

Decision Making Needs in a Changing Environment

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Question Six: What types of information are needed for adaptation decision making?

This paper describes the basic non-climatic data that can assist decision makers in taking protective measures against high likelihood climate change impacts. It then describes in detail the information needs for responsive, proactive and robust policy making and planning. The author also stresses the role of a range of key stakeholders - including national governments, local communities, civil society and meteorological and hydrological agencies - in defining information needs.

Information needs for responsive policymaking/planning

As recently as the 1990s, climate change was not yet news, although scientific findings of its existence and warnings of its potential impacts were first published over 40 years ago. Its early manifestations were treated merely as an aberration of nature whose probability of recurrence was too low to affect national socio-economic development. Accordingly, it was never budgeted for in many countries. However, the recent exponential increase in the frequency and severity of natural disasters and extreme events (most of which are climate -caused or -induced) worldwide exposed the extent of vulnerability of all countries. The situation is more

desperate for developing countries, especially Small Island Developing States (SIDS) and Least Developed Countries (LDCs) which are the most vulnerable and at risk of more devastation in the coming decades, yet are hardly capable of responding to these disasters, let alone preparing for them. Already, as exemplified in the 2010 Pakistan situation, climate-related disasters are stifling development and are even causing development retrogression in some countries. Consequently, climate matters have taken on a socio-political dimension, with many developed nations now having full ministries specifically mandated to address climate change. The attendance and attention now being focused on the United Nations Framework Convention on Climate Change (UNFCCC) Conferences of Parties and the recent progress made at COP16 (Cancun, Mexico, 2010) clearly indicate that climate is now one of the most dominating global factors affecting humankind. For many countries it is now a matter of life and death as well as disappearing land and islands.

Now that the politicians are aware of their fate (like losing elections) if they are not seen to be addressing the impacts of climate change, it is no longer necessary to persuade them to act. However, it is important for them to have relevant facts and figures in order to make appropriate responsive decisions as well as to take protective measures for high likelihood impacts. These could include the following:

- The basic climatology of their country (meteorological statistics on important climate parameters which they are most familiar with, namely temperature and rainfall). The basic primary statistics including averages, extremes, trends, periodicities or cycles. These are derived from weather and climate records from national meteorological services. From these they can know the types (for example, floods, droughts, landslides, mudslides extent, intensity and frequency of occurrence of extreme weather events, trends in rainfall and temperatures and their spatial distribution of over time, among others.
- In conjunction with other vulnerable factors such as agriculture and food security, energy, health and the environment, pertinent information includes: changes in weather calendars, onset and cessation of effective rains for crop production, patterns of agro-ecological zones, pest and disease patterns and trends (for example increases in malaria due to temperature rises) fresh surface and underground water supply patterns, peak return periods (from water table fluctuations from boreholes and wells) and vulnerability/ most-prone and risk maps.

The information above is pre-requisite as it provides the necessary background and foundation upon which preparedness plans are designed by the various sectors. For responsive planning, the focus is on prevention and protection, in other words, reducing the climate change risks to a minimum by taking measures such as ensuring that essential services, resources and infrastructure are protected. In addition, communication channels need to be in place for timely dissemination of information.

- Non- climatic data. It is important for the policy makers to work with figures in order to:
 - (a) identify which areas of the country have been affected and what is the extent of the devastation (impact assessments);
 - (b) determine how many communities have been affected;
 - (c) determine the number of casualties (for example deaths, injured, infrastructure damaged);
 - (d) decide the types of assistance needed where and prioritising these needs (needs assessments);
 - (e) ascertain financial, manpower and equipment and other requirements like fresh water, medicines (in cases of floods). For droughts, the requirements are different but pivot around food distribution;
 - (f) strategise how to render assistance and rescue services (logistics such as moving equipment and personnel assembling human and equipment); and
 - (g) mobilise resources and determine whether outside assistance is needed, what form it takes and how much is required.

