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SUSTAINABLE DEVELOPMENT - A CHALLENGE FOR THE WORLD ECONOMY

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Introduction

The economic history of the so-called industrialized nations reveals a remarkable correlation between economic growth and the use of natural resources. Even before the industrial revolution, irreversible forest exploitation for energetic use and manufacturing had depleted all the natural forests in Europe. Thereafter, in the course of the industrialization process, economic growth took up momentum, leading to an unprecedented increase of fossil fuel consumption. As a result, today's industrialized nations are highly dependent on fossil energy resources. Due to the rising energy prices and increasing public awareness with respect to environmental damages, some industrialized nations are currently attempting to decouple the use of natural resources and economic growth. In economic to decouple the use of natural resources and economic growth. In economic terms. This process involves substitution of natural resources as a factor of production for financial and human capital. Given their relatively rich endowment with these factors of production, industrialized countries can relatively easily adjust their economies.

However, this does not apply to developing and newly industrializing countries. Given their comparatively low developmental stage, these countries are eager to seize the growth potential that can be realized by using fossil fuels and their domestic natural resources. In this respect, these countries are on the way to follow the wake of industrialized nations, though the world has definitely changed in at least two respects:

Firstly, a number of environmental problems reveal a global dimension, while it is questionable, whether the global ecological system can sustain further economic development based on the growing consumption of fossil fuels and other non-renewable natural assets. The reason is that some of these assets like the ozone layer, biodiversity or the stability of the world climate have become extremely scarce on a global level.

Secondly, the use of natural resources has irreversible impacts on the welfare of these developing countries. Thus, even in their own self-interest these countries should refrain from exploiting their natural resources excessively.

As far as the first aspect is concerned, most developing countries tend to reject any responsibility for the so-called global environmental costs. This position can be supported by two arguments. On the one hand, it is undoubted that the prevailing scarcity of natural assets is primarily the consequence of economic development in today's industrialized nations. Hence, it cannot be justified that the developing countries as latecomers should refrain from using these natural resources and thus renounce valuable opportunities for economic development. On the other hand, developing countries are not prepared to give up their sovereignity over their natural resources or accept any limits for the use of these resources, if this has a detrimental impact on economic growth. This is of special importance for those countries that has unique ecosystems like, for instance, natural rain forests. As a consequence, there is an environmental component adding

to theexisting tension in North-South relationships calling for multinational institutional arrangements (Simonis, 1991).

Hence, sustainable development and its implementation is not simply a national issue for developing countries but involves questions on the future distribution of economic welfare. This paper will attempt to briefly outline this global aspect of sustainable development and discuss some international mechanisms that can deal with these distributional problems. The next section will survey the main-stream definitions of sustainable development. Thereafter, section three will briefly discuss options for worldwide economic adjustments in the light of global environmental problems. Finally, section four yields a short description of prevailing concepts to solve these problems.

Sustainable Development: Concepts and Definitions

The term "sustainable development" (SD) has emerged as the latest development catchphrase, since a number of governments and NGOs have embraced it as the new paradigm of development. Most people use the phrase interchangeably with ecologically sustainable or environmentally sound development. The World Conservation Strategy developed by the International Union for Conservation of Nature and Natural Resources in 1980 was probably the first attempt to carry the concept of sustainability beyond simple renewable resource systems (IUCN, 1980). It suggested three ecological principles for ecological sustainability, namely maintenance of essential ecological processes and life-support systems, the preservation of genetic diversity and the sustainable utilization of species and resources (Lele, 1991). Though this definition constitutes a useful starting point, it is clearly recursive in the sense that it lists theconditions for sustainability without really defining it.

A more deductive definition of SD has actually two components: development and sustainability. Even the first component is highly arbitrary because development is a value word implying change that is desirable, while there is no consensus with respect to its meaning. In this paper development is meant to cover a vector of desirable social objectives including:

- positive increases of per capita real income
- improvement in health and nutritional conditions
- educational achievement and improvement in social security
- a fairer distribution of income and access to economic resources.

