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**Extracts from:**

**RISK AND SOCIETY– AN AFRICAN PERSPECTIVE**

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**- and subsequent comments on the African Renaissance, the Budapest Declaration on Science, and the Fancourt Declaration of the Commonwealth Heads of Government**

**November 1999**

**DESPAIR OF THE LITTLE PEOPLE**

I am a little person from a little country within a country.  
The messages of serious weather and climate variations have been heard loud and clear.  
Is this a change in the winds?  
Is this a change in temperature or rainfall?  
Is this yet another catastrophic event?  
Or is this a myth?  
I am not so sure.

I am not scientifically sound, and yet,  
I must figure out, for myself, how to cope.  
Do you know where I live?  
If so, can you make a change?  
Am I safe and shielded from the inevitable?  
Where do I go? I cannot afford an insurance policy.  
How about my goats, sheep, cattle and fish.  
Should they just perish?  
Remember, this is my bank account and my village stock exchange, however small.  
Have you thought of this?

I am told that my little country has a heavy debt burden.  
I am told that I am the one to toil to service the debts of yesteryear.  
I am also told that viral diseases, with yet no cure, are wiping out my kith and kin.

Furthermore, I have no land, capital or indeed sufficient knowledge to eke out a decent living.  
I am in a cul-de-sac.  
Give me an outlet.

With the experience of yesterday,  
I stand ready to change my ways.  
But teach me how to do this.  
Give me the necessary tools to act before it is too late.  
I am ready to act now.  
Assist me, then, to consolidate the little gains achieved thus far.  
Make a difference in my life.  
I am a little person from a country within a country.

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## 1. Introduction

The production of food and the provision of water are the foundations on which society is built. These in turn are dependent on the productive capacity of the soils and the annual rainfall. In moderate climates the rainfall is generally dependable, and for most of the time it exceeds the needs of the soil on which it falls. The surplus flows into the perennially flowing rivers. The risks of below average rainfall can be quantified and accommodated in financially secure societies where alternative sources of food can be imported into the areas where shortfalls are experienced.

The situation is very different in the semi-arid regions of the world where soils are less productive and the rainfall is much more variable. River channels are dry for most of the year and water supplies cannot be assured without the construction of water storage works. The risks of crop failures and stock losses due to prolonged rainfall shortages (droughts) are consequently much greater.

The position is worsened by the high level of population growth in poor communities. This in turn has led to over-utilization of the natural environment which has become severely degraded and its productive capacity is severely diminished. Neither the agricultural communities themselves nor their governments have the financial resources to import food in times of severe shortages and they have to rely on emergency relief from other countries to avert widespread famine.

Because the climate in these semiarid regions is more variable, abnormally high rainfall is also more frequent and gives rise to severe floods with consequent high loss of life and loss of possessions and livelihoods.

These two forms of natural disasters – floods and droughts – are not only more severe in semiarid regions due to their more variable climates, but they also cause significantly more damage to the social and economic infrastructures that are affected by them. The rural populations are malnourished and more prone to disabling and life-threatening diseases which are on the increase in many African countries.

The situation in most countries on the African continent continues to deteriorate at an alarming rate, and the objectives of the United Nations General Assembly Resolution establishing the International Decade for Natural Disaster Reduction (IDNDR) are not being met. Disasters are not increasing because of the increase in the frequency of hazards, but because of the increasing vulnerability to hazards. The ability of many countries to finance vulnerability reduction measures is hampered by financial austerity programmes associated with economic reform and the heavy tax burdens required to service the national debt.

This presentation reflects the African perspective on natural disaster reduction. It is based on information gathered from many sources, including IDNDR publications, publications of United Nations agencies, African country reports, presentations at conferences, discussions with professional colleagues, and personal observations and experiences in Southern African countries stretching over a period of more than forty years.

The conclusion reached is that if the principles of natural disaster reduction – particularly vulnerability reduction methods – are not included in national policies, the slide from democracy to civil unrest and eventually to anarchy will affect an increasing number of countries on the African continent.

This is a complex problem with no easy solutions.

## 2. United Nations Resolutions

### 2.1 *United Nations General Assembly Resolution: 1989*

Arising from the alarming world-wide increase in loss of life and physical damage due to natural disasters with resultant secondary effects of lost income, unemployment, reduced productive capacity and economic growth, the United Nations General Assembly Resolution 44/236 adopted in 1989 declared the period 1990-2000 to be the International Decade of Natural Disaster Reduction (IDNDR).

The preamble to the resolution stressed that natural disasters have adversely affected the lives of a great number of people and caused considerable damage to infrastructure and property world-wide, especially in developing countries. It recognized the necessity for the international community to demonstrate the strong political determination required to mobilise and use existing scientific and technical knowledge to mitigate natural disasters, particularly the needs of developing countries. There was no reference to vulnerability reduction through socio-economic measures.

