

Geography, sustainability and the concept of glocalization

Herman Theodoor Verstappen*

Abstract. Sustainability focuses on the question whether our planet can sustain the present and future global human impact. The related environmental issues and particularly global changes, such as increasing temperatures, rising sea level, deforestation and deteriorating biodiversity, have become a key subject in earth science research. The social and economic components of sustainability, however, get less scientific attention and are often ignored in political and religious circles. Emphasis is on the symptoms of the issue rather than on coping strategies. Are the growing population numbers and social discrepancies compatible with sustainability and is the free market economy of our consumption society compatible with the ecological limits of growth,

social balance and human aspirations? Sustainable development is a realistic concept only if its economic aspects are shouldered by social and environmental considerations and if regional and local diversity is respected. The globalization required today thus should be coupled with decentralized glocalization. In this interdisciplinary field of regional differentiation geography can make important contributions. Earth observation from satellites and data handling using geoinformation systems are essential tools.

Key words: Development, geography, global change, globalization, glocalization, sustainability.

Geografía, sustentabilidad y el concepto de glocalización

Resumen. La sustentabilidad se basa en la pregunta de si nuestro planeta puede sostener el impacto humano global del presente y del futuro. Temas ambientales relacionados, y en particular los cambios globales como son el aumento de las temperaturas, el incremento del nivel del mar, la deforestación y el deterioro de la biodiversidad, se han vuelto temas clave en la investigación de las Ciencias de la Tierra. No obstante, los componentes sociales y económicos de la sustentabilidad reciben menos atención científica y son ignorados en los círculos políticos y religiosos. Se da mucho mayor énfasis a los sistemas que a la búsqueda de estrategias. ¿Son compatibles con la sustentabilidad los números del crecimiento poblacional y las discrepancias sociales? ¿Es compatible la economía de libre mercado de nuestra sociedad consumista con los límites ecológicos de cre-

cimiento, de equilibrio social y las aspiraciones humanas? El concepto de desarrollo sustentable sólo es realista si se apoya en sus aspectos económicos, en las consideraciones ecológicas y sociales, y si se respetan las diversidades locales y regionales. La globalización así requerida debería estar acompañada de una *glocalización* descentralizada, y en el campo interdisciplinario de la diferenciación regional, la geografía puede hacer contribuciones importantes. La observación de la Tierra desde los satélites y el manejo de los datos por medio de los sistemas de información geográfica son herramientas esenciales para tal fin.

Palabras clave: Desarrollo, geografía, cambio global, globalización, glocalización, sustentabilidad.

* International Institute for Geoinformation Science and Earth Observation (ITC), Mozartlaan 188, 7522 HS Enschede, The Netherlands. E-mail: hergraverstappen@planet.nl

“We are now at a stage in the evolution of geographical knowledge when an accounting can be made of the mutual relations between the earth and its human inhabitants”

Josué de Castro

INTRODUCTION

The human impact on the environment has increased at an alarming rate since the beginning of the industrial revolution and particularly in recent decades. Scientists, governments and the public at large are gradually becoming aware of the fact that the data gathered on issues such as land degradation, deforestation, water- and air pollution, climate change, etc. clearly indicate a world-wide ecological degradation of our planet due to unsustainable human activities. Early warnings, based on a variety of observations and local studies, date back more than a century, but systematic, global, investigations only became possible when, in the 1960s, the conventional research methods could be coupled with continuous monitoring of our planet by earth observation from satellites and when the techniques required for handling the enormous amount of the gathered data had become available in the form of geographical information systems.

THE GLOBAL ENVIRONMENTAL DEGRADATION

The kinds and magnitudes of the causative devastating human activities are reflected in the statistics on the use and depletion of non-renewable resources, on the application of pesticides, the quantities of urban waste, etc. Scientists, alarmed naturalists, journalists and novelists have highlighted specific harmful effects of these activities. Several of these publications were eye-openers that shocked large sectors of society and contributed to triggering appropriate action. In “The Rape of the Earth” Jacks and Whyte (1939) gave an impressive, well-documented overview of the rapidly increasing soil erosion all over the world resulting from excessive pressure on the land and inappropriate agricul-