Since there is a high degree of correlation between these elements, development can be measured by using a single proxy indicator. The measure most widely entertained is real income per capita. Sustainable development is then a situation in which the development vector D or per capita real income does not decrease in the long run. In theory, this implies the adoption of an indefinite time horizon. The aim is to achieve lasting development. Practical decision-making, however, requires some finite horizon. Since the choice of this horizon is arbitrary, sustainability depends on the time period considered. Moreover, there remains the question whether the development vector must be positive for each and every time period (strong sustainability) or whether only the long-term trend of the development vector should be positive (weak sustainability). For the latter, it is equivalent to say that the present value of development benefits is positive (Pearce, Barbier, Markandya, 1990).

Both concepts are subject to social and environmental conditions. The former will be skipped in this paper though the social conditions are one of the main determinants for developing societies. Environmental

conditions are, however, equally important, as following the belief of SD-proponents environmental quality and economic development are interdependent and in the long run mutually reinforcing. The preservation of environmental quality can be based on the requirement that the natural capital stock should not decrease over time. Natural capital stock in this context is equivalent to the stock of all environmental and natural resource assets from oil in the ground to the quality of soil and groundwater, from the stock of fish in the oceans to the capacity of the globe to recycle and absorb carbon and other waste materials.

The rationale for a constant natural capital stock is based on a notion of justice in respect of the socially disadvantaged future generations and nature. In most developing countries it is the socially disadvantaged people that reveal a higher dependence on natural resources. In the same vein, a reduction of the natural capital stock neglects the interests of future generations. Finally, some environmentalists attach some existence value to nature itself, which is independent of their actual user value.

The constancy of the capital stock can take on several different meanings. A common interpretation is in terms of constant physical capital stock, e.g. the Brundtland Report or the World Commission for Environment and Development (Lele, 1991). This can be a sound strategy, as long as there is a high degree of uncertainty with respect to the interactions within the environment or between environment, economy and society. It reflects an aversion to risks arising from our ignorance of the functioning of ecosystems and from lowmargins of resilience towards external shocks such as drought and other stress to the ecosystems. There is, therefore, a rationale in terms of uncertainty and irreversibility for conserving the existing stock, at least until we have a clearer understanding of what the optimal stock is and how it might be identified. Though this concept seems to be very appealing for renewable resources, it cannot be applied to exhaustible resources, since by definition, any positive rate of exploitation reduces the natural capital stock irreversibly. An alternative interpretation focuses on the constant economic value of the stock. This allows for declining physical stock with rising real price over time, as long as the rise in prices is sufficient to maintain a constant economic value. However, this concept raises serious problems regarding the determination of prices and economic values for natural resources. Especially for renewable resources, current prices are less likely to reflect future scarcity.

A broader version of the constant value rule requires that the total value of all capital stocks remains constant. This concept allows for substitution between natural capital stocks and man-made capital goods or financial capital. The underlying assumption is that there is some degree of substitutability of these capital stocks both in production and consumption, while complementarities of use are assumed. The basic idea is that it makes no difference to future generations, whether they inherit man-made capital or natural capital, as long as the combined capital stock is not smaller. Under this concept, the depletion of a resource, e.g. oil can be justified, if it is compensated for by other investments generating the same income. This concept has been already used for the environmental adjustment of GNP of resource using countries. The idea is to deduct depreciations for resource use from GNP growth and thus calculate the net growth effect. Although this method looks veryappealing at first sight, it does not reduce the degree of arbitrariness which is implicit in GNP calculations. For instance, a country like Saudi Arabia, which does not reinvest all of her petrodollars for good economic reasons, would reveal two-digit negative rates of per capita GNP growth, which does not go in harmony with the

undoubted positive economic development in that country.

For this reason, economists, or more correctly proponents of neoclassical environmental economics, argue in terms of costs and benefits of changing the natural capital stock (Van den Bergh, Nijkamp, 1990). A reduction of the natural capital stock is due to some economic use like, for instance, conversion of forest areas into agricultural land or natural habitats into housing development areas. Thus, each destructive activity has benefits in terms of gains from the use. The environment as a waste sink, a consumption good or a factor of production reduces the overall costs of production and consumption, thus adding to the individual and national economic welfare, even when the cost of environmental destruction is included. Hence, the optimal use of resources can be determined on the basis of such cost-benefit-analysis, which, however, reveals many conceptual shortcomings, i.e. the determination of the discount rate for future costs and benefits as well as the valuation of environmental goods in the light of uncertainty (Bojo, Maler, Unema, 1991). As this concept imposes the weakest restrictions on the preservation of the natural capital stock, such an economic optimization must produce different results when compared to the other concept. Despite this inherent weakness, the concept will be used in the following because it is more suited for the discussion of interlinks between economic mechanisms and the ecological system.