Attention was drawn to the impact of natural disasters on health care, particularly to the vulnerability of hospitals and health sectors, but there was no mention of health risks associated with natural disasters. Nor was the disastrous effect of HIV/AIDS contemplated.

### 2.2 *The Yokohama Strategy and Plan of Action: 1994*

A very successful mid-decade conference held in Yokohama, Japan in May 1994 started with some reservations. The impact of natural disasters was on the rise. The member states expressed their deep concern for the continuing human suffering and disruption of development caused by natural disasters. They affirmed that the impact of natural disasters in terms of human and economic losses had risen in recent years, and society in general had become more vulnerable to natural disasters. The people usually most affected by natural disasters were the poor and socially disadvantaged groups in developing countries as they were least equipped to cope with the disasters.

The objectives of the Decade were confirmed:

*By the year 2000, all countries, as part of their plan to achieve sustainable development should have in place comprehensive national assessments of risks from natural hazards integrated into development plans; mitigation plans at national and/or local levels that address long-term prevention, preparedness, and community awareness; and ready access to global, regional, national and local warning systems.*

Countries were advised to stimulate genuine community involvement and empowerment of women and other socially disadvantaged groups at all stages of disaster management programmes in order to facilitate capacity building, which is an essential precondition for reducing the vulnerability of communities to natural disasters. The application of traditional knowledge, practices and values of local communities for disaster reduction, should be recognized. Traditional coping mechanisms are a valuable contribution to the empowerment of local communities, enabling their spontaneous co-operation in all disaster reduction programmes.

### 3. African experiences

#### 3.1 Regional IDNDR meeting for Africa: May 1999

The purpose of the meeting was to look beyond the end of the Decade. The first item on the agenda was socio-economic concerns, followed by development and environment concerns, scientific and technological concerns, and actions towards the 21<sup>st</sup> century. During the discussions it became clear that the principal objective of the 1989 United Nations Resolution establishing the IDNDR was not being met on the African continent. Natural disasters continued to cause loss of life and the livelihoods of tens of thousands of people as well as causing considerable damage to infrastructure and property.

No African countries have been successful in reducing vulnerability to droughts and floods through environmental conservation measures. The most disappointing report submitted to the meeting was that by the United Nations Environment Programme (UNEP) where it was reported:

1. *The environment and related problems in Africa have been articulated at various levels and by several intergovernmental and non-governmental fora.*
2. *These problems can be coarsely classified into the following categories: land degradation, pollution and depletion of water resources, loss of forests and other organic species, impacts of the environment on human health and welfare, and inadequate policy and institutional response measures; inadequate capacity to keep abreast of changes in the environment; increasing pressure of human population and activities on the environment; economic sector and industrial activities not operating in tandem with environmental management; and lack of awareness on the side of policy makers and political conflicts.*
3. *UNEP has not been able to live up to expectation in responding to various concerns because of poor coordination; lack of adequate financial resources; underestimation by the UNEP of the enormity of problems spanning 53 African countries in the vast continent; inadequate cooperation between UNEP and other regional and sub-regional players; and lack of mobilization of the private sectors.*

In my opinion the lack of success is due to more fundamental reasons than those listed above. These are discussed later in this presentation. The following are some other comments made at the African Regional Meeting in Nairobi.

- People have been living in these areas for centuries and have developed survival techniques. Care must be exercised when proposing alleviation measures developed in other regions of the world.
- For the poor, natural disasters are not the only threats to lives and livelihoods.
- Droughts scatter people.
- Africa is being left out in the cold.
- The sustainable land use approach is not happening.
- Drought resistant crops are not succeeding.
- There is a dramatic unplanned and unmanaged urbanization due to a lack of policy by governments.
- There is a lack of capacity to apply technologies.

- Confusing messages are coming from the scientific community which is undermining the credibility of local agencies which are being overwhelmed with confusing and inappropriate technology.
- There is no way to reverse the trend. After 20 years Africa is on the verge of total collapse.

These examples from Africa must lead to the question – why are the lessons and experience of thousands of years, of no avail? And even more importantly, why is modern scientific and technological knowledge of so little assistance in preventing the continuing large loss of life and livelihoods on the African continent?

### **3.2 Egypt**

The natural environment is never in a state of equilibrium. Seasonal and multi-year fluctuations have to be countered to ensure a sustainable utilisation of the resource. In the 1970s the Aswan High Dam was built to stabilise the flow in the Nile River. A system of canals was built to convey water to the irrigated lands. The dam also provides hydro-electric power. In the event of a major flood the excess water will be diverted into low-lying areas of the desert adjacent to the dam. There is therefore complete control of floods in the Nile River, and maximum potential utilisation of the water in the river. However, the flow in the river is a finite resource and can therefore only support a finite population.

Up to the 1940s the irrigated lands along the Nile River were sufficient to feed the population and provide surplus food for export. Within the next thirty years the size of the population exceeded the production capacity of agricultural resources available to feed it. Increasing population pressure resulted in urban development spreading onto the highly productive agricultural land which was no longer subject to flood risks. This reduced the national food production. Simultaneously, the population in the rural communities continued to rise. This placed stress on the rural communities, and conflicts of interest developed between the individuals and the State.

