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Sincerely,

A handwritten signature in cursive that reads "Judy Oglethorpe" with a circled "e" at the end.

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**RECONCILING NATIONAL AND GLOBAL PRIORITIES IN ADAPTATION
TO CLIMATE CHANGE: WITH AN ILLUSTRATION FROM UGANDA**

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Abstract. Many developing countries, especially in Africa, contribute only very small amounts to the world total of greenhouse gas emissions. For them, the reduction of such emissions is not a priority, and the more important issue is to find ways to reduce their vulnerability to the projected climate change which is being imposed upon them largely as a result of emissions from developed countries. This priority does not accord with the ultimate objective of the United Nations Framework Convention on Climate Change, which is to achieve stabilization of greenhouse gas emissions. This paper reports upon studies in Uganda designed to help in the development of a national adaptation strategy, and addresses the need to reconcile such a strategy with the global priority accorded to mitigation and with national economic development priorities. Some features of a national climate change adaptation strategy are identified and questions are raised about the need for an international regime to facilitate and support adaptation.

Key words: climate change, adaptation, economic development.

1. Global and national priorities

The ultimate objective of the United Nations Framework Convention on Climate Change is to achieve stabilisation of greenhouse gas (GHG) concentrations in the atmosphere.¹ Controlling global emissions of GHGs is, of course, critical to reversing (or at least slowing) climate change. However, the emissions from most of the developing country signatories to the Convention are very low and are expected to remain low on a comparative global scale. These countries have a different priority: adapting to the adverse effects of climate change brought on by GHGs emitted largely by the developed countries.

This is true of most African countries. According to the recent IPCC Report on the regional impacts of climate change (IPCC 1997), Africa, of all the major world regions, has contributed the least to potential climate change because of its low greenhouse gas

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¹ This paper is concerned only with low-emission countries. It does not address those larger and rapidly growing developing country economies where emissions are growing and which could collectively overtake developed country emissions

emissions. Yet Africa is the most vulnerable continent to climate change because widespread poverty limits its capacities for adaptation. The poorer developing country Parties to the Convention in Africa and elsewhere are thus signatories to an international agreement which is largely addressed to emissions control (to which they make only minor contributions), and which entertains adaptation to climate change only as a much less important activity. There is a primary divergence between the global priorities of the Convention and the national priorities of these most vulnerable countries.

It is already evident from negotiations that took place in Kyoto in December 1997 that the developed country Parties to the Convention place high importance on obtaining commitments from the developing countries to reduce their own future emissions, or to grow them more slowly. As these negotiations proceed, the role of adaptation seems likely to become increasingly important, and developing countries may well insist on greater support for their adaptation actions as a condition for commitments to mitigation of emissions. This paper addresses the question of how adaptation support can best be made available to particularly vulnerable countries in a way which supports their own national development priorities, and at the same time conforms to the global objectives of the Framework Convention.

All Parties to the United Nations Framework Convention on Climate Change are committed to implementing and reporting on climate change adaptation measures (Article 4, section 1 (b)). Preliminary indications are that national climate change actions plans (Benioff, Ness, and Hirst 1997) are placing the highest priority on improving the current domestic economic situation regardless of climate change. From a national perspective, climate change action plans thus seem set to emphasise strategies that can be justified in their own right within the present development decision framework, whether the climate changes or not, and on adaptation measures relevant to immediate national development priorities, and which yield benefits entirely or largely within the national territory. This might be called a "no regrets" adaptation strategy. Particularly for poorer countries, allocating scarce resources to short-term development needs – poverty alleviation, primary education, health, and combating disasters, food and housing scarcities and the like – leaves little, if any, funding for measures to anticipate the impacts of uncertain future climate change such as those described on the basis of $2 \times \text{CO}_2$ scenarios.

At the global level, developed country Parties to the Convention have committed to assisting the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation to these adverse effects (Article 4, section 4). Towards this end, the Parties to the Convention have designated the Global Environment Facility (GEF) as the interim financial mechanism. The Parties and the GEF are now considering the terms and procedures under which developing countries can request assistance with the costs of adaptation.

