demographic as well as socio-economic variables? In what time horizons? What would be the main limitations, and what would be the trade-offs between possibly conflicting goals?

A basic premise set for the economic model was that there was no reason why the results of the Limits to Growth model should necessarily carry over if there was any degree of rationality or adjustment of economic agents to their environment. In other words: it seemed less likely that present trends of production, consumption, population growth and environmental insensitivity would continue blindly into the future, heading towards a catastrophe, as assumed by the Meadows team, than that some adjustment of the human actors to economic circumstances would occur. Hence, rather than projecting the future as a magnified carbon copy of the present, we set to look for alternatives. The logics behind this can be described as follows. In order to contradict a statement of the type 'A catastrophe will necessarily occur' it is only necessary to prove 'A catastrophe may be avoided provided measures, X, Y, or Z are taken.'

We constructed a model of the world economy where feasible development paths were proven to exist for most regions of the third world in which the environment was neither poisoned nor depleted, and we spelled out its conditions.

Since the model was not to be just a projective exercise, a second problem was to define the *goals* of the proposed development policies, i.e., what was an admissable or feasible development path. By contrast with most development planning goals which set GNP targets, ours was set to be the per capita satisfaction of basic needs of the population in real terms: feasible paths were those that achieved per capita consumption of three goods, food, housing and education, to reach or exceed certain minimum levels. These levels were given by the minimum requirements for an individual to effectively participate in society; they are partly economic, partly physical and partly culturally determined, and certain common denominators were approximately given for each of the regions under consideration by the experts of the team.

It was decided to prepare a separate economic analysis of certain regions of the world, and to study each with a high degree of independence, in contrast with other previous world modelling efforts. These regions were the developed countries (which for the purpose of the analysis were not differentiated by their political or social organization), and three regions in the underdeveloped world: Latin America, Africa and Asia. This was done for several reasons. One was to establish whether the various regions (or nations within them) could attain the specified goals using, in the main, their own resources. This would also help to answer questions of whether it is the development of the underdeveloped world or the continuation of the present trends of growth

and consumption in the North that should be considered more responsible for possible environmental disruption and depletion, or even a catastrophe. Another reason was that the similarity of the initial conditions of a group of nations within a region would make it plausible to study for all a relatively similar set of development strategies. It turns out that even within these blocks great disparities could be found. Perhaps it would have been ideal to disaggregate them into yet more homogeneous regions but operational requirements initially precluded this: at present further disaggregation is being performed over smaller regions and also for specific countries such as Argentina and Brazil. In any case the model concentrates especially on the problem of countries in the third world, and so they receive a more detailed treatment than do the more economically advanced nations.

The economic model was then constructed to simulate in each group of countries in broad terms the functioning of an economic system of production and demographic growth through time. Given initial quantities of resources, capital and labor of different types, the economic system produces goods grouped into sectors: three basic goods (nutrition, education, housing); a capital goods sector; and finally a sector of other consumption goods and services. This last sector comprises all that is not in the other four. The growth of the population is related to, in the sense of being partly a function of, per capita consumption of basic needs. The model concentrates on finding feasible development paths, described by consumption-investment choices as well as by choices of allocations of resources among the five sectors of the economy. The goal of per capita consumption of basic needs is attained by planning the use of resources and of consumption-investment through time. Such a planning approach is adequate for a physical feasibility study and for finding broad guidelines for possible growth strategies. For mixed (partly market, partly planned) economies, which form the bulk of the model, a study of the effects of the market system on production and distribution of goods could provide a framework for a further study of socioeconomic feasibility. These points are discussed in Section 4.

As mentioned above, the output in the three basic goods sectors is measured separately and in real terms, and it is given in number of standard units of basic goods produced in each sector. For example, the housing sector production function describes a relationship between resources, capital and labor used on the one hand and number of units of houses of a basic type produced on the other. The experts on housing decided what should be considered as a basic housing unit for a family in each of the regions.

We found, however, that in general there are no statistics to measure these types of output. This is another example of the type of statistical problems discussed above, which represented an empirical as well as a theoretical difficulty in structuring the model.[10] The output of the housing sector for a given capital/labor unit would, for instance,

10. It also represented for me a test of perseverence in the face of tried and practical attitudes towards building a model, coming from the people within the group that knew the existence data, and hence leaned towards a GNP measurement of growth as the only feasible, observable, amenable to theory and data, etc.

be obtained from present statistics in total dollar value of houses produced, but one cannot in general distinguish whether one large house or twenty medium size units were produced. On the face of this lack of data the desired measurement of output then had to be approximated by dividing the value of housing produced for each capital/labor/resources combination by the market cost of a 'basic housing unit.'

The method used for measuring output in the economic model is not the usual in the development literature. It literally studies output as a *vector* of real goods rather than as a number or a dollar sum of value of goods produced at market prices. Even though prices were used in the computations as explained above, the monetary value of the output was not the target, but rather the amount of units of basic goods being produced. This way there are no trade-offs here between types of consumption as in the case where there is one number representing value of output, given by GNP or a welfare function. The level of satisfaction of basic needs is measured simultaneously in per capita consumption of each basic good separately.

The model had an 'adjustment of data' period in which the parameters of the model were calibrated, from 1960 to 1970, and then a 'future development path' period starting in 1980. From 1970 to 1980 the model projects existing trends for the main variables. From 1980 until 2060, alternative paths of development are simulated. In this last period a choice could be made at each point in the run between allocating production goods in consumption or investment. In addition the resources and factors of production could be allocated for production in the different consumption sectors of the economy in different proportions (within limits). We then had a set of choices to make, and thus it was necessary to formulate a criterion of efficiency of the economic system that would conform to the goals of the model. First, a *feasible* path (there are in principle many of them) was defined as one from which resources, productive abilities and factors of production would reach the area of the three-dimensional space where the per capita values of consumption of the basic goods attained or exceeded the minimum requirements. An illustrative picture of a feasible path can be given as follows.

In Figure 1 the vector V represents the minimum values of per capita consumption of the three basic goods. The feasible path P reaches the region of vectors where all components of per capita consumption of the three goods are larger than or equal to the components of V. This region of satisfaction of basic needs is the shaded cone with vertex V in Fig. 1.

An additional criterion of feasibility was added: per capita consumption of basic goods cannot decrease through time along any feasible development path. This assumption in fact prevents the model from considering as solutions paths in which per capita consumption drops drastically at the beginning of the planning period so as to increase investment and to allow for more future consumption. We considered such type of paths undesirable from a social viewpoint.

Other special characteristics of the alternative paths of development of the model are due to the fact that the target of satisfaction of basic needs is given in per capita terms. For instance, per capita consumption of calories (total level of calories

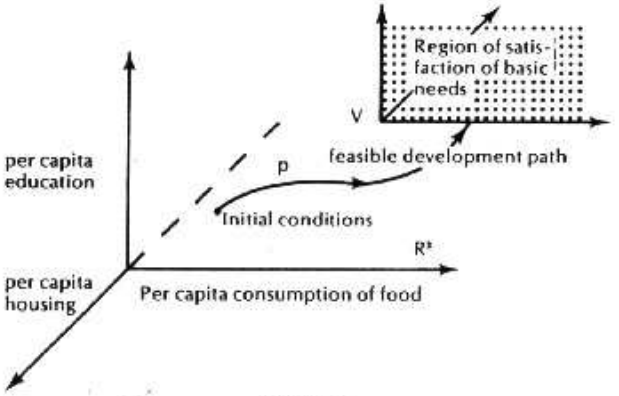

Figure 1

available for consumption over number of people) must eventually attain about a 3.000 calory/day level.[11] In this case, one way of increasing per capita nutrition is either to produce more total calories or to have less people to share them. This introduces an alternative to the usual consumption-investment choices in the planning models, for the reasons I shall explain next. We linked population size endogenously with some economic variables through a demographic submodel. This submodel permitted the exploration of one of the basic premises put forward by this study, namely, that a most adequate may of controlling population growth is to improve living conditions (with a lag). Both the research conducted in constructing the demographic sector and the results of the computer runs showed this hypothesis to be essentially correct. Hence, if present consumption increases (and thus present investment decreases), the per capita indicator of consumption may increase in the future (rather than decrease) because its denominator (population size) decreases. Thus, when concerned with per capita consumption indicators of development, the paradigm that for more growth there should be less consumption and more investment may be in part contradicted, at least for some ranges of the variables, for which more consumption means a decrease in the rate of population growth. Increases of human productivity directed to a betterment of living conditions is another way for this phenomenon to occur.

