

# **Discussion Paper**

## **Drought Risk and Development Policy**

*Modern society has distinct advantages over those civilizations of the past that suffered or even collapsed for reasons linked to water. We have great knowledge, and the capacity to disperse that knowledge to the remotest places on earth. We are also beneficiaries of scientific leaps that have improved weather forecasting, agricultural practices, natural resources management, disaster prevention, preparedness and management...But only a rationale and informed political, social and cultural response – and public participation in all stages of the disaster management cycle – can reduce disaster vulnerability, and ensure that hazards do not turn into unmanageable disasters.*

*Kofi Annan  
Message on World Water Day 2004*

### **Overview and Structure**

The principle objective of this discussion paper is to propose that drought should be managed as an aspect of development, as opposed to simply a natural hazard. It argues that drought management should be given the attention it deserves, as reflected in being integrated and mainstreamed with other aspects of development. It asserts that mainstreaming requires that policy makers should be informed and aware of how other, perhaps seemingly unrelated factors or decisions may actually affect the degree of impact of drought on the livelihood systems which support people.

The **introductory section** covers recent findings on drought related policy issues and the complex interaction between drought and development. It also provides a broad and comparative picture of how drought impacts on both the populations and the economy of various countries and regions.

Following the introduction, this paper is divided in to **five further sections**. The **second** section addresses the question of how the way we think about drought affects the way we manage it, and the **third** tackles the question of how drought, food security and sustainable development are interrelated. The **fourth** examines how policies are likely to increase or decrease vulnerability to drought, why and for whom. The **fifth** broaches the question of how the policy process can be influenced such that risks are seen as an integral part of development. Finally, the **sixth** briefly introduces the potential roles of external players in assisting countries enhance their resilience to drought.

## **Abstract**

This discussion paper argues that policy makers in countries which are chronically drought-prone and where this has a significant development impact need to be more aware that their decisions - even in areas which may seem unrelated to drought - may actually increase vulnerability at household and higher level to impacts from drought. It also argues that well-informed decision making can simultaneously increase net resilience to the impacts of drought whilst advancing other development objectives; having the same resources at their disposal but simply organized in a different manner. This implies that chronically drought-impacted societies need to put drought near the centre of their sustainable development priorities or risk reversing even national development gains in a number of areas. There is ample evidence of the cost of ignoring this principle. Unfortunately, the tendency to compartmentalize development has led to different groups each addressing only one or two areas of development, unaware of the interactions with others. This paper demonstrates that drought, water management and food security are not just rural or agricultural issues. It demonstrates that societies can choose to insure themselves against drought in many ways, which might include trading their way out of inadequate *in situ* crop production, and through the trade in virtual water.

The implication of these arguments is that policy makers require awareness, knowledge in suitable forms, analytical methods and consultative processes to identify what the drought vulnerability implications will likely be of a particular development choice. In particular they need to be able to predict the potential impacts on drought vulnerability for various segments of the population. It should be openly recognized that virtually all policy making involves decisions which imply reallocation of resources and therefore that policy making is an inherently political process. There is nothing wrong with this as long as there is genuine participation of the groups potentially affected. This is often not the case with the groups most vulnerable to drought impacts; drylands populations (particularly pastoralists) who are typically marginalized, politically, socially and economically. As such, the question of drought vulnerability is just as much a question of - indeed a test of - governance as it is of the technical capacity of meteorological services.

Policy makers may tend to ignore the potential political implications of issues of reallocation, power structures and unrepresentative decision making by presenting water and food security as technical issues: simply inadequate rainfall, poor infrastructure, lack of technical knowledge *etc.* In some cases it may genuinely be a question of a sub-optimal assignment of resources to achieve development. In other cases there may be a lack of awareness of how policy decisions in areas which may appear remote from drought can have significant influence on vulnerability to drought. Many policy decisions can be critical in determining whether a shortfall of rain triggers a disaster or simply a short-term change in prices.

This assertion is substantiated by the UNDP analysis cited in this report, which reveals that even countries in the same drought exposure category and GNP class can have very different levels of drought impacts. Furthermore, an examination at the sub-national scale would likely reveal distributions of the costs and benefits of existing policies which mirror the power structure in those societies. This can make it difficult to implement policies which would result in the greatest decrease in vulnerability to drought, as marginalised groups are typically the most vulnerable to natural hazards and yet the least able to influence policy. This presents an opportunity for partnership, for addressing drought risk through the optic of a development problematic in order to create a critical mass for change.

**Key Concepts:** drought vulnerability and resilience, social adaptive capacity, meteorological versus socio-economic drought, trade in virtual water.

# Table of Content

## Overview and Structure

### Abstract

### List of acronyms

### List of figures

### Scope of paper

#### 1.0 Introduction

- 1.1 Drought can reverse nation development gains
- 1.2 UNDP finds drought to be the most important natural hazard in terms of human mortality
- 1.3 Economic development buys options for drought management

#### 2.0 The way we think about drought affects the way we manage it

- 1.1 Drought affects different groups in diverse ways
- 1.2 Inadequate understanding and /or inappropriate policies increase drought vulnerability even in developed countries
- 1.3 Drought and food security
- 1.4 Drought is a situation – specific and this should be reflected like in policy

#### 3.0 Relationship(s) between drought, food security and sustainable development

- 3.1 Drought and development
- 3.2 Vulnerability and resilience to drought

#### 4.0 Drought and society: policy implication, policy options

- 4.1 Societal responses to drought
- 4.2 Social adaptive capacity
- 4.3 Policy option: The special case of agricultural policy on water and food security
- 4.4 The context for agricultural policy and food security options; The international political economy of food and virtual water

#### 5.0 How can the policy process be influenced such that risk is seen as integral component of development?

- 5.1 Policy choices can either undermine or enhance resilience to drought
- 5.2 Drought policy principles in the context of uncertainty
- 5.3 Policy options for managing drought risk; what are we really trying to manage through drought-related policy?

#### 6.0 The role(s) of external players in assisting countries enhance their resilience to drought

### Discussion questions

### References

## List of Acronyms

ADP - African Development Bank

BCPR - United Nations Bureau for Crisis Prevention and Recovery

DDC - United Nations Dryland Development Centre

GEF- Global Environmental Facility

GDP - Gross Domestic Product

GNP - Gross National Product

ISDR - The United Nations International Strategy for Disaster Reduction

MDG's - Millennium Development Goals

UNDP - United Nation Development Programme

PSRP - Poverty Reduction Strategy Paper

UNFCCC - United Nations Framework Convention for Climate Change

UNCCD - United Nations Convention to Combat Desertification

UNDP-RBAP - United Nations Development Programme and Regional Bureau for Asia and Pacific

USAID-OFDA - United State Agency for International Development and Office for Foreign Disaster Assistance

<b>List of Figures</b>	<b>Page</b>
<b>Figure 1:</b> Relative vulnerability for drought 1980-2000	10
<b>Figure 2:</b> Physical exposure and relative vulnerability to drought, 1980-2000	11
<b>Figure 3:</b> A drought vulnerable society	15
<b>Figure 4:</b> A drought resilience society	16
<b>Figure 5:</b> Water resources in relation to social adaptive capacity	19
<b>Figure 6:</b> Annual virtual water trade in 2000	22
<b>Figure 7:</b> Trends in food production, food aid and drought in Sub-Saharan Africa	24
<b>Figure 8:</b> Countries facing food emergencies in 2003	26

## Scope of this Paper

This paper reflects the scope of the meeting it helps inform by focussing on drought at the policy and hence national and international levels. As such, it helps set a context for the actual scales of intervention, which are typically sub-national. Much has been written about the coping strategies of particular, relatively small, groups from which one can derive principles which would assist the process of designing policy. Nevertheless this paper and the meeting it helps orient do not propose to delve into these already heavily treaded waters. Rather, it focuses on the sorts of questions which might be asked by an individual in a position to influence national policy and who is trying to grapple with the implications of various strategic development options in terms of national food security. This scenario is further refined by considering such decision-makers to operate in African countries where national development gains are regularly reversed by major droughts and/or where drought impact and food security are chronic problems. As will be seen in this paper, a number of African countries have been in a quasi-continuous state of food relief for as long as twenty years. Clearly, in such a situation, a household-level study of a particular group in a particular corner of the country will be of little direct value to policy makers in that country, though a digest of household level drought food security issues in the country would be useful if translated into national priorities and if it informs strategic options.

The objective of this paper is not to provide such a digest but rather to stimulate a debate, which will help identify elements of a proposed initiative on mainstreaming drought risk into national development thinking in Africa. The objectives and anticipated outcomes of the meeting are summarized in a separate document. One objective of the meeting which this paper directly relates is that of reflecting upon the relationship(s) between the risk of climate shocks – specifically drought – and development in drought-prone African societies and economies. As such, the emphasis is more on the macro level, on the international context, which we argue is the ‘political economy of food aid and trade’. It also concerns, within this context, the integration of drought into national development and food security options. As such there will be sessions in the meeting which address *what* needs to be integrated and *how*, as well as a session specifically on linking household level risk to national policies. This Discussion Paper hopes to introduce concepts potentially useful to those sessions and others, but without pretending to answer them.

This paper is intended rather to stimulate discussions which will help generate a number of situation-specific answers or sets of answers. The participants will then also strategize about how to operationalize these elements of the proposed initiative through the various channels at their respective and collective disposal. The long-term effect should be a change in thinking, resulting in more effective ways for development actors to carry out the business of ‘drought proofing’ the livelihood systems which sustain people across Africa. It will also have a direct and concrete output by helping orient a major UNDP program on complex food security and ‘new variant’ famines in Africa.

In order to achieve a balance between the ‘conceptual’, policy level approach to drought risk and development taken in this paper with the desire participants may have for detailed and practical information, each participant will also receive a copy of the publication *Success Stories in the Struggle Against Desertification*, which is a collection of local level case studies. It remains, however, for the reader to extract from these situation-specific projects general principles which can inform an approach to other situations. Then if we upscale this idea we come back to the topic addressed by this paper: what options exists at a national level? Furthermore, when addressing drought risk and food security at a national scale one is really addressing issues of a process of objective setting, prioritization, costing and trade offs. In short, one keeps coming back to development policy. Therefore we must strive to set the management of drought risk within the context of the processes of daily decision making at the national level and their implications for

drought-exposed populations if we are to be able to meaningfully address the question of whether Africa can be free from the consequences of recurring climate shocks.