There has been significant hesitation on the part the developed country Parties to instruct the GEF to fund the costs of adaptation. Three stages have cautiously been established for funding adaptation as follows:

Stage I: Planning, with emphasis on impact studies to identify vulnerabilities, policy options and capacity-building.

Stage II: Measures, including further capacity-building, which may be taken to prepare for adaptation, as envisaged by Article 4.1 (e).

Stage III: Measures to facilitate adequate adaptation, including insurance, and other adaptation measures as envisaged by Article 4.1 (b) and 4.4.

Thus far, the GEF is authorised to fund only Stage I activities. The reason for the slow start on adaptation can be seen in the history of the GEF. The GEF was created at the time of the June 1992 "Rio Earth Summit" (the United Nations Conference on Environment and Development), and was designed to accompany several new international Conventions and agreements that were being negotiated at that time. The developing country Parties argued that these agreements threatened to divert development funds into activities designed to protect the global environment. If they were to be party to such global environment conventions, additional development assistance would be required above and beyond the existing multilateral and bilateral aid programmes. The GEF was created largely in response to this concern, as an additional funding mechanism devoted to helping developing countries bear the additional costs of actions to protect the global environment. When this philosophy is applied to the Climate Change Convention, it differentially favours mitigation actions (reduction of greenhouse gas emissions) over adaptation measures (reduction of vulnerability to climate change). The reason is that the benefits of mitigation actions are globally distributed. That is, slowing down the rate of greenhouse gas accumulation in the atmosphere slows down the rate of climate change to the benefit of all countries. The country making the mitigation expenditure captures only a small fraction of the benefits. This is seen as a legitimate charge against the GEF. In the case of adaptation, on the other hand, the benefits of adaptation measures tend to fall in the location where they are applied. The developed country parties and the GEF consider it to be in the national self-interest of each country to develop its own adaptation strategy, and since there are few extra-territorial or global benefits, they see little justification for using GEF funds to support adaptation.

There is however another rationale for providing development assistance to adaptation measures, and this is presumably why the developed country Parties to the Convention agreed to help particularly vulnerable countries. The need to adapt to climate change as distinct from everyday climate variability arises because the climate is being changed by the historical accumulation of greenhouse gases in the atmosphere emitted largely by developed countries over the course of their industrial development stemming back for more than 200 years. In this sense, the costs of adaptation are being imposed by the developed countries, and it follows that the global community should assist in meeting those costs. Although this was not in the original thinking that led to the establishment of the GEF, the notion of imposed costs provides a compelling argument for including them within the GEF's funding mandate.

There are three ways in which the present architecture of global response to climate change points to different priorities from those which the poorer and most vulnerable developing countries are likely to prefer, and should prefer in their own interests. First, as noted above, the Framework Convention gives priority to mitigation of climate

change, and only secondary importance to adaptation. Thus, poorer countries have received international support to carry out inventories of greenhouse gas emissions of which they produce only minuscule amounts, and have mostly not received support from GEF to study adaptation responses of which they are in much greater need. The Netherlands, United States, UNEP and others have financed country studies of impacts and adaptations. However, the main purpose of these studies is not to identify adaptations, but to show how serious the impacts could be if emissions are not seriously reduced. The practical utility of some of these studies is questionable regarding their ability to inform national short- and medium-term investment decisions.

Second, the distinction between assistance justified by global benefits and assistance justified by imposed costs has implications for the way in which adaptation measures in particularly vulnerable countries will be supported through the GEF. In the former case, a narrower view of adaptation measures results, in which requests to GEF would need to show widely distributed benefits, and/or benefits attributable specifically to the reduction of climate change impacts (damages). Where the imposed costs of adaptation are recognised, a case can be made for allocating funds in a less restricted manner. Development assistance might be used to enhance the capacity of a country to respond to current climate variability, recognising that climate change is already happening, and that the distinction between climate variability and climate change cannot be specified in practice.

Third, the lack of specific commitments to support adaptation activities, and the general expectation that when and if funds are made available they will be strictly limited to well defined projects, and limited to the incremental costs of climate change, will likely serve to discourage the development of adaptation programmes in the poorer countries faced with strongly competing priorities. We return to these issues after a brief consideration of the experience in Uganda.