The financial incentives for farmers to sell their land to developers were greater than potential incomes from agricultural production. It was also more profitable to sell topsoil for brick-making than to maintain agricultural production. Where government assistance was provided to poor farmers in the form of fertiliser quotas, some small farmers sold their quotas on the black market in exchange for quick cash. The government attempted to control the activities but intervention by the State was politically unpopular as it restricted the right of its citizens to prosper and determine their own futures. (Kishk 1996)

### **3.3 Horn of Africa floods: 1997/98**

Climatologists predicted that 1997 would see the beginning of '*The mother of all El Niños*'. One of the areas identified as being at risk was flooding in the Horn of Africa (principally Kenya and Somalia). Like the biblical prophecies this one also came to pass, but unlike the biblical prophecies the message did not get through to those at risk.

The rains came, and severe flooding occurred over a wide area. Hundreds of people died and 80% of the livestock (mainly sheep and goats) were lost. The loss of income resulted in malnutrition and outbreaks of life-threatening, water-related diseases. There was an exodus of 200 000 people to the already over-populated surrounding areas.

### **3.4 EL NIÑO was a non-event in Southern Africa: 1997/98**

Another area identified as being at risk due to the El Niño phenomenon was Southern Africa where severe droughts were predicted. This prediction received widespread press

publicity, and several southern African countries mobilized resources to deal with the forecast drought conditions in Southern Africa.

In the event most of Southern Africa received normal to above normal rains, but agricultural performance declined due to the cautious attitude adopted by many farmers. In Zimbabwe farmers, fearing the worst decided to minimize their losses by reducing the areas under staple food; diversifying to more drought resilient but less profitable crops; and resorting to wildlife farming. The maize production was reduced by 35% of the potential yield, and the nation was forced to import food for human and animal consumption. The Zimbabwe Stock Exchange reacted negatively to the news from the external press which resulted in fall of the value of stocks during the second half of 1997.

This false alarm serves as a lesson to those who relied on exaggerated overseas press reports, and to scientists to perfect their skills at producing forecasts which include estimates of their reliability, using a terminology that the general public will understand.

#### **4. Pattern of impoverishment of the rural poor**

Disasters are not increasing because of the increase in the frequency of hazards, but due to the increasing vulnerability to hazards. The increase in vulnerability to disasters in many developing countries of Africa arises from the following repetitive sequence.

1. Growing population.
2. Increasing utilisation of natural resources.
3. Land clearing.
4. Felling of trees for firewood.
5. Overgrazing of fragile ecosystems especially in semi-arid areas.
6. Soil erosion.
7. Desertification.
8. Collapse of natural ecosystems.
9. Hunger and malnutrition.
10. Partial recovery after the drought has passed, and the cycle is repeated

The downward trend of impoverishment will continue unless this cycle is broken. If conditions continue to deteriorate, the rural population will be attracted to urban areas on the assumption that their living conditions will improve.

11. Migration to the cities by rural poor and refugees.
12. Unplanned occupation of high risk peri-urban areas.
13. Few job opportunities, and rising crime rate as a means of survival.
14. Breakdown of civil administration.
15. Political instability.
16. Civil war.
17. Cross-border conflict.
18. Anarchy.

These symptoms are present in many African countries.

## **5. Sustainable development**

### **5.1 *Limitations***

All land used for pastoral agriculture has a finite livestock carrying capacity. This equals the rate of growth of palatable vegetation. The rate of growth varies not only with seasonal changes in rainfall, but also multi-year changes such as during droughts. Over-grazing can have serious consequences when the vegetation changes from palatable species to less palatable species. Land cover can be reduced, encouraging the erosion of productive topsoil. Gully erosion follows, and eventually large tracts of land become unproductive.

A great deal of research has been conducted in South Africa and elsewhere during the past 50 years to determine the optimum stock carrying capacities in semiarid regions, and the means to ensure long term sustainability. State aid was made available for controlling soil and gully erosion, and penalties imposed where land was allowed to deteriorate. During droughts, State-subsidised stock reduction schemes were introduced that enabled farmers to maintain nucleus herds during droughts until conditions improved.

However, it is far more difficult to introduce these measures in communal farming areas where there is no individual land ownership. This is the situation in most African countries. In these areas intervention by the State is often seen as a threat rather than providing assistance.

For example, in a report on the position in Senegal it was stated that the pattern of disaster vulnerability had been deepened by territorial reforms that led to the creation of a highly bureaucratic system. People were subordinate to central government in all sectors of resource management including forest protection and agricultural development. The administrative reorganization resulted in the abolishment of indigenous land use and responsibilities.