## **1.0 Introduction**

*This section introduces the complex interaction between drought and development and highlights the fact that in chronically drought impacted countries in Africa drought risk must be seen as a central development concern and therefore mainstreamed into the national planning processes. Furthermore it draws on an important new study to demonstrate that there is no direct relationship between drought exposure and drought impact. This is because climate risk is mediated through complex socio-economic pathways which can either dampen or even exaggerate the effect of natural hazard such as drought. The policy implication of this are explored over the rest of the paper.*

### **1.1**

#### **Drought can reverse national development gains**

The impact of drought and climatic variability in both economic and mortality terms is generally larger for relatively simple, predominantly agricultural economies (e.g. Malawi or Mozambique). In the case of 'intermediate' economies (e.g. Zimbabwe) the impacts are better absorbed by a more complex and diversified economy (as in South Africa). Drought impact is mitigated in dualistic mineral exporting economies (e.g. Botswana, Namibia, and Zambia before the rapid decline in its copper industry during the 1980s) (Clay *et al* 2003) because these sectors are de-linked from other sectors of the economy and afford the opportunity of subsidizing the rainfall-dependent component of the economy. In many countries the frequency, duration and severity of drought can impact GDP and even threaten to reverse many apparently unrelated investments in national development. Drought in a simple or intermediate economy will have a particularly significant impact on the economy both directly and through knock-on effects to industries which add value to and export weather-dependent production. For example in Zimbabwe the drought of 1990/1991 resulted in a 45% drop in agricultural production but also a 62% decline in the value of the stock market, a 9% drop in manufacturing output and an 11% drop in the GDP (USAID-OFDA 1998). Similarly, in Kenya, the drought of 1999-2001 cost the economy some 2.5 billion dollars. As a proportion of the national economy this is a very significant loss and can best be thought of as 2.5 billion dollars of foregone development, for example, hospitals and schools not built.

### **1.2**

#### **UNDP finds drought to be the most important natural hazard in-terms of human mortality**

Disasters affect a wide range socio-economic development and the range of stakeholders is broad. Every year disasters affect millions of people, cause economic losses of tens of billions of dollar, and kill tens of thousands of people (UN-ISDR 2003). The impacts are much greater for the poor, in terms of death rates, shattered livelihoods, starvation, and sometimes diseases. The economic impacts of disasters are a serious handicap to the economic development of many less developed countries, with losses sometimes equal to several years of national growth gains (UN-ISDR 2003).

The recent and influential inter-agency publication *Poverty and Climate Change* (ADB *et al.* 2004) highlights the fact that, in spite of all the science of climate modeling at our disposal, the only way we can really get an idea of how human societies might adapt to climate change is to analyze the experience of populations who have had to cope with climate uncertainty. This is principally in drylands areas and specifically the way they have adapted to the constant threat of drought. But

as much as we can learn from these adapt-or-perish socio-ecological systems, as much as these systems are a resource for policy options for adaptation, drought is not just a weather or climate issue. In many countries the frequency, duration and severity of drought can impact GDP and even threaten to reverse many apparently unrelated investments in national development.

UNDP-BCPR has recently launched the report *Reducing Disaster Risk Report: A Challenge for Development* (BCPR 2004), which is the first attempt to compare exposure to and effects from natural hazards worldwide. This analysis found that the single most significant natural hazard worldwide in terms of human mortality is drought. Furthermore, the impact index (human mortality) greatly underestimates the effects of drought, which are insidious due to their 'creeping' nature. Human mortality is simply the end state of this process. Seven out of the ten most vulnerable countries according to this index are in Sub-Saharan Africa (Somalia, Sudan, Ethiopia, Uganda, Chad, Mauritania and Mozambique) (Figure 1). These same countries have also suffered from either armed conflicts or political instability during the study period (1980-2000), which typically translates drought exposure into loss of human life by rendering households more vulnerable to the potential impacts of drought.

When discussing drought impacts it is important to note that policy choices in one country may have transboundary impacts. For example, the combination of drought and civil unrest in Sudan and Somalia has resulted in some 126,000 refugees in camps living on international support in Ethiopia, itself a drought-affected country; similarly some 110,000 Sudanese have recently fled to Chad, again a drought affected country.

While drought is often associated in peoples' minds with Africa because of the devastating Sahelian and Ethiopian droughts, it is in fact is a universal disaster. Asia has the greatest number of people affected by drought triggered disasters (Figure 2) Some 12,000,000 Afghans have been exposed to drought over the past several years, (UNDP-RBAP 2003) a situation clearly exacerbated by conflict. In China over the same period 22.6 million persons had inadequate drinking water due to drought (State Flood and Drought Relief Headquarters). In India approximately 130,000,000 people (15% of the population) have been exposed to drought over the past two years (UNDP-RBAP 2003). In Africa about 50 million people are affected by drought disasters in the early 1970's, 1980's, the beginning of the 1990's and in 2001.

### **1.3** **Drought and food security**

Drought and food insecurity go hand in hand, and much chronic and acute hunger in the world is associated with highly variable rainfall, with hunger peaking in times of drought. However, the common interpretation that drought causes food shortage is simplistic and ignores most of the important dynamics of rural economies that are associated with hunger. Extreme poverty accounts for half of the variability in malnutrition rates in across-country regression analyses. Smith and Haddad (2002) found that a rise of \$1,020 in per capita income across a number of countries was associated with a 7.4% reduction in child mortality. Thus, food security improves with income in the same way as the ability to cope with drought. Richer societies have more ways of securing livelihoods and those options translate into resilience. The availability of food on the market is obviously correlated with food security, but the relationship is not absolute, and many other factors act to determine whether an individual can buy the food and can prepare it, eat it and utilize it efficiently. Between 1970 and 1995 increased food availability accounted for only about one quarter of the global reduction in child malnutrition (Smith and Haddad, 2000). Food production is necessary to eliminate food insecurity, but it is seldom sufficient. For example, there are more hungry children in countries that have a surplus of cereals than in countries that have a deficit (Scherr, 2003). Almost one tenth of the world's hungry live in India, which maintains a large wheat surplus from year to year.

Drought can be a major determinant of food security. It can lead to crop loss, which has an immediate effect on smallholder agricultural households, but its effects are often indirectly felt, for example when the market price of food increases as it becomes more scarce. Food production is a major engine of the rural economy in poor countries, and drought will always have a widespread effect. People who depend upon income from farm work, food processing or food transport and marketing all lose income when food production is affected by drought. However, a drought-resilient society will also be a hunger-resilient society, as the same social and physical determinants are associated both with food security and drought resilience. The fact that hunger is a function of people's abilities to cope with external shocks, including drought, has been recognized by the major relief agencies. Both food security and drought resilience result from a complex set of interacting physical and societal traits and food security policy needs to be informed by knowledge of these interactions, not by linear models that imply an absolute certainty of drought leading to food insecurity. In one country drought may cause major human suffering and even death, whilst in another – as we shall see – a drought of a similar severity only has an economic impact. So how can we explain this and what are the implications for managing drought risk?

#### **1.4**

#### **Economic development buys options for drought management**

While most of the fatalities from drought and related disasters are experienced in the developing countries, developed countries record most of the economic losses; for example the drought of 1988 in the US caused an estimated damage of forty billion dollars due to direct and knock-on effects (Wilhite 1993). The size of the US economy is sufficient to absorb this shock, but what of many less developed countries? The UNDP study found that there was no direct correlation between drought exposure and human mortality (Figure 2) because the effects of a natural hazard are mediated through a socio-economic system which either attenuates or exacerbates the natural effects. For example in Indonesia, which has the same drought exposure as Australia, some 25,000 deaths per year are attributed to drought, whereas in the latter there were none. Clearly, ***the interrelated themes of governance, participation and growth collectively mediate impacts*** which point to the prospects for improved adaptation to climate uncertainty through appropriate development policies.

