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Environmental disruption: economic growth and the human environment

Udo Ernst Simonis

The outcome of a growth policy which is guided by only inadequate and deficient indicators (as the National Product or National Income) in the end may reveal itself partly as a pseudo-growth when carefully analyzed. Increases in GNP and income may ensue not only from an increase of net-production but at the cost of the natural, constructed, and social environment. A growth policy under the given conditions pursuing the maximization of the growth rate of GNP runs the great risk of:

- a diminishing welfare relevance of its own results,
- a generally worsening provision of infrastructure (especially welfare-oriented infrastructure),
- over-agglomerating industries and population (stabilizing traditional structures),
- increasingly polluting the environment or neglecting the quality of the environment.

Does this support the critic who said, that "economic growth renders many things obsolete, and one of them is economic theory?"

If those deficiencies and their outcome mentioned above are indeed considered to be grave, then we will have to look for new ways and means to overcome this dilemma. Economic planning in its present form barely seems prepared to take over this task (particularly because it was and still is mainly concerned with *growth* in the traditional sense of the word). However, one has to be aware of the fact that the need is more fundamental than merely to scrutinize existing economic theorems and to replace them with new ones. Here, we shall refrain from checking in detail

the usefulness of the applied instruments of practical economic policy or from asking how to promote a general "environment-consciousness" or how to institutionalize an "environment-conscience" in the public agencies (DISCH) in order to save time and space for inquiring in which direction methodological treatment of the goal-problem may or should be developed, when sensible orientations and data are looked for.

Supplementary and alternative approaches

One of the necessary conditions for integrating environment-oriented considerations into economic and regional policy seems to be clear: strictly speaking we have to internalize the negative external effects of economic activities or we have to eliminate them. In other words, the pollution of the environment has to be considered as social costs which have to be integrated into the cost-benefit-statements of private and public institutions. Cost-benefit-statements have to become more accurate.

To internalize or to eliminate the negative external effects from the beginning seems, however, to be easier said than done. To use the "originating principle" (*Verursachungsprinzip*) in the field of environmental disruptions by forcing the originator to liquidate or minimize them is applicable, in the given state of economic activities, only within certain limits. It would, for instance, make little sense to ask each and every car owner or house owner to reduce the

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COMMUNITY SCALE		I	II	III	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ELEMENTS	EXISTIC UNITS	MAN	ROOM	DWELLING	DWELLING GROUP	SMALL NEIGHBORHOOD	NEIGHBORHOOD	SMALL TOWN	TOWN	LARGE CITY	METROPOLIS	CONURBATION	MEGALOPOLIS	URBAN REGION	URBANIZED CONTINENT	ECUMENOPOLIS
	NATURE												•	•		
	MAN															
	SOCIETY													•		
	SHELLS															
	NETWORKS															
SYNTHESIS: HUMAN SETTLEMENTS																

degree of carbon monoxide or sulphur of the exhaust gases they produce; in this case it would be more effective (and less costly) to induce the producers of cars and petrol to develop clean engines and to sell petrol with only a low content of sulphur (MOBIUS, p. 9).

Economists have suggested various instruments for protecting and planning the environment as e.g., (1) regulations, licenses, and prohibitions and (2) taxes and duties. But there remains the problem that these instruments will not be introduced in the near future or will be effective only in the long run. Therefore, a first (or supplementary) step towards effective environment protection seems to lie in the differentiation of the *concept of development* in individual, regional, and national planning — combined with the revision of the GNP or income concept as such.

From "growth" to "development"

On several occasions the United Nations has already requested the search for a new development-concept. The following quotation can be found in a report of 1962:

Development is growth plus change; change, in turn, is social and cultural as well as economic, and qualitative as well as quantitative. It should no longer be necessary to speak of "economic and social development" since development — as distinct from growth — should automatically include both. A direct corollary of this new approach to development was that the purely economic indicators of progress were seen to provide only limited insight and might conceal as much as they indicate. (UNITED NATIONS, 1962, p. 2).

These considerations have not yet been generally accepted, even not within all the United Nations' suborganizations.

Less than one decade later another United Nations report enlarges the perspectives and attracts attention towards the existing environmental crisis, the decreasing quality of life and the aggression against the ecosystem, thus becoming the starting point for the preparations of the World Conference on Human Environment in Stockholm, in 1972. This report says: "In planning and management of the human environment, emphasis is generally placed on economic criteria and on physical and quantitative aspects of the problems more than on qualitative and socio-cultural aspects. This results in many large-scale developments, particularly in housing, which do not fully respond to legitimate human aspirations and social needs." Moreover, "... alternative development projects having different environmental consequences are rarely studied and economic choices are made with little reference to environmental consequences, particularly those of an ecological nature. This applies particularly to large-scale development projects in less developed countries" (UNITED NATIONS, 1969, p. 19).