This view was repeated in the case of Sudan where it was reported that excessive human pressure on fragile natural resources and harsh climatic conditions had resulted in severe land degradation. Socio-economic investigations showed that traditional land-use systems had undergone a dramatic change. In the early 1970s the policy was that the natural resources of State-owned lands should be accessible to all. This led to the abolition of communal grazing areas, thus eliminating the rights of the local communities to manage and nurture their own resources.

A more recent example is the 1998 drought in the Limpopo valley of Southern Africa. Previously, State-owned land was unexploited during normal years but made available for grazing in times of drought. However, increasing development increased the stocking rate within the adjoining areas, making these areas more vulnerable to drier conditions. The use of State owned land for emergency use became more frequent, until it was also degraded and unable to function as a buffer during severe droughts.

### **5.2 *Misguided notions of sustainable development***

The origins of the concept of sustainable development go back to the 1980s. In 1987 the Brundtland Report of the World Commission for Environment and Development defined sustainable development as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. Since then the concept has been promoted world wide. It was included in the 1989 General Assembly Resolution establishing the IDNDR as well as in the 1994 Yokohama Declaration. In 1992, The Earth Summit in Rio de Janeiro presented Agenda 21 as a master plan to achieve

sustainable development. It is a broad concept that goes beyond the tradition of wise use of resources and introduces ecological, economic, equity, and social considerations.

Several African countries have adopted this concept in their constitutions or in legislation. A good example is to be found in the constitution of the Republic of Namibia.

*The State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at the maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future.*

The emphasis is on the welfare of the people, and the utilization of the natural resources on a sustainable basis for the benefit of the people. It is the socio-economic aspects that have to be addressed and understood if the goals of sustainable development and natural disaster reduction are to be achieved. The issue is how can the welfare of the people be assured within the constraints of environmental conservation?

Few would disagree that environmental degradation due to over-utilization of the natural resources has made large areas of Africa increasingly susceptible to natural disasters. Nor can it be disputed that if environmental degradation is reduced, the vulnerability to natural disasters will also be reduced.

However, there appears to be a lack of appreciation of the fact that this is a complex socio-economic problem. All the well-meaning resolutions of international bodies including the United Nations agencies, and the adoption of these policies by national states will come to nothing if the root causes of the increase in vulnerability to natural disasters over large areas of Africa, are not addressed.

African experience has shown that edicts issued by the State that attempt to enforce environmental conservation in an attempt to achieve sustainable development will be ignored if they do not lead to an early and recognisable improvement in present living conditions.

One fundamental fact has to be appreciated by those who propagate this approach. The concept of sustainable development is based on the assumption that the targeted resources are not yet fully utilised. There are very few, if any, poor communities anywhere in the world who are already over-exploiting the long term productivity of the natural environment who will be prepared to make personal sacrifices in their present low standard of living in order to ensure the maintenance of a higher standard by future generations. It is unlikely that local political decision makers would attempt to enforce conservation practices in this situation. Overseas pressure groups could more profitably target their financial resources and advice on alleviating poverty as the route to follow to achieve environmental conservation.

Here is a selection of relevant comments.

- It has been claimed that democracy is fundamentally incapable of properly protecting the environment.
- It was the obviously non-sustainable lifestyles and economic systems of the industrialised countries that created a need for a new, ecologically enshrined development paradigm.
- The fundamental interdependence of ecological, economic and social objectives is the heart of the sustainability concept.
- From a political science perspective, the concept of 'sustainable development' is included with concepts such as 'freedom' and 'justice', among society's primary objectives. However, like 'freedom' and 'justice' it is incapable of precise definition, and protagonists use the concept to promote their own objectives and ideas.

- Distributing the costs of environmental management is complicated because of the scientific and economic uncertainty.
- The cost of unchecked environmental degradation will not fall evenly.
- A difficulty in developing sustainability is devising policies that are able to survive political and ideological challenges.
- Neither sanctions nor incentives are particularly strong in these circumstances.
- Disaster reduction and sustainable development are mutually supportive goals.

## **6. Natural disaster mitigation in rural areas**

In general, the objectives of any State are to provide a long-term shelter within which its citizens can prosper. Where this shelter is endangered, the State is obliged to take action to preserve it. The objectives of the individuals within the State are firstly to survive and secondly to prosper within the national shelter. The objectives of the State as well as its citizens are accommodated in most developed countries, but not in many developing countries where the long-term objectives of the State conflict with the short-term objectives of large sectors of the population.

It is clearly impossible for the State to accept responsibility for every disaster that may befall its individual citizens. It is equally clear that the State has responsibilities for implementing disaster mitigation measures for larger, highly vulnerable communities. The difficult issue of drawing the line between helping the people to help themselves and making the people dependent on the State for the rest of their lives is well documented. The objective of State assistance should be such that it increases the resilience of vulnerable communities without encouraging long-term dependence on the State.

### **6.1 Rescue and rehabilitation**

Rescue and rehabilitation have been called the '*biscuits and blankets*' approach to disaster mitigation.