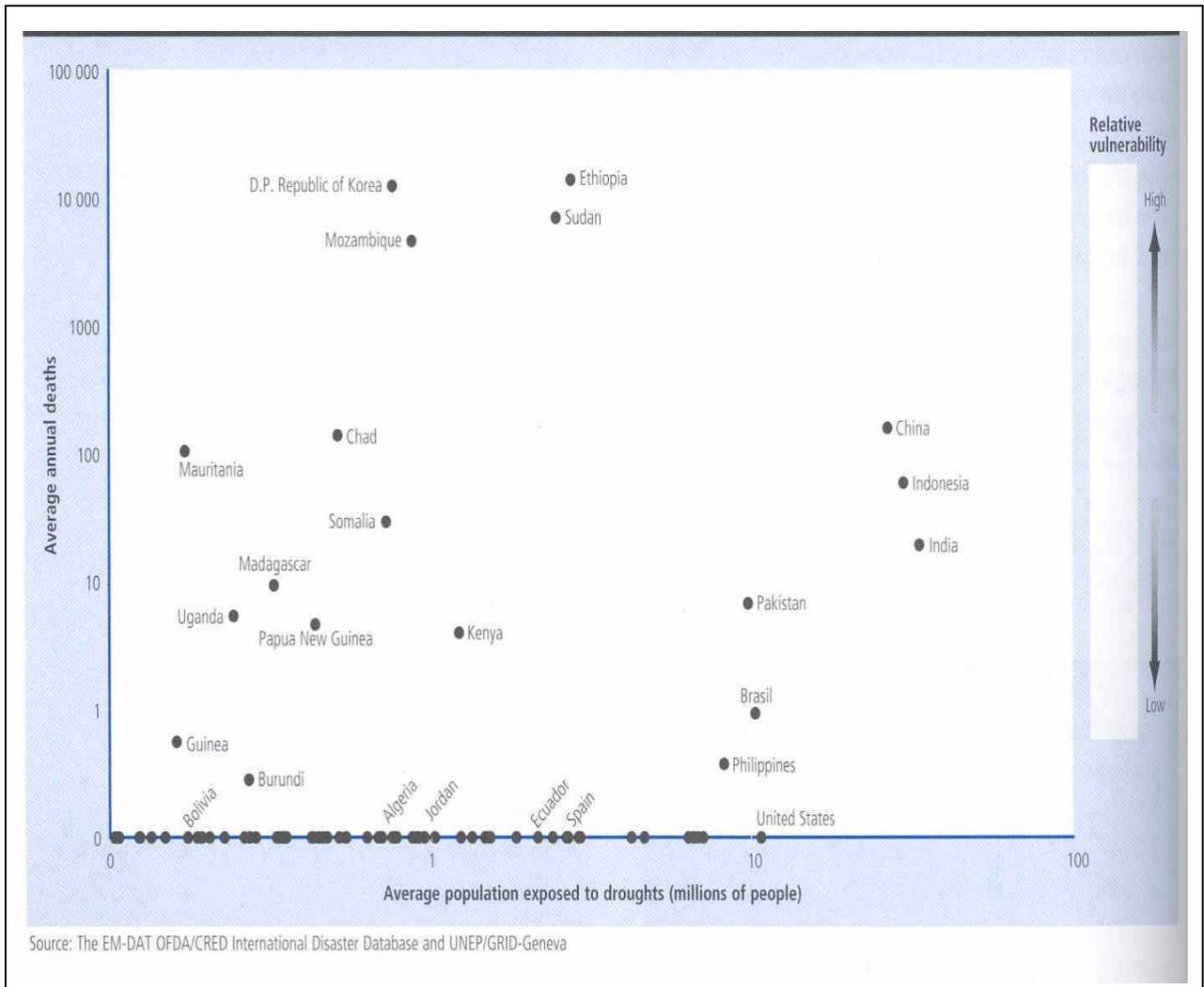
Furthermore, the study found that even countries in the same drought exposure class with similar GNP's had very different impacts. Nevertheless, there is a very strong correlation between *per capita* GNP and drought impact (as can be deduced from Figure 2). To be simplistic, the solution is development, but clearly there are many possible patterns of development, some of which may actually increase vulnerability. For example, rural populations drawn to a city may exchange drought vulnerability for even greater vulnerability in the form of exposure to crime, air pollution *etc.* Therefore policy makers must reflect carefully on the distribution of costs and benefits of various pathways to development, which is an inherently but often silent political issue.

Ideally national development policies should be informed by an understanding of policy options, the situations in which they are promising, and a determination of whether a particular policy increases or decreases vulnerability to climate risk and for whom. It is precisely this sort of integrated, sophisticated but practical policy support which UNDP hopes to provide together with various partners, in particular through a multi-facet programme of support to UNDP Country Offices and their national policy counterparts.

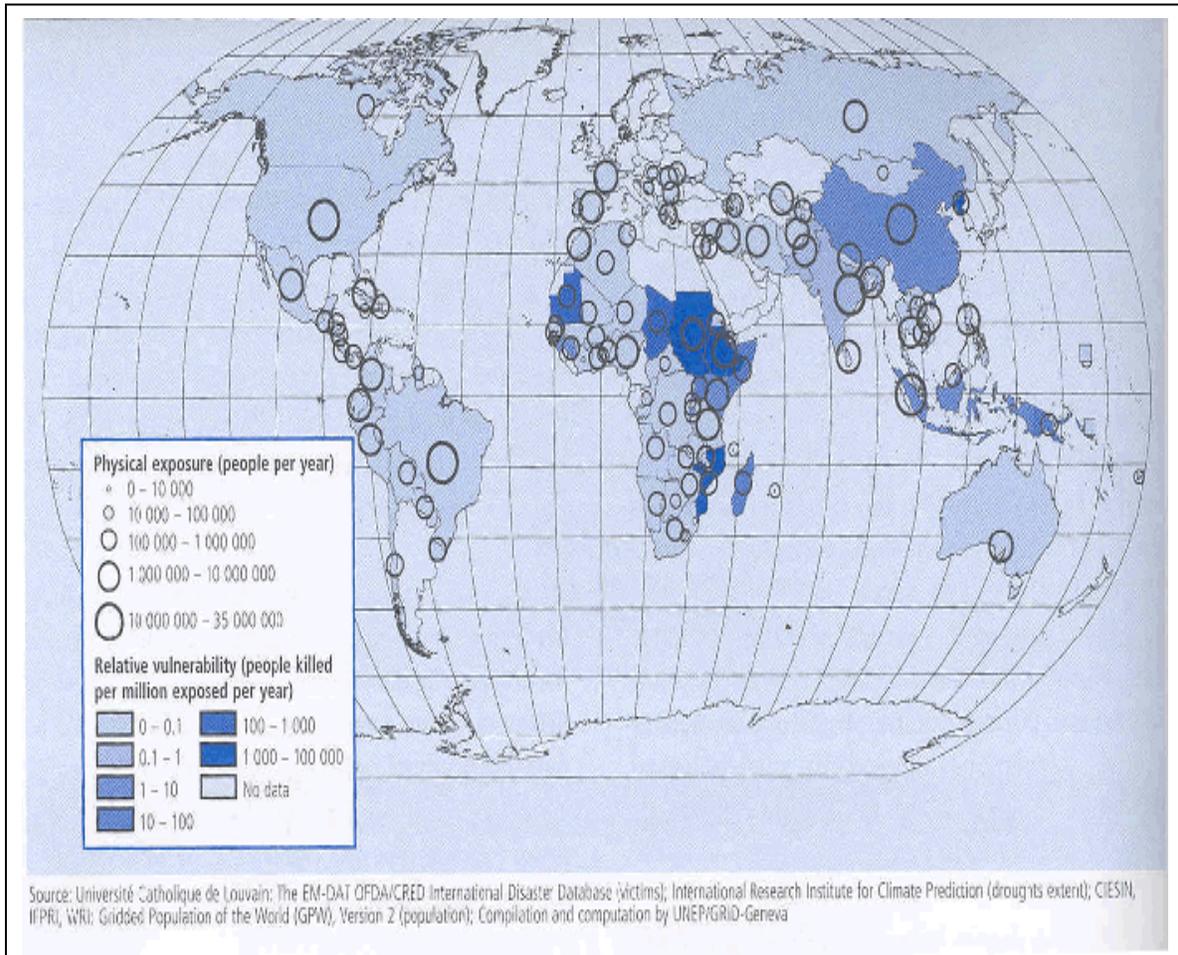
In short, in spite of the many methodological shortfalls, the UNDP study is an important step towards comparability of vulnerability and powerfully highlights how national economies can serve as a buffer to the potential impacts of natural hazards such as drought. Furthermore it demonstrates that even countries with similar *per capita* GNP's can experience very different

impacts when subjected to the same drought exposure, implying different levels of effectiveness in managing disaster risk.

**Figure 1**  
**Physical exposure to drought, 1980-2000**



**Figure 2**  
**Physical exposure and relative vulnerability to drought, 1980-2000**



## **2.0 The way we think about drought risk affects the way we manage it**

*Different groups have different perceptions, tolerances and capacities to manage various types of risk. Similarly, drought affects different groups in diverse ways, for example pastoralists as opposed to farmers living in drylands. This section explores how human societies adapt well or poorly to drought, which may be a function of an inadequate understanding of drought and/or inappropriate policy. This is illustrated by examples from North America and the Sahel region of Africa. Finally, drought is examined as a situation-specific management challenge and various types or conceptions of drought identified and the environment implications examined.*

## **2.1**

### **Drought affects different groups in diverse ways**

Drylands users such as pastoralists can be seen on the one hand as exposing themselves to the risk of drought impact by 'choosing' to live in drought-prone environments, but their livelihood strategies provide evidence that they are highly capable, specialized risk managers. Nevertheless their livelihoods often suffer drought impacts the most. This is because their level of vulnerability is largely determined by factors beyond both their knowledge and in particular beyond their control. They have built up an excellent knowledge of rainfall patterns and are able to cope with even severe droughts; however, they may know little of and have less control over national policies of land tenure or other issues which may undermine their risk-management systems.

It is important to distinguish at this point between risk and uncertainty. To continue with the example above, pastoralists have an idea of objective risk of the rainfall leading to drought, but little knowledge of which types of policy decisions might be made which could impact their livelihood system and coping strategies, whether and when such decisions may be made or what the consequences will be. As such, they are not in a very good position to prepare for them, increasing their vulnerability.

Similar principles apply to farmers in drylands. For example, a survey done in northern Nigeria during the great Sahelian drought of 1973-74 revealed some of the adaptive responses to famine; among these are use of famine foods (drought resistant foods), divestment, income diversification and mobility (Mortimore 1998). In this region, as others, seasonality bestows both the opportunity and sometimes the necessity for diversification for dryland households. In West Africa, informal economic integration of the Sahelian and wetter coastal regions has long been formalized in dry season migration as well as in permanent transfers of population (Michael 1998).

In short, different groups have different approaches and capacities to manage risk as a function of their opportunities, situation, experience and this variety needs to be taken into account when devising drought risk policy. Some of the factors which explain whether a group adapts or maladapts to drought include lack of climate trend information, perverse policy incentives, and the nature of the relationships between drought and development.

## **2.2**

### **Inadequate understanding and/or inappropriate policies increase drought vulnerability even in developed countries**

A recent climate analysis reported in the journal *Science* shows that an unusually wet period in North America at the beginning of the 20<sup>th</sup> century encouraged immigrants from the overcrowded northeast of the US to spread into the Midwest, a process further promoted by land grants and other policies designed to settle the states in this area. High cotton prices also acted as an incentive and resulted in the planting of inappropriate, water intense crops. Then when rainfall patterns switched in the late 1920's and early 1930's it resulted in the well-known dustbowl. Farming techniques brought from areas of more reliable rainfall as well as widespread overgrazing due, in part, to new technologies such as barbwire fencing also played a role. In Canada during the wet decades of the 1950's to 1970's large-scale drainage of the Prairies was undertaken, including leveling, paving the way for mechanized monocropping (Herriot, 2003). This approach was strongly encouraged by agricultural support and the advice structures of the state. It also had the effect of greatly decreasing surface water storage. Recent severe droughts have revealed that ecosystem function has been undermined in terms of regulating the hydrological cycle, only apparent during a climate-induced stress.