Implementing Sustainable Development Strategies

Following Repetto (1986), sustainable development calls for a "development strategy that manages all assets, natural resources, and human resources, as well as the financial and physical assets for increasing long-term wealth and well-being. Sustainable development as a goal rejects policies and practices that support current living standards by depleting the productive base including natural resources, and that leaves future generations with poorer prospects and greater risks than our own".

More than that, an implementation of such a development strategy requires institutional adjustments and systematic changes in social values. This section will discuss only a small segment of these requirements, namely the multinational institutional capacity required to handle sustainable development policies.

There are a number of reasons as to why developing nations are not in a position to adhere to sustainable development policies:

There are a number of countries which lack the institutional capacity to assume control of their natural resources or take into account the costs caused by natural resource-based economic activities (O'Connor, Turnham, 1992).

Even given these institutional capacities, it can be in the interest of developing countries to excessively exploit their natural resources. Environmental damages usually cause economic costs in the medium turn or even in the long-run. For a large number of economic agents, these costs are of comparatively less importance, since they have to exploit their natural resources in order to guarantee their existence in theshort-tun. The same does apply to governments in these countries that have to come up with high economic growth

in the short run, in order to provide basic needs for the population. Many countries even run the risk of being caught in the so-called environment-poverty trap. This means that the destruction of the environment fails to enhance the economic process, while the structure of production continues to be heavily dependent on the exploitation of natural resources. As the latter become more scarce, the development potential is ultimately lower than it was before (Pearce, Barbier, Markandya, 1991, Chap.2).

Moreover, governments and economic agents in developing countries might have different attitudes, as far as the global scarcity and the value of their natural capital stock is concerned. For instance, countries like Indonesia and Zaire are not likely to perceive their stocks of tropical rain forests as scarce from their national point of view, though tropical deforestation and the related climatic effects are global issues. Though these global externalities ultimately affect all nations, the respective developing countries are not willing to give a high priority to these future costs, given their more short-run economic goals. Nor are these countries prepared to apply resource-saving sustainable development strategies which increase costs of production and consumption, thus reducing the short-run economic welfare and growth potential. For instance, developing countries renouncing the use of their tropical forests would accept an excess burden for the preservation of the world climate (Amelung, Diehl, Chap.6), while a part of the economic benefits due to conservation are due to other countries (positive international externalities). Hence, the implementation of sustainable development policies is hindered by the fact that the respective developing countriescannot realize a moderate share in the economic benefits of this strategy.

As far as the lack of institutional capacities and environment-poverty-traps are prevailing, development aid has to put these countries in a position to realize their long-term national optimum (Runnal, 1991). After a period of transition, during which development aid supports structural adjustments and institution-building, the respective countries will, in their own interest, adhere to a strategy that is less natural -resource-consuming.

However, even if developing countries realize a national optimum, the respective level of natural resource exploitation will not be sustainable from a global point of view. A policy change towards a more resource-saving economic structure would not only involve benefits to the country that implements this strategy, but these benefits accrue to neighbour states in the case of regional environmental problems or to the world community, as far as global environmental issues are at stake. In a sense, these countries are engaged in exports of environmental services, even though these exports do not create any contribution to the country's national income. For this reason, one cannot expect that developing countries will implement sustainable development strategies to an extent that takes account of worldwide scarcities of natural capital. This, however, is a necessary condition, since it is unlikely that today's developing nations can pursue an industrialization strategy that is sustainable with respect to climate stability and biodiversity.

The next section will show that in these cases multilateral institutional mechanisms that create incentives in developing countries are needed to convey policies that are notsimply subject to a national but a worldwide optimum.

Multinational Agreements and Institutions for Implementation of Sustainable Development Strategies

There are mainly two environmental issues that seem to play a major role in the North-South relationship, namely the stability

of the world climate (greenhouse effect, ozone layer) and the deforestation of tropical rain forests. Though these issues are often treated separately in political discussion, there is a high degree of interrelatedness between them, since 30% of all CO_2 emissions in 1989 were due to deforestation in the tropics (Myers, 1989). Moreover, the conservation of tropical forests can be regarded as a major contribution for preserving genetic diversity. This additional environmental service and the simple fact that CO_2 emission due to deforestation cannot be controlled as easily as in industry (Fischer, di Primio, Stein, 1991), justify a separation of these problems.