Within the African context it is imperative that authorities make every effort to restore the affected communities to at least their pre-disaster status as soon as possible. This includes activities to combat malnutrition, disease, loss of livelihoods, and migration to areas that are perceived to be less vulnerable to disasters. Failure to do so will increase their vulnerability to future climatic extremes.

Although rehabilitation in the form of financial assistance has been the traditional response to disasters, the provision of State aid after the event as an alternative to pre-emptive action is becoming less socially and politically acceptable. Emergency assistance will continue to have an important role to play but it is too frequently spurred by the appearance of hunger. Subsistence farmers and their families do not go hungry until after they have sold their assets. By the time the danger signals of hunger are heard, farmers have already reached a level of impoverishment that severely reduces their ability to recover after the drought is over, sometimes permanently losing income-generating potential. There is still a large group of survivors of the Sahelian droughts of the 1980s who remain refugees, without the basic means of re-establishing their independent existence as producers.

It is becoming increasingly difficult for international organizations to provide aid efficiently and effectively. The following comments were made during the IDNDR African regional conference in Nairobi in May 1999.

- Inappropriate relief – overwhelming needs – highly stressed officers – competing priorities – influx of international assistance – outburst of mutual assistance – lack of coordination.
- Information is not shared due to rivalry between agencies.
- Donor fatigue sets in – its purpose must be identified and the results must be tangible.
- How much donor money is needed and where will it come from?
- There are doubts about the UN agencies' capacity to assist.
- Politicians are misusing aid to get votes. Even reporting a disease can become a political issue.
- Funding is readily available after disasters but little for preventing disasters.
- Unsolicited and inappropriate relief.
- Recent research findings demonstrate the marginal role played by relief food distribution.
- Relief in the form of food-for-work (preferably cash-for-work) that can be geared up or scaled down is preferable to piecemeal relief actions. It is difficult and takes time but there is no alternative.
- The last people to get information are the people themselves.

## **6.2 *Inappropriate technology and assistance***

The following are some examples of inappropriate technology and assistance in Africa.

- Africa needs technical assistance but not the sort that tries to make it leap forward to practices its farmers can neither sustain nor afford. It needs assistance to make the best of its own material and intellectual resources.
- During a disaster some families need aid, but others need credit.
- Inappropriate assistance can cause more harm than good.
- Drought resistant crops were introduced. However, the income from these crops was less than that of commercial varieties. The introduction was not successful.
- An exotic breed of cattle was introduced in a semiarid area as a substitute for the indigenous cattle. Controlled experiments had shown that they are more efficient in converting fodder into meat. The substitution of these cattle was unsuccessful as they were susceptible to African cattle diseases to which the indigenous cattle were immune.
- Groundwater abstraction costs in the sandy interior of Southern Africa are very high. A plant was installed to generate methane gas from cattle manure to be used as a fuel for pumping water. The collection of this manure deprived the natural grazing of a source of nutrients. Now donkeys are used to operate pumps using the two thousand year old Archimedes screw principle.

## **6.3 *Food security***

Food insecurity lies at the very heart of vulnerability to the effects of severe droughts. It is also the most difficult aspect of vulnerability reduction to implement.

- In Africa, women are responsible for tilling the fields, drawing water, and caring for the sick. During a drought there is more disease and sickness, reduced availability of water and fuel. Pregnant and lactating women need more nutrients, and are more vulnerable. More than 50% of the children are ordinarily malnourished. This is worse during a drought.
- There are fewer meals and people start eating seeds for the next season's crops. Distress sales cause a lowering of prices, while restocking has to take place at higher prices.
- The underlying reasons for food insecurity in non-acute periods are responsible for increased household vulnerability in times of emergency.
- Despite the drought resilience of small grains, increases in areas planted with drought-resilient crops are less than expected. There has been little shift to more drought resilient crops.
- There is growing pressure to identify and encourage livelihood practices that are more likely to sustain food security in high risk areas and discourage practices that enhance the risk. This places reduction of risk at the centre of development planning.
- Innovative ways of combining attitude change and capacity-building in vulnerable areas should be identified and encouraged.
- Innovative strategies to protect food insecurities in times of stress that augment and reinforce risk-averse agriculture should be explored.
- Subsidise access to drought-tolerant seed and encourage greater crop diversification.
- Reduce the need for large-scale food relief.
- Initiate ongoing employment projects that can be readily scaled up in times of stress, particularly those that have lasting effects on the environment and sustainable agriculture.

Development gains in at-risk communities could be quickly undermined by poorly managed responses to climate and rainfall variability.

#### **6.4 Water security**

The demand for water in many countries of the world will soon exceed available water resources. The frequency and magnitude of the shortages will increase as the demand increases, particularly in semiarid regions where river flow is ephemeral and highly variable.

The target in South Africa is to bring at least 25 litres of clean water per person per day to the majority of the people at a walking distance of not more than 200 metres from their homes. There has been very good progress towards achieving this objective.

As the demand for water increases with increasing population, the position is reached where even in good years there will be insufficient water to meet the demands. The modern tendency is to institute demand management to restrict wasteful usage rather than construct more storage dams to meet the rising demand.