After defining feasible paths, one then defines efficiency in the model as a criterion to orient the economy in an optimal way. An *efficient* path is a feasible path that reaches the target area of satisfaction of basic needs (see Figure 1) as soon as possible (in terms of time, the model showed that different minimal time periods were needed for each of the regions). Remember that along any feasible path, per capita consumption has to be increasing or stable through time.

In the computational model the criterion of efficiency was replaced by that of maximization of life expectancy at birth at each point during the run. The two criteria are not the same; it was felt, however, that life expectancy at birth was a good proxy for the level of living conditions of the population. In addition, this latter criterion was chosen in the computational model for operational reasons.

11. This calorie level was determined taking into consideration losses due to transportation, packaging, distribution, etc., in addition to physiological needs for certain average levels of activities.

A final point to make about the structure of the model refers to the substitution of capital and labor. Within limits, we allowed a certain amount of adjustment of the technologies of production to the availability of factors of production. This point, together with the endogeneity of the population growth, represents a fundamental difference with other world models. For, in a model without any substitution between capital and labor (so-called fixed coefficient technologies), as soon as there is scarcity of capital, as is the case in most of the underdeveloped world, additional labor becomes redundant for production. In this case, capital becomes the only productive factor. If one adds an exogenously given rate of population growth, the situation can only deteriorate forever. Labor only consumes, and eventually, a catastrophe will necessarily occur, due to the assumptions of the model.

On the basis of the model that has been described we were able to study the physical feasibility of the basic needs goals for each region. Essentially this involved determining the period of time and the conditions under which the different regions could satisfy basic needs to given levels. We were also able to examine the effects of the proposed policies on demographic variables. Several runs were performed under alternative conditions. The main characteristics of the standard run are as follows (for details see [4]):

(a) The level of food and education required for satisfaction of basic need were 3,000 calories and 100 grams of protein per person per day and twelve years of basic education between the ages of 7 and 18. Slightly higher levels were fixed for developed countries. Regarding housing, the basic standard unit required about seven square meters per person and included complementary transportation and sanitary services.

(b) An aggregated yield of four tons per hectare per year (10^7 Kcal/ha · yr) is assumed in agriculture. Once the desired per capita level of proteins and calories is reached, a stock of food reserves is built up, depending on the economic potential and the competing demand on resources of the other basic needs.

(c) The optimization mechanisms transfer employment of labor from one sector of the economy to another, but the rate of transfer of labor among sectors cannot exceed 2 percent of the human power in any sector in a particular year.

(d) The maximum rate of investment was fixed at 25 percent of total product, based on historical experience and the consideration of social factors.

(e) A coefficient of technical progress was built into the production functions by modelling levels of technical change lower than those observed historically. Alternative runs were made without technical progress after the year 2000.

(f) It was required that until basic needs are satisfied the percentage of total output (in 1960 prices) allocated to sector 4 (of goods and services other than basic goods and capital goods) should not fall below 45 percent of total production, nor increase with respect to 1970 levels of allocation to this sector. This represents in fact a restriction on non-essential consumption until basic needs are satisfied. On the other hand it represents an upper bound on this restriction so as not to interfere with the functioning of the infrastructure of the economy.

TABLE 1

Evolution of the Main Economic and Demographic Indicators for *Developed Countries*

	1960	1980	2000	2020	2040	2060
Economic indicators						
Total per capita value of output in 1960 prices	1402	2962	4778	5984	7512	9470
Investment rate (% of above)	21.6	25	11.9	10.2	9.2	8.1
Consumption (%)	49.5	55.6	70.9	75.0	80.5	85.4
% allocated to food	16.7	8.69	8.03	6.7	4.13	2.52
Demographic and health indicators						
Population growth rate (%)	1.3	0.41	0.22	0.03	−0.05	0.04
Total population (millions)	947	1082	1150	1181	1175	1177
Life expectancy (years)	69.2	71.15	71.20	71.24	71.33	71.4
Crude mortality rate	10.8	10.2	11.7	13.85	14.6	13.65
Birthrate	21.3	14.2	14.11	14.1	14.05	14.08
Infant mortality	26.6	21.58	21.30	21.20	20.99	20.87
Persons/family	3.7	3.4	3	2.84	2.8	2.86

(g) The constraints on natural resources, land availability and pollution levels were built into the production functions of the sectors.

(h) In developed regions when GNP exceeds $4500 per capita (in 1960 US Dollars) annual economic growth was somewhat restricted; this was not the case for underdeveloped regions. The object of this differential was to reduce the gap between the developed and the underdeveloped world.

The tables below give the results of the runs for each region including only the most important socio-economic indicators. The data on the levels of per capita consumption of basic needs in real terms can be found in [4]. For purposes of presentation we give here the total output value of consumption in 1960 prices only. In view of the previous discussion this is adequate for limited purposes. It should be noted that the level of output is, however, obtained by following a policy of satisfaction of basic needs in real terms and not maximizing GNP. In each region the level of satisfaction of basic needs is obtained at different total values of output, since each region pursues its own basic needs strategies with different factor and resource costs, and methods of production. The demographic variables obtained in the run are related to the consumption of basic goods, also with a lag.

Predictably, given the initial conditions, basic needs are satisfied in the developed countries in the first years of the run (Table 1). GNP grows from $1402 in 1960 to $4500 in 1995; growth rate decreases then with GNP per capita reaching US $9470 in 2060. The population growth rate, which was 1.3 percent in 1960, is reduced to zero by 2023

TABLE 2
Evolution of the Main Economic and Demographic Indicators for *Latin America*

	1960	1980	2000	2020	2040	2060
Economic indicators						
Total per capita value of output in 1960 prices	372	530	1107	2247	3822	5746
Investment rate (% of above)	18.2	21.2	25	25	25	25
Consumption %	49.6	55.8	54.8	59.8	60.6	61.6
% allocated to food	21.2	14.21	10.63	7.69	6.3	5.34
Demographic and health indicators						
Population growth rate (%)	2.8	2.6	1.27	0.89	0.56	0.43
Total population (millions)	208.4	350.6	486.3	601.2	693.9	759.2
Life expectancy (years)	55.8	65.8	70.24	70.75	71.04	71.38
Crude mortality rate	14.7	7.02	5.91	8.53	11.56	12.03
Birthrate	40.36	30.04	18.34	17.57	17.07	16.22
Infant mortality	115	37	24	22.5	21.7	20.88
Persons/family	4.5	4.9	3.5	3.3	3.1	3

after it fluctuates, being positive and negative around zero, and the population remains essentially constant. These fluctuations are due to mortality rate which varies in relation to the pyramid of population. The advanced countries can reach high levels of well being even if their economic growth is somewhat restricted; they have the opportunity to reduce work and increase leisure time while maintaining a growth rate that allows them to preserve and improve the physical and human environment.

