Human Security in a Changing Environment

Objectives and Purpose
of the United Nations University Institute
for Environment and Human Security,
Bonn, Germany

Indian Village near Jadatsinpur flooded (Source: Reuters/e-lance media)

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Supported by:
The Federal Government of the Federal Republic of Germany, represented by
the Federal Ministry of Education and Research, and
the State of North Rhine-Westphalia, represented by
the Ministry of Science and Research

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To preserve the world for the future of our children we must strive for sustainable development – a development that meets the needs of the present generation without compromising the options and resources for future generations to meet their own needs. It implies environmentally sound development in a society free from threats to life and property. Human security is an essential ingredient of sustainability, increasingly threatened by extreme natural events such as large floods, droughts, tropical storms, storm surges, heavy rain-induced landslides, earthquakes, volcano eruptions or tsunami waves. They affect people living in an increasingly vulnerable environment. Damages in lives lost and destroyed property are increasing in frequency and magnitude. They take disproportionate tolls on the economic strength, particularly of developing countries, forcing international efforts by governmental and non-governmental donor organizations to give emergency assistance rather than offer or develop preventive measures for avoiding future losses. Why does this happen?

We live in a changing world. Climatologists show how the climate is changing due to increased CO_2 levels in the atmosphere, causing a gradual increase of the temperature due to the green house effect. The slowly rising sea level is threatening low lying countries with more severe storm surges and some scientists suspect that recent large floods such as the one on the Elbe and Oder rivers in Central Europe are indications of more severe natural events in the future. In the Northern hemisphere, we find melting glaciers and warmer winters, with not nearly as much snow in the mountains as in the past. Melting permafrost destabilizes land surfaces in the Taigas and Tundras of subarctic regions and of mountain slopes. Landslides occur that may block valleys from creating natural dams, only to cause disastrous floods when these dams fail.

Even more dramatic are man-made environmental changes caused by population growth and changing lifestyles of the better off. They result in changes of social and cultural structures, changes of land use and related phenomena. The environment becomes increasingly endangered, especially when man encroaches on and modifies fragile environments.

In industrial countries, people ignore age old experience and build houses on flood plains, in hurricane prone coastal regions, or on land slide threatened mountain slopes or coastal bluffs. In the developing world, the pressure of a rapidly increasing population changes the environment even more dramatically: wetlands and tropical forests are converted into farmland, while on the other hand farmland and pastures are given up, swallowed by urban sprawl, or due to

erosion of thin layers of topsoil, over-grazing or desertification. Land without protective forest cover dries up from lack of water and is blown away by the wind. Salt as residual of strong evaporation covers the surface of irrigated soils without adequate drainage. Population growth and lack of local employment opportunities force rural labour to move to the cities, leaving behind the weaker and older to fight poverty. As a consequence, cities are growing at rates which outstrip abilities of city administrations to supply necessary infrastructures such as schools, hospitals, roads, water supply, or sanitation. In many cities of the world uncontrolled growth accounts for a large percentage of the total inhabited area.

If extreme natural events hit a population that is already weakened by a deteriorating environment, people may no longer be able to recover using their own resources but depend on external assistance. Natural events like floods or droughts in an uninhabited region do not cause a disaster. It is people who suffer from it because their living conditions and livelihood are endangered, affected, or deteriorated. In many countries of the world, existing or changing social and economic conditions make people living in rural and urban areas increasingly vulnerable, thus susceptible to disasters.

Understanding the causes of vulnerability is a prerequisite for ensuring human security and decreasing human vulnerability, but it is not enough. We need to develop local, regional and national strategies for alleviating disasters: long term strategies to reduce the vulnerability of the people threatened by extreme events but also short term strategies to reduce their possible impacts. Strengthening human security is demanded from governments and the creation of a safer world is one of the major challenges facing all countries. The complexity of the factors that determine vulnerability and the ability to cope with extreme natural forces call for improvement of the scientific basis for decision making in disaster reduction.