Similarly, in the Sahel in the 1960's, which was a period of above-average rainfall in that region, farmers moved into areas which were really only suited for, and had traditionally been used for, less water-intense production. Again, this was reinforced by policy, both government and donor, which saw cereal production as the key to food security, cash crop production as the source of revenue for the newly independent states and pastoralism as an outdated and inefficient - even embarrassingly primitive mode of production. This led to an implicit 'right of the hoe' in land tenure policy, a perverse incentive which even saw pastoralists farming in highly damaging and uneconomic ways, simply to claim land. Not surprisingly, when lengthy droughts struck from the late 1960's through the mid 1980's the consequences were far greater than would otherwise have been, as the mode of development chosen by these societies had unwittingly greatly increased their exposure to risk and their vulnerability to its impacts.

### **2.3**

#### **Drought is situation-specific and this should be reflected in policy**

In order to devise appropriate policies for water and food security and productivity with respect to drought it is important to be specific about the context. Generally drought experts distinguish between four main types of drought; which are really different ways of looking at the same thing:

- **Meteorological drought:** A below average rainfall
- **Agricultural drought:** An insufficient and/or inadequately distributed rainfall for crop production
- **Hydrological drought:** A lower- than-average flow in rivers, low levels in reservoirs
- **Socio-economic drought:** A lower-than-average supply of an economic good as a knock-on effect of one or more the above forms of drought.

The last could also be thought as drought triggered food insecurity due to vulnerable socio-economic conditions of either of particular group or even an entire society. This could even lead to what Cannon (2004) calls a 'policy famine', which is an artificial shortage caused by disastrous policy or the use of food as a weapon.

In setting drought in its context for the purpose of analysis one could even be more specific; conditions which lead to a 'wheat-drought' would not also cause a 'goat drought'. Therefore if land use were to change there would be a change in drought frequency without a change in weather or climate (Warren and Agnew 1988). Of course a use-specific definition of drought might be difficult to operationalize but it can also be very revealing for the purpose scenario building and identification of options. Such an analysis can reveal the degree of weather-dependency of a social choice. By social choice we mean the objectives into which society puts its resources, which always means taking resources away from some current or potential use. This is clearly a political decision and therefore one which is rarely made purely on the basis of science, even though the rationale which justifies the decision may employ technical-sounding explanations. For example, what is really a socio-economic drought resulting from choices which reflect powerful interest may be characterized as an unavoidable 'Act of God'

This is made easier by the fact that the relationship between the natural and socio-economic factors explaining drought impact can be difficult to disentangle. For example, a study of the wider socio-economic consequences of drought in Southern Africa revealed that the impacts of climatic variability are readily apparent, but more difficult to quantify, because they are partly the result of or act through other influences. Furthermore, the impacts of climatic factors change from event to event, depending on the pattern and severity of each climatic anomaly, which typically have distinctive features. The scale and form of impacts were also found to depend on the structure of the affected economy and on the changing political and economic environment (Clay 2003). In short, the development of policy which accounts for drought risk is an analytical challenge made

more complex by the political advantages of portraying drought impact as essentially the inevitable result of the whims of nature

### **3.0 Relationship(s) between drought, food security and sustainable development**

*Building upon the proposition and finding developed thus far, this section introduces the complex interactions between drought, food security and sustainable development. Furthermore, it raises the question of whether and how governments and development agencies can address this issue through the integration and mainstreaming of drought policy with other development issues in order to realize sustainable development. A simple model of two ideal-type societies, one drought vulnerable and another drought resilient is used to illustrate the complex interactions between drought and other factors which influence development, which in turn mediates the impacts of drought.*

#### **3.1 Drought and development**

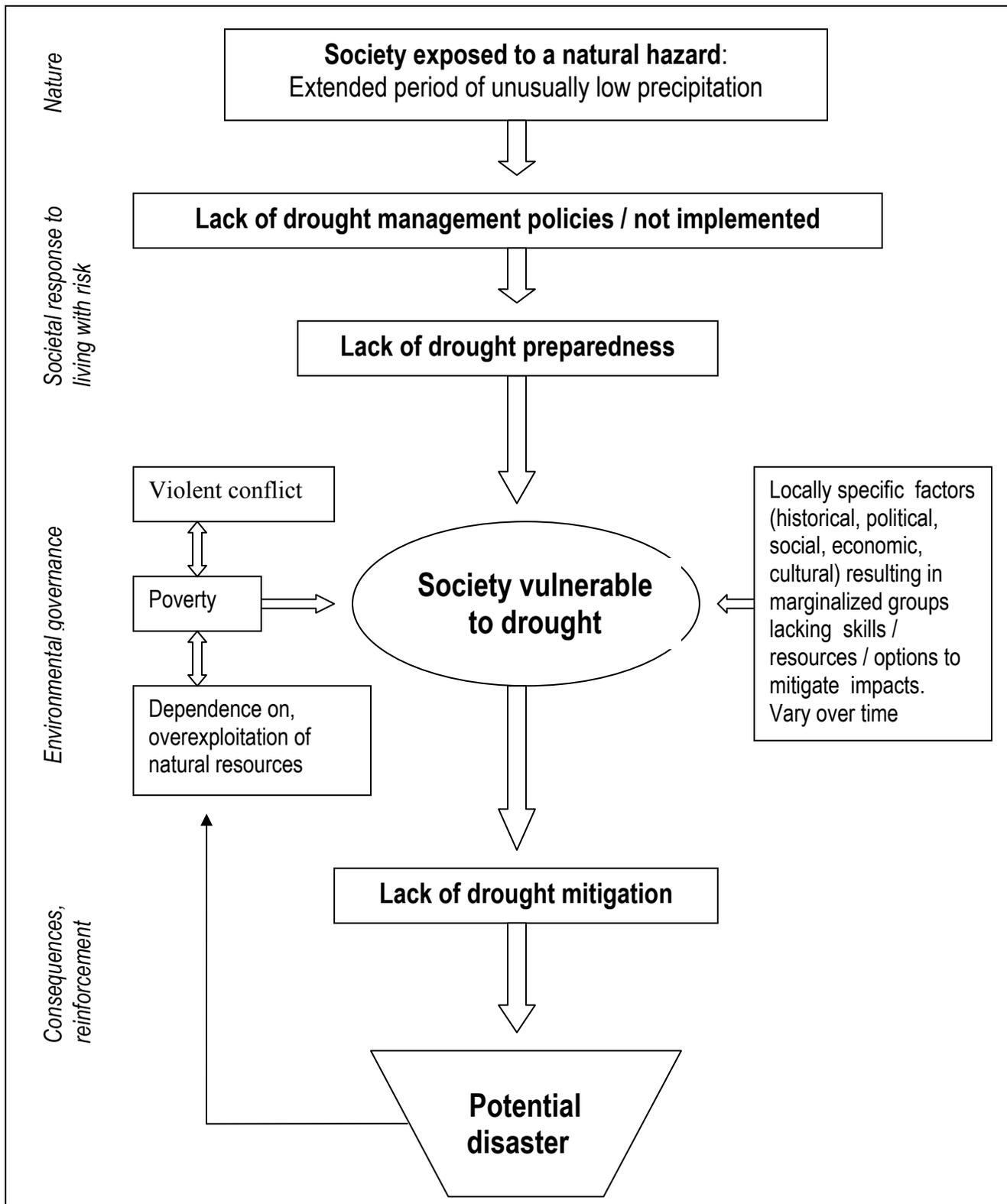
There are complex interactions between drought, food security and sustainable development. Drought has profound effects on food security, especially in less developed countries and particularly where economies are heavily weather dependent. Whenever there is a severe drought or prolonged famine the affected populations draw upon their 'social adaptive capacities', typically complemented by aid and relief food. A number of development actors have recognised the complex interactions between drought and food security and are consequently seeking to integrate and mainstream drought issues into broader development initiatives in order to realise sustainable development, the definition of which must include resilience to climate shocks.

#### **3.2 Vulnerability and resilience to drought**

The United Nation Inter-Agency Working Group on Drought (2003) has generated a simple model of two 'ideal type' societies for the purpose of illustrating some connections between drought and the socio-economic complex it acts upon; one a 'drought vulnerable society' and the other a 'drought resilient society'. These are represented graphically in the following two figures which illustrate the complex interactions between drought and other factors. UNDP-DDC tested this analytical tool with the Environment Group of Ethiopian parliamentarians, inserting Ethiopia-specific information, and found it to be a useful aid in identifying key relationships and the implications of policy decisions on drought vulnerability.

They also repeated this analysis for a series of major droughts in Ethiopia, asking each time whether drought impact had increased or decreased and if so why. This exercise provided a rapid sketch of the evolution of policy thinking and drought practice in Ethiopia over the last three decades. This is one example of how analytical tools can be developed in order to help policy makers think through how to best "drought proof" their population and economies and safeguard their development gains.

**Figure 3 A Drought Vulnerable Society**





It should be apparent from these models that sustainable development can only be realized if all the major factors that impact on drought and food security are addressed appropriately and timely. Policy changes will be inevitable in order to mainstream, incorporate and integrate drought and food security with other factors of development HIV/AIDS, gender, governance land tenure, water management and others at local, national, regional and international level and through established planning and prioritization mechanisms such as PRSP's.

## **4.0 Drought and society: Towards policy options**

*This section examines some of the societal responses to drought. It explores some of the ways in which societies and groups address the risk of drought, such as drawing upon coping strategies and social adaptive capacity and how policy decision can either reinforce or undermine adaptive responses to risk. In particular, the impacts of agricultural policy on water and food security are examined. Similarly, the context for agricultural policy, the international political economy of food, clearly illustrates how some societies have overcome water shortages and manage drought risk by engaging in trade in virtual water. This section, also examines how the concept of virtual water is generally understood and applied and how it can be used to 'insure' a population against the worst effects of drought impacts.*

### **4.1 Societal responses to drought**

Different communities have different approaches and capacities to manage risk. In the past communities in drylands typically controlled, managed, conserved and protected their resources communally. They had accumulated a wealth of knowledge, ideas and experience of managing and coping with disaster risk, even in the face of severe droughts. Today much of these responsibilities have been conferred to governments, which in turn have established institutions and mechanisms through which drought issues are addressed either directly or indirectly. These institutions are charged with the responsibility of reducing and managing drought risk, alerting communities of drought events and assisting in coping with them. However pastoralist and other communities who live in marginal areas which have been neglected by central authorities are still primarily relying upon their own social adaptive capacity in order to cope with drought.