However, a concretely new approach to planning has yet to be formulated, although the demand for differentiating the development concept has contributed not a few ideas to it. Quite conceivable, on the other hand, is the suggestion made on how to determine the "degree of integration" of an economy or a region.

"Degree of integration"

To revive the discussion on economic goals and means Reimut Jochimsen in 1966 suggested (JOCHIMSEN, p. 15 *et passim*) to define "development" by two different features (although he has found only little help from the statisticians till now): (a) the "level of economic activities" and (b) the "degree of integration."

While the "level of economic activities" measures the amount of goods and services produced in the economy (or region) expressed in the GNP or in the GNP per capita (or employee), the "degree of integration" indicates the personal, sectoral, and firm-size deviations of incomes earned for comparable factor inputs (income differentials). The economy (region) would be "totally integrated" if there would be no income-differences for comparable inputs, or: the degree of integration would be *one*.

The main argument of this concept is that the "level of economic activities" and the "degree of integration" are interdependent but do not develop necessarily in parallel; it is possible that the level (a) is increasing while the degree of integration (b) remains low or is actually decreasing.

The weakness of this concept, however, is that even if the "degree of integration" would be *one* this need not automatically mean that the negative external effects involved are internalized or eliminated and allotted correctly. Furthermore, the GNP concept is still adhered to. As long as the negative external effects are still existing or not strongly reduced it may be advisable to introduce an additional or alternative step: to revise the traditional GNP-concept (SIMONIS, p. 460).

"Net national welfare"

The Gross National Product is, as has been indicated, an aggregation of only those goods and services having (or being given) a positive price. The aim is to correct this concept: the "bads" must be deducted from the "goods." To get a more adequate measure for the welfare of a nation or a region, to quantify welfare-oriented income figures, it seems advisable to label the negative external effects (disproducts) with negative prices and consequently to deduct them from the Gross National Product — i.e., to compensate for all or for certain environmental disruptions. It is easily agreed upon that it will be difficult to do so in statistical practice, since the market does not provide

for exact or reliable prices (be they positive or negative ones), shadow-prices have to be brought in, and social cost-benefit-analyses to be carried out.

Such a new index (Gross or Net National Welfare index) means integrating and observing environmental values in economic and political activities and decisions.

One of the problems concerning this suggestion is that deductions, computed on the micro-economic level, have to be "transferred" to the macro-economic level. How can one include air pollution, water pollution, congestions due to over-sized agglomerations, time losses due to traffic accidents, the current costs for obsolete infrastructures, the uglifying of cities, etc., within one concept which will then give a clue to a new welfare indicator?

One way to overcome this problem would be first to classify the disproducts known or agreed upon in accordance with certain standards or common characteristics. It should be clear by now that the economists would be excessively overburdened in doing this job alone: a multi-disciplinary approach is highly needed. Following Shigeto Tsuru one may classify the disproducts into five types via several auxiliary calculations (TSURU):

1. "Cost of Life"-type: Example: Commuting costs due to excessive urban sprawl and distance between living and working places; expensive burglar alarm and heating systems due to individual housing.
2. "Interference of Income"-type: Example: The generation of income for otherwise dispensable goods and services which is made indispensable through a built-in institutional arrangement of the society concerned. (J.A. Schumpeter believed part of the lawyers and real estate brokers belonged to an income-interfering profession).
3. "Institutionalization of Waste"-type: Example: Waste being institutionalized in such a way that less wasteful alternatives are deliberately kept out of the market (built-in obsolescences are legion, as popularized and analyzed by V. Packard, J.K. Galbraith, and T. Veblen).
4. "Depletion of Resources"-type: Example: Raising of the growth rate of GNP by ignoring the need for conserving renewable resources (KAPP).
5. "Inefficiency of Dynamic Adjustments"-type: Example: Promotion of land-using industries in land-scarce regions due to inefficient adjustment to land-saving production.