UNU's Response

This challenge has been taken up under the leadership of the United Nations University (UNU). UNU has been founded in 1975, based on an earlier proposal of the then Secretary General of the United Nations, U-Thant, with the purpose of helping to close the gap between rich and poor nations by improving education and transfer of knowledge and skills, and to assist developing countries in increasing their scientific capabilities. Its headquarters is located in Tokyo, but as a global university, it has research and training centres and programmes as well as associated institutions in many

countries such as Japan, Finland, Belgium, Canada, Ghana, Zambia, Iceland, China, Venezuela, The Netherlands, Jordan, United Kingdom, Korea, USA, and now in Germany. In the Strategic Plan of the year 2002, UNU emphasizes its main programme areas "Peace and Governance" and "Environment and Sustainable Development". Due to its central importance to peace, stability and sustainability, the issue of how to improve human security is an important academic challenge area for UNU.

Both research and capacity building, especially in the context of developing and transitional countries, are needed to strengthen coping capacities of national governments, provincial authorities and municipalities. Furthermore, UNU has a particular mandate to help to build academic capacities in the countries which most need them.

The United Nations University Institute for Environment and Human Security has been conceived and created to spearhead UNU's thrust into this challenge area. The Institute is supported by the Ministry of Education and Research of Germany and the Ministry of Science and Research of the State of North Rhine-Westphalia.

During its inception phase, a scoping workshop on Environment and Human Security was held in Bonn (24/25 October 2002), addressing three potential themes for the then future institute:

- land degradation and its impact on human security;
- human security in flood plain environments;
- water, health and urbanization.

The more than 50 expert participants in this workshop formulated the Bonn Declaration on Human Security and Environment.

This publication summarizes the developmental challenges, scientific background, thoughts and expectations leading to the establishment of the United Nations University Institute for Environment and Human Security.

The Institute came into being on 1st December 2003 while its Opening Ceremony took place on 15th June 2004 in the presence of the Rector of the United Nations University, Professor Hans van Ginkel, Under Secretary General of the United Nations.

Malaysian parched field (Source: Reuters/e-lance media)

Example 1:

Land degradation and drought

The International Federation of Red Cross and Red Crescent Societies has estimated that during the period from 1960 to 1993 drought led to over 73,000 deaths, affected 58 million people, and caused economic losses of nearly US$ 4 billion. This is a large scale assessment, lumping many effects that can be attributed to severe drought conditions. However, a definition of drought on a smaller scale is not simple. For example, meteorologists, climatologists, hydrologists and economists all have different definitions. Meteorologically speaking, it is a shortage of rain in areas where there usually is rain. Obviously, no rain in the desert is not a drought. On the other hand, a drought implies also that the soil is involved: no rain on a barren mountain slope does not cause a drought. A drought definition should be based on water shortage or lack of water, so that water demands for supporting life or livelihood cannot be met. Hydrologists identify a drought as a condition where the soil is no longer capable to support plant life (small scale) or as a condition where the streams are carrying a discharge lower than some critical value (large scale).

With regard to human security, a drought is identified not by its causes but by its consequences. Whether a drought constitutes a disaster or not is a matter of scale: a drought as a disaster for a farmer is different from the drought leading to shortage of drinking water for a city with extensive storage capacity of water in reservoirs or lakes. Droughts can be expressed in economic terms but the significance of a drought causing a bush fire in Australia is different from that of a drought that destroys the water supply for livestock in the Sahel zone. However one defines a drought, it is evident that climatic variability is the ultimate cause: rains, to which practices of land and water use have been adjusted, do not occur in the regular fashion they usually do.

Tetziulan pueblo landslide, Mexico (Source: Reuters/e-lance media)

As was stated in the introduction, a disaster is the impact of an extreme natural event that leaves the people involved incapable of handling its consequences with the help of their own resources. To the farmer who sees the top soil of his parched fields blown away by wind or whose cattle is dying of thirst, a drought is a very concrete disaster, an event that threatens their livelihoods. On the surface it appears their own human actions are partially responsible for the disaster which struck them, such as settling in drought prone areas, degrading land by removing the plant cover which protected the soil from a parching summer sun, destroying tropical forests that were growing on a very thin and fragile layer of top soil which had generated their own humid micro climate under the dense cover of broad crowns of tropical trees. However, the deeper cause is what drove people to do it: the socio-economic conditions with their many different aspects of population pressure, ill-conceived administrative guidance and economic necessity that force people in need to look for short term gains, even if these may threaten their long term survival. Due to prevailing socio-economic and cultural conditions as well as lack of respect for the environment, land degradation is a common occurrence. It is estimated that every year more than 5 million hectares of land are severely damaged by soil degradation, desertification, and deforestation worldwide.