2. Experience from Uganda

2.1. ECONOMIC DEVELOPMENT AND PRESENT CLIMATE

The Government of Uganda's overall development strategy places priority on macroeconomic stability, eradication of poverty (through meeting basic needs and raising rural incomes), environmental protection, agricultural modernisation, infrastructure (especially roads), universal primary education, decentralisation of government, and good governance.

Rainfed agriculture is the mainstay of Uganda's economy with at least 80% of the working population engaged in agriculture. The major subsistence crops include bananas, maize, beans, cassava, groundnuts, sorghum and millet. In addition there are cash crops including coffee (in 1996, coffee with a value of US\$ 396 million accounted for 60% of exports), tea, cotton and tobacco. There is also a growing horticultural export oriented industry. The contribution of agriculture to GDP (monetary and non-monetary) is 43%. Most likely, future economic development will depend upon the exploitation of natural resources, notably for commercial agriculture and forestry, minerals and

hydropower. It is evident, therefore, that potential and actual climate change impacts upon agriculture are of crucial importance to Uganda.

UGANDA'S GEOGRAPHY

Uganda is a landlocked country in the Great Lakes region of East Africa, with an area of 240,000 sq. km. of which 44,000 sq. km. is inland water. Much of the country is a plateau above 500 m. above mean sea level with numerous hills and valleys, and extensive plains. Due to the elevation, temperatures are more moderate than the equatorial position might suggest and, therefore, conditions vary from the hot and relatively dry plains in the North East to the cooler climate in the mountainous South West. The mean temperature is 22°C. with a mean maximum 27°C. and a mean minimum of 17°C. The temperatures however do vary quite significantly and temperatures up to 35°C and down to 12°C are not uncommon. The mean rainfall varies between 750 mm in the dryer north eastern region to 2500 mm. in the Lake Victoria Islands.

In the past, when climate variability was less erratic, most of Uganda received over 1250 mm. of rainfall per annum, creating a high potential for a rich and prosperous agricultural and livestock economy. Most of southern Uganda has a bimodal rainfall distribution, making it frequently possible to produce two crops per year without the need for irrigation. Current climatic variability, particularly with respect to the onset, duration, and intensity of rainfall, diminishes this potential. Although some of the obstacles to the development of the agricultural economy are social and macro-economic in nature, (e.g., over-dependence on one food crop; lack of well developed export and domestic markets; poor infrastructure/roads; inadequate access to credit and agricultural inputs), the unreliability and variability of rains is the major threat (Ogallo 1988; Ogallo, Janowiak and Halpert 1988). During El Niño years, for instance, the onset of the rains may be delayed by one or two months, and the total amount of rainfall may increase by more than 200%. Farmers can lose all their crops either due to too much rain (floods and landslides) or to too little rain (drought). This was the case in 1997 (excessive rains) and 1993/4 (drought), two recent El Niño years. If the variability worsens by climate change – meaning an increased frequency and intensity of drought – then Uganda's economic development plans would be seriously affected.

Moreover, predicting this rainfall is still in its developmental stages. Where weather predictions are made, the farming communities do not yet take them seriously. It also seems that many potential users of meteorological products do not have the capacity to interpret and use them optimally.

2.2. RESPONDING TO CLIMATE CHANGE

To meet its commitments as a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), Uganda completed an inventory of its greenhouse gas emissions. A preliminary study of the potential impacts of and vulnerability of climate change

was also conducted, as was a preliminary assessment of adaptation options for four sectors vital to Uganda's economy: forestry, water resources, crops, livestock and rangelands. In addition, mitigation options were assessed for the energy and non-energy forest sectors.

2.2.1. Greenhouse gas emissions

Uganda completed an inventory of anthropogenic sources and sinks of greenhouse gases for the base year 1990. The inventory shows that carbon dioxide (CO₂) and methane (CH₄) emissions amounted to 740 Gg and 1,160 Gg., respectively (Republic of Uganda, Ministry of Natural Resources, 1994). Uganda's fossil fuel combustion contributed 0.708 million tonnes of CO₂ in 1990 as compared, for example, to the total U.S. contribution of 4895 million metric tonnes for the same year (Inventory of U.S. greenhouse gases, 1994 and Uganda's GHG inventory 1994). In short, Uganda's total emissions are extremely low on a global scale, and the amount of future increase is also expected to be relatively low when compared with the major emitting countries.