When making use of this approach in practice we can easily conclude that all factors mentioned above have been and still are in force in industrial as well as developing nations and especially in highly agglomerated regions; they inflate GNP and the regional income but do not necessarily increase the welfare of the people. A similarly pragmatic scheme

could as well be classified sectorally, by looking for the main hidden social costs, in each sector of the economy: Agriculture — storing of over-production, DDT-poisoning of food; Industry — exploitation and exhaustion of reproducible natural resources; Transport — time-losses due to accidents and traffic congestion; Urbanization — insufficient canalization, uglifying of cities, reduction of "green areas" within the cities, etc. When thus revising the existing GNP-concept, the traditional criterion of economic success, by establishing a system of more welfare-oriented social accounts, the advantages will be evident: measures taken to improve the quality of the environment (environment protection) do not reduce the growth-rates of the newly defined welfare-oriented social product (the net national welfare). The traditional argument that "more environment protection will necessarily reduce the growth-rate of the economy" no longer would be valid; there would be no inherent antagonism between environment protection and the rentability of a given economic policy measure.

Another actual problem of regional economic policy could thus also be revealed: The centrifugal discrepancies between highly agglomerated centers and depleting regions within one economy or one region can be attributed to a certain degree to inadequate cost- and benefit-calculations of production. In practice, the state very often is supposed to take over a considerable part (30 or even more percent) of the total costs of new investments (as e.g., infrastructure, industrial estates, tax deductions, allowances) in those problem-regions — one variant of the well-known policy via subsidies, nowadays mostly given a more suggestive image and called "regional program," "regional action program," etc. But, if instead environmental costs in highly agglomerated centers would be allocated (fully or partly) to those who cause them, generally it would be more reasonable for them to move to less agglomerated regions, since the costs for environmental disruptions integrated in their cost-calculations would have the effect of increasing the prices of their end-products thus impairing their market position. A carefully differentiated scale of pollution-standards would mean a change in the conditions of competition — a fact which could be used much more positively in regional policy.

We shall only briefly deal here with one more aspect of a revised system of social accounts: the excessive demand for a private good due to the gap between the total (social) and the partial (private) costs of production can, in turn, enormously stimulate the production of a public good. One can assume that such a relationship does exist between the demand for private cars and the supply of urban expressways. (Investigating this phenomenon, the total costs of a privately owned car in Hamburg were estimated to be four times as high as the actual purchase price, e.g. a

newly bought car costing \$2,000 will create additional costs of about \$6,000, the city-uglifying effects, etc., not being included because of the immanent difficulties of quantifying such effects.

In order to guard the new concept against serious objections, the following should be kept in mind: to establish a new welfare-oriented income-concept does not mean that we can replace the stock of natural resources which was lost through environment exploitation (contrary to the reproducible stock of private capital). Therefore, of course, it is inevitable to combine this new macro-economic concept with new micro-economic behavior, with new motivations of production and consumption and with new environment-protecting technologies. To deduct disproducts from the traditional GNP is only the first but nevertheless necessary move towards conserving and protecting the stock of social and natural resources and for improving the quality of the environment, an alleviating step which can be arranged for to a large extent by economists.

Social stock and qualitative indicators

Stock-figures have been seen as fixed data (*Datenkranz*), not to be explained by economics (JANSEN, p. 401). This neglect of stock-variables is especially true for the social stock of the economy or region; the grown infrastructure is a "white spot in the map of economic research." This may partly be due to statistical problems. It is already difficult enough to evaluate stocks as such but it is even more difficult when qualitative factors play an important role, when the share of intangibles is large, when there is only a small chance to value at market prices or when this procedure is intolerable. No wonder then, that no satisfying determination of the social stock of an economy and region has been undertaken up till now. This implies that the next step in how to evaluate social stock and how to form an opinion on whether or not they are "sufficient," "good," or "bad" has to rely more on personal feelings than on well-founded knowledge. Therefore, national and regional political actions, and especially non-actions, very often depend largely on ignorance and only to a smaller degree on information. However, everybody who is called upon to plan has to refer to ideas about the necessary infrastructure. Since their own criteria are lacking, the planners do resort very often to international comparisons (or to comparisons with higher developed regions which is formally the same). All those much discussed "gaps," as the "technology gap," the "education gap," the "communication gap," etc., are but statements about shortcomings within certain categories of infrastructure obtained through international (interregional) comparisons. One has to keep in mind, however, that these statements may conceal the fact that there are very different basic conditions in different countries (or regions) and very

different goals pursued. Such criteria and standards used may thus easily be identified as being "dried-up prejudices" (FREY) and thus may contain the danger that mess and carelessness are projected into the future.

The main problem of the post-industrial society is no longer *how much* to produce but *what* and *how* to produce, e.g., the structure of production and mainly the relation between private and public goods (GALBRAITH). This, in turn, means that the structure and quality of the capital stock as such and its use will become more important in the welfare experience of the people.