#### **6.5 Employment security**

Recurrent droughts lead to loss of employment and increased dependence on the State. Public works programmes are a more effective means for maintaining community welfare than food or financial handouts.

## 6.6 *Health security*

Every disaster has serious implications on public health. Disasters such as drought, famine, floods, refugees, displaced persons and epidemics which affect the health and quality of life of large and poor communities, are more closely associated with African countries than with any other regions.

- More people are killed by disease after floods than directly by floods
- In the countries of Africa, various communicable diseases such as cholera, meningitis, haemorrhagic fever, and water-related diseases follow droughts and floods.
- Since 1982 Africa has reported the highest incidence rate of cholera in the world. In 1994 cholera was present in more countries in Africa than ever before, with 28 countries reporting 162 000 cases.
- There has also been an increase in emerging and re-emerging infectious diseases due to an increase in population movement after disasters.
- Cross-border surveillance and epidemic disease prevention and control remain weak.
- In Africa AIDS has become the major natural disaster of modern times. In large parts of Southern Africa the death rate has exceeded the birth rate for the first time in history. It is anticipated that the average life expectancy will decrease instead of increasing in the coming decades.

## 6.7 *Accommodating climate variability*

The basic objective at all levels from the individual citizen through to the nation as a whole is an increasing, or at least a constant level of prosperity in the face of climatic variability. This is achieved by the provision of storage of essential commodities in times of plenty for use in times of scarcity.

- **Storage of crops** is the traditional method adopted by crop farmers since the beginning of civilisation, an example being the biblical seven-year drought in Egypt. Storage of crops was traditionally at family or small community level, but has now spread to national and international level. If the storage is provided at higher than small community level, payments have to be made to the supplier. This involves the capability to pay, which in turn involves the storage of wealth.
- **Storage of water** is achieved by building storage dams or utilising natural storage in groundwater. Many countries have sophisticated and effective programmes for the provision of water to all those who need it. Storage dams are generally designed to provide a constant supply during prolonged droughts – usually three to five years of deficient flow. They are therefore not sensitive to droughts of a shorter duration.
- **Storage of wealth** is a more sophisticated form of storage, but requires the generation of wealth during times of plenty for use in times of scarcity. The capacity to store wealth is directly related to the ability to generate wealth. It involves various degrees of wealth management which is very difficult for individuals in lower income groups to achieve.
- **Risk assessment.** All methods of storage, be they of water, crops or wealth, require an assessment of the risks of the undesirable events occurring. This in turn requires an assessment of the probable magnitude and duration of the worst case that can

reasonably be expected to occur within a specified period of time. For example once in fifty years on average in the case of national water supplies.

- **Insurance.** Risks can be reduced by the purchase of insurance cover, which is another form of wealth management. This is only available to the more affluent members of society unless State aided insurance is available.
- **Forecasting.** Risks can also be reduced if the possibility of the adverse event occurring in the immediate future can be predicted with a reasonable degree of accuracy.

### **6.8 Managing drought risks**

There are at least two strategies for managing drought risks in Africa. The first is to maximise the gains, while the second is to minimize the losses.

The first is the preferred option for less vulnerable areas with higher production potentials. The strategy is to maximise the value of production in normal and good rainfall years, while minimising the set-backs in bad years. The idea is that gains from a higher value strategy will outweigh the losses, which themselves will be reduced by on- and off-farm development. It is an outward-oriented drought management strategy and it is essential if small farmers are to escape from the rural poverty trap.

The second strategy is more defensive and conservative. It is the preferred option for the very marginal and vulnerable areas. It involves an emphasis on survival mechanisms such as the use of drought tolerant crops for domestic and local consumption. The emphasis is on survival in a hostile environment rather than for income generation. This should not be seen as a permanent solution.

Risks must be managed in such a way by the State and the subsistence farmers that a route is opened that leads not only away from vulnerability to drought, but away from poverty as well.

### **6.9 Social impact studies and public participation**

Social impact studies are gaining increasing importance in project planning and execution. The issues are social impact studies versus environmental impact studies, and a sustainable society versus a sustainable environment. Note that these are not commensurate objectives in that the full achievement of one objective can only be achieved at the expense of the other. Decisions will have to be made on the extent to which one objective will have to be sacrificed to achieve the other. The role of the analyst is to present a range of scenarios and their benefits and consequences from which the decision-maker can select the most appropriate compromise solution.

## **7. Flood risk reduction in unplanned urban settlements**

The migration of the rural poor to the cities and resultant development of informal settlements in flood prone areas have caused an exponential increase in the risk of loss of life and possessions during floods. In South Africa alone there are tens of thousands of people living in unplanned, flood prone settlements in urban areas. Most local authorities around the world prohibit residential occupation below a designated floodline, yet in many urban areas in developing countries there are thousands of people living along the banks of rivers below this floodline. Shacks are often built on all available space right up to the edge of the almost vertical river banks. In some cases shacks are built on refuse dumps within the channel itself. Even minor floods that do not overtop the river banks could engulf the shacks within the river

channel, and undermine the river banks causing the shacks on the banks to collapse into the river.