If the proposed policies are implemented, the general evolution of Latin America would make it possible to fullfill the basic needs of population around 1990 (Table 2). Regarding food, little extra land needs to be developed, but by and large land should be made available without rental cost to the food producers. The uncultivated land in 1960 was 85 percent, in 2060 is reduced to 63.2 percent and before the turn of the century a one year stock of food is accumulated and maintained until 2060. GNP per capita raises from US $372 in 1960 to $5746 at the end of the run. The satisfaction of basic needs is attained with a GNP of about US $809.

Under the proposed policies, Africa satisfies its basic needs but in a longer time period than Latin America, the target being reached in 2008, in approximately 30 years (See Table 3). Life expectancy increases continuously from the initial level of 43.3 years in 1960 to 70.4 by the end of the run. GNP per capita, US $137 in 1960, reaches US $559 in 2008 when all basic needs are satisfied and US $2657 in the last year of the run. The proportion of GNP allocated to consumption rises from 49.6 percent in 1960 to 61.6 percent in 2060. The pro-

TABLE 3
Evolution of the Main Economic and Demographic Indicators for *Africa*

	1960	1980	2000	2020	2040	2060
Economic indicators						
Total per capita value of output in 1960 prices	137	167	387	911	1728	2657
Investment rate (% of above)	15.1	16.7	25	25	25	25
Consumption (%)	49.6	53.9	45.4	51.6	59.6	61.6
% allocated to food	26.40	22.16	20	14.29	7.27	4.86
Demographic and health indicators						
Population growth rate (%)	2.6	2.69	1.93	1.19	0.79	0.37
Total population (millions)	257	432.4	701.5	929.2	1127	1260
Life expectancy (years)	43.4	48.4	64.6	68.8	70	70.4
Crude mortality rate	20.6	17.04	7.14	6.85	9.28	12.4
Infant mortality	196	163	39.9	27.4	24.4	23.2
Birthrate	46.5	42.8	24.6	18.7	17.1	16
Persons/family	4.5	4.7	4	3.5	3.3	3

portion of GNP allocated to food decreases from 26.4 percent in 1960 to 4.86 percent at the end of the run. The same conditions about land use are assumed as in Latin America.

The results of the run for Asia are very different from the results for other regions (see Table 4). Because of the initial conditions, basic needs are not satisfied to the desired levels; hence there are in principle no feasible paths of development (according to our definition) reaching basic needs satisfaction for this region under the assumptions of the standard run. The failure to attain satisfaction of basic needs to desired levels is due to a combination of circumstances. The problem of food in Asia is related, as discussed above, to the rate of population growth, which is reduced very slowly, and the population shows five-fold increases in eighty years, reaching 7480 million in 2040. Life expectancy at birth improves, but always below the level of other regions.

By 2010 all available land is being cultivated. Thereafter, economic effort in the food sector is devoted to increasing livestock and fisheries. This, however, is not enough to feed the growing population, and consumption starts at this date to drop drastically below the minimum needed for survival. The rapid increase in the cost of food production, due to the need to develop new land, takes resources away from the rest of the economy, hindering the satisfaction of the other basic needs. In summary, the delay in reaching adequate levels of well-being leads to a sustained high population growth rate and a vicious circle develops: increased population and increased cost of food make it more and more difficult to satisfy basic needs. In this run we wanted to test whether Asia could be self-sufficient in food. Hence, even though Asia could import food, this solution was not consistent with the requirements of the run.

TABLE 4
Evolution of the Main Economic and Demographic Indicators for *Asia*

	1960	1980	2000	2020	2040
Economic indicators					
Total per capita value of output in 1960 prices	89.7	135.6	262.8	450.7	707.3
Investment rate (% of above)	16	17	25	25	25
Consumption (%)	49.7	58.16	52.28	48.06	47.93
% allocated to food	27.2	18.94	15.70	21.20	22.27
Demographic and health indicators					
Population growth rate (%)	2.42	2.55	2.01	1.73	1.38
Total population (millions)	1544	2526	4021	5794	7940
Life expectancy (years)	48.6	55.65	66.8	66.17	66.72
Crude mortality rate	17.30	12.81	6.47	7.84	9.25
Infant mortality	148	99	32.2	33.8	32.4
Birthrate	37.8	37.1	25.55	24.9	22.7
Persons/family	4.63	4.92	4.69	4.27	3.56

An alternative run was performed assuming that Asia managed to raise agricultural yields to six tons per hectare, instead of four as taken in the previous run (see Table 5). Basic needs could then be satisfied. Per capita food consumption reaches 3,000 calories by 1994 and six years later desired protein levels are reached also. Schooling requirements are obtained between 2000 and 2010 and housing goals in 2020. GNP per capita US $89.70 in 1960 reaches US $506.20 in 2020 when all basic needs are satisfied. However, food is still a problem for the region, and by the end of the period available land runs out. It seems that family planning together with nonconventional sources of food or food imports are needed to close the gap.

In addition to the standard run discussed above, several others were performed with alternative hypotheses. The relationship between technological progress and socio-economic goals was checked in an alternative run where technical progress decreased after the year 2000 against historical trends. The consequences for the underdeveloped countries were serious. In Latin America, feasible paths exist but the satisfaction of basic needs takes a longer time period. In Africa and in Asia feasible paths don't exist, and their economic systems collapse.

International solidarity was tested in an alternative run, where the developed countries are not restricted in their growth and allocate up to 2 percent of their GNP to economic aid without repayment conditions to the more needy regions of Asia and Africa. The distribution of this aid is made proportional to the population and inversely proportional to life expectancy at birth, starting in 1980 with 0.2 percent of GNP and increasing until it reaches 2 percent in 1990. The results of this run suggest that demographic and socio-economic variables would not be greatly

TABLE 5
Evolution of the Main Economic and Demographic Indicators for Asia (Second Run)

	1960	1980	2000	2020	2040	2060
Economic indicators						
Total per capita value of output in 1960 prices	89.72	135.6	267.5	506.2	928.8	1516.
Investment rate (% of above)	16	17	25	25	25	25
Consumption (%)	49.7	58.16	53.07	52.16	53.83	53.55
% allocated to food	27.2	18.94	15.25	14.70	12.84	13.73
Demographic and health indicators						
Population growth rate (%)	2.42	2.55	2.04	1.16	0.82	0.55
Total population (millions)	1544	2526	4025	5498	6701	7649
Life expectancy (years)	48.06	55.65	66.77	67.83	68.36	68.68
Crude mortality rate	17.30	12.81	6.54	7.26	9.80	12.16
Birthrate	37.79	37.09	25.84	18.79	18.04	17.58
Infant mortality	148	98.95	32.58	29.60	28.38	27.49
Persons/family	4.63	4.92	4.72	3.47	3.24	3.04

affected in most regions; life expectancy and infant mortality are only minimally changed in Africa. The greater effects are felt during the first decade of the next century. In Asia demographic indicators are also not greatly affected. By 2060 the population in this run is, however, 15 percent less than the standard run. Satisfaction of basic needs is attained about 15 years before that in the standard run.[12]

Another run studied the relations of satisfaction of basic needs with income distribution. Since the model emphasized per capita consumption, which is tantamount to a roughly egalitarian distribution of wealth, calculations were made in GNP terms to establish the average GNP per capita necessary for the basic needs of each income group to be satisfied under the assumption that the current income distribution is maintained for the countries considered. This run was carried out in Geneva at the International Labour Office by M. Hopkins and H. Scolnick with the collaboration of M. McLean. The calculations assumed that all basic needs are satisfied when the least privileged 20 percent reaches an income level permitting fulfillment of these needs.

Calculations based on the Bariloche Model

12. This is consistent with the content of recent public communications of the World Bank with respect to the effect of aid, and their study of alternative aid policies and also with results in [1]. Internal income redistribution along with international solidarity was not, however, thoroughly tested in this run. This was done, in part, for consistency with historical experience, and because of further reasons that make questionable the feasibility of widespread use of international aid (see for instance [1], [4]) along with internal income redistribution, for reaching basic needs targets.