2.2.2. Projected climate changes

The output of three General Circulation Models (GCM's) suggest that there may be an increase in temperature on the order of 2.5 to 3.5°C and a decrease in rainfall amounting to 1 mm. per day. With respect to rainfall, there are expected to be important regional differences. The northeastern districts (Karamoja and Kotido) and the cattle corridor extending to the southeast will experience a reduction in rainfall. For the lake basin and central districts, the GCM's showed a potential increase in rainfall of up to 20%. Indeed, the El Niño phenomenon shows this type of characteristic, with the Eastern Districts and most of southern Uganda experiencing increased precipitation.

Over the past 30 years, no trends in rainfall totals have been observed in Uganda. Local meteorologists have explained the frequent drought episodes as falling within the expected pattern of rainfall variability. In this connection, the GCM model results are of little help, for while they project changes in means, they give little information about changes in future variability. On the other hand, there has been evidence of some warming in most areas of southern Uganda. To some extent, therefore, it appears that higher rainfall totals might be offset by increases in evapotranspiration, although the potential effects of increased cloudiness and relative humidity cannot yet be determined.

Atmospheric science does not now permit the direct linking of particular weather events in a cause and effect relationship with climate change. The "bottom line" on climate change in Uganda shows strong evidence that climate change is coming and may well already be underway, but that there is a high degree of uncertainty about the exact nature and rate of change. To the extent that present activities are adapted to present climate, any change is likely to require improvements in adaptation at some unknown costs to the economy.

2.2.3. Potential impacts of climate change

The potential climate changes could have both beneficial and adverse impacts. The dangers could include the worsening of some current problems, as well as the potential

appearance of some new problems. In view of the fact that the "new" problems cannot be specified precisely, it was considered most prudent to begin consideration of the impacts of potential climate change by focusing on those impacts which have been observed within the context of current climate variability. The logic of this view is that if Uganda can document the impacts of current climate events and respond to current vulnerability, then the country will be in a better position to deal with future changes.

IMPACTS OF EL NIÑO IN UGANDA

In 1997-8 Uganda experienced damaging climate events that appear to be linked to the exceptionally strong occurrence of the El Niño phenomenon in the eastern Pacific Ocean. Impacts in Uganda in the El Niño year 1997-8 include the following. An estimated 525 people have died and over 11,000 were hospitalised and treated for cholera triggered by El Niño induced floods and landslides occurring between October 1997 and January 1998. An estimated 1,000 people are reported to have died in flood related accidents, while 150,000 people has been displaced from their homes. Trunk and rural roads have suffered considerable damage and repair and replacements costs have been estimated at US \$400 million. In many cases roads have become impassable delaying or preventing food and cash crops from reaching the markets. It is not known to what extent the El Niño phenomenon may be linked to climate change, but it is clear that these kinds of impacts are what might be expected under a destabilised climate and an intensified hydrological cycle.

Furthermore, expenditures on reducing vulnerability to current climate can bring immediate or near-term benefits that are not likely to be "regretted." Accordingly, a study team was established to examine the impacts of recent climate events². Chief among the recent events was the drought and famine of 1993/4.³ The study of potential impacts was greatly assisted by the findings of the 1994 Commission on the 1993/4 drought and famine for the North and Eastern Districts of Uganda (Republic of Uganda, Ministry of Agriculture Animal Industry and Fisheries 1994). Key issues were raised by the Commission including low rainfall (from an annual average of 1,300 mm. to 869 mm. unpredictability of the rains, population displacement, excessive food selling, and lack of environmental conservation (Madraa 1997).

Although climate change impacts upon Uganda are difficult to quantify due to uncertainty about the rate of climate change, and its magnitude, the Uganda country study identified many specific impacts which might be anticipated in agriculture, livestock and rangelands, forests and forestry, and water resources. In general, the drier areas are likely to experience increased drought episodes and more rainfall variability with negative consequences for the agricultural economy. Further south there may be increased incidences of flooding and landslides. With increased frequency in magnitude and frequency of either droughts or floods, adaptation strategies will be required to address both the positive and negative impacts of the changes. A selected list of 16 of the more important impacts is shown in Table 1.