### **4.2 Social adaptive capacity**

A quick survey of history, or indeed just examining a cross section of drought-prone societies today reveals that different societies manage the risk of drought impact in different ways. This is partly a function of different levels of economic development, which partly determines a society's options, as illustrated by the UNDP study, which found a very high inverse correlation between GNP and human mortality in the face of drought.

One way of explaining differences in drought vulnerability between societies or policy environments is to think of the 'drought exposure – drought impact' relationship as being mediated through *social adaptive capacity*. This term is employed in this paper to mean the ability of a system or a society to accommodate, adjust and adapt to a stress, specifically a drought-induced stress (Figure 5). We distinguish between social adaptive capacity and coping strategies by considering the former to be an attribute or potential resource while the latter are particular expressions of resilience's in a particular situation, and typically at the household or community level.

Where the society under consideration comprises citizens of a nation state, their large and relatively complex society often transcends the spatial extent of a drought and may be able to allocate resources from a non-drought-affected area or compensate through a less drought affected sector. For example, exchanging goods and services for 'virtual water' a concept defined and elaborated upon below. At the level of household or community on the other hand, society is typically entirely subject to a particular drought event. Much has been written about coping strategies but less about the social adaptive capacity to drought, though the climate change debate is starting to change.

Societies in the past which were incapable of adapting to climate risk and/or climate shocks, perhaps through mismanagement of water, often simply disappeared. For example, there is intriguing archaeological evidence that mismanaged irrigation water resulted in massive salinization around some Mesopotamian city-states, precipitating their rapid demise. Similarly, the mismanagement of the Aral Sea, while not endangering the existence of a nation-state, has undermined large segments of the populations on behalf of whom these policy decisions were made. Figure 5 demonstrates that for the same level of water scarcity there can be very different levels of human development of a society, as measured by the UNDP Human Development Index (HDI). This can be interpreted to mean that societies which are better able to overcome water shortages manifest higher levels of social adaptive capacity, in this figure termed "social resources". If this is accurate then it means that there is little environmental or climatic determinism in terms of the relationship between a society's natural resource endowment and how they use their capabilities and their ingenuity to turn it into development. Development, in turn can act as insurance against the worst impacts of vagaries of nature, as revealed by the UNDP study, which shows strongly inverse relationship between *per capita* GNP and drought mortality.

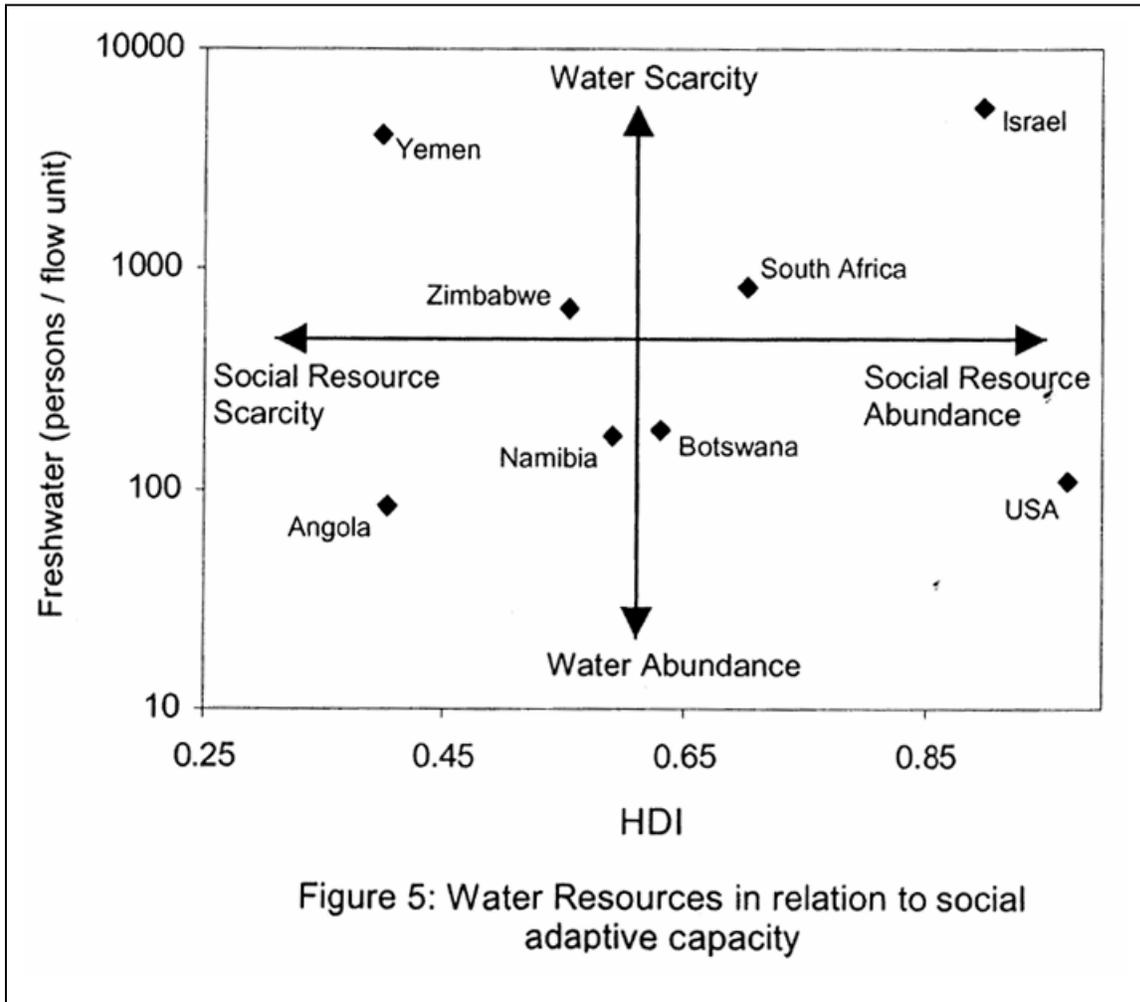
From a policy perspective, which normally corresponds to the nation state as the unit of decision making, policy makers need to recognize that their decisions can enhance or undermine assets such as adaptive capacity. It is important to note in this context that a decision may result in a total or average decrease in drought vulnerability but still increase the vulnerability of a particular group(s). On the other hand, a society may choose to collectively subsidize a particularly exposed or vulnerable group or sub-system, in the spirit of pro-poor policy, even at the cost of an increase in the average impact of drought, but one which is more evenly distributed. Therefore and importantly, when talking about vulnerability to drought, we must also ask ourselves 'vulnerability for whom'?

Finally, it should be emphasized at the end of the day any attempt to influence national level policy making can only achieve just that: influence. The actual outcomes in a society ultimately represent the net effect of numerous, perhaps apparently insignificant decisions made units of various scales which collectively comprise a society. Therefore policy makers need to define their policy room-to-manoeuvre within a given situation. This would take into account resources, constraints and opportunities in order to identify the highest leverage instruments and avenues through which to create an enabling environment for society itself – to achieve change. This will maximize the value of their own adaptive management strategies and energies and priorities in order to achieve more sensible water allocation, greater food security and enhance drought resilience while simultaneously advancing other development objectives.

### Figure 5

## Water resource in relation to social adaptive capacity

(Earle 2001)



### 4.3

#### **Policy options:**

#### **The special case of agricultural policy on water and food security**

Agriculture still uses some 80% of the freshwater employed by humans, and hence agricultural policies have a strong influence on water management. Food is a very emotive issue, as is the idea of a nation-state being self-sufficient in food for reasons of national security. This has often led to often perverse incentives, which in turn lead to an irrational allocation of water, normally through market distortions like unrealistically low prices. This in turn leads to excessive demand, and as it is normally politically unpalatable to try to decrease water consumption, to a drive to increase supply. All of which involve issues of intergenerational equity and environmental externalities. In short, a fundamentally 'political' question, one of allocation of a scarce and essential resource, is depoliticized by being portrayed as a technical question of increasing supply.

Agricultural policy may override or amplify purely weather related factors. For example, in Malawi maize production declined by 20% in 1986/87, but weather was only one factor; other important constraint were pricing and availability of inputs and the policies of the ADMARC, responsible for marketing and managing national food security stocks (Clay *et al* 2003). Similarly, in Zimbabwe policies have influenced the structural change in agriculture through land redistribution and political developments and related economic changes. This resulted in increasing volatility in maize yields associated with a shift in production to smallholders and a decline in large-scale commercial output (Clay *et al* 2003).

### 4.4

#### **The context for agricultural policy and food security options; The international political economy of food and virtual water**

Societies like Singapore, Hong Kong and Macau grow nothing yet never suffer from food insecurity, though of course disadvantaged individuals or groups may. They indirectly and perhaps unwittingly ensure general food security by engaging in the international system to exchange labour, ideas and organization - in the form of the goods and services they sell - for the water required to grow the rice and other food stuffs they import. Of course, with city-states there is insufficient land to ensure food security by growing food themselves. But even in countries which are known as the breadbaskets of the world one notes a similar phenomenon. In fact only about 3% of the population of developed countries is directly engaged in agriculture, which rises to perhaps 15% in some of these countries if associated activities are taken into account. These countries produce more food than they know what to do with because of price distortions - principally production subsidies - which encourage more production than the domestic market would demand. On the other side of the world a country such as Jordan, one of the most water scarce in the world, imports large quantities of 'virtual water' in the form of grain from developed countries, which together with other forms of imported water accounts for 60-90% of water used by Jordanians, depending on the year (Hoekstra 2003). 'Virtual' water is defined as the water (rainfall or groundwater) required to grow one kilogram of a dry cereal; one to two cubic meters, depending on the crop. Using this logic, it has been estimated that every year Egypt imports more water- 'embedded' with grain - than the annual flow of the Nile, which historically assured Egypt's food security (Alan 2001).