tural and grazing practices. De Castro (1953), in his equally impressive “Geography of Hunger”, focussed on the issue of food shortage and famine in the past and the present. He highlighted in particular the importance of the socio-economic and political context and the related mismanagement caused by wars, landlordism, etc. Surprisingly, he disregards population increase as a factor because, according to him, every individual can increase food production. However, this may, in the author’s view, apply to subsistence farming and other rural societies, but certainly not to the modern industrialized world where only a very small percentage of the population is engaged in food production (Curry and Hugo, 1984). Every human being has to be fed and has to be provided with work and shelter. Carson (1962), wrote “Silent Spring” when realizing that the massive use of pesticides for raising the food production required for the growing world population, had adverse side-effects on bird life, biodiversity and other forms of degradation of the biosphere. FAO’s “Green Revolution” served its aim, but temporarily only, because the global population growth is continuing.

At present it is gradually understood that not only our environment is in danger but also that the fate of humanity is at stake. The data gathered about the deteriorating state of the earth, first doubted by some, have been proven to be statistically significant. A dwindling group of scientists still attempts to deny or minimize the related anthropogenic driving forces. These discussions about the causes of global environmental changes are in fact diverting our attention from the core of the problem: Our globe obviously cannot support the growing demands of the consumption society. This is, therefore, incompatible with sustainable development. Some kinds of human impact have already caused irreversible changes; for others it will take centuries to restore the natural balances even if we (could) stop or modify the causative human activities immediately. Sustainability is also endangered by the growing socio-economic disparities all over the world. This threat is a rather neglected element in the context of sustainability, even in global research programmes. Yet it is evident that the growing numbers of have-nots all over the world

are not only a time - bomb under the consumption society but also preclude global sustainability. The latter can only be achieved if environmental, social and economic elements are in balance.

PLANET EARTH: A DYNAMIC SYSTEM

The natural ecological conditions at the surface of our planet result from the complex and ever changing interactions between the geosphere and the biosphere where subtle equilibria between the land surface, the oceans and the atmosphere play a leading part. Together, these factors form a dynamic system that is generated by a number of driving forces and ultimately by the sun. This system is affected by variations in solar radiation and other extraterrestrial phenomena. However, it is also very sensitive for disturbances in the existing ecological equilibria on the earth and this makes it extremely vulnerable for the massive interferences with nature by our modern society (Goudie, 1981; Heap, 2004). The ecological damages caused by the increasingly intensive human interference with the environment have for many decades been ignored, underestimated or simply accepted as a matter of fact (Bianchi, 1994). Humanity should urgently face the acute environmental problems and concentrate on developing appropriate coping strategies at the global scale (Bohle, 1993). The invention and application of new technologies is urgently needed but also changing our priorities and ways of life will be inevitable. The decisions to be taken should be rooted in scientific research on the global, regional and local levels, related to the complex ecology of the earth and to the needs of a sustainable society. Geography, traditionally focussing on regional differences in the interrelations between society and natural environment, can play an important part in this research (Yeung, 1996).

That devastation of our environment is a boomerang with detrimental effects for society that even endangers the future of mankind is now gradually, and by some only reluctantly, becoming accepted (Verstappen, 1996a). We are the causes and as well victims of the present rape of our planet. The, now famous, warning issued by the Club of

Rome in its report "Limits to Growth" (Meadows, 1972), is a landmark in this context. The problem has been highlighted further in the Brundtland Report "Our Common Future" (1987) of the United Nations Commission on Sustainable Development (UN CSD). This provoked a cascade of publications (Schubert and Láng, 2005). Also Al Gore's "Earth in the Balance" (1993) and "An Inconvenient Truth" (2006) contributed substantially to the global awareness of the problem that now ranks high on the international political agenda, as is evidenced by the UN Conference "Agenda 21" in Rio de Janeiro and the UN Millennium Development Goals Report (2005). The United Nations declared 2008 "The International Year of Planet Earth", the events of which actually began in 2007 and will continue throughout 2009.