² In theory it was also considered desirable to examine the record of floods, but no major flood has occurred in the recent past and the record of damage, and adaptation measures are not sufficiently detailed or fresh in people's minds to permit a detailed analysis. Attention was therefore concentrated on drought.

- Crop failure or significantly reduced crop production in some years due to increased drought incidences associated with increased climatic variability
- Increased hunger and famine due to crop failure caused by drought and/or flooding
- Increased land degradation due to droughts and floods
- Destruction or damage to wetlands and estuaries
- Increased pest infestations such as army worm, cassava mosaic, and other temperature/weather related plant pathogens
- Higher order impacts including increased costs of production, increased risks, lower profitability, leading to a decrease in food security, reduced exports and a need for more food imports
- A shift in vegetation zones, particularly in the rangelands and the cattle corridor. In times of drought this will adversely affect both livestock and wildlife
- Variations in the hydrological cycle will at times reduce the available water for livestock and wildlife
- Reduced livestock feed because of drought will lead to a reduction in total live stock and hence a reduction of animal protein in the diet, leading to malnutrition in those communities that rely more heavily on the cattle economy.
- Reduction in the bio-diversity in tropical forests, which may result in the loss of important medicinal and gene resources.
- Reduction of the moderating impacts of forests on climate. If the forest area shrinks significantly it will mean reduced water catchment areas, and hence reduced downstream flow.
- Loss of regeneration capacity in forests, e.g., when forest cover is lost due to drought, and land clearance the natural capacity to grow back will have been lost, and entire forest ecosystems will be at risk.
- Reduction of underground water resources, (especially in the Karamoja region) resulting in changed land cover and lack of water for the growth of human settlements.
- Expansion in the areal extent of some disease vectors, increased incidence of climate related diseases including malaria, schistosomiasis, trypanosomiasis, yellow fever, onchocerciasis and encephalitis

Source: United States Country Studies Programme United States Environmental Protection Agency. Washington D.C. 1996

Table 1 Selected Potential Impacts of Climate Change in Uganda

2.2.4. Potential adaptation measures

Present national development policies do not explicitly acknowledge the challenges of adapting to climate change; however, some sectoral development strategies and activities do recognise the need to adapt to present climate variability. For example, a premise of the Ten-Year Road Programme is that improved trunk and rural (feeder) roads will enhance the development of internal markets in food crops. Uncertainty about the rate of climate change, the eventual extent of the changes, and the precise impacts, makes the identification of appropriate future responses to climate change extremely difficult. Uganda's challenge is to identify and evaluate potential adaptation measures, and incorporate them into the country's development policy and management practices. Yet, spending scarce financial resources now on uncertain future problems risks making a

serious misallocation of funds. If climate change occurs in some different way than is now projected, and if impacts turn out to be significantly different from those that can be identified now, then there is a clear danger of "regret". By "regret" in this context we mean the opportunity cost of not allocating financial resources in ways that would be more beneficial to Uganda. It is for this reason that much international policy discussion about measures to mitigate and adapt to climate change has been about so-called "no regrets measures."

Based upon the study of the observed impacts of current climate variability, a series of sectoral papers were written on potential adaptation measures in Uganda's major economic sectors. Subsequently, a national workshop was held in Kampala in March 1997, on the theme, "Towards an Adaptation Strategy for Climate Change and Development" (Department of Meteorology 1997). The workshop identified and recommended a range of adaptation measures, and examined the similarities and convergences between sectors, and as well as duplications and omissions.

Not surprisingly, when the array of adaptation measures emerged from papers and presentations at the workshop it was observed that most of the measures could be related to existing and ongoing government programmes. In this paper we adopt a simple two-fold classification of adaptation measures: (i) cross-cutting adaptation measures relating to a variety of government policies and programmes; and (ii) adaptation measures which are incremental to specific sectoral programmes of government ministries and departments. These measures are summarised in Table 2.

In addition, it is important to acknowledge the importance of adaptation measures that can be taken by the non-governmental groups, organisations and individuals comprising "civil society". While the workshop did not explicitly formulate a list of measures that can be taken by civil society, it was clear that many of the suggested governmental initiatives depend for their success upon the active cooperation of individuals and organisations. Further attention is needed to the role of civil society in the development of adaptation responses to climate change and variability.

