

## INFORMATION FOR CLIMATE CHANGE ADAPTATION: SOUTH ASIA REGIONAL WORKSHOP SUMMARY DOCUMENT - DRAFT

This document summarizes conclusions from a South Asia regional workshop convened by the World Resources Institute and Development Alternatives, with support from the UK Department for International Development. The workshop aimed to inform new investments in information systems for climate adaptation in the region by exploring the following questions:

**Improving information:** Can we identify a core body of critical information that many information users will want for adaptation decision-making? How can we ensure that this “must have” information exists in South Asia and is made available to decision makers? These questions are addressed in sections I and II of this summary: Information Needs, and Access to Information.

**Coping with imperfect information:** Knowing that improvements in information may take some time, how can decision-makers best leverage existing information? Which approaches to adaptation best help them avoid delaying action? These questions will be addressed in sections III and IV: Integration of Information, and Information for Adaptation Options Identification.

The workshop brought together researchers and practitioners from India, Sri Lanka, Nepal and Bangladesh, as well as international experts on issues of uncertainty and the use of climate science in adaptation decision-making. The participants list is attached in Annex I; the workshop agenda is Annex II. Annex III provides a working paper produced by WRI as an input to the workshop.

### I. Information Needs

Adaptation information needs can differ depending on the adaptation and decision-making context. Therefore, this summary document does not provide an exhaustive inventory of information needs for adaptation decision making in South Asia. Rather, it highlights salient issues that emerged from the wide-ranging workshop discussions.

The participants explored the information needs of several end-user groups, especially national policy-makers and rural local communities, through participatory exercises. In addition, a series of presentations at the workshop reflected on information needs of the scientific community in order to provide better climate projections. Through these discussions and presentations, several critical messages about the information needed for adaptation emerged:

#### **Climatic information:**

- i. **Historical observations** and current **systems for monitoring** the climate are important:
  - It is critical to have a better understanding of current climate conditions and variability as a first step in adaptation decision-making
  - In order to do this, it is necessary to support station observation systems in the region, as well as improve the accessibility of data recorded at these stations.
  - Satellite-based observation is growing in the region, however surface observation are still important for ground truthing.
- ii. Decision-makers seek reliable projections of **future climate**, tailored to a small enough scale and short enough time horizon to be relevant for decision-making. In addition, they want this future climate information in an easily understood format. Unfortunately, many

downscaling methods (especially dynamic methods) do not work well in the South Asian region. Given the complexity of modeling the monsoon, insufficient knowledge on the influence of Himalayan massif on precipitation, and data scarcity, the global climate models cannot adequately capture some of the key features in the region. Basic issues around making projected information useful include:

- Climate change projections need to reflect the outputs of multiple global climate models (GCMs).
  - Downscaling of projections works best when multiple GCMs are used.
  - Uncertainties in projected information, including uncertainty about timeframes over which changes are projected to occur, need to be treated explicitly.
  - More observational information is needed to evaluate and improve GCMs skills over South Asia and to support more effective downscaling of the climate models.
- iii. **Stakeholder perceptions** of the climate will always be a relevant source of information for decision-makers, so reliable systems for gathering and using this information are needed.

**Bio-physical information:** As with stakeholder perceptions of climate, local-level stakeholder observations and knowledge about bio-physical information about a region are also very pertinent, and this information needs to be better collected and communicated. The conversation at the workshop centered on bio-physical information related to agriculture, water and natural resource management, including the examples listed in Box 1. For instance, the state of Madhya Pradesh in India experienced unseasonal frost one year, and farmers who knew that irrigation combined with smoke can save the crops were better adapted to surprise extreme weather conditions.

**Socio-economic information:** Adaptation decision-making within a socio-economic context is important, for instance post-conflict state building in Nepal and the reorganization of internal state boundaries will affect the country's development trajectory. Socio-economic scenarios are an important form of information for adaptation decision-making, but these scenarios often do not exist, or decision-makers are not confident using them. Participants raised a wide range of socioeconomic information needs throughout the workshop, including the examples listed in Box 1. For instance in the agricultural sector this includes better information about markets, existing government schemes, testing services and insurance.