Once the flood water level rises above the river banks the flimsy, densely packed shacks further from the river will start collapsing. The debris from the shacks, particularly floating timber and submerged corrugated iron sheets caught in the fast flowing water will seriously injure escapees attempting to wade through the water even if this is less than knee-deep.

This debris will also hinder rescue attempts and increase the probability that people washed into the river will drown. Debris may also block bridge openings and deflect the flood to another area that would otherwise have been out of danger. Lives may be lost when spectators gather on bridges or on the river banks and their escape routes are cut off as the river rises, or the river banks collapse. It will be impossible to use rubber boats on the river to rescue people trapped in the debris. A major flood will rise rapidly, destroy all shacks in its path and result in a large loss of life.

The development and dissemination of awareness programmes is an essential prerequisite for successful flood risk reduction measures in this situation. This is particularly important for newly established communities who have not been exposed to flood risks.

Impediments to efficient awareness programmes in Africa include low literacy levels. (Only 60% of the population of Burundi are literate, and low literacy levels exist in many other African countries.) Other impediments to communications with those at risk are the variety of vernacular languages, dialects and customs.

Complete success of flood risk reduction measures in informal settlements within urban areas is unlikely to be achieved because of the very high exposure to flood risks, as well as limitations of manpower and other resources available to deal with the resulting emergencies. An unpalatable fact is that after a flood the failures such as loss of life can easily be measured, but successes can not.

## **8. Education and training**

Education and training are often seen in the context of schools, universities and specialised training institutions. While these undoubtedly play a very important role, the type of knowledge that these bodies provide does not meet the immediate needs of the rural communities at risk from natural disasters. Nor is there time to wait until children have completed their schooling, or the universities have trained local specialists in sufficient numbers to reverse the downward trend of impoverishment that these communities have to endure.

In many developing countries the limited financial resources and technological expertise prevent the development of disaster mitigation measures. The importation of expertise developed elsewhere is inhibited by language differences and lack of expert knowledge of local socio-economic conditions of the recipients and their ability to understand and implement the proposals.

Knowledge is more successfully transferred by example than by theory. The most likely scenario for success would be to select several communities that have expressed their willingness to participate, and then to develop mitigation measures in a tripartite alliance consisting of the communities, outside expert organisations working in conjunction with their national counterparts, and local agricultural extension officers. All three parties will benefit from the exercise. Once a successful procedure has been developed, this will greatly facilitate the transfer of knowledge to other communities.

The three ingredients of this success are willing communities, pragmatic and knowledgeable experts, and enthusiastic local extension officers. Conversely, success is unlikely to be achieved if one or more of these ingredients are absent.

The most unlikely route to successful technology transfer is when the State attempts to impose broad recommendations by well-meaning outside scientists against the will of local communities. There is no learning experience by either the communities or the State. A good example is the imposition of environmental conservation measures. The benefits of these measures have to be demonstrated in actual examples and not imposed, particularly if the benefits are not apparent within a year or two at most. Alternatively, the State will have to provide financial incentives instead of punitive disincentives if the programmes are to succeed. The danger of this approach is that it increases the community's dependence on the State. There is also little learning experience.

## **9. Into the 21<sup>st</sup> century**

The attention paid to natural disasters and vulnerability reduction by the international community has grown steadily during the Decade. Many developed countries have reported significant reduction in loss of life, principally due to more efficient warning systems coupled with awareness programmes. However, developing countries continue to report increasing levels of loss of life and impoverishment caused principally by the exponential increase in the vulnerability of their populations to natural disasters. Economic losses continue to rise in all countries due to economic pressures that encourage development within higher risk areas.

The following are some condensed comments from IDNDR and other reports.

- Significant progress and decrease in loss of life have been achieved in developed countries but the loss of life and impoverishment still continue to increase in developing countries.
- Socio-economic consequences of disasters including the rising death toll from malnutrition and disease are still not sufficiently appreciated and addressed.
- It is also not fully appreciated that socio-economic vulnerability reduction measures and not physical vulnerability reduction measures are the most effective for risk reduction in African developing countries.
- The effects of drought continue to deepen social polarization and poverty. The poorest families find it increasingly difficult to recover from one drought before entering another. There is progressive income and asset depletion among the poorest households who sacrifice long-term economic growth by holding their assets in liquid or near liquid forms.
- The ability of many countries to finance disaster mitigation activities is hampered by financial austerity programmes associated with economic reform and the heavy tax burdens required to service the national debt.
- Over a period of time, recurrent small-scale hazards tend to cause more damage than infrequent large-scale hazards.
- Limited financial resources and trained personnel have become critical problems in rural areas.
- In many countries there are disaster plans on paper but not much planning on the ground.
- Disasters are relatively more costly in developing than in developed countries.
- The poor suffer in a personal sense while the rich suffer in an economic sense. This has an effect on their perceptions when adopting procedures to combat disasters.
- People who have to live in vulnerable areas seldom do so by choice.