I. Cross-cutting Measures

- Strengthen Uganda's meteorological services so that they may provide reliable medium to long term advisories with respect to droughts and floods.
- Strengthen the Early Warning Information capacity, especially for food security and short-term climate prediction.
- Incorporate climate change and variability information and projections into Uganda's long-term development plans, such as the National Environment Action Plan (NEAP), the Water Action Plan (WAP), the Forest Action Plan (FAP), the Poverty Eradication Action Plan (PEAP), and the Decentralisation Process.
- Carry out an inventory of existing practices and policies used to adapt to different climates in all line agencies and sectors, so as to begin more detailed identification of adaptation measures for evaluation and adoption.
- Ensure that the Uganda Disaster Preparedness Committee (UDPC) includes in its work plan long term hazard reduction related to climate change and climate variability.

Table 2 Cont'd

<ul style="list-style-type: none"> • Promote awareness of climate variability and change and potential response alternatives throughout Ugandan society. <p>II. Adaptation Measures Incremental to Specific Sectoral Programmes</p> <p><i>Agriculture</i></p> <ul style="list-style-type: none"> • Develop better heat- and drought-resistant crop types and seed banks to counteract climate change and/ or expand food production in currently marginal areas. • Reduce reliance on mono-culture, (e.g., matoke (banana) planting). • Expand irrigation and increase irrigation efficiency. <p><i>Water Resources</i></p> <ul style="list-style-type: none"> • Renegotiate the Nile Waters agreement to include climate change response plans on the utilisation of the Nile River waters. • Both the Uganda Government and communities should begin to adopt contingency planning for both drought and floods, aimed at managing current climate variability especially in the most vulnerable districts • Ensure that development on potential dam sites along the Nile River and other basins is controlled to ensure future development without encumbrances. • Encourage water conservation at all levels of the community using appropriate methods including the use of market based systems. <p><i>Forests and Ecosystems</i></p> <ul style="list-style-type: none"> • Review the Uganda Forest Action Plan to ensure that climate variability and change have been considered. • Enhance and strengthen The Uganda Tree Seed Project to ensure that original biodiversity is protected against climate change and climate variability to guard against irreversible species disappearance • Re-examine the current forestry managerial practices and strategies so as to provide a buffer against climate variability (e.g., the feasibility of planting drought-resistant trees in the north-east ranges of the country to accommodate current drought episodes. • Reduce geographic fragmentation of forests to ensure that forest types can freely migrate in the face of climate change. • Coordinate with neighbouring countries to plan and manage ecosystems, particularly in light of Uganda's very high level of biodiversity and its vulnerability to climatic variability and change. • Encourage creation and protection of migration corridors and ecosystem buffer zones, so that species can migrate in response to climate change. • Encourage off-site biodiversity protection so as to avoid species extinction.

Source: Uganda Government Ministries as reported in Department of Meteorology 1997

Table 2. Selected Adaptation Measures

3. Harmonising adaptation measures with national economic development priorities

The wide list of potential adaptation measures by no means represents the full range of possibilities. Climate change and variability is such a pervasive phenomenon, with potential impacts in practically all aspects of the society and economy, that a full and coherent national adaptation strategy would potentially touch upon all programmes within the overall national development strategy. For example, a pro-active climate policy could be adopted whereby additional financial resources are allocated to many agencies and programmes so that they can deal more effectively with current and future climate impacts. Clearly, however, climate change will impact some sectors disproportionately more than others, meaning that adaptation may require a greater proportion of resources to be allocated to those sectors. Furthermore, interventions in some sectors may be disproportionately cheaper or more cost-effective than others. For example, increasing awareness of climate change is important for adapting to climate change in the long term, but it would be hard to justify the allocation of additional resources to primary education specifically to this end. Adaptation to climate change may, however, justify the allocation of significant additional resources to agriculture. With these considerations in mind, the following conclusions can be drawn from Uganda's experience.