TABLE 6
Results of Runs of the Model to Establish the Minimum GNP Required to Satisfy Basic Needs

Regions	A Proportion of Total Income Received by the Poorest 20% (% of GNP)	B GNP per Capita Required to Satisfy Basic Needs with Egalitarian Income Distribution	C GNP per Capita Required to Satisfy Basic Needs if the Present Income Distribution is Maintained	C B
North America	5.7	4407	15463	3.5
South America (more developed)	4.0	807	4035	5
South America (less developed)	4.1	740	3610	4.9
Western Europe (more developed)	4.6	2164	9409	4.3
Western Europe (less developed)	5.3	892	3366	3.8
USSR	10.4	1602	3081	1.9
Eastern Europe	10.4	1359	2613	1.9
Japan	7.7	2416	6275	2.6
Far East and India	7.3	428	1173	2.7
Middle East (oil-producing states)	5.6	540	1929	3.6
Africa (more developed)	5.5	651	1640	3.6
Africa (less developed)	4.8	505	2104	4.1
South Africa	1.9	1093	11505	10.1
Australia and New Zealand	7.0	2867	8191	2.8
People's Republic of China	No data	—	—	—

were made, this time, for fifteen regions into which the world is divided by the United Nations Model [5], excluding the People's Republic of China because of lack of data. This regionalization was preferred because it includes more homogeneous groups of countries than the regions into which the world is divided for the purpose of income distribution. The model was run for each of the regions to establish the minimum GNP required to satisfy basic needs. The results of these runs appear in Table 6. As can be seen, in the underdeveloped countries, the GNP per capita needed to satisfy basic needs in egalitarian conditions is somewhere between three and five times less than that required if current income structures are maintained. Even in capitalist countries, this factor varies between 2.6 for Japan and 4.3 for the most advanced Western European countries. In socialist states, where income distribution is more egalitarian, the factor is lower than 2.

With these results a comparison can be made of the social and economic consequences of the two growth hypotheses considered.

For example, in Africa basic needs are satisfied in the standard run following the policies of the model around the year 2008, with an average in-

come per capita of US $558. Under a distribution of income like the one in the present, this income level should be about $2000 to achieve the same level of satisfaction of basic needs. This value is reached in this last run of the model in 2046, thirty eight years later. In Latin America, similar computations show that the satisfaction of basic needs would be delayed by fifty years. It should be noted, however, that these runs look only at per capita income of the different groups in dollar terms, and represent only a very simplified way of comparing these two growth patterns. In any case these runs also indicate that much (twice) higher savings rates are needed to reach the satisfaction of basic needs in the time horizon in which the standard run attained the same target.

The above can be summarized in the following conclusions. The results of the model demonstrate that, if the policies proposed here were implemented, all the regions of the third world could attain an adequate standard of living within a period a little longer than one generation with available resources. The ecological part of the model, not discussed here, [4] shows that this goal can be attained without deterioration or exhaustion of the environment if adequate policies are followed. The only problem of physical limitation that arises is the exhaustion of the supply of cultivable land in Asia in the middle of the next century. However, the large reserves of cultivable land in other regions could cover this deficit. Other local solutions would be increasing the yield of crops, which in the model was assumed to be well below the theoretically possible levels, producing foods from nonconventional sources, and the application of an active family planning policy that would enable the population to achieve a balance within a shorter period than predicted by the model.

The obstacles that currently stand in the way of the underdeveloped countries are not physical or economic in the strict sense, but essentially sociopolitical. In effect, the growth rates by which the desired objectives are achieved are, as was seen in the previous section, those considered normal in the current economic situation. The goals are therefore achieved not by very high economic growth, but by a reduction in nonessential consumption; increased investment on the production of basic goods; the elimination of socio-economic barriers, which hinder the optimal use of land, both for food production and for urban planning; and, in developing countries, the implementation of an active policy to better distribute goods and services and to eliminate deficits in international trade.

The growth rates necessary to achieve these objectives, and which can be easily attained without imposing intolerable social sacrifice, contrast with those required to satisfy, in approximately the same period of time, the basic needs within the current income structure, or the same socio-economic organization. These economic growth rates, which for developing countries vary between 10 and nearly 12 percent, seem in fact impossible to attain.

The effect of possible international transfers of resources from the industrialized countries to the poor countries is also studied. Even if a greater level of international aid than that advised by the United Nations is implemented, it may help raise the level of well being at the time of transfer, but in no way decisively. In the conditions currently prevailing in most developing countries, unless

different policies are implemented, much of the effect of the aid contributes to increase spending by privileged sectors, with little effect on the living conditions of the majority of the population. However, the rich countries could contribute to relieving the long run pressure on available resources by curtailing their consumption.[13]

It was shown that in the year 2060, at which the computer runs were terminated, there will still be inequalities between the levels of well-being in the developed and poor countries, particularly with respect to Asia. However, a moderate increase in productivity, for instance, through technological progress, could narrow the gap.

4. Development Patterns and the International Order

In the last section I discussed the Bariloche Model, its underlying concepts and results. The satisfaction of basic needs was studied as a goal of development for four major regions of the world; its physical feasibility and the policies and time horizons to attain it were examined.

In this section I will discuss some questions that flow from the completed work of the Bariloche effort. Advocacy of alternative development theory and statistics, for instance, raises two related questions: how different are development policies oriented towards the satisfaction of basic needs from others where the goal is the maximization of the Gross National Product? Are these two policies consistent with each other, and if not, why? These two questions lead naturally to a third one: is the goal of satisfaction of basic needs an emergency call, a goal desirable for humanitarian purposes only, or can be seen as part of an overall development strategy where desired goods and services are produced over time with increasing choices over leisure and lifestyles, allowing the pursuit of a better quality of life for all? A further question is whether there exists within mixed economies (partly market-partly planned) the ability to steer towards development strategies that are consistent with the satisfaction of basic needs and also sustainable, in the sense of tending to reinforce themselves rather than to deform into something else by their very structure.

When discussing such development strategies it is important to realize that they should provide a framework of analysis for certain basic questions, for instance, the possible relationship between income distribution and growth. In particular, one should examine lines of arguments that proceed as follows: With a more skewed income distribution there is more investment because the higher income groups tend to invest proportionally more of their income than the lower income groups. Since more investment implies more growth, and eventually increased growth improves every-

13. This was proposed, for instance, by President Carter in his 1977 Energy Plan. As shown by the model, in the short-medium run non-renewable resources do not pose a problem for the satisfaction of basic needs, in terms of physical availability. This, however, does not exclude the possibility of resources bottlenecks arising, for instance, from misallocations socio-economically induced. However, in the long run, about 30 + years, without technological leaps, there is a physical problem availability of certain resources that has to be dealt with. In addition, in both short-medium and long-run, excessive use of resources by the richer countries may be detrimental: it may increase the cost of reaching basic needs targets in the South and deteriorate the environment in the North, as well as induce less desirable global patterns of development.

body's living conditions through increased production, employment, etc., a more unequal distribution of income is likely to result in more development, for future betterment of everybody's status.[14] Other basic questions of development concern the role of international trade and of aid policies. In particular, what is the relationship, if any, between satisfaction of basic needs and collective self-reliance in the South, in the context of such a development strategy?

Finally, considering the present and future of the international order, one may ask what historical and economic circumstances can be considered favorable to such development strategies, consistent with the satisfaction of basic needs within the South, and with more equal North-South relations?

To answer the above questions in any detail would exceed the scope of this paper. I will only give an abbreviated response here.