Moreover, there is an additional reason as to why rain forest conservation and greenhouse gas emissions are treated as different issues in the political debate. The world climate, which is likely to be destabilized through greenhouse gas emissions (Schmandt, 1992), can be regarded as common property for all nations in the world. Hence, a multinational agreement that can be negotiated between a number of nations though not necessarily all nations of the world, is likely to have an environmental impact. By contrast, rain forests and biodiversity cannot be treated as common property, since the respective natural resources are subject to the sovereignity of the respective countries, in which these resources are located. As long as these countries are not prepared to participate in a multinational arrangement,there will be hardly any long-term effect. On top of that, a number of countries have become very sensitive regarding international attempts to negotiate proposals for the conservation of these natural resources. For instance in Brazil, there have been complaints against so-called "ecological imperialism", questioning the property rights of tropical countries with respect to their forests (Amelung, 1989). For this reason, the political rationale calls for a separation of the greenhouse gas issue and the problems concerning tropical deforestation.

Nevertheless, both the stability of the world climate and biodiversity are global environmental issues in the sense that a resource-saving policy in one country does not only yield benefits to the respective country but to all other countries in the world. In economic theory, this situation calls for a compensation of countries that export environmental services. Such transfer payments make sense, as long as they lead to a more profitable accumulation of the world's natural resources and factors of production (Amelung, 1989).

Basically, the shift towards a more resource-saving structure of production involves costly processes of substitution in which natural resources as a factor of production are replaced by a combination of human and physical capital. In this respect, the technology in industrialized countries is very advanced compared to the world average. For instance, the energy efficiency of fossil-fuel-fired power plants in Germany ranks among the highest in the world (Scholtholt, 1992). The reason is that developed countries face a relative abundance of human capital and physical capital, while they have already been experiencing a regional shortage of natural resources, for instance in the form of clean air. Even though the industrialized countries are responsible for the bulk of greenhouse gas emissions, their substitution process has already advanced. This means that anadditional unit of physical/human capital will lead to a relatively modest saving of natural resources, while the opposite is true in developing countries. Since in these countries the efficiency in natural resource use is remarkably lower, a transfer of capital from industrialized to developing countries and a subsequent decline of resource wasting production, may help to fight global environmental problems more effectively than a mere substitution process in industrialized countries.

This does not mean, however, that all substitution processes have to take place in developing countries. Depending on national environmental regulations and the availability of new technologies in industrialized countries, the delinking of natural resource use and economic growth can be definitely further fostered in industrialized countries as well.

In this respect, there is a conceptual problem, as there is a need to optimize the efficiency of natural resource use both in developing newly industrializing and industrialized countries, given completely different structures of production in the individual countries. Basically, capital abundant countries have to implement transfer payments to less capital abundant countries, thus achieving the best environmental impact resulting from a substitution of natural resources for physical or human capital.

Such transfer payments put less developed and capital-poor countries in a position to finance a sustainable development program, while the losses in terms of GNP growth are compensated by the transfer payments. In theory, this form of international cooperation gives the less developed countries the opportunity to simply leap over a developmental stage based on excessive resource use. To a certain extent, thesecountries will not be forced to copy the development process in today's industrialized countries, but rather create a new economic structure that is environmentally and technologically more advanced than the respective economic structure in industrialized nations.

As far as the greenhouse-gas emissions are concerned one can think of several examples.

- Renewable energy system, e.g. photovoltaics, wind energy, biological waste, mini-hydro, etc., are relatively expensive in countries with an advanced interconnected system and unfavourable climatic conditions. The opposite holds true in many developing countries. Instead of developing their system of distribution, it may pay for some countries to concentrate on renewable energy sources and decentralized systems.

- Many countries of the third world are still to develop their power generation capacities. Given financial support in the form of transfer payments, many countries can afford the import of highly energy efficient generation capacities. On the global level, this is a more efficient approach than to force all electricity producers in industrialized countries to replace parts of their existing capacities that are not in line with the latest environmental technology but compare relatively well with average energy efficiency in the world.

- In the same vein, it should be more profitable to converse existing sinks for CO_2 in developing countries than engaging in costly afforestation programs in more developed and densely populated parts of the world. This economic rationale calls for aconservation of tropical forests through transfer payments.