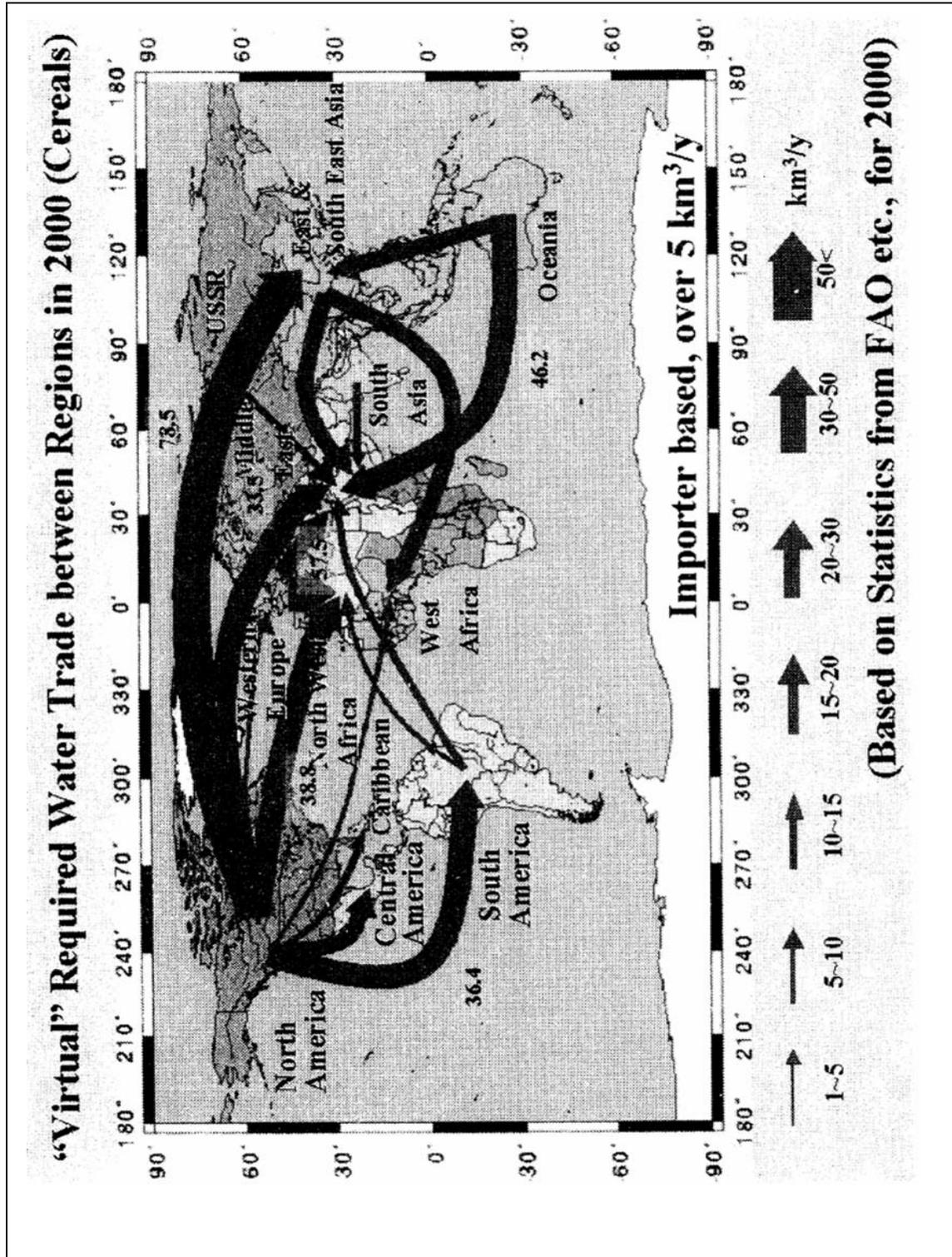
Globally, the trade in virtual water represents some 15% of the water used by humanity. Regions which are net exporters of virtual water are the Americas, Southeast Asia and Australia, the rest of the world being net importers (Hoekstra 2003) (See Figure 6). Perhaps surprisingly, some chronically drought-affected countries, such as Sudan, Niger and Burkina Faso are revealed to be net exporters of water when virtual water is taken into account. This is probably explained by the

influence of livestock exports on the calculations and the relatively low level of food imports into poor countries. In a virtual water calculation the water used to grow the grains and grasses they consume would be the water associated with the meat exported. Water challenged countries exporting water does not necessarily represent an irrational policy choice. Indeed, it may be the most appropriate way of turning rainfall into livelihoods, food security and pay for imports, as it may be the most efficient use in terms of cash – per - drop or employment– per - drop or food– security- per- drop

Finally, if water – or reliability thereof - is the most limiting factor of production, then policies need to be rationalized in term of return to water rather than return to land; the traditional measure of agricultural productivity, as the science of agricultural economics developed in an area of land scarcity but reliable rainfall. To take it a step further, one could think in terms of policy criteria of, for example, the number of jobs generated per unit of water. Yet again, a careful analysis of food and water security demonstrates that viewing the same problem in a new light may reveal policy options which may have always been there but which simply went unrecognized.

There are many examples of societies which re-organized their limited capacities in a new way to successfully address a threat. Boserup (1981) calls this expression of social adaptive capacity 'induced innovation' One must therefore ponder why in many areas of Africa there have been significant flows of food relief for decades on end. Has the international system for humanitarian dumping of surplus grains insured Africa against the consequences of climate risk but at the same time perpetuated bad policy by alleviating its consequences? If so, what are the alternatives?

**Figure 6**  
**Annual virtual water trade in 2000**  
(Oki and Kanae 2000)



The international trade in grains and hence of virtual water is driven in part by the fact that it is much cheaper to send one kilogram of grain in dry form from, say, the USA to Egypt than to send the 1,000 to 2,000 kilograms of water which would be required for the Egyptians to grow that one kilogram of grain themselves. It is also driven by price distortions which mean that producers are looking for opportunities to essentially dump food. Naturally this might have powerful effects in the recipient countries, an emotive debate but the evidence for which is sometimes contradictory and rarely straightforward. In Africa there is no evidence at the level of the entire continent that food aid has suppressed food production.

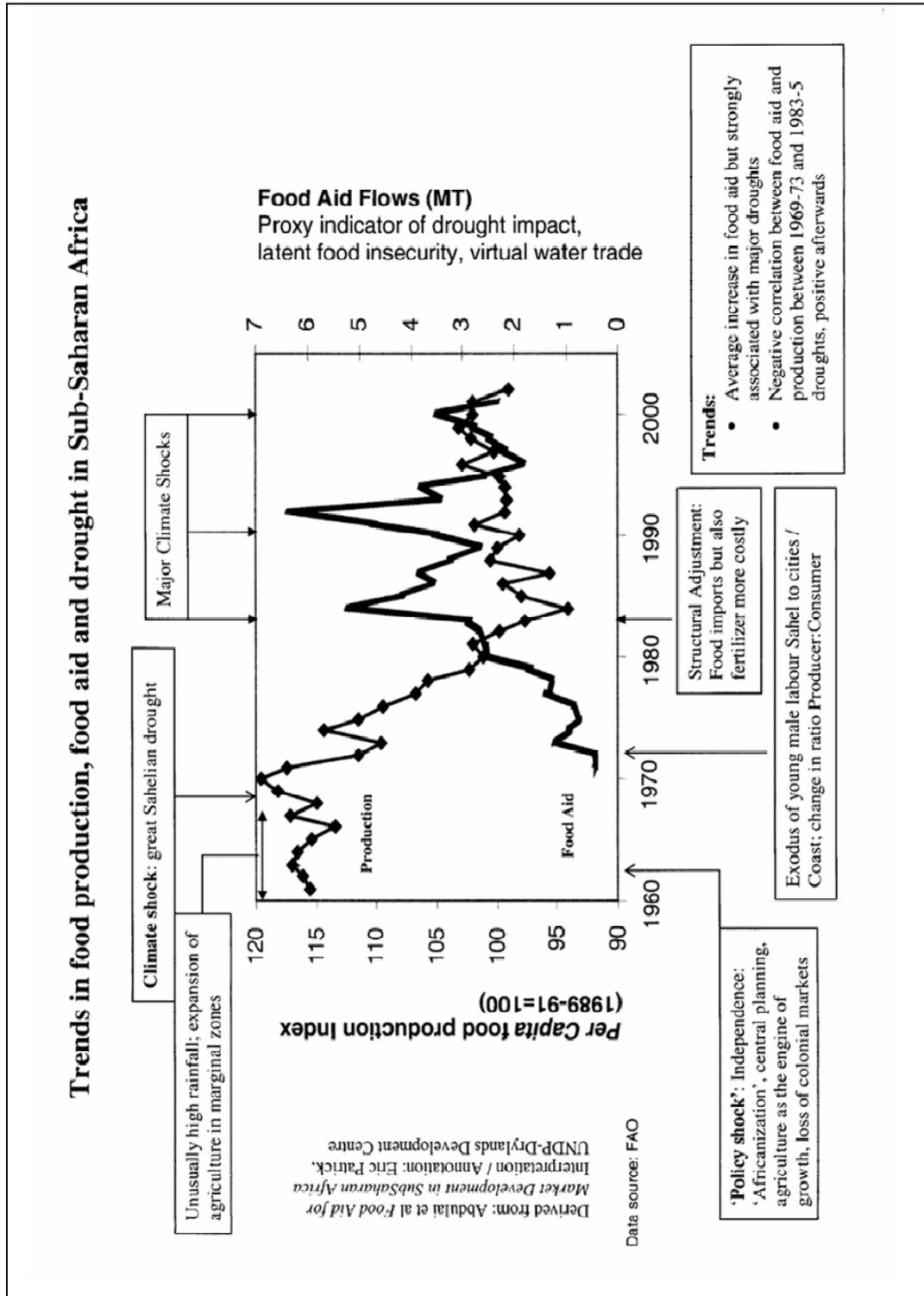
Interestingly, from the beginning of food aid to Africa in about 1973 with the great Sahelian drought and famine until 1984, another major famine year and also the beginning of Structural Adjustment in many African countries, there was an inverse relationship between food aid and food production (Figure 7). Yet from 1984 food production has steadily increased in both absolute and *per capita* terms, even as food aid has increased, again as can be seen from Figure 7. This may be due to the fact that structural adjustment made foreign exchange expensive, which may have reduced food imports and/or made them more expensive, stimulating local production. On the other hand it would also have made fertilizer imports more expensive. In any case, at the local level, there is abundant evidence that regular food aid at least temporarily suppresses production and – more importantly - creates a dependency mentality. Furthermore, its distribution has often been politicized, either within the structure of patron-client relations or even as a weapon. Food aid, like other aid, essentially equates to dropping a very valued, free and extra-budgetary resource into a given set of power relations, with predictable results.