Droughts and non-sustainable land use are inextricably interwoven. In many parts of the world, where land is allowed to degrade further, drought disasters will inevitably become more common. Furthermore, because of its relationship to climate, droughts will change when the climate changes. Various climate models show that the long-range effects of increased atmospheric temperature will lead to longer intervals of droughts, often followed by periods of strong rainfall activity.

In recent years scientists have discovered and explored the strong relationship between meteorological phenomena and sea surface temperature. The El Niño phenomenon in particular has been studied – a large area of increased water surface temperature west of Peru determined to a large extent by the weather in the South Pacific. A strong El Niño phenomenon indicates that Australia will suffer from shortage of rain, whereas drought conditions prevail in the South West of the USA. Since longer and stronger El Niño episodes must be expected, a diminishing severity of droughts in the South West Pacific is unlikely. The relationship of seasonal sea surface temperature development with drought and other climate related phenomena is time delayed: the El Niño phenomenon is observed months earlier than the drought. This sequence points to a possible means of forecasting droughts from observations of the changes in sea surface temperature and other meteorological and oceanographical variables, allowing people at risk of drought to be better prepared. Translation of drought forecasts into warnings and preparedness actions is an important research topic – not only for natural scientists, but also for social scientists.

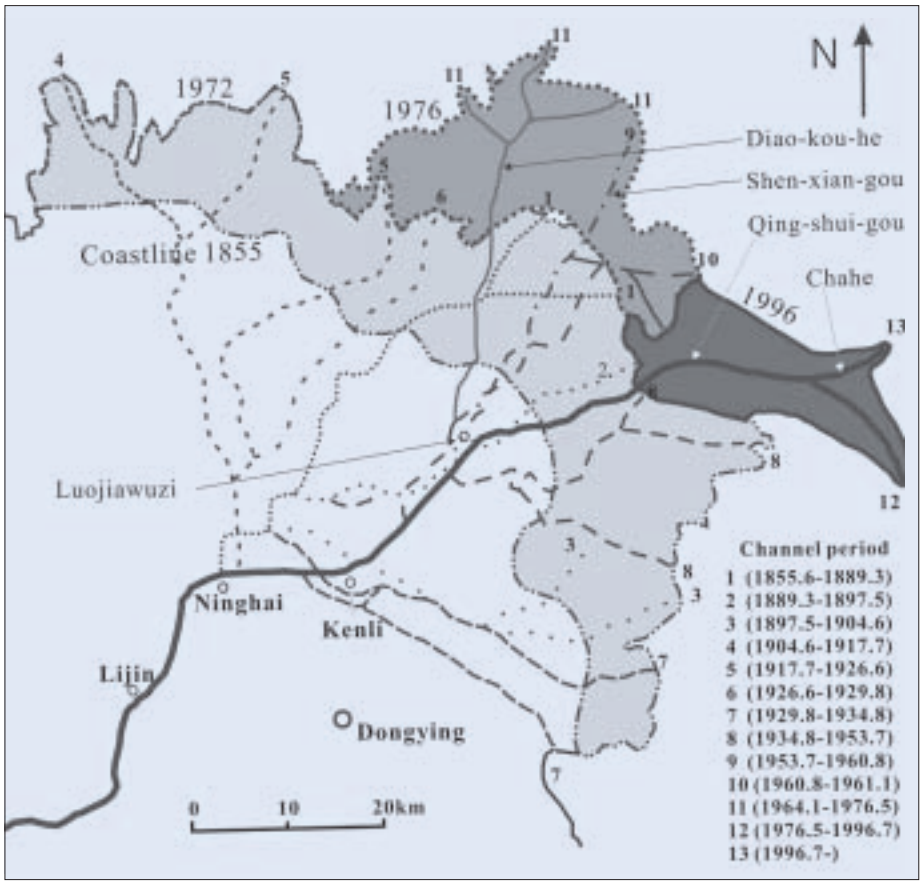
To prevent meteorological droughts from becoming disasters, they have to be handled according to the capacities available locally and regionally, ranging from self-help assistance through insurance to providing adequate forecasts and advice on drought management. Also, it may be important to install national or regional storage centres for storing emergency supplies and foodstuffs, or to set up a system of mutual assistance between different parts of a large country. In parts of India, for instance, farmers affected by a drought are hired by the government to improve infrastructures, such as highways or irrigation canals and reservoirs in return for food and water during droughts. Other projects may combine government assistance with reclaiming degraded land. Evidently, different solutions for drought mitigation are appropriate in different regions and strategies for selecting from the mix of available measures. Likewise, the development of new methods and technologies for improved forecast and mitigation measures is badly needed as well. A catalogue of measures, including statements on where and how to use them in different regions, may be a fruitful research topic so that guidance for local self help actions may be given.