Both for the problem of climate change and the tropical deforestation issue a number of proposals have been developed. As far as the problem of climate change is concerned, it makes sense to develop a flexible system of emission quotas and compensation payments (Cline, 1992). Mainstream models for the control of climatic gases stipulate that all emission should be divided by the world population. This average should be multiplied with every country's population size in order to yield the maximum emission allowance for each country. This emission quota has to be corrected by different climatic conditions prevailing in different countries, thus

affecting the need for heating and respective energy demand. Hence, industrialized countries are given emission allowances that are lower than their actual emission, while the opposite holds true for developing countries. Industrialized countries may decide, whether they should reduce emissions or purchase emission allowances from developing countries. In the same vein, the developing countries have to decide whether they should foster their development based on the emission of climatic gases or sell their emission allowances. The latter solution ultimately calls for the implementation of a sustainable developement strategy. However, the model described above does not lead to a reduction of climate-destabilizing gas emission but rather to a stabilization. A gradual reduction requires that the sum of all national emission allowances is reduced by a prefixed percentage every year.

Yet one can think of three ways of fund-raising for these transfers. Firstly, it is possible to raise a CO_2 - levy or energy tax in order to give incentives for more efficient energy use and finance the purchasing of emission quotas from developing countries. Though in theory a CO_2 - tax comes moreclose to the polluter-pays-principle, an energy tax should be considered as more reasonable, since it takes account of limits to replacing coal and oil by gas and nuclear energy. The former is not in a position to replace other fuels while nuclear energy bears other environmental risks.

Secondly, one can allow for a free worldwide trade of greenhouse gas emission permits, so that the individual companies have to decide, whether they reduce their emissions, pay the price or provide costless energy saving technologies for developing countries in exchange for additional quotas. Both ways are efficient in a sense that they give incentives to reducing gas emissions both in industrialized and developing countries, thus fostering sustainable development in the third world or newly industrializing countries.

Likewise compensatory finance solutions have already been developed for the tropical deforestation issue. A number of organizations have stipulated a so-called tropical forest fund (Amelung, 1989). While tropical countries contribute protected primary forests to this fund, non-tropical countries have to supply the compensatory finance or resource-saving technologies, which can be used for the conservation of tropical forest areas. The GNP of the individual non-tropical countries may serve as a useful indicator for determining their share in the fund. The GNP consists of two components, as it is the product of per-capita-income and population size. Since every individual participates equally from the benefits of rainforest conservation, size of population should be the one criterion for the financial shares in the fund. Moreover, ability and willingness to pay should also be a criterion. Basically, more rich countries have a more long-term interest in global environmental issues, because the governments and individuals in these countries face less insecurity in the future,while most basic needs are guaranteed for the majority of the population in the long-run.

It has to be noted, however, that a fund relying on the GNP-key of financing has been challenged by some industrialized countries. Moreover, it has to be questioned whether the industrialized nations will agree on a system of emission quotas, which certainly will constitute a substantial financial burden for them. Nevertheless, compensatory finance solutions are the only mechanism in economic theory that can tackle global environmental problems.

The present state of empirical economic research cannot come up with estimates on the probable financial needs to implement compensatory finance solutions. However, there are reasonable indications that the

compensation that has to be offered to developing countries will not exceed the ability of the more developed countries to pay.

Following a study by Ruitenbeek (1990), transfer payments of 1060.15 ECU/sq.km/year are necessary to conserve the tropical rain forest in the Korup National Park in Cameroon. This is the result of a cost-benefit-analysis which takes into account the cost of environmental destruction in the respective tropical country and thus the environmental service function for the region. Though the author concedes that this transfer should be considered as relatively high compared to other rain forest areas, let us assume for a moment that this is a reasonable on price for the bulk of the world's rain forest areas. Accordingly, a yearly transfer payment of 6.4 billion ECU or 8.5 billion $ would be sufficient to protect half of the world's tropical rain forest areas which were 12.01 million sq.km. in 1989.