Because of the nature of the Bariloche model, i.e., planning for an alternative world, an element which is not explored in the model and which runs throughout the questions or problems just posed is the characteristics of the markets for different goods and services which depend, in turn, on productivity, employment, wages, profits and associated income distributions.

The model concentrates on the physical feasibility of attaining satisfaction of basic needs. Certain policy implications are derived in the model, for instance from the study of the effect of income distributions on the time horizons to attain the goal, or the effect of land distribution on the satisfaction of food and housing needs. However, the goal is attained by simulating planning in the use of resources; the possible market effects on the distribution as well as the composition of the output are not analyzed.

In fact, the model concentrates on countries which at present have mixed, partly market, partly planned economies. A planning approach is adequate for a feasibility study that gives broad guidelines of development, but for these mixed economies a further study of the present system of production and distribution would shed more light on questions of socio-economic feasibility of a basic needs strategy.

The emphasis on demand is especially relevant to the study of the relationship between basic needs and GNP maximization. I shall now outline and then criticize a standard rationale for GNP maximization.

A competitive market equilibrium can be proven, under certain conditions, to yield a Pareto optimal allocation (also called Pareto efficient) of goods for the agents of the economy. An allocation is called Pareto optimal when there is no reallocation among the agents of the available total resources that could improve everybody's position in terms of their preferences, i.e., when a deviation from the allocation can only improve

14. The remark about future betterment of everybody's living standards is also called "trickle down" effect, which has now become discredited. For example Cyrus Vance, U.S. Secretary of State stated: "the case for more concerned action is clear. Almost 1,000 million people live in absolute poverty. The problem is growing. Increases in GNP for many developing countries have not meant benefits for the poor. For many, in fact, life is worse, development has too often not "trickled down", address to the O.E.C.D., Paris, June 3, 1977.

somebody's position at the cost of worsening someone else's. In a general equilibrium model, the prices that equilibriate the market (supply equals demand for all goods) determine, through profit and utility maximization, values of total production, consumption, and allocations of goods among the agents, which under certain conditions are Pareto optimal with respect to the preferences of these agents. Hence the market equilibrium prices appear to promote general welfare, and to give values to different goods according to their relative contribution to the achievement of such Pareto optimal allocations. Thus, those values seem desirable as the weights to give to total amounts of different goods and services when one desires to sum them in order to obtain one single number as an aggregate measure of economic performance rather than a set of numbers, one for each good or service. This number or sum is precisely a GNP index. The rationale underlying a GNP maximization strategy is that with the aid of those price-values, to maximize GNP corresponds to maximizing at each point in time a measure of output that is in turn allocated in a Pareto optimal way according to the agents perferences when the economy is in equilibrium. A development path which maximizes GNP seems to be one where the economy is moving at each point in time as far as it can (maximizing that sum) along its productive capabilities. The composition of the production in such a path is being decided by market equilibrium prices that reflect a 'Pareto optimal decision' of the agents through the market mechanism.[15]

However, Pareto optimal allocations are not necessarily desirable from a social welfare point of view: in such an allocation one of the agents may have most goods, and the others almost none. A simple Edgeworth box diagram (Figure 2) makes the point:

In this two goods-two agents Edgeworth's box diagram, X_1 and Y_1 measure, with origin the southwest corner (0,0), one agents' share of both goods; the share of the second economic agent is measured with origin the northeast corner (X_0, Y_0) by X_2 and Y_2. Since there are finite total resources, it follows that $X_1 + X_2 = X_0$ and $Y_1 + Y_2 = Y_0$. The curved lines U_1 indicate equal utility lines, called the indifference surfaces of the first agent, because the agent is indifferent to any two points in such a line. Those of the second agent are indicated by U_2. The set consisting of points in the two thick curves denoted P_1 and P_2 make up a set of Pareto optimal allocations, also called Pareto set denoted P. At each point z in P a perturbation away from P is Pareto inferior, i.e., someone is made worse off. Note that the point z* is Pareto optimal and that at z* the first agent owns almost all of both goods. Furthermore, for the preferences indicated here, from that part P_2 of

15. One representative of this view can be found in an article about the Bariloche Model by W. Nordhaus, "World Modelling from the Bottom Up," Working Paper IIASA, Vienna, 1975. That Pareto optimal allocations may be not desirable when distributional considerations are made, however, is sometimes mentioned in development and planning courses (M. Bruno and H. Chenery, 1977). As far as I know there is no widespread understanding in the development literature of this argument and its implications. Pareto optimality of market equilibria, it is assumed, is a strong argument for it and against planning.

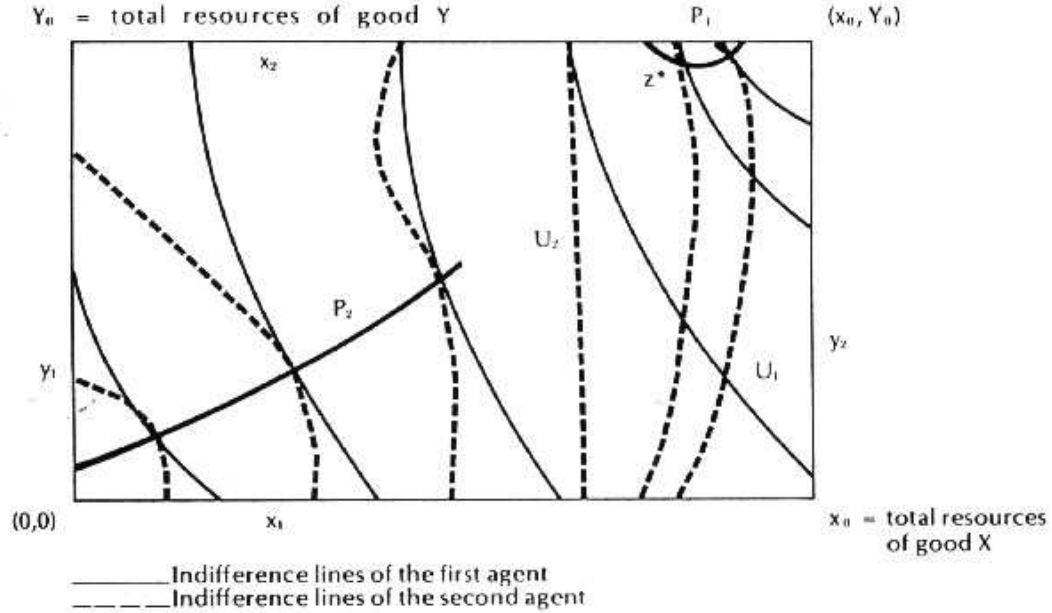

Figure 2

the Pareto set it is not possible to move to the more egalitarian part of P denoted P_2 near the middle of the box without violating Pareto optimality, i.e., without leaving the Pareto set P. This occurs because the preference of at least one of the agents is not everywhere convex. Such non-convexities arise, for instance, with public goods, or when there are externalities in the economy. In any case, a Pareto optimal, market equilibrium-induced allocation, and its corresponding GNP maximization path, may consist of a sequence of allocations such as z^*, where one agent, say, a high income group, has almost all goods and another, say, a low income group, has very little in a Pareto optimal way.

Pareto efficiency in a sense refers more to a property of stability of market equilibrium and the fact that agents are 'locked' into the situation if everyone's vote counts so that each agent has a veto power. Someone in this case will always have reason to refuse, and be able to veto, any move away from such an allocation. This is why it is sometimes preferable to call Pareto optimal allocations by the less value laden expression, "Pareto stable."