Example 2:

Floods on the flood plain of large rivers

Almost nowhere is global change due to natural causes more strongly felt than in delta regions of large rivers. Sediment eroded from land in the upstream part of the river basin is carried through the steeper parts of the river to lower reaches where reduction in slope of the land causes the river to flow more sluggishly. The sediment carrying capacity of the river is reduced and sand and gravel is deposited in the river bed and on its banks. Gradually, the river bed is raised and, if not confined in mountain valleys or by actions of man, it will eventually overflow its banks and find a new course, where the process starts again. These processes continue through geological times. Vast deltas are created where large rivers meet the ocean. Nowhere is this process more apparent than on the large streams of South Asia: on the Ganges-Brahmaputra in Bangladesh, the Mekong in Cambodia and Vietnam, the Yangtse and the Yellow River in China.

A striking example is the fan of the lower Yellow River, as shown in the map below.



Displacements of Yellow River channels caused by extreme sediment deposition in the river mouth. The coastlines show the land created by the river in the periods between 1855–1972, 1972–1976, and 1976–1996 (courtesy of Z.Y.Wang, Tsinghua University China).

Bangladesh river erosion (Source: Reuters/e-Ince media)

The Yellow River is the world largest carrier of sediment, carrying an unbelievable 1.6 billion metric tons of sediment each year into the coastal plain of which only 1.0 billion reaches Lijin near the river mouth on the Yellow Sea. The rest is deposited in the river stretch between Zhengzhou and Lijin, gradually raising the river bed. The area along this reach is heavily populated, by about 150 million people today, so dikes were built along the river since 1888. It has been confined between dikes up to Lijin. But downstream, where a sparse population could not control the river, an alluvial fan with a radius of about 50 km evolved. The river changes its course roughly every 10 to 15 years, sweeping across the plain and creating new land at its ocean outlet. This example is a powerful illustration of the natural process described above. It reappears on a much larger scale and over longer times on the 400 to 500 km long reach of the Yellow River from where it leaves the mountains near Zhengzhou.

In contrast to the Lijin fan, the fan with its apex at Zhengzhou has been modified by human actions. Since the plains formed by the fan are fertile and the soils easily cultivated, early civilizations were already willing to fight the river for land. Throughout history, the Chinese have tried in vain to confine the river between dikes, developing a cycle of ever-higher dikes being built, then sediment deposits raising the river bed until the water could no longer be confined and destroyed the dikes. With enormous force, the river rushed to the sea following the steepest slope and created a new bed. After recovering from the flood disaster, people built new dikes along the new course, and the process of build up and dike raising was repeated until the time of the next extreme flood. In this way, the river changed its bed many times, causing losses of millions of people. 1,593 dike breaches occurred between 602 BC and 1950, and the river changed its course 26 times, including 7 major shifts from the Northern extreme to the Southern edge of the fan. Today, about 150 million people live in the fan shaped area, threatened by future shifts which can be only temporarily avoided.

A different way of human interaction with a delta of a large river is found on the lower Mekong. This river has been allowed to develop naturally and it branched into many smaller river branches throughout the delta, branches which until recently were allowed to shift and find their new channels. Due to much lower sediment loads, the shifting is much more gradual, and adaptive strategies can be used which permit people to live with the river. In such conditions, flooding is a very frequent phenomenon, and large scale inundations are observed almost every year – for example during the last big flood in the year 2000 an area of more than 30,000 square kilometres was flooded.

