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Draft outline for science policy statement of the *Global Science Panel on Population and Environment*

# Population in Sustainable Development

**If we do not put the human population at the core of the sustainable development agenda, our efforts to improve human wellbeing and preserve the quality of the environment will fail. Only if we understand how the human population and society interact with the natural environment will we be able to attain the goals of sustainable development.**

## Introduction

In Rio de Janeiro in 1992, over 170 countries adopted the Rio Principles and Agreements and Agenda 21, a common framework for action toward sustainable development. In September of 2002, the World Summit on Sustainable Development in Johannesburg will assess accomplishments and obstacles over the past ten years with the aim of reinvigorating the goals and implementation of Agenda 21.

In Rio, thinking was dominated by the goal of converging trends in different parts of the world. There was the clear hope that the least developed countries would catch up, while the rich countries would become increasingly environmentally conscious and curb their pollution and waste. This has not come to pass. [*This failure has many reasons. Has the lack of appropriate attention given to the human dimension been a main reason?*]

Currently the proposed agenda for the Summit and the initial preparatory process for the Summit do not appear to have identified and emphasized the essential focus on putting people and demographic issues at the core of sustainable development. This is in contrast to the first principle of the Rio Declaration, that “human beings are at the center of concerns for sustainable development.” Whether addressing vulnerability to environmental change, responsibility for environmental degradation, or policy priorities, explicit consideration of the particular groups of people involved, and their social, economic, and environmental conditions, is essential.

Fortunately, much has been learned about the role of population and the human dimension in sustainable development over the past 10 years.

The International Conference on Population and Development (ICPD) in Cairo in 1994 was a milestone toward this new understanding. The Cairo Programme of Action represented a paradigm shift away from a narrow focus on the consequences of population growth and toward a new international consensus recognizing that population policy should be oriented toward improving social conditions and expanding choices for individuals. Investments in reproductive health services, the status of women and particularly basic female education would simultaneously improve the preconditions for individual choice and wellbeing and bring down fertility rates in cases where the demographic transition is not yet complete. The insight that focusing on people – their rights, capabilities, and opportunities – will have multiple benefits for individuals, for society, and for their sustainable relationship with the environment is a lesson that should be integrated into the Johannesburg agenda. In short, the road from Rio to Johannesburg must pass through Cairo.

*Questions:*

- *Does this introduction adequately represent the paradigm change of Cairo?*
- *To what extent do you agree that the human dimension is missing from the Johannesburg agenda, and that it should be a central focus?*
- *Please add any additional questions or important issues that should be raised.*

## **Putting the Human Population at the Center**

*[The human population can be put at the center of sustainable development in different ways. We propose to highlight three key themes.]* First is the vulnerability of particular groups of people to stresses to their wellbeing, including poverty, poor health, lack of education, and environmental changes. Agenda 21 pointed out that different populations have “common but differentiated responsibilities” for impacts on the environment, an observation that remains relevant and should be further developed. It is also clear that different groups of people have common but differentiated vulnerabilities, a point of view that can be a valuable guide to setting policy priorities. Second, the traditional emphasis on population size and growth rate as the demographic indicators most relevant to sustainable development, reflected in the implicit goal

of “population stabilization,” is too narrow to fit the divergent experiences and conditions around the world. The concept of “population balance,” which considers changes in age structure as well as size, and adds qualitative components such as education, gender, health, and poverty, is a more relevant framework for conceptualizing people as the core of sustainable development. Finally, when considering the broad array of priorities and policies that can contribute to promoting sustainable development, social development and in particular education stand out as the essential foundation for achieving the goals of sustainable development.