In fact, there are no objective definitions of

what is an optimal allocation. Any such criterion must involve, under general conditions, interpersonal comparisons that are necessarily subjective to an extent; the study of these problems is contained in the literature of welfare economics and social choice theory. Such a realization leads us to reject reliance on the GNP index as an index of welfare, but also at the same time to question the value of any aggregate index as well. If this is so, then we may choose the disaggregated criterion of satisfaction of basic needs: It will do as well as any other. Moreover this criterion has the advantage of concentrating on the welfare of the very poor.[16] Given the problems facing the underdeveloped world, a measure of satisfaction of basic needs seems at least as important as a GNP index as a test of economic performance.

In any case, we can now address the first question given above: How does GNP maximization differ from the efficiency criteria in the satisfaction of basic needs which was given in Section 3? One answer can be given as follows. A result proven in [2] is that at each point in time (t) of the path of development, in order to achieve the satisfaction of basic needs as soon as possible within constraints, one needs to choose consumption and investment combinations represented by the vector u within a feasible set, so as to maximize a weighted sum over the different sectors of the economy:

$$I(t) = \sum_{i=1}^{n} P_i^{(t)} \cdot f_i(u(t)).$$

Here the index i runs over the sectors of the economy, as described in Section 2, and the instrument vector u are consumption-investment choices as well as choices about allocation of resources over the different sectors. The value of consumption and of net investment in each sector of the economy is weighted in this sum by numbers P_i which measure their relative contribution to the attainment of the target of satisfaction of basic needs at the earliest date.[17] Since a GNP criterion will also give a measure of the relative contribution of investment towards its target (maximization of GNP) this gives a basis for comparison of the two criteria. The weights given here would differ in general from the weights that one would give to investment if one has as a goal GNP maximization, and this would lead in general to different investment policies for the two criteria. This may happen because of the effect of investment in the production of those consumption goods that weight more heavily in GNP terms. Thus, more expensive or luxury goods may increase the GNP index while not achieving basic needs targets. This is not a matter of choice between consumption and investment, but between *types of consumption*. To these arguments one can add others about the difference between GNP and basic needs policies on consumption-investment choices. But how does a GNP index distinguish between two numbers, for instance, one made of the values of a large amount of basic housing at moderate prices and one of a few large housing units at very high prices? The index itself does not distinguish

16. In fact, there are some analogies between this criterion and J. Rawls' maximum principle, that can be derived from a set of axioms of justice; see *A Theory of Justice*.

17. They can be shown to be identifiable with the solutions to a differential equation, see [2].

between them, but producers who analyze the market structure may find that the few expensive units are more saleable than the others. This would likely be the case if income distribution is very skewed, for in that case a large number of low income people may not be able to offer a sufficient market for the sale of the goods they need, while a very small group of high income people may instead establish a good market for a few very expensive goods. And as far as the GNP index is concerned, the two possible production plans would presumably rate the same. From the point of view of basic needs they are obviously not the case, as the many less expensive housing units contribute more to the per capita satisfaction of basic needs. Their construction would be appraised higher than a smaller number of luxury dwellings having the same total sales value. But, one may ask in the case of housing, by what mechanism do low income people in such a mixed economy obtain those houses, since they do not offer a market to buy them? Since it is geared to explore an alternative society where these problems do not arise, the Bariloche model does not offer an answer to this question. In a sense, it ignores such a question by assuming a per capita index of consumption, which is tantamount to assuming a roughly equal distribution of goods. It is plausible to assume that the production of many less expensive housing units will encourage a more equal distribution of housing. For in general, it is more difficult to accumulate several inexpensive houses than to own one expensive unit that costs an equivalent amount. Still, because of the assumptions of an egalitarian income distribution, the distribution problem is, in my opinion, not sufficiently studied in the Bariloche model, so as to derive certain socioeconomic implications of basic needs strategies for present mixed economies.

Given the well-accepted Keynesian view that the level of demand is an important determinant, a "pulling force," of economic growth, one may in this case go one step further and postulate the following disaggregated Keynesian demand view: an important determinant of *the composition of output* is the *composition of demand*. For instance, if a market economy is to grow along a basic needs strategy path, it should have a composition of the demand that would "pull" economic growth along a path of output of the appropriate composition of the economic output. Income distribution is at the core then, not only of the *consumption* targets proposed by the Bariloche Model, but also of the *patterns of production* that are obtainable. It is possible to go a step further and note that the distribution of income is, by and large, derived from employment, wages and profit levels. Therefore, demand and supply structures are both closely intertwined with patterns of growth. For example, in mixed economies the productivity of low income people is related to their income and this in turn shapes the structure of the demand for products in the economy. Hence, any basic needs strategy addressed to mixed economies must realistically consider these factors.

In light of this analysis we can ask whether a basic needs strategy may or may not be consistent with one of GNP maximization in a mixed economy. One answer is implicit in the above: it depends on the structure of the demand as well as of supply of the economy. For instance, an economy with a very skewed income distribution

is not likely to contain a demand structure that would "pull" economic production along a path where satisfaction of basic needs would be more rapidly satisfied. Similar to the example of Figure 2 above, such an economy may tend to grow along a GNP maximizing path made up of points of the form of z^*. Even if the diagram is expanding (i.e., X_0 and Y_0 increasing) because more commodities are being produced through time, the composition of the output may be leaning towards either proportionally more luxury goods or else to fewer but more expensive luxury goods, rather than to more basic goods. Furthermore, as shown in Figure 2, the distribution among income groups of what is produced of both goods may also be quite unequal; actually, as discussed above, there is also a connection between what is being produced and how it is distributed. These conclusions lead us back to the third question posed at the beginning of this section, whether to consider the satisfaction of basic needs as an emergency call or as part of an overall development strategy. In the above discussion, an adequate structure of demand, with corresponding underlying productivity and employment patterns, would be necessary to pull the economy towards development paths geared towards the satisfaction of basic needs. But, in fact, such a demand structure can also be regarded as a first segment of an overall path of demand leading to further development past the point of satisfaction of basic needs. In this manner a basic needs strategy can be considered as an initial segment of a larger, sustainable development strategy, not just an ad hoc device to deal with an emergency.[18]

This brings us then to the fourth question posed at the beginning of this section, i.e., the relationship between income distribution and basic needs development strategies.

The need for a good demand structure to foster development is, as we said, quite well understood by the economists and policy makers within the Northern economies. For instance, it is an accepted fact that if at a point in time a serious deterioration of the purchasing power of a large group of their population occurs, this may hurt consumer demand and, with a lag, profits, investment and further growth, unless other markets can be secured. Hence, if we only rely on local markets, a good demand structure is a necessary part of a development process. If we now rephrase this in the context of a underdeveloped country, a similar reasoning applies. Hence a seriously skewed income distribution within an underdeveloped country may be in the long run a hinderance to development, unless other markets can be secured.

The differences of income distribution within countries in the North and those of the South show the latter lagging badly. This fact is consistent with the above-discussed relationships between underdevelopment and lack of adequate market structures.[19] But, in addition, there is an

18. It should be noted that when 'market expansion' does not necessarily mean market for more goods: it could also mean market for more leisure. After all, production and distribution of enjoyable leisure is an important component of any developed economy.