The two examples show the range of options open for river management: to fight the river, and be prepared (if possible) for the extreme consequence of an extremely large flood breaching the dikes leading to a new river bed, or to live with the river, allowing for its variability and be prepared to accommodate the flooding. The latter approach is systematically used in the Ganges-Brahmaputra delta of Bangladesh. Here, living with the river implies flood protection through early warning and getting people to move to safe havens – elevated mounds with shelters – where room for people and their livestock exists and which can be used for other purposes such as schools or meeting places outside the flood season. The disadvantage of allowing the river to shift its course is that land boundaries shift as well: infrastructure such as highways is threatened, farmland is eroded away in places while elsewhere, due to deposition of sediment, new land is formed. Fighting the river, on the other hand, is a continuous process involving enormous investments in flood protection measures such as polders, retention basins and dikes.

The question of fighting the river or living with it repeats itself at a smaller scale on inland rivers. A balanced approach has to be found, leaving the rivers and creeks intact – except for local situations where life and property is threatened. Not only on the large rivers but also on smaller ones, solutions to regional problems have to be found somewhere in between the two extremes. Such solutions have to consider national or regional priorities and geographic conditions. Furthermore, they must be adjusted to the lifestyle of people living in the area – but they also have to be flexible enough to allow for adjustment if future regional developments and changing priorities have to be satisfied.

Example 3:

Vulnerability of urban areas

An increasingly growing proportion of the human population lives in urban centres. There are various estimates concluding that by the year 2010 more than half of the world population will live in urban areas. Already in 1992 the World Bank stated: "The need has never been greater for expanding our understanding of the vulnerability of major metropolitan areas to disasters. Priority should be given to reversing the failure of conventional development programmes and policies". More than ten years later, the need has not diminished. Optimistic forecasts assuming that urban populations of the mega-cities in the developing world would level off after a rapid increase to reach stable conditions which would allow city administrations to catch up with development needs, proved to be wrong.

Urban complexes of more than 10 million inhabitants are growing, most of them in developing countries – projections of population development indicate that Mexico City, Mumbay (Bombay), Manila, Cairo and many other cities will outstrip the growth of the mega-cities in developed countries like New York, Tokyo or London. The new centres, particularly in the developing world, very frequently are not in equilibrium with their surroundings. In past centuries, cities were the cultural and commercial centres and formed an equilibrium with their surrounding agricultural regions. Advantages of location placed them at crossroads or near large rivers or into the midst of large fertile lands. While their agricultural fringe provided the means of supporting life in the city, people in neighbouring rural areas profited from the city. At the same time, city administrators were able to use returns from local taxes to provide, maintain, and improve the infrastructure such as water supply and sanitation. With increasing size and growing commercial activities,

Settlement Jukskai/Johannesburg, S.A.
(made available by Prof. W.R.Alexander)

the cities reached their boundaries. They became less beneficial to their neighbours, expanding deeper and deeper into their territory. Due to their larger numbers and their heavy use of resources, city dwellers deplete the resources of the surroundings. This development used up some of the most productive farmland and displaced farmers, drawing on their resources of water. Deforestation of adjacent regions is aggravated by the need for firewood, (for example, the city of New Delhi uses more than 600 tons of fire wood daily). Balanced agricultural production in the outer fringes of the cities was abandoned in favour of larger areas of mono-cultures for the cities, leading to land degradation where agriculture is still practiced. This happens in the Mata Atlantica of Brazil, inland from and adjacent to the city of Rio de Janeiro. The landscape has been deforested and land, quite unsuited for agriculture because of its hilly nature, is mostly used for growing tomatoes on steep slopes of heavily degraded soil. Due to low prices for their product and the inequity of land ownership, farmers are forced to keep degrading the land or to abandon farming and try to find employment in an uncertain city environment.