1. Features of an effective national climate change adaptation strategy.

Adaptation can and should take place at all levels in the society, from national strategic development thinking to the local and individual level. A national strategy will, therefore, necessarily contain many components, most of which depend on additional financial resources. At an aggregate level, it seems true to say that rapid economic growth to increase the national wealth and disposable income throughout society is an indispensable condition for strengthening national capacity to respond to climate change. However, not every pattern of economic growth will reduce vulnerability. Development that increases economic disparities regionally or socially could actually increase vulnerability. In short, economic growth is an important context for an adaptation strategy, but only as moderated by other interventions such the Poverty Eradication Action Plan (PEAP). From the perspective of a general development strategy for Uganda, economic development in the framework of the PEAP may be an effective way to reduce vulnerability to present climate variability and future climate change.

2. Funding for the "imposed costs" of adaptation.

Within the current guidelines for GEF funding, national economic development activities are not likely to be sufficiently climate-specific, and not as easy to justify as global environmental projects. Funds for adaptation are more likely to be made available on a project-specific basis where there are added or incremental benefits that can be related directly to the reduction of climate change damages. The complexity of such calculations, and the high degree of scientific uncertainty about what climate change is, and what is "normal" climate variability could lead to a very restricted view of climate change

adaptation. For example, consider the adaptation proposal to develop better heat and drought resistant crops. The rationale for this was stated as "to counteract climate change and/or to expand food production in currently marginal areas." If such a project were to be proposed for international funding, it would be practically impossible to find a rational basis for allocating the costs between adaptation to climate change and expansion of current food production. Similarly with irrigation projects that are used to supplement rainfed agriculture. How much of the project costs would be allocated to normal (business as usual) development activities, and how much to reducing vulnerability to climate change?

From the point of view of national economic development planning, it might appear to be of little significance. However, the distinction between "adaptation to climate change costs" and "normal" development costs including the costs of adaptation to "normal climate variability" is important given the recognition that "adaptation to climate change costs" have been imposed. Developing countries can justifiably expect additional resources from developed countries to meet these costs. Clearly, the rules that govern the funding regime for adaptation measures will influence the type of programmes that receive support. The international funding regime could have a distorting effect on national development strategies, where countries do not adequately plan for meeting the imposed costs because their limited resources cannot finance them.

3. Implications for an international regime to support adaptation.

An important question therefore is how the international funding regime now being formulated by and on behalf of the Conference of the Parties to the Convention through the GEF will influence the development of national adaptation strategies. It seems safe to say that at the least, the tendency will be to lead to a focus on a few very specific projects, especially infrastructure and "hardware" projects that can be shown to reduce vulnerability to climate change. The tendency will also be to focus on longer-term projects (because the impact of climate change will be greater at a later date than it is now) than short-term projects and programmes where immediate benefits are not easily distinguished from normal climate variability. This possible international focus contrasts with the wide array of adaptation measures suggested for Uganda, many of which: (i) have immediate or short-term benefits; (ii) are potentially no-regrets measures but do not immediately qualify for support under the emerging regime, (iii) may be implemented at the various levels of Government and civil society; and (iv) may be most effectively implemented as incremental additions to on-going activities.

4. Alternative approaches in the design on an international adaptation assistance regime

What then might be a suitable arrangement for providing international assistance for adaptation to climate change, which is consistent with the aims and objectives of the Climate Convention, and which at the same time is harmonised with national development objectives and does not distort them? We suggest that there are three approaches to this question.

1 The presently emerging regime.

The emerging architecture for the GEF regime seems likely to emphasize specific projects (especially "hardware" or capital projects such as irrigation projects, coastal defences *etc.*), and will be limited to that incremental part of the project that can be specifically demonstrated to reduce vulnerability to climate change of the scale and magnitude projected in GCM scenarios based on a doubling of greenhouse gas concentrations. It is suggested that this would severely limit the activities qualifying for GEF assistance, and may well have a distorting effect on national development planning as countries confine their choice of adaptation measures to those which meet the criteria for this type of funding.