The problem, therefore, may not be food aid *per se* but its context. The results of schemes based on giving assets-for-work, cash instead of food, vouchers for local food purchases and other experiments demonstrate that there is no immediate alternative to internationally sourced food aid or purchases as short term relief from a major drought event. When this assistance, however, becomes institutionalized, as in some countries in the Greater Horn for one or two decades (Figure 7 illustrate this), it raises fundamental questions.

In general, however, as can be seen from Figure 7, although average food aid quantities for Africa have been steadily rising, the temporal distribution largely corresponds to major drought events (note spikes in 1984, 2001). This indicates that, whatever its faults, the international political economy of surplus production through perverse incentives in Western countries (though the same could be said of many developing countries), driven by domestic politics, is neatly wed to post-War prosperity and the associated humanitarian imperative. This in turn operates through aid institutions and is made possible by quick and relatively cheap communications and transportation, the often unrecognized phenomenon of transfers of virtual water in the form of grains and failed policy in many developing countries. In short, it is a manifestation of globalization and contrasts greatly with, say, the political economy in place during the Great Potato Famine in Ireland in the mid nineteenth century.

It is essentially a system of Western taxpayers acting as the re-insurer of last resort when countries are overwhelmed by a major drought event or other natural hazard. The only difference from insurance is that the insured may not pay any premiums, and like any free good or service may be applied inefficiently. On the other hand, payment may be in the form of political services rendered to grain-surplus nations, particularly in the case of a strategic region such as the Middle East, or for having the good or poor fortune of having been colonized by a particular country. Indeed, even with conditionality now being the norm with aid, a World Bank study found that the single best predictor of from whom and how much a country receives in aid is simply whether it was a former colony of a donor and is quite unrelated to whether its policies were considered to be 'good' (World Bank 1998).

**Figure 7**  
**Trends in food production, food aid and drought in Sub-Saharan Africa**



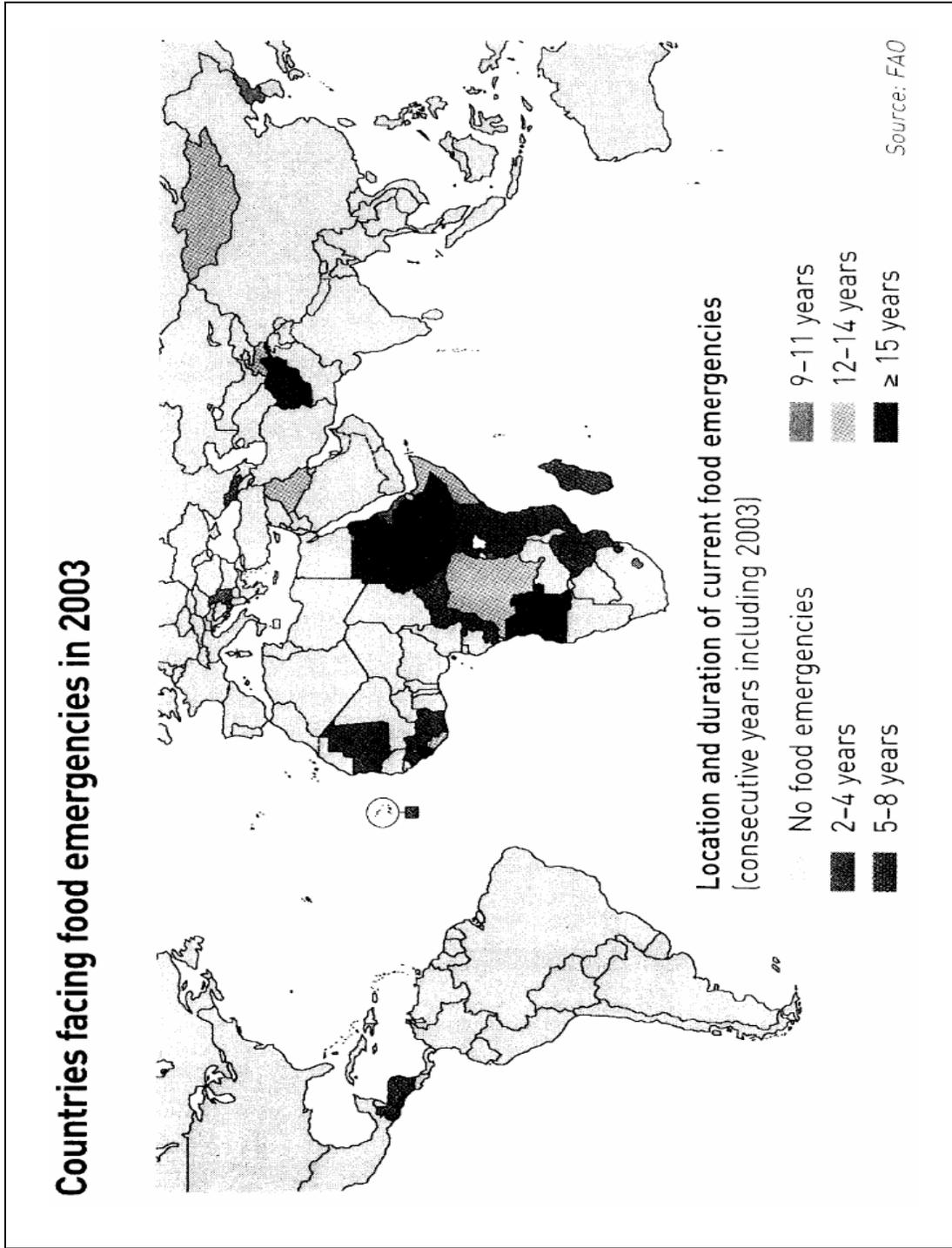
In short, the current international marriage of convenience is an attractive system in terms of reducing human mortality due to drought, but in practice may subsidize the effects of bad policy or stave off necessary changes to structural power relations within the recipient countries and encourage dependency. Where even massive external assistance has been inadequate to prevent widespread famine, the basic political order may be questioned and lead to the government being overthrown, as happened in Ethiopia on several occasions shortly after major drought/famine events (Gignoux 1995). On the other hand, where the political system is sufficiently powerful, even a major famine - even if induced primarily through policy failure such as China's Great Leap Forward in the 1950's - the system may survive but the policy or even the ideology behind that policy may come into question. Cannon (1994) calls such drought-related but policy-induced food insecurity events 'policy famines'. Such droughts - operating through a particular mode by which society chooses to organize itself - can also be thought of as 'revelatory droughts' (Solway, 1994); in other words, reveal structural or other inadequacies by way of the vulnerabilities they create or exacerbate.

Whether or not it is effective or wise - indeed knowingly or not - many societies in Africa and elsewhere have made a strategic 'choice' to insure themselves against drought impacts by importing water in exchange for commodities or political favors, rather than to encouraging *in situ* food production. Yet rarely would a strategic debate such as which development pathway should be pursued to ensure national food security occur within, for example, the Ministry of Agriculture or Ministry of Water, even though many may assume that these very Ministries have responsibility for national food security. This highlights the fact that national trade policies and international trade regimes cannot be de-linked from the questions of drought, food security and water management. Indeed, countries which attempt autarkic development, cutting themselves off from the international system, also rob themselves of food security options. The difference in drought impact between the two Koreas in recent years (see Figures 8) is testimony of this, though of course there may also be other factors.

Ironically, the source area for much of the global food security insurance system is itself a water-challenged, semi-arid area, the Great Plains of North America and to a lesser degree Australia (Figure 7). This indicates (reinforcing the point made in the discussion of social adaptive capacity) that - within reason - a society need not be hostage to its natural resource endowment, including water. Indeed, Non environmental factors may very well be more significant in turning a society's various capabilities into food security than the degree of water scarcity. Ironically, this often results in water-scarce countries such as Israel or South Africa exporting water-intense but high value-added products such as tomatoes or melons. At the same time, however they may import high bulk but low value staples which are essentially subsidized by the exporter. This is a logical strategy, facilitating food security whilst moving up the value added chain.

To take this logic a step further, if one were to calculate the amount of water used on an agricultural field and then rezoned that area as a high-tech industrial park and the same amount of water were used for its plumbing, one would find an exponential increase in the value efficiency of that water, which could also be thought of as the jobs-per-drop (Alan 2001). Of course the missing ingredients in such a scenario are capital and specialized technical knowledge and the other elements of development, all of which takes us back to the fact that water and food policies and security must be seen as integral to national development strategic objectives.