The information above is necessary for policy makers to respond to disasters when they occur. However, with respect to adaptation, more information is needed beforehand. For example, if agriculture is the country's mainstay of the economy it is important to get information such as:

- (a) Percentage of rain-fed agriculture practised as opposed to irrigated crop production. What appropriate policies and attendant actions are needed to maintain national food security (for example, diversification, alternative cropping, more irrigation scheduling, incentives, hybridisation, etc)?
- (b) In terms of climate change, which way is the climate changing in any given country? The first order effects of climate change are felt locally. This is

fundamental in that if the scenario is for reduced rainfall, increased droughts or a drier climate, crop production becomes unsustainable and so food security is then threatened. The question to ask is what percentage of communities are practising subsistence agriculture and how are they going to cope with reduced rainfall? What other coping strategies can be identified that the affected communities can venture into?

(c) It is also important, beforehand, to have an updated inventory list and skills audit of all able bodied (and so potentially working and trainable people) in the communities who can be assisted financially to start on self generating projects. By so doing they may provide employment opportunities for other members of their local society and thus reduce the dependency syndrome. At the same time, it is imperative to use a bottom up and participatory approach by encouraging communities to propose fundable projects.

Stakeholders and their roles

Adaptation, like drought, is very pervasive. Unlike floods, it is impossible to determine exact starting points. It is slow in progression. It has no onset and it only becomes felt, for instance, after repeated crop failures at local levels. It may take a long time for these effects and impacts to be felt at the national level. This situation is made even worse when there are disparities between rich and poor in a country, as it may take longer to be felt by the majority and policy makers.

In order to determine these information needs the stakeholders in the value chain include:

- The Government, which has the overall responsibility over the welfare of the country's citizens. It is accountable to the people. It provides the policies and enactments. It is the depository of all national statistics and will be responsible for overseeing all responsive plans and programmes by coordinating other stakeholders;
- The local communities which are the most vulnerable and immediately affected. In experiencing the impacts of climate change they have to play their role in coping with these impacts. They have to participate in the adaptation intervention, specifically, in its implementation;
- Civil societies, represented by non-governmental organisations (NGOs). These are very important in that they work with and in the communities and have access to a large amount of information and data at local level. They also play an important part in raising awareness, education, training,

resource mobilisation, identifying interventions and implementation programme such as food for work programmes;

- National meteorological and hydrological services. These specialised services provide the meteorological, climatological and hydrological data and forecasts. With respect to adaptation, they monitor and analyse these data and generate projections of future climate. The projections are then used by other sectors to make impact assessments.
- Research and technology institutes (including universities). These are an essential component of the adaptation intervention chain as they, for example, generate various impact studies for most vulnerable sectors. They identify direct impacts (such as floods, droughts, sea level rise, retreating/ melting glaciers, natural disasters) and indirect consequences of these impacts (for example, food shortage, damage to infrastructure, crop failure, water shortage and diseases). By using these scenarios they prepare intervention strategies, initiatives and options for use/ consideration by NGOs and/or the Government.
- Business or private sector. These are the drivers of national economies as they generate employment, revenue and growth for the country. For climate change they need to adapt by, for example, establishing new businesses, introducing new technologies and monitoring global trends and market behaviour. Thus, public-private partnerships are created between the business sector and the government.

In the end, all the stakeholders should work together to come up with integrated, responsive plans and policies focusing on issues such as safety, economy, health, poverty reduction, sustainable development, culture and shelter. It is necessary to apportion responsibility to avoid duplication of efforts, minimise wastage and promote effective utilisation of expertise and financial resources. There should be a clearly defined role for each stakeholder.

Information needs for *proactive* policymaking/ planning

With respect to sea level rise, the global impacts largely will be felt years from now. However, the increasing frequency of tsunamis and their worsening impacts is already sending signals to politicians at regional and local levels. There is, thus, the need for medium and long-term proactive plans, policies and contingency measures to be put in place. This is essential for risk reduction purposes as well as calculating costs for adaptation. Some of the most useful information needed may include the following:

- science-based climate and hydrological projections at various levels beginning at the local levels and culminating with national levels;
- geographical information system-based vulnerability and risk analysis maps. It is important that critical data such as spatial coverage, land-use, resources and services are mapped at various levels so that priority needs assessments and preparedness plans are made.
- population statistics, population dynamics and population projections at various time frames;
- sector-specific (energy, tourism, transport, water, health, agriculture, fishing, etc.) data and projections at various levels;
- design and strategic placement of hazard-resistant infrastructure such as flood protection embankments and drains, including safe havens like tropical cyclone shelters, livestock refuges;
- research on alternative sources of income as a means of diversification; and
- establish new towns either inland or on higher ground and provide incentives (such as tax breaks for new businesses, low interest loans for start-up projects) and infrastructure. This has the potential to decongest the coastal cities at the same time creating employment in the newly established cities.