2. A climate change and variability regime.

An alternative proposal is that the GEF would recognise that in many development activities there is an incremental cost associated with reducing vulnerability to current climate variability which at the same time, reduces potential vulnerability to longer term climate change. It might be possible therefore to create a funding regime which recognises that in many current development projects and programmes there can be an incremental cost (and corresponding benefit) associated with reducing vulnerability to current climate variability, including projects and programmes which do not have the reduction of vulnerability to current climate variability as their main focus. Such projects would qualify for international (GEF) support on the grounds that they will help to reduce vulnerability both in the shorter and longer term and that longer term costs for adaptation assistance would therefore be reduced. It would thus be in the enlightened self-interest of the developed countries to develop such a flexible funding regime, while at the same time reducing the risks of distortion of national development priorities, and permitting governments greater autonomy in the selection of projects supportive of national development priorities. Such a regime would still be dependent upon the cycle of project identification, assessment and approval subject to internationally established guidelines for benefit cost analysis.

3. The adaptation fund regime.

A third and far more radical proposal would be the creation of a mechanism through which an "adaptation strategy and measures allocation" would be made to each particularly vulnerable country on the basis of an agreed formula. The size of the allocation in each case would have to reflect the degree of vulnerability to climate change which could be measured and an appropriate index produced. The index would be subject to modification according to changes in vulnerability, and improvements in the atmospheric science of climate change. One important advantage of such an adaptation fund is that it would permit national governments much greater flexibility in integrating adaptation to climate change into national development activities. It could support short-term development activities provided that these could be shown to help in the reduction of vulnerability to climate variability and longer-term climate change. Limitations on the allocation of funds by national governments would include the requirement that they be used for adaptation measures, but these could include a significantly wider range of activities

beyond conventional capital projects. They might include much smaller levels of funding to civil society initiatives, and thus promote poverty alleviation at the local and community level.

5. Next steps: developing an adaptation strategy

Experience in the exploration of adaptation measures in Uganda strongly suggests that ways need to be found of integrating adaptation to climate change and variability into the national development programme. There are three reasons why this is an important next step in the development of an international approach to adaptation:

- there is a general synergy between adaptation strategies and national development strategies that can be exploited to their common benefit;
- there is an apparent potential to make cost-effective adaptation interventions as incremental additions to existing development activities, and
- there is an imperative that adaptation measures have high socio-economic rates of return, and do more than meet general benefit-cost criteria.

If national governments have sufficient autonomy in allocating resources earmarked for adaptation to development activities, this will help to:

- ensure an optimal mix of adaptation interventions, *i.e.*, at the various levels of government and civil society, and will include incremental additions to ongoing programmes, as well as new “no regrets” options, and pure adaptation options, (as opposed to the more traditional capital projects that are otherwise likely to be favoured);
- ensure that national governments retain the ability to allocate resources according to development priorities (*i.e.*, facilitate the genuine integration of adaptation strategies into national development strategies).

If the experience in Uganda is to provide a platform for further experimentation, a next possible step would be the development of a framework for facilitating adaptation measures. This is preferred as a preparatory step, rather than the development of a shopping list of adaptation projects, given that:

- there remains considerable uncertainty regarding the impacts of climate change;
- there is therefore also uncertainty concerning the calculation of benefits and costs of the broad range of potential adaptation measures; and,
- adaptation interventions are to be developed at all levels of government and civil society.

The creation of a framework for Uganda and/or similar countries would have as an objective to make possible and to foster realisation of the full range of feasible adaptation measures. This might include:

- further work on the impacts of climate change (the methodology is steadily improving, and interesting new integration models are under development);

- new work on the economics of adaptation measures, including experiments in the CBA ranking of measures;
- development of an appropriate policy framework (either stand alone, or within an existing policy framework such as the NEAP);
- sensitisation of policy makers, stakeholders, and civil society regarding the impacts and consequences of climate change, and the range of adaptation measures and their short and longer term benefits;
- review and analysis of alternative financing mechanisms for adaptation measures,
- development of implementation modalities for adaptation measures; and
- periodic updating of greenhouse gas inventories (taking into account the improvements in the methodologies and the increases in emissions), so as to facilitate trade of emissions entitlement to OECD countries to finance adaptation measures locally.

There is now an opportunity to integrate climate change adaptation into national development activity in ways that will promote development and reduce both short and long term vulnerability. How quickly this opportunity can be seized will depend in part upon developing countries initiatives within the context of the international arrangements being negotiated under the UN Framework Convention on Climate Change.

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