The dimension of such transfer augments certainly does not go beyond the industrialized countries ability to pay, especially if one considers the future opportunities resulting from disarmament, conversion and the subsequent financial flexibility in budget decision. As table 1 in the appendix shows, the defense expenditures of the world's 20 richest nations add up to roughly 480 billion $. It is not too heroic to assume that a cut of approximately 30 percent can be achieved in the next five years. Even if we assume that only a third of this peace dividend is allocated for global environmental problems, while two-thirds are devoted to economic reforms both in Eastern European and industrialized countries, there is a financial potential of 48 billion $ that can be utilized for compensatory finance as well as research & development. By contrast, costs of climate change have been calculated to amount to 6 percent of GNP in the USA in 2010 (Chine, 1992).

Though all these calculations are highly tentative, they point to the fact that both the financial capacity and the requirements for compensatory finance are not impediments for implementing compensatory finance solutions that can manage global environmental issues. Moreover, these calculations lend support to the hypothesis that it is less costly to manage global environmental issues instead of remaining passive.

Summary and Conclusions

The switching from current development paths that are heavily dependent on natural resource consumption to so-called sustainable development strategies is a simple process of substituting natural resources as a factor of production for human and physical capital. As most developingcountries are not well-endowed with financial, physical and human capital, they can be hardly expected to sustain a costly substitution process, especially because such a switch in the development strategy may incur a loss in the growth momentum in these economies.

On the global level, there is some evidence that a development strategy based on the same structures of industrial development as had been prevailing in the old industrialized countries can hardly be sustained. The bottle-neck for such a natural resource - consuming strategy is given by the destabilization of the world climate and the reduction of biodiversity. Since these issues are not in the interest of the respective developing countries alone, the former have to assume a responsibility in the sense that capital should be allocated to those countries that are willing to pursue a sustainable development path.

In economic terms, such compensatory finance arrangements are much more effective than simply stipulating far-reaching environmental goals only in industrializing countries or - even worse than that - in some industrialized regions as the EC. The industrial structure of many newly industrializing and developing countries reveals much more flexibility as far as the implementation of modern and resource-saving technologies are concerned. On top of that, these countries have not yet reached a high efficiency in natural resource use, so that the capital allocated to these countries is likely to show substantially more environmental effects compared to the same amount used in industrialized countries.

As the paper shows, there are various proposals how to organize multilateral funds that can be used to tackle global environmental problems such as deforestation in tropical countries as well as climatechange. Although calculations on the costs of such fund solutions or compensatory finance agreements have not been subject to empirical analysis, the future opportunities for disarmament and the financial needs of developing countries seem to indicate that it is not the fiscal problem that is hindering a multilateral solution. As earlier negotiations have shown, there is a free-rider-problem as far as the potential payers, i.e. the industrialized countries are concerned, while most developing countries have been considering international arrangements as an attack on their sovereignity. For this reason, more international coordination is needed to find a consensus on the management of global environmental issues by international arrangements, as these issues cannot be settled by letter of intents or other less binding agreements (Simonis *et al.*, 1990).

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Table 1 : Defense expenditures in the 20 richest nations of the World, 1989

Country	Defense/ Gov. exp %	Gov.exp./ GNP %	Defense/ GNP %	GNP/ Cap %	GNP Mill.$	Defense exp. Mill. $
Singapore	21,2	23,3	4,9	10450	28215	1394
New	4,8	45,9	2,2	12070	39831	878
Zealand	8,9	27,0	2,4	14360	241248	5797
Australia	12,5	34,6	4,3	14610	835692	36144
UK	3,6	47,9	1,7	15120	869400	14992
Italy	5,0	54,5	2,7	15920	235616	6421
Netherlan	19,9	31,0	6,2	16150	32300	1993
ds	4,7	50,7	2,4	16220	162200	3865
Kuwait	2,7	39,3	1,1	17300	131480	1395
Belgium	6,1	42,6	2,6	17820	1001484	26025
Austria	43,9	13,0	5,7	18430	27645	1578
France	7,3	23,1	1,7	19030	498586	8408
UAR	8,7	29,0	2,5	20440	1267280	31973
Canada	5,4	41,8	2,3	20450	104295	2354
Germany	24,6	23,0	5,7	20910	5202408	294352
Denmark	6,5	40,6	2,6	21570	183345	4838
USA	5,1	29,3	1,5	22120	110600	1653
Sweden	7,8	42,7	3,3	22290	93618	3118
Finland	na	na	1,0	23810	2931011	29310
Norway	15,1	13,3	2,0	29880	197208	3961
Japan						
Switzerla nd						
Total	na	na	na	na	14193462	480447

Source : World Bank, *World Development Report* 1991, own calculations.