The influence of large cities is not only felt in their direct neighbourhood, but often over large distances: in water scarce areas, water is drawn from far away sources, thereby diverting water from agricultural and local use. The city of Chennai in Southern India has taken over many of the reservoirs originally constructed for irrigation, and it extended further to take water from far away rivers to meet the water demand of its growing population and its industry.

Degradation of the environment also takes place within the city. Water is taken from underground, leading to land subsidence (Bangkok) and, in coastal areas, salinity intrusion

Buckingham Channel, Chennai, India (Source: Ehlers)

into the groundwater. Uncontrolled, cities frequently expand into land that in the past had not been inhabited because, among other reasons, it was threatened by natural hazards such as floods or land slides. Building regulations and zoning are absent, insufficient, or reflect obsolete principles of urban planning. Administrations are unable to provide efficient service due to lack of manpower and of resources for proper maintenance or municipal services. Lack of income, compounded by inadequate systems of taxation and distribution of taxes, leave city administrations with insufficient funds, unable to invest in infrastructure developments such as highways and other life lines. Water supply and sanitation is lacking in newly inhabited areas, thus leading to health problems. The city of Lima, for example, with more than 2 million people living in the non-developed urban fringe, suffered a severe case of cholera in 1991 with more than 50,000 fatalities. In some cities people turn to self-help such as digging wells, often too close to sanitary installations, to avoid the high cost of water sold by street vendors. Self-help without proper guidance may be counterproductive and increase the danger of a flood polluting the water supply, of the drawdown of water tables causing inflow from nearby polluted sites or, in coastal areas, of sea water.

It is evident that solutions to the problems of urban growth and water supply are not simple since they range over a very wide spectrum of possibilities: traditional technical solutions as well as improvement of the professionalism of city managers, including social aspects ranging from self-help to strategies for reducing poverty of the citizens living in endangered areas. If an urban complex is threatened by extreme natural events, disaster mitigation is one of the most effective means of stabilizing the income basis to prevent it from being used to overcome the damage of disasters. In every case, a bundle of measures will have to be developed which is specific to every region and every city, and interdisciplinary concepts including social as well as engineering aspects need to be considered, improved, and adapted. This task offers a challenge to scientists, both generalists and local experts, to cooperate in interdisciplinary planning teams with administrators and practitioners, with politicians and with the people who are to benefit from their plans. It may well be that the problem of water supply and infrastructure development of the cities of the developing world, particularly of the mega-cities, will be the most pressing problem of the 21st century and beyond, and that management of too much or too little water, its quality and quantity, will challenge the best brains of future generations.

As the afore-mentioned examples show, a complex interaction of human development, growing populations, and the possibly increasing numbers of extreme natural events threatens human security in many parts of the world. Scientists and engineers must address these issues: “As all of us know from tragic experience, no part of our world is immune from natural disasters. Floods, hurricanes, earthquakes, fire, and other forces of nature continue to threaten property and lives across the globe. We cannot prevent most natural extreme events but it is the duty of every nation to pool its resources to develop and implement new ways to reduce the loss of life and property when these events do occur.“ (US Pres. B.Clinton, April 1999).

To implement the objectives of President Clinton’s challenge, expressed at the closing ceremony of the International Decade for Natural Disaster Reduction in Geneva, international efforts are needed to reduce the risks from natural disasters not only by developing technologies for better protection, but also by understanding why and how extreme events affect a vulnerable population. We must learn how to implement the risk cycle, illustrated in Fig. 1, which illustrates that the management of human security involves a continuous, repetitive and circular process, to be revisited and solved by every generation according to the best available scientific and technical knowledge, and attuned to the value system of the society.

It requires us to take actions which lead to risk analysis and planning in the aftermath or in anticipation of natural disasters, the implementation of better or improved protection systems and to the operation of the system, including early warning and preparedness activities. As risk is the

Fig. 1: The Risk Management Cycle

product of vulnerability and hazard, we have to realize that reducing the hazard by technical means merely reduces the risk. We must also reduce vulnerability – and this is a task that implies that we must make people less vulnerable. Ideally, we should be able to prevent any natural extreme event from turning into a disaster. As was shown in the examples given on the previous pages, vulnerability is intrinsically linked to the environment in which we live, but vulnerability also is as much a socio-economic condition as it is a physical one. We have the capability, as exemplified by many cases of natural extreme events occurring in developed countries, to overcome the impacts of extreme events with little or no lives lost. We realize that this is a consequence of advantaged socio-economic and administrative conditions. Our goal must be to create these conditions in the developing world as well. This is a long term objective, but it is not enough; in the short term we are challenged to increase the protection of people who are threatened by extreme events or, in case of a disaster, to give them maximum support for rebuilding their existence in a sustainable environment.