INTERNATIONAL RESEARCH PROGRAMMES AND SUSTAINABILITY

The large international research programmes, such as the International Geosphere Biosphere Programme (IGBP), the World Climate Research Programme (WCRP) and the International Human Dimension (IHDP), each comprising numerous specific projects, that have been launched in recent decades aim at investigating the present state of our planet and the past, ongoing and expected environmental changes (Verstappen, 2001). The international scientific community at large is involved in this interdisciplinary global research. The aim of the International Year of Planet Earth is to promote the use of the knowledge gathered by hundreds of thousands of scientists all over the world about the earth and its climate and environment, for building safe, healthy and economically strong societies. Although the emphasis often is on geosciences it is understood that a-biotic and biotic factors are inseparable where our physical environment is concerned. The focus is on humanity, both as devastating actor and as potential victim (Eckart and Kraft, 2006). These research programmes have significantly increased our knowledge of the dynamics of our planet and have resulted in awareness raising world side. Two questions remain, however.

First one may wonder whether the orientation of all research done is sufficiently geared towards the core of the issue: how to cope with the environmental problems (Graaff, 2008). Secondly one may argue that the response by the global community and its leaders is as yet inadequate for developing a sustainable global village.

As to the first question: Our knowledge about the physical characteristics of the globe has made unprecedented progress since the advent of earth observation from satellites. At present continuous monitoring of the state of the earth is a fact. In the beginning the information so gathered was mainly valid on the global level. However, the high-resolution satellite data that have become available subsequently, made this technology also valid on the regional and local levels. The cascade of information so produced is being structured and visualized with the aid of geo-information systems (GIS) that also satisfy the need for integrating aerospace data with other scientific and statistical information. Modelling techniques then serve to reveal trends of change and to predict future environmental conditions. The accuracy of these predictions will undoubtedly increase in the coming years, with growing data input and improving modelling techniques. However, one may wonder whether the issue of change is not overemphasized, in view of the fact that already the present situation is unsustainable. There can be no doubt that monitoring and revealing the fragile dynamic system of our planet are important scientific issues that should form the basis for global management. On the other hand, however, it is rather irrelevant for practical purposes to know that today's global warming and related sea level rise are at least mainly due to human factors: the disturbances of the planetary dynamic system already are either irrevocable or their remedy requires centuries of millennia. We simply have to face the problem and respond timely by appropriate action.

This leads us to the second question: is the response by the global society and its leaders adequate at the moment. The scientific community has been very successful in raising global awareness of the alarming situation and managed to get the issue high on the international agenda. All this evolved

rapidly, particularly during the last decade. This is very positive indeed and gives us hope that society is a dynamic system too, capable of making the appropriate decisions and introducing the changes required for its future. Humanity has, from the dawn of its existence, always managed to survive, though with pains and pitfalls. However, our problems today are of a much larger, global, dimension and demand rethinking the limits of growth. Diversified projects for reducing the global environmental degradation and the misuse of natural resources have been launched by international organizations and national governments. In comparison to what is really required the efforts are, however, as yet marginal only. They will remain so unless the societal factors that do not comply with sustainability are recognized and remedied. The world is consuming too much but individuals in the economically strong, "overdeveloped", parts of the world are unwilling to restrain and those in poor countries are with justification looking forward to a better living. Reducing economic growth is, for governments, political suicide and reducing the world population by birth control is unacceptable for many religious leaders. Obviously sustainability encompasses much more than the physical environment only.

SUSTAINABILITY: AN ETHICAL OBLIGATION AND URGENT NECESSITY

The term "sustainable development" is often used nowadays, in U.N. circles, by government authorities and in the media. For a better understanding of this term it is necessary to define what is meant with these two words: "sustainable" and "development". Sustainability basically implies the thorough, continuous maintenance of our global life support system. It is a complicated matter as both our environment and the society are ever-changing dynamic systems. The environmental conditions have been subject to change by natural causes over the geological time scale and at present especially by massive human impact. Society has been changing during the past centuries and even millennia under the influence of a variety of factors.

Economic, social and cultural factors rank high in this context but also changes and limitations of environmental resources should be mentioned. Nature and society are closely interwoven, and the study of their interrelationships, the hardcore of the science of geography, ranks high in sustainability matters.