### **Differentiated Vulnerability, Differentiated Responsibility**

*[This section will be based on analysis contained in background papers that we propose would address some of the following issues. Differences in life expectancy (probably the most fundamental quality of life indicator) have increased and some African countries have experienced significant mortality increases. For the two other components of the Human Development Index, education and income, the results are not much different. A number of countries saw declining school enrolment ratios, while in other parts of the world the knowledge and technology revolution has been gaining speed. Inequality in income both between and within countries has grown in many parts of the world. For example, while in India an estimated 180 million people have a western lifestyle and level of consumption, more than half of the total population is still illiterate and many live in poverty and hunger.*

*Populations also differ in their vulnerability to environmental changes. Recent studies of the likely impact of global climate change on the potential for regional agricultural output show that North America, Japan and most of Europe could benefit, while much of sub-Saharan Africa and the Indian subcontinent are likely to see negative effects. Within countries, households suffering from low levels of education, poverty, and poor nutritional status are the most vulnerable to environmental stresses such as resource scarcity, poor water or air quality, and declining soil fertility.*

*One promising proposal has been to illustrate some of these issues through a series of case studies. A couple of examples are listed in the annex but we are asking for additional suggestions.]*

Effective policies towards sustainable development need to be tailored to specific population segments in order to address widening social, demographic, and environmental

divides. Not all people contribute equally as agents of environmental change, and not all are equally affected by those changes.

### ***Population, Poverty and Differential Vulnerability***

Deteriorating environmental conditions do not affect all populations in the same way, nor do they affect all households of a given population in the same manner. Even within a household, the effects may differ by age and gender. Key determinants of vulnerability are poverty, health status, institutional arrangements, and education.

Poverty, which has been defined as a lack of means to protect oneself against all kinds of threats to health and personal integrity, by definition implies a lack of protection against the adverse consequences of environmental change. Some 800 million people go hungry every day, and over one billion live on less than a dollar a day. Without social, economic, and scientific progress, a third of the world's expected population of some 9 billion, in the second half of the 21<sup>st</sup> century, could be living in extreme poverty. The food insecurity and poverty affecting a fifth of the world's current population is a sad indictment of the world's failure to respond adequately in a time of unprecedented plenty. The challenge of poverty reduction cannot be avoided in a world of interdependence, reciprocity and interpenetration.

Health status is another important determinant of quality of life and protection against threats. Environmental degradation of various sorts is likely to cause additional problems for persons already in weak health, as well as pose increasing health risks for the rest of the population. In this context local environmental problems such as lack of clean water may pose even more serious health threats than global climate change. Those local environmental problems already exist now, have serious health consequences and could with some effort be removed soon. They also tend to affect the poorest, the least educated and hence the most vulnerable. In this context poor women of reproductive age and their youngest children are particularly vulnerable to non-hygienic conditions and maternal and infant mortality tend to be very high under such conditions. Improving reproductive health and family planning services can not only contribute to improve the health status and reduce the vulnerability of poor women and their young children but also contribute to a decline in the incidence of unplanned pregnancies and health-threatening short birth intervals.

Migration, including urbanization and movements to coastal areas, is an important issue in this context since it can be both a coping strategy in response to environmental change as well as a cause of environmental degradation.

At the societal level the vulnerability to environmental change depends on the efficiency of institutions, including social and political organizations, infrastructure and markets. In order to cope effectively with environmental degradation it is important to have real choices through knowledge and education on the one hand, and the material means on the other, with good governance being one of the most decisive factors.

There does not seem to be a universal remedy against vulnerability. The best candidate seems to be investment in human capital formation and education. With appropriate skills and education comes better access to information as well as better health status, lower risk of poverty and lower population growth in the case of high fertility conditions. A higher educational status of the general population makes it also more likely to have efficient control over public affairs and contribute to good governance. More educated populations tend to have more efficient and more responsible governments that can more effectively deal with environmental vulnerability. The progress in science and technology, including the knowledge revolution and environmentally sound management of natural resources, have the potential to reshape and manage the emerging challenges of the 21<sup>st</sup> century. But in order to be effective they must adequately address differential needs and be aware of differential vulnerability.