Stakeholders, as identified in 1 above, need to collectively identify, assess and plan for climate change-related risks that should cushion citizens. This is best done by ensuring that the right people are in the right place and that there are performance measures in place which can be monitored to ensure that plans do not go astray. Equally important is the need to educate all citizens to develop and, in some cases, enforce a culture of prevention and resilience. They should be convinced that there are more benefits to being prepared than to wait for crises to happen and then act.

Information needs for *robust* policymaking/ planning

For each most vulnerable sector, the following information is useful:

- * There must be a robust inter-agency coordination. All stakeholders (national and local government, legislature, politicians, donors, private/businesses, insurers, research institutes (including universities), civil society (represented by NGOs) and local communities must take part. There are those specialising in advocacy, civic education, insurance, others in development assistance, some on relief and humanitarian assistance, while a significant number dwell on rescue services/emergencies. This creates synergies which will result in capability development processes so that people,

infrastructure, expert systems and technologies are effectively working together.

* Research and technological development are essential for adaptation planning. It is important to carry out technology needs assessments, indicating the various approaches to adaptation using best scientific knowledge and different levels of uncertainties. The fusion of traditional knowledge and evidence-based scientific knowledge helps in the uptake of any solutions and can accelerate implementation.

* Due to the salient nature of adaptation, it is impossible to be fully prepared. The future is unknown, particularly the severity and frequency of impacts. However, for planning purposes, there must be realistic scenarios of future climate. The attendant potential impacts, sector by sector, must be analysed using the worst case scenarios. Adaptation measures should then be formulated and supported by appropriate policies and legislation. In order for these measures to be adopted by policy makers, the parameterisation and model initialisation should be credible, downscaled to be understood and supported by sound science, facts and figures.

* There should be existing climate change-related examples which policy makers can easily relate to and which have an immediate and direct bearing on their day-to-day lives. For example, the climate has already changed in many parts of the world, with developing countries the most affected. Therefore, climate change should not be regarded as a future event, but as a phenomenon already upon us. What is being experienced (floods, droughts, melting and retreating of glaciers, increasing natural disasters) are just symptoms of climate which rapidly changed in the seventies. Robust science should demonstrate whether the impacts are permanent or not and if they are going to be worse than at present. This is best supported by pilot projects whose outcomes are of a win-win nature and whose performance indicators are without controversy.

* Adaptation measures should be incorporated into already existing national development plans. This is not easy, as it is relatively new and many developing countries have “more pressing and immediate needs”. These measures should be convincing and flexible enough to policy makers. This requires having strategists who have a long-term vision. It requires strong and enlightened leadership to set aside funds for adaptation from the national budget. Thus, there is a need for extra-budgetary sources to finance adaptation.

Concluding remarks

The impacts of climate change vary spatially and temporally across the globe. Thus, the adoptive and adaptive capacities will also vary from country to country and from sector to sector depending on the degree of vulnerability. Since the uncertainties of the impacts of climate change are unknown, it is difficult to plan accordingly. For example, global warming may alter the demand on energy production, at the same time as enhancing the spread of malaria zones and shifting agro-ecological zones all within the same country. Accordingly, the risks will vary. Some of them require immediate remedies while others are of a long-term nature. It is imperative to identify and categorise these various types of risks to enable prioritisation and timely and coordinated allocation of resources for adaptation. For example, with respect to floods, infrastructure - particularly transport, telecommunications, water and energy - require immediate solutions. Droughts, which affect food security, will be deemed a long-term threat if they persist and prolong. The risks associated with sea level rise also have a long-term effect.

Information needs do vary if there is less certainty about the risk. As long as the perceived threats of climate change are not deemed to be immediate, and are shrouded in controversy with no clear consensus, the tendency among policy makers would be to adopt a wait-and see attitude. The end result would be a crisis-by- management approach.

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