### **Box 1: Examples of Important Bio-physical and Socio-economic Information for Adaptation**

People often think first of the climate when they think of information needed for adaptation. However, workshop participants identified several key areas of information from bio-physical and socio-economic spheres.

#### **Bio-physical**

- Water availability for agriculture
- Crop varieties
- Crop disease
- Bio-physical effects of interventions such as tillage, irrigation, post-harvest management

#### **Socio-economic**

- Prices for crops under government procurement policies
- Information about existing government schemes
- Gender-specific adaptation information
- Costs and benefits of adaptation interventions
- Sources of adaptation finance

Data gaps present a barrier to development of much of the information needed for adaptation. The main challenge to collecting this basic data is poor weather station networks, which are expensive to establish. The data from weather stations need to be monitored, transmitted and stored, all of which requires maintenance of the data collection system. Inconsistent data or data of unreliable quality results in imprecise baselines, which are often the basis for determining vulnerability or assessing climate impacts.

Participants discussed the necessity of developing data collection strategies that work under the uncertainty of not knowing what data might be required for adaptation decision-making. They raised user-owned, flexible, and dynamic data collection mechanisms as opportunities for addressing data gaps.

## II. Access to Information

Beyond the need for additional data and creation of new information, access to information is often limited in developing countries for reasons that range from poor information sharing systems to government secrecy. Workshop participants identified several challenges with ensuring information is accessible to the people who need it when they need it, including:

**Appropriate form and presentation of information:** These include the need to translate information into vernacular languages, and presentation in user-friendly formats. Participants also noted the difficulty of incorporating the uncertainty associated with a piece of information into its content or presentation. Different stakeholders, including those typically marginalized or disengaged from decision-making, may find different formats more or less accessible. For example, at the local level the directional sense of climate change presented in simple charts or graphs may be adequate, but national policy makers will require more in-depth information.

**Constraints upon the creators and conveyors of information:** Government secrecy around key information types (trans-boundary water flows, for example) was cited as a barrier to information access in much of the region. In addition, there are significant capacity issues. Key communicators, such as journalists, often do not have enough understanding of climate change to effectively communicate information relevant to adaptation.

Opportunities for improving information access include measures in the realm of technology, law, and stakeholder participation, among others. Workshop participants highlighted the following opportunities:

### Improving mechanisms for access:

- i. Improving access to (and training for) information communication technology (ICT), including mobile phones and internet, will allow small-scale decision-makers like farmers to make more informed decisions. The emerging state-of-environment website in India is an example of using ICT as a platform for information sharing. Traditional communication tools, such as community radio and folk art, can also be better used to transmit adaptation-related information.
- ii. Institutionalizing information access, for example through Right to Information Laws, is already increasing transparency and access to information in developing countries. Adaptation practitioners need to ensure that they make use of such laws.

### Engaging stakeholders for increased access:

- i. Engaging youth in producing and communicating adaptation information may ensure greater access. For instance, one participant attended the workshop to better understand

how to involve high school youth in collecting data about climate change. This population is important to involve because adaptation is a fairly new issue which needs to be better communicated about.

- ii. Engaging women in adaptation planning can encourage the creation and dissemination gender-specific adaptation information.
- iii. Creating networks of local data gatherers promotes sharing of information between producers. If information production at the local level is decentralized, it may be easier for users to incorporate their needs into information producers' processes.

One workshop break-out group explored interface organizations as a possible mechanism for addressing many of these information access challenges. Box 2 highlights key aspects of this potential adaptation information solution.

### **Box 2: The Central Role of Interface Organizations**

An interface organization is a sub-national organization that acts as a facilitator for both downward and upward transmission of information. Interface organizations can act as honest brokers of information and help to bridge the gaps between scientists, policy-makers, non-governmental organizations and local-level stakeholders. These organizations also can help translate information out of highly technical formats for increased usability at the local level. Agricultural extension agencies, such as India's Krishi Vigyan Kendras<sup>1</sup> (KVKs) provide a common example of such interface organizations. However, the strength of such extension agencies has waned in many countries over the past several decades, and few have yet built specific expertise in adaptation.