*Questions:*

- *Are there important dimensions of vulnerability that are left out of this text?*
- *Are there important dimensions of policy responses left out (e.g., health care)?*
- *How should we deal with the important role of institutions in influencing differences in vulnerability within this framework?*
- *Please add any additional questions or important issues that should be raised.*

**Beyond I=PAT**

**[THIS STILL NEEDS WORK...]**

Over the past 30 years, one specific identity equation has gained prominence. The I=PAT identity (Environmental Impact = Population \* Affluence \* Technology) has become the starting point of several decomposition exercises, the most important point of which was to show that any monocausal explanation of environmental pollution and degradation is bound to fail and that several factors are involved. Although this identity can serve as a useful first approach to the issue it is inappropriate as an analytical tool for deeper analysis. In a more sophisticated approach the population dimension would include additional factors such as age structure, living arrangements, or spatial distribution. I=PAT also does not explicitly consider the interdependencies between the PAT factors and other sources of impact that are not directly proportional to population. Feedbacks from the environment to population that in some cases may be important are not included. Finally, it masks many underlying factors that drive trends in the PAT variables or that may be the real mechanisms through which P, A, or T affect impact. These can include social development, institutional arrangements (including policies), culture, population movements, inequality, etc.

### ***Population, Consumption and Differential Responsibility***

Over the past several decades many analyses of the role of population in environmental impact have used national population size as the primary demographic variable of interest. This approach can be informative for some broad, macro-level comparisons, for example of the per capita environmental impact of different countries. However such analyses cannot differentiate the contributions of subgroups of the population, obscuring the real factors underlying impacts. For example, in many cases numbers and types of households are a better basis for accounting for environmentally significant consumption than total population size. Different types of households with different incomes, lifestyles, and compositions have different environmental consequences, as do households living in urban, suburban, or rural environments. Similarly, population movements and internal migration may cause environmental impacts such as deforestation that would not have occurred otherwise.

Understanding the consequences of and the responsibility for consumption can also be improved by differentiating among various kinds of consumption. For example, one can distinguish between consumption of goods produced by means that are more or less efficient; some goods use more natural resources than others, and some involve the production of more pollution than others. Another distinction can be made between consumption for survival, and consumption for luxuries. Understanding how different types of consumption are distributed over different types of households can help guide policies aimed at unsustainable consumption. In addition, it is important to consider that consumption *per se* is not something to be avoided since it is one important aspect of improving human wellbeing. Equally important is the recognition that the relationship between wellbeing, consumption, and environmental impact depends on the value system, the availability and effectiveness of institutions (including forms of governance) and technology.

Technological progress can play a key role in a transition to sustainable development. Improved technology can, for example, offset the effects of increased consumption in some cases. However, new technologies are not created overnight and they take time to disseminate, especially if they require significant research and infrastructural investments. Consideration of the role of technology can benefit from placing it within the context of particular groups of people. In the poorest areas, weak infrastructure and lack of capital may be important roadblocks to a quick and effective application of new technologies. As a consequence these obstacles may further widen the divide between countries and possibly within countries. Human capital

formation and the educational composition of the population may increasingly become a key factor in the development and dissemination of relevant, more efficient and environmentally benign technologies, especially if their application requires high skill levels.

*Questions:*

- *Does this section do justice to the IPAT equation?*
- *How should we deal with the important role of institutions in influencing differences in consumption patterns within this framework?*
- *Please add any additional questions or important issues that should be raised.*

### ***Toward Population Balance***

Ten years after Rio we observe increasing demographic divergence. Fertility does not seem to converge to replacement. It has become so low in some European countries and Japan that serious concerns are raised about the possible negative consequences of rapid population ageing. At the same time, demographic concerns in other regions still center on population growth rates. In Africa, despite HIV/AIDS, a doubling of population size is still highly likely. The demographic divide does not separate countries into familiar groupings but instead reflects an outlook that is more heterogeneous than it was 10 years ago. While China is likely to experience an end to population growth within the next three decades, the USA is likely to see continued population growth.

“Population Balance” has been chosen as the tentative name for a new and broader view of population that focuses not only on population size but also on age structure. It adds a quality dimension to the strictly demographic perspective (size and age structure by sex changing through fertility, mortality and migration) by explicitly considering characteristics of the population such as education, although the approach could be expanded to include gender, empowerment and the human resource as creating wellbeing. Population balance is based on the more general understanding that both too rapid population growth and too rapid population ageing can have serious negative consequences, that other characteristics of the population will jointly determine those consequences, and that implications of particular population conditions will depend on social, economic, and environmental settings of society as a whole. For example, too rapid growth may put very heavy pressure on the educational system, while too rapid ageing may bring dangerous stress for the old age security system. But moderate growth or ageing may

not necessarily have negative implications, especially if environmental constraints are not yet relevant and productivity per person (which is closely related to education) increases over time. Population balance means that consideration should be given to both population growth and aging; to both demographic and socioeconomic characteristics of individuals; and to demographic, socioeconomic, and environmental conditions of societies.