19. Mr. McNamara, the present president of the World Bank, cites World Bank figures to show how equitable income distribution is lagging in poor countries. The upper 20% of the population receives 55% of national income and the lowest 20% receives less than 5%. In the US the upper 20% gets 45% of a far greater income and the lowest 20% about the same.

important difference between these two groups of countries: total production in poor countries is far less than in the North. Even if they had similar income distributions, the bottom of the income scale in the underdeveloped world is in a qualitatively different situation. In such countries, a large proportion of the population is both less productive and has many children; in part this pattern reflects rather than causes underconsumption, that is consumption below the level of satisfaction of basic needs.[20] This leads to a self-deteriorating spiral that confines a large portion of the population to a survival struggle. Such people cannot contribute to the "demand pull" for growth along a basic needs satisfaction path. They would also fail to provide a basis for further continuous market expansion, an expansion that is one of the engines of sustained long-term economic development.[21]

There is an important aspect of the above-described development paths which has been mentioned already, and which brings us to the fifth question posed at the beginning of this section on the role of international trade. One way to break out the market demand bottleneck that stalls the engine of development is to rely on foreign markets. Reliance of this kind has, in fact, been characteristic for some development success stories of the 60's and 70's, and Mexico, for instance, which were "export-led." In the case of Brazil, worsening or non-improvement of the internal income distribution in development processes[22] may have brought initially more fuel for increased investment and growth as discussed above. But, when higher income groups invest more than lower income groups, this has two effects. One, as noted above, is that their increased income may bring forth an increase in the rate and quantity of investment, if higher income groups tend to save and invest proportionally more than lower income groups. But the other, less noticed effect is that the increased income of the high income groups will lead, for the same reason, to reduced local demand for consumption. Of course, more luxury goods (or more expensive ones) can be "packed" initially into fewer hands of the high income group which is now relatively richer, but this offset has a limit

20. This is not to be understood as a cause-effect statement; all the Bariloche Model, or any model, could show is a (lagged) statistical relationship between satisfaction of basic needs and rate of population growth.

21. It should be further analyzed why such industrialization experiences of the North (as for instance the 1865–1900 US period) cannot be replicated in the underdeveloped world of the 20th century, with the world economy dominated by North-South trade. Trade with industrialized countries, for instance, is presently more than 80% of all trade for underdeveloped countries. The term 'engine of growth' was used by W. Arthur Lewis in two enlightening lectures on the evolution of the International Economic Order [6].

22. The case of Brazil, for instance, provides a further example of the phenomena we are looking at. During 1960–72, Brazil grew at an unprecedented rate of at least 8% per year in GNP terms while life expectency, according to the U.N. Demographic Yearbook, decreased from 1960–1970 about 4–5 years. If one considers life expectancy a proxy for the direction of change of the income distribution (see also A. Fishlow "Brazilian Size Income Distribution," *American Economic Review*, 1973), Brazil becomes a candidate for the above discussion. It is a good example because its population is quite large (about 110 million) and the country is quite rich in natural resources, hence the elements for a good internal market structure for development should in principle be there. Nevertheless, the pattern of Brazil is one of the exponents of 'export-led' development with internal deterioration of markets.

for the above described relation between income level and consumption/saving behavior. As a consequence the underdeveloped country's higher income group needs to obtain an additional market to sell the product of their investment (which has increased in the income redistribution process that made them richer) since the local market is now not so good. These groups will then look for markets outside. If this economic profile is similar throughout the South, then looking outside means the North. Thus we see these developing countries engaged in an export-led path of growth, the export being led to Northern countries.[23]

In the UNCTAD IV meeting in Nairobi, the South sought to impose access to reliable market targets on the North in order to be able to sell the product of their investment. The South sought an assurance that by the year 2000, 25 percent of their industrial production of the international market would be generated in the South.

However, this demand and the underlying strategy giving rise to it poses a problem for the North. The South is now not only selling raw materials, but also manufactured products: shoes and textiles are two common examples. The North finds that providing markets for these manufactured goods conflicts with domestic employment goals, and may have a regressive impact on income distribution within the North (see for instance [1]). Evidence of this concern is available by reference to arguments and pressures mounted by labor unions in the North, as well as in stands taken to aid policy by several northern governments.[24] Hence, the North may not be able to provide markets for Southern goods. In such an eventuality, further development of the South will be achieved only if new markets are developed within the South. A further argument for the desirability of the development of markets within the South is the consistency and sustainability of a global development strategy. For, even if one country could at one time carry on an export-led path of development, it would represent a big burden for the North to provide markets for *all* countries in the South. In particular, this would be unrealistic, since such a policy would affect adversely the North as noted above. Thus export-led development paths may not be consistent with more than a very few countries developing at the time—and those countries being dependent on the North for pull of their development. Such paths do not seem desirable candidates for global development strategies. They violate the condition of self-sustainability, in addition to not being desirable for their socioeconomic characteristics.[25] As it happens, a sustainable expansion of markets in the South would be consistent with the satisfaction of the basic needs of people within

23. Which as a strategy replaced more recently the import-substitution strategy of the '50's.

24. See for instance the Amalgamated Textile Workers Union communication in the New York Times, April 1977. Also see, for example, Carter's administration position in the North-South conference in Paris, that'it no longer makes sense to tax the poor people in the rich countries for the benefit of the rich people in the poor countries.' (New York Times, June 3, 1977).

25. One could in principle imagine export-led growth oriented towards Northern markets coupled with internal income redistribution to prevent deterioration of the internal markets. Example usually brought to attention are South Korea and Taiwan, where export led growth has occurred with what some statistics indicate may be a more egalitarian income distribution. But, in fact, a case can be made that this is a difficult combination to obtain. These two countries had, for historical

the South, for the reasons already set forth. As a consequence, if these countries would pursue economic policies that assure a good functioning of their engine-pull of growth, they would thereby invigorate development on their own.

This brings us to the remaining question posed at the beginning of this section on the historical and economic circumstances that could be favorable to economic development paths for mixed economies and paths that are sustainable and consistent with the satisfaction of basic needs and more equal North-South relations.

In the context of the New International Economic Order, and more in general the North-South dialogue, there is a tendency to overemphasize factors external to both the South and the North. Examples are the emphasis on a transfer of wealth or aid from the North to the South and on the terms of trade and commodity agreements of North and South goods. For another example, in *The Future of the World Economy*, W. Leontieff computes transfers of wealth or financial flows as the policies needed to help close the gap of wealth between the North and the South, according to given U.N. targets. The transfers needed, in any case, are outside the boundaries of historical experience and seem to make it impossible to reach the target by the year 2000 [5].

This choice of the agenda relects an emphasis in the external relationship between the North and the South rather than on internal factors of the North and the South, and their relationship. However it is becoming increasingly clear that these internal factors are quite important. For instance, as pointed out above, there is a growing discomfort in the North about transfers and other external policies; it is felt, as formalized in the

circumstances that would be different to reproduce, quite successful land reform programs which had an equalizing effect. These programs, in the case of Taiwan, are being monitored by careful land taxation policies. This was accompanied by agricultural modernization and the development of rural industries. In a Ricardian analysis, the wages of the manufacturing sector would reflect similar equalization. In fact, the relatively high labor intensity of Taiwan and South Korean manufacturing, coupled with those effects on wages discussed above are many times brought up as an explanation of these two countries experiences, and also of the difficulties of reproducing them, see for instance, *Redistribution with Growth*, Chenery, et al., (Oxford University Press, 1974), Ranis: "Taiwan," pp. 285-90, Fei, Ranis and Kuo, "Equity with Growth: The Taiwan Case," New Haven, mimeo (1976). In the usual cases where initial resources, in particular land and capital, are not so equitably distributed, the above closer to egalitarian growth may be very difficult to obtain with export-led policies, since the relative advantages for exports of goods usually depend on lower local wages which are in general inconsistent with income redistribution policies. Firms which are leading the export-led growth resist such redistribution policies; in countries where labor is quite inexpensive, which are also by and large countries with a low degree of unionization, these firms may be successful in preventing income redistribution. The only case where export-led may be consistent with some income redistribution would be countries with large government sectors. Government then may increase total wages of government employees, bureaucracy, etc., in an attempt to redistribute income and possibly enlarge local markets. In some cases this could lead to temporary betterment of the income of certain groups, but since, as in Brazil, labor is not unionized, such policies are not sustainable. In addition, they may lead to an increase, indeed a 'bloating,' of the government sector, having as a side effect an enlargement of the government role over the polity. If the government is, as in many countries in the South, not representative or authoritarian, this may lead to further undesirable authoritarism. These problems require careful study.