Sustainability comprises economic, social and environmental aspects. These three basic elements are closely related and should be in balance. An efficient economic system is mentioned first by those who believe that the social and ecological goals can only be reached when sufficient financial resources are available. Others point out that where social balance fails, the have-nots will cause political unrest and uprisings that preclude the creation of a sustainable society. This applies to the world as a whole and on the national level also. The economic discrepancy between the rich countries of the “North” and the poor countries of the “South” is a major destabilizing factor in the world of today. The socio-economic change in the USA in the period 2000-2006 is an example on the national level. The economic growth of the USA in that period was 18%, but the income of the average American nevertheless decreased by 1.1%. At the same time the income of the highest ten percent income group increased 32% and of the highest 0.1 % even 425%. (NRC Handelsblad 1 November 2008). It is evident that social deterioration is not only unacceptable but also conflicts with sustainability. The idea that environment comes first as an element in sustainability is increasingly heard. Don't we have the obligation to save our planet for ethical reasons and also for our own sake? They proclaim that the correct order is: Planet – Person – Profit.

When the word “development” is used in the context of sustainability, one should realize that society must get organized within the limits set by our planetary resources (Mosishima, 2002). Emphasis thus is by necessity on the fulfilment of basic needs and the achievement of a state of well-being for all. The continuously rising consumption rates, required to blow-up the economic balloon of our consumption society, are, at the global scale, incompatible with the environmental basis of sustainability. If the economic balloon bursts

—as it appears to be doing at the moment— the environment may to some extent benefit, but there will be widespread unemployment and the jobless will further destabilize the social pillar of sustainability. The only answer is a better distribution of sustainable economic resources at planetary, regional and local levels. This is the core of the sustainability issue; a core that is difficult to accept for society because it implies that we have to change our priorities, lifestyles and values.

The difficulties that many of us have with recognizing the intricate relationship between humanity and the ecology of our planet, derives, at least partly, from the fact that we been taught for millennia that mankind is a divine creation, separate from the biosphere and born to be master of the world. This human-centred concept of being apart from nature has brought about a certain arrogance and disregard for environmental issues that facilitates the ruthless exploitation and destruction of the earth's resources. We should reconsider our attitudes and define the ethics of sustainability (Engel and Engel, 1990; Adam and Madl, 2002), realizing that we form a part of nature and live carefully with it! Even in some global research programmes this fact is sometimes overlooked. During the International Decade for Natural Disaster Reduction (IDNDR), for instance, emphasis was on the impact of natural disasters on society. The mandate of the consecutive International Strategy for Disaster Reduction (ISDR) is larger and also covers the risks caused by technological, industrial, disasters. That humanitarian disasters are excluded is understandable, because these usually relate to inadequate governance and thus belong to the political agenda of the U.N. Environmental disasters endangering the biosphere, however, are as yet completely ignored, even though the communities forming part of the local ecology are also adversely affected by those events. The present surge of globalization even exposes humanity at large to environmental disasters.

GLOBALIZATION OR GLOCALIZATION?

It is beyond doubt that achieving sustainability requires co-ordinated action at a planetary scale

not only in the field of environment but also encompassing society and economy. It has become clear a few decades ago, however, that a centralized production system, enforced by governments, cannot manage the magnitude and complexity of economic activities in a world that is rapidly evolving into a patchwork of interdependent communities. Negligence of environmental issues and human aspirations also made sustainability problematic. The decentralized free market production system, dominating world economics today, has brought enormous economic progress in many parts of the world. It is not a panacea for our major problems, however (Verstappen, 1994). The driving force of the system is a continuous increase of production and a steadily growing consumption society. This concept clashes with the limits of the global environmental resources and thus conflicts with sustainability. The total freedom left to the captains of industry versus employees and consumers also puts the social component of sustainability at risk. The idea that the system would be self-regulating in this respect is overestimating the moral restraint of humans and therefore unrealistic. Pitfalls such as the present economic crisis with steeply rising unemployment, stock market swindle, continuing high bonuses for managers, etc., are inherent to the system.

A way out may be in realizing that globalization in its present form is lopsided as it is restricted mainly to economic affairs (Hertz, 2001). The global economy lacks the stabilizing effects of governments and trade unions that characterize the economy on national, provincial and municipal levels in democratic countries. Globalization in these sectors is badly needed. Environmental equity should be the guiding principle for all actors. This principle has been advertised first by non-governmental organizations, such as the World Wildlife Fund and Green peace. It is becoming accepted gradually by national governments and in the international arena.