As a metaphor the notion of “balanced nutrition” has inspired this concept. One can live in good health with different kinds of diets as long as the diet does not become too extreme in any direction. Also, what may be considered an optimal diet depends on the climate, the culture and the personal lifestyle. In analogy, population balance may mean somewhat different things in densely populated and resource poor regions than in rich and sparsely populated regions. It may mean different things in societies with rapidly increasing educational levels and productivity and in stagnant or deteriorating educational systems; and it may be seen differently at the local, national and global level.

Population balance is a candidate for replacing the strictly one-dimensional notion of “population stabilization” which only considers the human population in terms of its total size. Although the notion of “population stabilization” has gained importance as a goal in international policy documents over the past decades it is problematic not only because of its one-dimensional focus on population size but also because it contradicts current trends. Real populations today are either on a path to further growth over the coming decades (due to high fertility or immigration) or on a path to ageing and shrinking (due to below replacement fertility). Applying the goal of “population stabilization” not only to high fertility developing countries but also to industrialized countries would imply that the US government should be asked to stop immigration as the major source of continued population growth in the US, or that the Russian government should be asked to implement very strong fertility enhancing policies to counteract the population shrinking, which is mostly due to the very low fertility level of only about half of that needed for replacement. Since the political credence of these policies is open to question, “population stabilization” is not the right term in a truly global context.

*Questions:*

- *Population balance is one option, among others, for providing a conceptual framework for the role of population in sustainable development. What are the strengths and weaknesses of this concept?*
- *Please add any additional questions or important issues that should be raised.*

## **Policy Priority**

*[There are many policies that might contribute to the goal of putting the human population at the center of the sustainable development agenda. We propose to highlight the following issues.]*

Lessons drawn from progress made in understanding the role of population in sustainable development suggest that when formulating policies, it is critical to consider carefully the common but differentiated vulnerabilities and responsibilities of populations. Some groups of people are more vulnerable than others to environmental stress, and some groups are more responsible than others for environmental impacts.

In addition, the analysis of relationships between population and the environment, seen through the concept of population balance, indicates that a top policy priority should be social development, in particular education. *[There will be background papers on the role of education in linking population with sustainable development.]* Education has many benefits that are important in their own right. It fosters female empowerment and increases individual choice. It is widely agreed to make an important contribution to economic growth by raising productivity, an effect that can lead to less pollution-intensive production. Education plays a key role in reducing vulnerability to environmental changes as well as to other stresses. More education gives more access to information about how to avoid negative impacts and how to protect oneself against such impacts if they are unavoidable. There is overwhelming evidence in all societies that more educated people are in better health for a multitude of reasons. The fertility depressing effect of education indirectly contributes to strengthening the resilience against all kinds of stress, and contributes to reducing the scale of human impact on the environment. Education also plays a key role in addressing concerns about the influence of different aspects of populations such as growth rate and age structure on the environment and on wellbeing. Its multiple benefits make it a clear “win-win” policy with no obvious drawbacks. However, while much lip service is paid to this goal, progress has been slow or, in some areas, nonexistent.

*Proposal for recommended language to be implemented in Johannesburg*

- *The term “population stabilization” should be replaced with the concept of “population balance.”*
- *Any major sections of text should explicitly recognize that different groups of people have differentiated vulnerabilities and responsibilities (i.e., talk about people rather than*

*countries).*

- *Policy recommendations should include a strong emphasis on education as a priority.*

*Questions:*

- *Are there additional recommendations for language?*
- *Is the focus on education as a policy priority appropriate?*
- *Is differentiated vulnerability/responsibility the appropriate framework for communicating important lessons from the analysis of population in sustainable development?*
- *Please add any additional questions or important issues that should be raised.*