Bariloche Model and discussed in Section 3, that aid may fail to significantly help the very poor. In addition, it is also felt that such aid may sometimes hurt the poor in the North: "Taxing the poor in the North to help the rich in the South does not make sense any longer," as stated in the North-South Paris talks.

In a sense, the poverty of the poor in the South is a powerful tool for the government leaders and elites of the South to claim a better share of the world's wealth. This point is more apparent when representatives of countries with quite skewed income distributions and of some non-democratic regimes in the South vocalize claims for a New Economic Order on the basis of North-South wealth differentials. In addition, at present, a random element, the geographic location of oil in the planet, and a historical element, the pattern of technologies and accompanying energy demands in the planet, gives some countries in the South a tool of political leverage. It is true, however, that if this tool is used to increase prices past a point, the North may respond with increase in prices of Northern exports, and this may at the end change little their relative positions. But in any case, such process would be inflationary for the North as well as for the South, and hence costly for both. Therefore, because of the geographical location of oil in relation to current demand, the South has in principle a tool to inflict costs to the North, even if while using this tool it may hurt itself. Handlers of this tool in the South are not, however, the very poor, whose needs are brought forth as a point of moral advantage and also of political stability threat in the North-South Dialogue. Because of its possible effects on improving the North's moral as well as real bargaining power in the North-South dialogue, certain policy makers and government officials within the North may find it desirable, if not easily feasible, to try to bypass the rich and to concentrate on the economic position of the poor in the South. Such a position, that may many times be only rhetoric, may also represent a recognition of international consciousness of the possible effects of the (relative and absolute) deterioration of the welfare of the lower income groups of the South, in more than a decade of growth (1960–1974).

The position outlined above would have some advantages, from the North's viewpoint, over one of yielding to wealth redistribution demands of the high income groups in the South; these would, in turn, continue using the unchanged poverty levels within the South as their tool.

There are, in addition, economic reasons for the North to seek an improvement of the welfare of the very poor in the South. If the South, as discussed above has its own markets, its own pull-engine of development, it may put less pressure on the North to offer markets for the South; it may reduce for instance export competition. Such a relief from pressure is especially important in a non-expanding world economy. Furthermore, the Southern countries may in turn offer an improved market for Northern exports, investments and loans on a sustainable basis. This may favor the interests of certain industries in the export sector, and also of agriculture and finance in the North.

In fact, economists in the North are increasingly acknowledging that developing countries' imports from the industrialized countries have an important and measurable impact on economic conditions in the North. The expansion of markets within the South seems to be increasingly im-

portant to the economies of the North, their rates of employment, inflation and growth."[26]

We should point out, however, a number of serious difficulties facing the above-described policies. The above analysis, for instance, treats the South as a unit. However, some countries of the North are attempting to collaborate directly with certain countries in the South that are more relevant to their economic goals (e.g. oil or other raw material producing countries, or countries with more developed markets for their exports). This strategy would be the best hope for a continued strong bargaining position of the industrialized countries in the North-South dialogue in the short and medium run. The fact that this is mostly known by all sectors may decrease its probability of success.

Other possible difficulties arise from the internal contradictions within countries of certain social coalitions, and their influence on policy of international capitalist coalitions in the North above, organized labor in the North increasingly demands more protection from competing labor intensive imports from the South, while some international capitalist coalitions in the North may favor a more open world economy for trade and for investment. Both these groups, however, have an interest in favor and also against an inward looking "basic needs" strategy on the part of the South.

In the case of organized labor in the North, for instance, inward looking strategies by the South, while helping their rates of employment in the short run, may deteriorate their real income in the short run (through the loss of the benefit from a wide variety of low-cost consumer goods imported from the South, such as shoes, clothing, etc.), as well as real income and employment in the medium run (through a decrease in investment and growth in Northern export related industries). Similar contradictions, of course, arise within countries of the South. In addition, the very groups that are more interested in basic needs strategies for the development of markets in the South may be also against certain inward looking strategies from the South, since such groups could sponsor more liberalized international markets. This, from the point of view of a basic needs strategy for the South, may have the effect of making its potential allies in goals, dangerous in practice, if basic needs strategies would necessarily require dissasociation from the North. However, a point I would like to make here is that these two latter concepts are at different economic as well as semantic levels. Inward looking does not imply disassociative, if it perhaps does

26. "One recent study concluded that the high imports in 1974 and 1975 by developing countries have had a perceptible import on business trends in developed countries. Their balance of payment deficit has sustained demand in the developed countries as much, say as a vigorous German demad expansion," and, "Indeed it is the perception that has led Claude Cheysson, the European Community Commissioner of Aid and Development, to conclude that the best and least inflationary method of recovery in the OECD countries would be to pump money into the economies of the developing countries through grants. The *Economist* has been advocating much the same solution to the dilemma of restoring world economic growth with minimal inflation," from J. P. Grant and J. W. Sewell, "The LDC Connection: How do Events in Developing Countries Affect Inflation, GNP growth and jobs in the U.S.," and from "The Less Developed Countries and the International Monetary Mechanism," *American Economic Review*, May 1976.

imply selectively disassociative, strategies. Of course, this point requires careful case by case analysis.

The above discussion points to the existence of elements in the present historical and economic circumstances that could be considered favorable in the short-medium run to basic needs strategies, and also to some of the difficulties that such strategies would encounter. Given the severity and self-reinforcing characteristics of poverty within the South, a basic needs strategy would be needed for the improvement of the markets within the South in a sustainable way, since economic policies adressed to small enlargement of markets through an increased membership into the medium-high income brackets may not be sustainable, as discussed before. This could break the shape of the 'exterior solutions' of the New International Economic Order, and would redefine its terms. A basic needs strategy would be, as we saw above, consistent with self-sustained and more inward looking patterns of development within the economies of the South. It also would be consistent with objectives of the South in the North-South dialogue. In addition, as it was set forth above, in this particular set of historical and economic circumstances, it may also serve certain interests of the North. It is perhaps this convergence of factors that makes policy makers in the North, as well as international organizations with a large US participation, rethink their conception of development and state their interest in basic human needs strategies of development.[12]

After these points are made, an important part of the economic analysis is in front of us. For, in a country with a mixed economy, an inward looking basic-needs strategy requires the improvement of the productivity of the lower income groups, for instance, the agricultural workers in much of the South. Such increases in productivity are, of course, related to incentives derived from international market behavior with respect to agricultural goods and manufacturers. Basic needs cannot be "given"; lower income groups must be able to procure basic needs without hindrances and in a sustainable way leading to further development towards an improved quality of life for all. In a mixed economy this may require initial increases of productivity in the agricultural sector, which may involve reorganization of modes of production. This in turn would be consistent, indeed concomitant, with a basic needs strategy and better North-South relations: increased productivity of the lower income groups in the South would command higher wages, and this, as discussed in [6], is one key element to help redefine the terms of trade so that a more equal North-South relation obtains. As long as we separate in our minds the different concepts of development, we shall be missing important problems and opportunities to move towards a world order that most of us would consider better. Independent

12. This is consistent with the content of recent public communications of the World Bank with respect to the effect of aid, and their study of alternative aid policies and also with results in [1]. Internal income redistribution along with international solidarity was not, however, thoroughly tested in this run. This was done, in part, for consistency with historical experience, and because of further reasons that make questionable the feasibility of widespread use of international aid (see for instance [1], [4]) along with internal income redistribution, for reaching basic needs targets.

U.N. surveys of statistics of income distribution, of consumption of basic goods, and of productivity levels of different groups of the population under alternative modes of production would be one important tool to research such alternative conceptions of development. It would also be a first step towards finding much needed cooperative solutions to problems in the North-South dialogue.

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