Workshop participants explored the potential role of interface organizations in improving the use of information in adaptation:

- From the bottom up, help understand what information is required by local-level stakeholders, and what format it needs to be in, to transmit to information producers. They can also aggregate local level indigenous information into usable input about adaptation options design and support systems for policy-making organizations.
- From the top down, translate and disseminate information from national and international information producers to stakeholders at the local level.
- Integrate climatic and non-climatic (biophysical, socio-economic) information from varied sources at the sub-national level.
- Diffuse information about new or unfamiliar options to local populations, and provide demonstrations and training on how to use information for adaptation decision-making.
- Establish and nurture a network of trusted providers (of information and services) to local level stakeholders.

Participants identified the following characteristics that would enable the development of effective interface organizations for adaptation:

- Increased inter-disciplinary research on adaptation.
- Human capacity and talent to convert or translate information from one format to another, and communicate it in the appropriate form.
- Trust and buy-in from a large network of top-down producers and bottom-up users of information.
- Flexibility to be a dynamic organization (internal monitoring and learning by doing)
- A business model for sustainability of the organization over time, and for up-scaling and/or replication.

<sup>1</sup> KVKs are a project of the Indian Council of Agricultural Research (ICAR). They are agriculture extension centers intended to transfer the latest agriculture technology to farmers, train them, and provide support for innovation.

### III. Integration of Information

The theme of integration wove through many discussions at the workshop. Adaptation decision-making often requires that different types of information be integrated in new ways across scales, sectors or disciplines. Typically, this requires increased dialogue between people who don't often talk to each other (e.g. climate scientists and social scientists), and may highlight issues that often do not receive a great deal of attention. For example, participants highlighted gender-specific adaptation and disease-related interventions as issues that might gain increased attention by integrating information.

Several challenges to successful integration of information were discussed, including:

**Appropriate Linkage and Aggregation of Data:** When several pieces of information are being integrated, for instance local and national information, the importance given to the same variables at different geographic scales may differ. It is challenging to communicate the assumptions that were made about key parameters when creating a given piece of information, and to connect different variables, or even the same variables which differ in their importance across scales.

**Institutions and capacity:** There are many government programs and schemes, especially at the local level, which are not coordinated. There is also limited coordination between ministries and other government organizations in South Asia. Integrating information created and / or used by these schemes, ministries and agencies would require even greater coordination. This will require increased human capacity and institutional capacity.

#### **Challenges around process:**

- i. Integration of information is a long and time-consuming process, for which there are few guidelines and limited shared vocabulary for use across disciplines, scales and sectors.
- ii. There can be a lack of ownership or responsibility for the integration process, or for the final product of an integration process, since it is now owned by one entity.
- iii. It is challenging to elicit and incorporate indigenous user information and user buy-in during the production of information, and then channel it upwards for integration into policy-making.
- iv. Better mechanisms of integration even at the same scale are necessary, for instance mechanisms to integrate regional socio-economic and climate scenarios.

Participants discussed the variety of institutions and individuals that can be involved in the creation and dissemination of integrated information for adaptation decision-making, including independent research institutes, district-level colleges and universities, academic organizations, ministries in finance and planning, and interface organizations. Specific entry-points include the research agendas embedded in national and state action plans, calls for research proposals, and GEF-funded projects. Other opportunities for integrating information include:

**Participatory research:** Research which is more participatory in nature provides opportunities for a more user- and problem-driven research agenda, thereby increasing integration between users and producers of information.

**Integrating adaptation into country systems:** Finding opportunities for integrating adaptation information into existing development decision-making processes can introduce adaptation to new stakeholders and encourage integration across sectors. For instance, mapping adaptation options to

existing government programs and available resources may encourage coordination between institutions.

### **Box 3: The Importance of Inter-disciplinary Research**

Participants identified inter-disciplinary research as an important means by which to integrate different types of information for adaptation. More specifically, participants explored how interdisciplinary research can:

- Help decision-makers identify and prioritize adaptation options by linking information about government policies and sources of available finance with interventions that address the bio-physical and socio-economic parameters that often determine vulnerability.
- Provide context for research done on specific issues to ensure the sustainability of adaptation interventions over time.
- Help create better indicators to define resilience and adaptive capacity, to gauge progress of adaptation interventions.
- Help distinguish development from adaptation.