## **Annex: Case Studies**

*[Note: A proposal was made to illustrate some of the points of analysis as well as the policy recommendations with some case studies. These could appear in “boxes” within the relevant section of the statement. Two well-studied examples are suggested here, one from the European and one from the African region. It may be relevant to present case studies of regions currently facing difficult challenges that would focus on options for the future rather than documenting discouraging outcomes from the past.]*

### ***Education and development: The case of Finland***

In the late 1860s Finland must have been one of the worst places in the world to be. Bad weather conditions resulted in harvest failures, widespread famines and as a consequence diseases. As an extremely poor marginalized rural population living in a very harsh climate without any resources except a forest that was growing slower than in most of Europe, the population of Finland was completely unprotected against these threats. In 1866-69 almost 20 percent of the Finnish population died either of hunger or of diseases resulting from the poor nutritional status; in 1868 40 percent of all children died. This was probably the last non-war related famine in Europe, hitting one of Europe’s most backward populations. Despite the very cold climate, a typical house of that time did not even have a stone chimney, yet people were sitting in rooms full of smoke. Today Finland is at the very top of the world by almost every

indicator, be it technology, economic growth rates, human development or the status of women in society. What made one of Europe's most backward populations without any natural resources and exploited by the Russian Empire, one of the world's top societies 130 years later? The answer is clear: Heavy investments in the education of the general population. Early on, the Lutheran Church of Finland made the literacy of the population its primary goal. Ministers were traveling from house to house through the woods; they only allowed young couples to marry if they could read from the bible and the catechism. By 1900 the number of primary school teachers was already ten times the number it was in 1870; primary education soon became universal. Secondary education only reached 10 percent of a cohort during the 1940s. The basic strategy early on was universal basic education at almost equal level for boys and girls. This made Finland one of the world's most egalitarian societies and one with the lowest gender inequalities.

### ***Breaking the vicious circle: The case of Mauritius***

Similar to Finland in the 1860s, in the 1960s Mauritius was probably one of the world's worst places to be. It was a small sugar cane island with one of the world's highest population densities and extreme poverty after having been exposed to Dutch, French and British colonial rule. In the 1950s population growth was at a record breaking 3.6 percent implying a doubling time of less than 20 years. The fertility rate was at 6.7 children per woman. Around 1960 this extreme situation caught the attention of two distinguished scientists: the influential social policy expert Richard Titmuss and the Nobel Prize winning economist J.E. Meade. Both conducted independent studies on Mauritius, making a textbook case of an island stuck in a vicious circle of poverty, high population growth and lack of natural resources. At that time Mauritius was worse off than most countries in the Africa region and the future looked very bleak. Today Mauritius is at the top of the African region and is even considered a newly industrializing country with high quality of life and very high environmental standards. What caused this unexpected and dramatic success? One study finds that there are three reasons in the following priority order: (1) early investments in universal primary education of women and men; (2) a successful strictly voluntary family planning program that was conducted in collaboration with the influential Catholic Church and that would not have succeed without the preceding female basic education campaign; and (3) political stability and wise far-sighted economic policies that, e.g., in the context of the Lome convention opted for stable although initially lower sugar prices. Similarly,

textile and tourism industries were developed with foresight and caution, and over the last 10 years with a high degree of environmental consciousness. Unlike 40 years ago, today the future of Mauritius looks bright.

*Questions:*

- *Given the deteriorating situation in Africa – declining food production and consumption, increasing poverty and inequity, poor health and particularly HIV/AIDS, land degradation, water scarcity, potential large impact of climate change, wars and conflicts, poor trade and commodity prices, etc. – we propose a case study that highlights the need for putting people at the core of the decision making process in the population-environment-development nexus. Should this study be focused on the sub-Saharan region, or on a specific country (or countries) within the region? Should we make a case for an international partnership to put the differentiated needs and people-centered priorities in sub-Saharan Africa on a sustainable and lasting development strategy?*
  
- *What other case studies should be produced and what points would they illustrate? Some ideas include:*
  - *An urban focus on an Asian city: possibly Cebu?*
  - *A large country, such as China or India*
  - *Amazonian migrant communities*
  
- *Please add any additional questions, suggestions for case studies, or important issues that should be raised.*