**Figure 8**  
**Countries facing food emergencies in 2003**



## **5.0 How can the policy process be influenced such that risk is seen as integral component of development?**

*Policy makers, governments and development agencies usually recognise that development initiatives interact and relate to one another in complex ways. Decisions and policies relating to one development activity will positively or negatively impact on others. Drought, as we have seen, is no an exception to this rule and hence development actors have been seeking to integrate and incorporate drought management as a policy direction with respect to the tools and concepts of development, such as Poverty Reduction Strategy Papers, good governance, gender equity, water management, and environmental sustainability. Some organisations have been active in trying to advocate for mainstreaming of sound drought management policies but may lack the analytical tools and/or policy influence to achieve this. Nevertheless, the importance of achieving this becomes critical in countries where drought regularly and strongly impacts development advances. How, then, can interested parties engage in shifting thinking about drought risk from the natural hazards paradigm to a social-political one and in doing so open up space for new policy options?*

### **5.1**

#### **Policy choices can either undermine or enhance resilience to drought**

As we have seen from the discussion so far, there are many factors which interact in complex ways which influence the way in which a society – at whatever scale - makes use of water, often with impacts on food security. Some of these factors are within the control of policy makers at national level, some not. If we then add drought to the formula, we are essentially greatly decreasing the ability of policy makers to influence an outcome, particularly if an economy is heavily reliant on weather-dependent activities. The knock-on effects of drought on Zimbabwe's economy, cited earlier - even in sectors one might not expect to be affected - illustrates this principle. In general, the lower the average rainfall in an area the higher the variability and the lower the crop the more directly weather dependent the economy.

Adapting policy to the reality of weather and even climate uncertainty may make the difference between major and minor impacts during a drought. Indeed, in some countries drought, water management and food security may be central development issues even if they are not explicitly recognized as such. Yet even where drought occurs with frequency and has major impacts - even reversing development advances – droughts and their impacts are often portrayed as surprising, unexpected events for which one could not have prepared. International assistance is then often forthcoming, which may unwittingly act as a disincentive for investing in drought resilience. For some years now a cross-section of development actors have been talking about the need to move from relief to development, from crisis management to reducing the risk of disasters but there is little evidence that this has moved to the centre of the policy agenda.

One constraint may be a lack of understanding of the impacts of policy choices on disaster risk and specifically, for this discussion, of vulnerability to drought. It must be emphasized that there is no substitute for policy makers taking stock of their own situation and systematically analyzing their various policy options on the criteria of whether they are likely to increase vulnerability or resilience to drought. These would then be prioritized according to likely impact, then related to the feasibility of making changes and the trade-offs between them. UNDP through the Drylands Development Centre (see end of paper) is developing capacity to assist policy makers in this area and works through UNDP Country Offices, present in most countries of the world.

## 5.2 Drought policy principles in the context of uncertainty

The level of resilience of drought users could be enhanced if there were better communication with higher-level decision-makers who influence their world. Even in the case of national policy makers, there may be the same issue of being unaware of some of the factors external to their world but which impinge upon it. This can be a major explanation of vulnerability to drought at the level of the policy environment over which they have influence, the nation state. There may be changes in global trade patterns, climate change, changes in policies in important partner countries, development agencies *etc.* But similarly, even within an idealized self-contained policy environment, it would be difficult to predict the outcome of drought, water and food security policy choices as they are mediated through complex socio-environmental systems. Furthermore, these systems consist of actors with 'agency'; (in other words free will) who may not respond in the expected or desired manner.

Nevertheless there are a number of principles of **ecosystem management** which have been developed (FAO 2004) which we find relevant to the question of how to devise an enabling policy environment for managing uncertainty in the context of regularly drought-exposed weather-dependent economies. Among these we highlight:

- Change is inevitable
- The objectives for which land, water and living resources are managed is a societal choice
- Representatives of affected groups should be involved and all relevant knowledge systems and practices (ie scientific and indigenous) should be considered and in order to do so management should be decentralized to the lowest appropriate level
- Recognizing that various parts of the society-environment complex operate at different time scales, and with unknown interactions and lag effects, objectives should be set for the long term
- Ecosystems must be managed within the limits of their functioning (*e.g.* regulation of the hydrological cycle) in order to ensure that they continue to supply provisioning services (*e.g.* groundwater for irrigation) and should consider the potential effect on linked systems
- Ecosystems are normally also **economic systems** and must be managed with sound economic principles in mind

Furthermore, it is important to remember that in the real world management often means allocating limited resources between competing demands and groups. This is an **inherently 'political'** and potentially conflictual situation and must be recognized as such rather than hoping to wish it away by politely ignoring it. In drought-prone environments this means that water and other essential but limited resources can become a source of conflict, especially when they are shared resources (*i.e.* groundwater, grazing). In such a situation the ability to generate collective action for sensible and equitable management of resources, resulting in a net increase of resilience to drought, becomes a critical issue in influencing policy. The failure to do so can be seen for example, in recent water triggered clashes between pastoralists and farmers in several areas of Kenya, resulting in some twenty deaths. In this case the drought triggered water relate conflict is just a tip of an iceberg of historic issues of resource access, which clearly have part of the equation.

### **5.3**

#### **Policy options for managing drought risk; What are we *really* trying to manage through drought-related policy?**

So far we have used the terms 'vulnerability to drought' and 'resilience to drought', but what do these really mean? The term vulnerability, in particular, has been used in development circles recently, each community tending to use it in its own way, in other words with an applications-specific definition. In the case of drought we simply mean 'a condition in which an individual, household, community or society is in danger of moving to a lower state of well-being when exposed to drought and taking considerable time to recover'. Resilience is used to mean the opposite. A drought impact normally occurs by acting upon a vulnerable situation, leading to a lower state of well-being, a crisis or even a disaster. Therefore drought policy should not be focused on drought. It should focus on the conditions which make a group or situation vulnerable to the impacts of drought. Making policy choices with the implications for drought vulnerability or resilience in mind also involves managing risk and uncertainty.

In short, the risk of drought impacts is a function of both the probability of receiving unusually low levels or an unfortunate distribution of rainfall together with the current state of vulnerability of the group or system exposed, as well as the degree to which there are mechanisms and resources to respond. As such, the best way to influence policy processes in order to mainstream risk would be educate all relevant actors to recognize the fact of the complex relationship between drought and its socio-economic settings. Having established awareness, a specific diagnostic methodology must then be developed to allow policy makers to assess whether a policy option enhances or undermines resilience to drought at various scales. Once proven, this then needs to be institutionalized in to national and district level standard prioritization and planning processes.

Finally supply side activities must be complemented by demand side activities which amplify the voices of the often politically marginalized drylands users in order to help shape the higher level decisions which may create an enabling or disabling environment for their highly evolved drought risk management strategies

## **6.0 The role(s) of 'external' players in assisting countries enhance their resilience to drought**

*External players have a central role to play in assisting countries enhance their resilience to drought, among them to network and collaborate with the governments of various countries to formulate and implement sound and broad drought management systems. They can also provide resources in terms of, training, personnel, finances, and information on strategies and global best practices for reducing drought risk and vulnerability. Furthermore, they can help strengthen existing institution structures and build capacity of the countries to manage, reduce and cope with future occurrences of similar events, which will surely occur. The role(s) of external players in the process of drought-proofing, Africa will be a major topic for discussion in the expert consultation. It will ideally lead to the identification of the respective roles which development actors should play in effecting a sea change in the way we address drought risk; away from one of the dependency on emergency and humanitarian relief and towards a more proactive and integrated approach.*

### **More information on UNDP's capacity building activities for drought resilience**

UNDP Drylands Development Centre and UNDP Bureau for Crisis Prevention & Recovery are currently developing a drought policy options document which addresses these issues in more detail and in a more applied manner. It discusses, in particular, how the way we perceive drought influences the policy options which a) policy makers believe exist and b) Policy makers believe to be the best option(s). It also examines specific drought management policy options which have been shown to work either historically or currently worldwide and attempts to identify the situations within which they are likely to succeed in order to allow decision-makers to analyze their own situation without reinventing the wheel. This document is being prepared as part of UNDP's commitment to highlighting best practices and applied knowledge management at a policy level, and to their application for the benefit of the most marginalized populations. This document will be available electronically on the UNDP-DDC website (see below) and in hard copy in English, French, Spanish and Arabic.

UNDP, through DDC, BCPR, GEF, The Climate Change Unit and Country Office programmes, amongst others also engage in concrete activities which address drought vulnerability and which are being implemented around the world.

Most development agencies have a component of drought or other related disaster risk management. They have been involved in promoting integration of disaster risk (drought) planning and preparation in to national and regional development programmes; sharing information on strategies and best practices for reducing disaster risk and vulnerability through regional and sub-regional knowledge network; thus, promoting the role of effective policy and frameworks in reducing disaster risk; supporting inter-agency disaster management training programmes available for disaster prone countries (DMTP). They are also working to mainstream drought into other development initiatives such as PRSP, gender, HIV/AIDS, food security, water management, sound governance and environmental and natural resource sustainability in the effort to realise the MDG's. At national and regional level development agencies strengthen institutional structures for sustainable disaster risk management, finance drought programmes and build capacity for prevention, mitigation, preparedness and post crisis recovery.

For those who would like more information or would be willing to review the draft document on drought policy options or contribute your own experience or to be listed as a drought policy resource person or institution please contact:

- UNDP-Drylands Development Centre: [eric.patrick@undp.org](mailto:eric.patrick@undp.org)
- UNDP-Bureau for Crisis Prevention & Recovery: [kenneth.westgate@undp.org](mailto:kenneth.westgate@undp.org)
- For more information on ISDR contact [fengmin.kan@unon.org](mailto:fengmin.kan@unon.org) or [Abchir@un.org](mailto:Abchir@un.org)

You are also invited to visit the UNDP corporate or country office web sites or the UNDP-DDC website: [www.undp.org/drylands](http://www.undp.org/drylands) (drought information can be accessed through the 'Vulnerability' link on the home page) or the weblink of disaster reduction unit of UNDP –BCPR : [www.undp.org/bcpr/disred](http://www.undp.org/bcpr/disred)

## **Suggested discussion questions**

- **How does the way we think about drought risk affect the way we address it?**
- **What is the relationship(s) between drought, food security and sustainable development?**
- **What policies are likely to increase or decrease vulnerability to drought, why and for whom?**
- **How can the policy process be influenced such that risk are seen as integral component of development? How can this be institutionalized?**
- **What is the role(s) of 'external' players in assisting countries enhance their resilience to drought?**

**Disclaimer:** The opinions expressed in this Discussion Paper, which is intended to provoke debate, and in particular the decision to cite particular countries in order to have real-world examples, are those of the authors and are not intended to imply that one set of national policy choices are superior to those of another nor do they necessarily reflect the views of UNDP.

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