What we need (besides revised flow-variables) are estimates and calculations of the accumulated social stock of the economy or region, in order to gain new goals for economic planning; we have to find *social indicators*, which can make economic planning more compatible and easier to coordinate. The new scientific task is to formulate a new "algebra of the society" (BOULDING).

New social indicators should depict clearly and reliably the real living conditions of a region and their changes, and it should be possible to correlate them (via direct or indirect indices) with economic variables, in order to find out how to change the allocation of resources for finally increasing the level of the indicator in question. The first problem to overcome is the selection problem: *which* indicators should be chosen for economic and regional planning?

The following classification of stock-variables could be applied:

- "natural" stock (as water and air)
- "public" stock (as housing and transportation)
- "private" stock (as durable consumer goods)
- "personal" stock (as teachers, doctors, students)
- "cultural" stock (as cultural institutions)
- "socio-institutional" stock (as welfare institutions)

which, in turn, can be subdivided or comprehended into a *behavior sphere* and an *environment sphere*, as was done in the case of Japanese development planning. The so-called *behavioral sphere* includes seven non-monetary indicators for nutrition, health, education, leisure and recreation, housing, safety, social security from, altogether, seventeen subindicators. The so-called *environment sphere* includes two non-monetary indicators for social environment and human environment arising from, altogether, eighteen subindicators.

Having chosen the indicators in question, the further problem is *how to aggregate them* or how much weight is to be given to each one them. It seems that no satisfactory study on the importance of certain indicators has been carried out so far. This is largely because it is obvious that one must have a dynamic approach: while the number of hospital beds may be thought to be important in period one, it may be

schools, public parks, or other leisure facilities in period two. Yet, it seems necessary, from what was said above, to get the weights needed not as ex-post figures from traditional income statistics, which may lead to simple projections but not to real ex-ante planning.

To find a (minimum) solution for these problems the reflections on *critical points of environmental quality*, on *existential minima*, *limits of tolerance*, and on *ranges of security* (zero pollution standards, life-quality standards, maximum population density, environment-neutral techniques) can be brought into the picture. Whenever these standards are over- or under-exceeded the evidence of *danger to environment* must be acknowledged. This procedure has been discussed in several of the reports concerning the United Nations Conference on the Human Environment in Stockholm in 1972 or in the proceedings for the "Tokyo Resolution" (TOYKO RESOLUTION, UNITED NATIONS 1969, 1971).

What is at issue here is to determine a sophisticated system of standards which shows from what point onwards the burdening of the environment has to be forbidden or reduced to a tolerable degree. It is obvious that this system of standards will have to be differentiated regionally. While, for example, a certain amount of sulphur exhaustion gases can be tolerated in a region with only a low degree of agglomeration of industries and population, it may under no circumstances be allowed within highly agglomerated regions.

Most of the indicators in use for economic and regional planning are of a quantitative and aggregated type; this is true for the GNP-concept as well as for some of the social indicators discussed above, such as the number of medical doctors per one thousand inhabitants.

More interesting than asking for the number of medical doctors (or of dwelling units, public parks, etc.) per one thousand inhabitants (1), may be to know (2) what percentage of the population in a certain region can expect reasonable professional help from competent doctors when needed, or (3) how big a percentage of the population is in good health. Let us assume that due to increased air pollution the disease-rate doubles within a region. The government may consequently decide to double the number of medical doctors in order to guarantee the same efficient medical treatment as was the case before the incident. The three indicators mentioned above will give three totally different results: (1) The first one tells that the number of medical doctors per one thousand inhabitants was doubled, a fact which appears to be a sign of progress; (2) the second one notes that a patient has the same probability of getting appropriate medical treatment as before; (3) the third indicator, however, will show that the population falls ill more often in spite of all doctors.

In other words: It is necessary for a welfare-oriented development policy to select an additional set of qualitative indicators that gives information on the rate of fulfilment of certain basic social needs. Each indicator just takes the values yes or no for each individual. By summing those scales of performance in a community, on a regional or national level, one gets percentage figures on how many have adequate fulfilment of each need — thus getting data for measuring and planning development. These values could be compared interregionally and intertemporally. Quite a number of social needs — housing, health, security, leisure, recreation, mobility, etc. — could be studied rather easily this way, and a weighted average of all the percentage figures for the different needs could be calculated, thus providing a general (additional) index of "development" and the base for an environment-oriented regional and national economic policy.

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