Scientists of UNU-EHS will investigate the impact on human vulnerability of natural hazards influenced or caused by global environmental changes and human activities. The United Nations Institute for Environment and Human Security in Bonn will seek to cooperate with scientists and managers worldwide, in particular in developing countries, to contribute to this goal. They shall seek to cooperate with members of institutions involved in the field both in Germany and other countries, in particular with institutes and experts in developing countries. They shall try to participate in case studies in the developing world, and be prepared to assist other UN organizations in their tasks. It is anticipated that a considerable proportion of its activities will be spent on the training of trainers as well as collaborating in international and national programmes. Furthermore, there shall also be projects of basic and applied research.

To put these objectives into focus, to connect the new centre to a network of institutes involved in disaster research and applications, and to interest the scientific community in the issues of environment and human security, a workshop was conducted in Bonn, on October 24 and 25, 2002. The conclusions from the workshop are summarized in the Bonn Declaration which can be considered as a blueprint for action of the newly created UNU-EHS centre in Bonn.

Bonn Declaration on Human Security and Environment

The participants of the international expert workshop on

Human Security and Environment,

held in Bonn, Germany on October 24 and 25, 2002, to debate and propose priority activities of the newly established

United Nations University – Research and Training Centre on Environment and Human Security (UNU/RTC-EHS)

- express their concerns about increasing frequencies and magnitudes of environmental risks and hazards, affecting human security on a global scale and vulnerability in particular in the countries least able to manage these hazards;
- welcome the United Nations University's initiative to create a centre focusing on issues pertaining to human security and environment;
- gratefully acknowledge the commitment and support of the Federal Republic of Germany and its Ministry of Education and Research (BMBF), of the Ministry of Education, Science and Research (MSWF) of the State of North Rhine-Westphalia for the establishment of this RTC-EHS; as well as the city of Bonn in the framework of its science and UN City policy;
- commit themselves – in the spirit of solidarity – to foster the ideas and ideals of this UNU-EHS as laid down in the Feasibility Study Report, including
  - creating a centre of expertise in the field of human security and environment;
  - making it a focal point of international networking;
  - developing innovative and integrative approaches and methodologies; and
  - fostering interdisciplinary research, training and capacity building;

to serve our ultimate goal of ensuring a safer world and a better quality of life to all human beings.

The participants understand human security to encompass social, political, economic and environmental dimensions (food, water, shelter and other basic needs) as well as the linkages between them. This UNU/RTC-EHS focuses from a human perspective on security as the coping capacity of individuals and / or societies suffering harm from the risk of hazards in deteriorating environments.

In order to achieve these aims and goals, the participants emphasize the significance and importance of the following tasks:

- development of relevant methodologies in respect to integrated risk assessment and management drawing the attention to traditional and local knowledge;
- research and training with a strong orientation to application;
- policy dialogue between researchers, politicians, policy makers and other stakeholders for context-specific appropriate interventions;
- development of regional cooperation and partnership in and between North and South in order to bridge the mismatch in the knowledge base between these regions;
- networking, cooperation and coordination of efforts among relevant institutions of excellence worldwide;
- pursuit of free and unfettered research of complex nature – society systems, decisive for human security.

Bonn, with its massive concentration of governmental institutions, research institutes and documentation centres in the field of development studies, UN agencies and non-governmental organizations (NGO's) active in related fields, is an excellent location for the successful implementation of these aims and goals as well as for the exchange of corresponding experiences and ideas.

The participants appeal to the international and professional scientific communities to join these efforts for the future development of the UNU-EHS. They invite all member states of the United Nations to support the work of the centre.

Bonn, October 25th, 2002

Bangladesh: Shelter to protect people and livestock (Source; DRK-GD)