In order to enable the development of inter-disciplinary research, participants identified the following enabling factors:

- Increased focus on building human capacity and training, and fostering innovation in information production and dissemination.
- Government research which is guided by an interdisciplinary mandates, including the creation of new inter-disciplinary research teams and greater inter-departmental government research
- Incentives, like universities and research organizations having pay-parity with private sector inter-disciplinary research organizations, special inter-disciplinary fellowships, and incentives for specialists to be increasingly involved in adaptation research

## **IV. Information for Adaptation Options Identification**

An area of significant interest at the workshop was the information required to identify and prioritize adaptation options. Participants highlighted some information requirements for options identification, including appropriate climatic and socio-economic scenarios. However, equally necessary is the ability to understand and utilize the scenarios. More generally, participants discussed the importance of understanding the limitations of any piece of information – and thereby the appropriate use of the information – for adaptation options identification.

Some of the challenges participants raised when discussing the information needs for identifying are listed below:

**Identifying options under uncertainty:** There is deep uncertainty about the climate future, which makes it difficult to choose adaptation interventions with surety. In addition to uncertainty about the climate, there is uncertainty associated with the criteria used to make decisions, for example the monetary value associated with a life.

**Information about trade-offs:** Different types of analysis, such as ecosystem-based vulnerability analysis and cost-benefit analysis, can help with adaptation options identification and decision-making. However, since adaptation is site-specific and context-dependent and the information that

goes into adaptation decision-making varies greatly it is unclear whether, and how much, information requirements for these varied forms of analyses might differ.

**Determining the adequate level of precision:** Participants discussed the discrepancy between scientists' focus on the very precise information and users' need for only fairly specific information. The TERI case study focuses on this issue in detail, and suggests that a directional sense of how the climate will change is adequate for decision-making at the local level in India. Even though the level of precision of information needed for adaptation decision-making may not necessarily be high, it is important to strive for greater accuracy of information.

In addition to the general needs for training and capacity building, participants identified the following opportunities for improving identification of adaptation options:

**Identification of cross-sectoral adaptation options:** This allows for decision-making within a more integrated context. Cross-sectoral adaptation options will enable cost sharing and likely be more sustainability over time. However, this will require greater sharing and integration of information.

**Participatory adaptation:** Eliciting and incorporating feedback from communities on the design of adaptation options, especially traditionally-excluded communities such as women and youth, creates a clearer picture of the adaptation options that may ultimately be successful.

**Alternative decision-making strategies:** Adaptation decision-making strategies that do not rely heavily on climate projections or on perfect information to make an optimal decision, but instead focus on criteria such as robustness or flexibility, can help identify adaptation interventions that are more immune to uncertainty and surprises. Adoption of alternative decision-making strategies represents a significant opportunity in the South Asian region, especially because these strategies help to meet today's development needs while preventing lock-in of future vulnerability.

## Next Step: case studies

This project will continue to investigate these questions through a set of five case studies which dive deeper into the issues presented in this paper. The five case studies are:

- "Information Use in Nepal's National Adaptation Plan of Action." This case study is set in Nepal and focuses on the approach used by the government to gather information about climate risks and current coping strategies in order to identify adaptation projects that meet urgent and immediate needs under the UNFCCC-mandated National Adaptation Plans of Action (NAPA).
- "Climate Adaptation Information Case Study: Applying Information for Adapting the Agriculture Sector in Bundelkhand, India." This case study is set in India and focuses on issues related to accessing, processing and applying information for adaptation decision-making in the agricultural sector.
- "Communicating modeled information for adaptation decision-making: a case study from Northern India." This case study is set in India and explores how adaptation-relevant information can best be disseminated to different users and audiences.
- "Sea-Level Rise: Adaptation Information Priorities and Gaps." This case study is set in Sri Lanka and evaluates implementation of the adaptation provisions in the 2004 Coastal Zone Management Plan, with particular attention to Sri Lanka's development of an information base for supporting coastal adaptation planning.

- “Application of Information in Current Adaptation Projects under the Bangladesh Climate Change Trust Fund (BCTF).” This case study analyzes kinds of information used in the creation and implementation of 10 projects under the Bangladesh Climate Trust Fund.

The findings from this project will contribute to the design of UK Department for International Development’s investments for information systems in South Asia.