- Social impact studies should include environmental impact studies and not vice-versa.
- Special attention needs to be focused on pre-famine indicators that give the earliest possible warning that a food supply problem may be imminent.
- Studies on the impact of drought show very clearly that a critical variable affecting the maintenance of productive assets is the availability of off-farm income flows.
- Successful cash-for-work projects such as public works and clearing exotic vegetation should be encouraged as a means of maintaining income during droughts.
- Early warning systems should be based on both physical and social vulnerability, for example nutritional indicators and measures of vegetation change.
- Disaster mitigation plans in the rural areas of Africa should move away from environmental concerns to human livelihood concerns. These measures must be considered in conjunction with the social, economic and political limitations of the communities at risk.

## 10. General conclusions

In many developing countries in Africa the rural areas are no longer able to support the rising populations that depend on them. The ability of these countries to finance disaster mitigation activities is hampered by financial austerity programmes associated with economic reform and the heavy tax burdens required to service the national debt.

**Drought mitigation strategy.** Disaster mitigation plans in the rural areas of Africa should move away from environmental concerns to human livelihood concerns. Because of the frequent occurrence of drought and its spatial extent, the costliest option is to ignore drought and simply react to each incident. Countries should include natural disaster reduction as part of their development plans, otherwise progress in social and economic development will continue to be eroded by recurring disasters. Disaster prevention, mitigation and preparedness is better than disaster response in achieving the goals and objectives of the Decade. These measures must be considered in conjunction with the social, economic and political limitations of the communities at risk.

**Flood risk reduction in unplanned urban settlements.** The best solution is to provide incentives that will encourage the threatened communities to move to less vulnerable areas. In many cases this will be a long process as job opportunities and housing will have to be provided at a faster rate than the influx of socially and economically disadvantaged people into the high risk areas. This leaves the implementation of flood awareness programmes and flood warning systems as the only viable short term solution.

**Technology transfer.** In many developing countries the limited financial resources and technological expertise prevent the development of disaster mitigation measures. The importation of expertise developed elsewhere is inhibited by language differences and lack of expert knowledge of local socio-economic conditions of the recipients and their ability to understand and implement the proposals. The best solution method of technology transfer is by planning and operating demonstration projects.

**Research.** There are many scientists undertaking research on climate change and on ecological and environmental problems, but not many researchers are undertaking research on disaster risk reduction. This imbalance will have to be rectified if the slide into further impoverishment has to be turned.

## 11. Postscript

There have been three major developments subsequent to the completion of this study. These are the escalation of interest in the African Renaissance, the Budapest Declaration on Science, and the Fancourt Declaration of the Commonwealth Heads of Government.

### 11.1 *The African Renaissance*

The African Renaissance is a political initiative that has wide popular and scientific support. The concept is simple – Africa must rise Phoenix-like from the ashes of poverty and join the other continents as an equal partner. This goal will be difficult to achieve in practice, and care will have to be taken not to compartmentalise research. The emphasis will have to be on inter-disciplinary and inter-institutional studies involving a wide range of disciplines. Many of the issues that will have to be addressed are detailed in this presentation.

### 11.2 *Budapest Declaration on Science and the Use of Scientific Knowledge*

A combined UNESCO/ICSU World Conference on Science was held in Budapest, Hungary from 26 June to 1 July 1999. The following are some extracts from the preamble to the 23-page *Declaration on Science and the Use of Scientific Knowledge*<sup>i</sup> produced by the Conference.

*We seek active collaboration across all fields of scientific endeavour, i.e. the natural sciences such as the physical, earth and biological sciences, the biomedical and engineering sciences, and the social and human sciences...Greater interdisciplinary efforts...are a prerequisite for dealing with ethical, social, cultural, environmental, gender, economic, and health issues...What distinguishes the poor (be they people or countries) from the rich is not only that they have fewer assets, but also that they are largely excluded from the creation and benefits of scientific knowledge...*

The Declaration considered that:

*...scientific research and its application may yield significant returns towards economic growth, sustainable human development, including poverty alleviation, and that the future of humankind will become more dependent on the equitable production, distribution and use of knowledge than ever before...*

The Declaration is fully compatible with the objectives of the African Renaissance.

### 11.3 *Fancourt Declaration on Globalisation and People-Centred Development*

The most recent development is the *Fancourt Declaration on Globalisation and People-Centred Development* issued by the Commonwealth Heads of Government on 14 November 1999. Details are given in the attached report published in the Pretoria News. Another report in the same newspaper is the unresolved conflict between South Africa and the European Union over wine labelling, and the effect that this may have on financial support from the European Union.

Other major international role players whose policies will have a direct effect on the achievement of the African Renaissance are the World Trade Organisation, the World Bank, and the International Monetary Fund.

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