An important prerequisite for obtaining worldwide support for the implementation of the changes required to save our planetary resources for the future generations, is the replacement of the present, centralized, top-down approach of globa-

lization by the decentralized bottom-up approach of glocalization rooted in deep respect for the rich diversity of our planet and of humanity. The emergence of an intercultural global village will result in reconsidering our values and in new concepts for sustainable development. Those who fear the present migration waves from the poor to the rich parts of the globe, for instance, should realize that these waves are the symptom of a global problem, not the cause of it. Building walls at international boundaries or whatever restrictive measure, is therefore bound to fail. Remedy of the economic and social driving forces is the only realistic response to the issue. All members of society have the right to decide about their future and this requires worldwide awareness of global problems and active participation of all segments of society in solving them. The future is in our hands (Verstappen, 1995b).

GEOGRAPHY: A KEY TO GLOCALIZATION AND SUSTAINABILITY

The understanding that the global issues that are challenging humanity in our days do not only concern the realm of economics but also encompass a complex pattern of physical and social elements automatically brings geography in focus (Ghorra-Gobin, 2008). Apart from analytical studies in many fields there is a great need for comprehensive geographical approaches (Vallega, 2001). It is not surprising therefore that geographers have, from the onset, been involved in the formulation and launching of several global change research programmes and it is encouraging to see that many geographers are now actively engaged in them (Verstappen, 1995a,c). The input of geography is threefold. First, there are analytical contributions by several specialized branches of geography. More fundamental, however, are the comprehensive studies made in the area of humanity and environment, a traditional focus of our science. In the third place geographers contribute by revealing the importance and intricate mechanisms of regional differentiation. The challenges of our time have resulted in a worldwide renaissance of geographical

thinking, even among non-geographers (Verstappen, 1996b).

Some specific fields of geographical inputs are listed below.

1. Studies on past landscape evolution for assessing the present situation and changes in the foreseeable future.
2. Modelling landscape dynamics, including human activities, for understanding the ecological systems and elucidating landscape heterogeneity.
3. Research on anthropogenic causes and social consequences of environmental change.
This includes Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) of environmental changes.
4. Regional studies on resource systems and cycles (e.g. energy, water, nutrients) in the context of sustainable resource management.
5. Appraisal of social behaviour and of coping strategies, traditional and new, with environmental constraints. This includes the issues of economic development *versus* environmental conservation and perception and adaptation of environmental quality.
6. Environmental hazard studies and risk assessment, issues of increasing importance because of the rising vulnerability levels in densely populated parts of the world.
7. Geographical education, focussing on the need for sustainable use of our planet.

Geography has always been stimulated by and responding to the evolving needs of society. In the age of discovery geographers described remote lands and peoples. It became an academic field in its own right in the 18th century, flourished in the 19th century and is now a mature science ready to face the greatest challenge of all: the incompatibility of the present global economy with social justice and planetary resources. The research capacity and the technological means are available. Will society respond?

CONCLUSIONS

The creation of a sustainable global society requires the continuous balance between three elements: environmental capacity, economic drives and human aspirations. It is evident that the present process of globalization is incompatible with sustainability, but humanity is as yet ill-prepared to invent consumption- and production patterns that can last for generations. We are facing a dramatic dwindling of planetary resources and a widening gap between and within rich and poor countries. This has triggered large-scale international migrations and protest movements in many parts of the world. This unrest will certainly increase in the years to come if the economic- and social balance remains.

Further there is a concentration of power and access to the economic process in the hands of multinational organizations that precludes corrective interventions by national governments and trade unions. Strong international governance and cross-boundary cooperation of labour organizations can remedy this socio-economic unbalance. They are, however, no guarantee for safe-guarding the environmental balance that is another prerequisite for sustainability. It has become clear that the present, centralized, "top-down" concept of globalization, that disregards the global diversity of cultures and aspirations, should be replaced by the "bottom-up" concept of glocalization that emphasizes the local and regional diversity with due respect for humans and his world. In this context geography can play a crucial, pioneering part.

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