

International Research Institute for Climate and Society

In the first of a two-part interview with *International Innovation*, Director **Dr Lisa Goddard** offers insights into the Society's aim to equip society with knowledge to manage, understand and anticipate the effects of climate change, particularly in developing countries

Could you introduce the International Research Institute for Climate and Society (IRI)? Upon what principles was it established?

IRI was established in 1996 by the US National Oceanic and Atmospheric Administration (NOAA) and Columbia University. Science is at our core, and the innovative research we conduct contributes to knowledge about climate and its impacts on the most vulnerable. IRI develops and shares prediction and forecasting products and other climate-related data that people need in order to turn climate risks into opportunities. We work with practitioners and decision makers in agriculture, health, water and several other sectors. IRI aims to create solutions that ultimately will increase adaptability to long-term climate change. Our work takes us around the world, training and collaborating with local, national and global partners to bring about real change.

What is climate risk management and how is this being integrated at IRI?

Climate risk management is a process that informs real-world decision making through the application of climate knowledge and information. Our approach consists of several interrelated components:

- Identify countries or regions most vulnerable to climate variability and change – almost every country is susceptible to droughts, floods, heat waves, etc. but the ability to mitigate adverse effects will depend on their livelihoods, technical capacity to anticipate and manage climate impacts, and the policies that exist to support action
- Provide climate information to support decisions – this includes the availability of observational data about past climate, monitoring capability of current climate and environmental conditions, and demonstrated skill in predicting future climate
- Identify technologies and practices that optimise results in coming years – forecasts could also help food security agencies determine if, when and where to pre-position food aid in anticipation of a crisis. Some crop failures may not be avoidable, but every famine is. In the water sector, engineers

using good quality climate information can optimise the design of new dams; for existing ones, they can use the information to make better decisions on how to allocate the water, or better quantify the chances of getting extremely low or high reservoir levels

- Demonstrate the potential usefulness of climate information to support climate-related decisions – this will almost always include more factors than just climate. Demonstrations are most effective if conducted collaboratively with decision makers, as well as scientists, practitioners, and information providers. These individuals and events enable implementation of climate-related risk management
- Develop, if necessary, financial tools that are appropriate to the climate-related risk and that can mediate residual risk – even the best quality climate information will still show a range of possible outcomes and thus risk. Climate or weather index insurance, for example, can enable rainfed farmers to take loans for their seeds and materials without worrying about going bankrupt in the event of a drought
- Look for training and capacity-building opportunities – which are important throughout the process and across the groups involved. Whether it is about understanding the factors involved in climate and its prediction, technical tools that can be used to create or apply information, or sharing of best practices through successes and lessons learned, this is a nascent field. Teaching and training, again in a collaborative sense, are key elements in managing climate-related risks

In which areas do you predominantly work? What are the main climate-related issues facing these locations?

We predominantly work in developing countries, with major activities in Africa, South America and Asia. These regions face a range of climate-related risks. Areas dependent on rainfed agriculture are constantly under threat of food shortages and insecurity. Extreme rainfall events and flooding often turn into disasters that impact roads, homes, crops, and water quality. Variations in temperature and rainfall from one year to the next, and even one decade to the next, can alter the incidence and distribution of vector-



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borne diseases such as malaria and dengue fever, and threaten to overwhelm public health systems.

What efforts are you making in order to specifically meet the needs of the developing world?

The Institute works with partners at the local, national, and regional level to address their climate issues. Often solutions start with existing, but under-utilised, information that can bring better awareness of opportunities and risk mitigation – whether it’s analysing past risks, monitoring present conditions, or forecasting future seasons. In many cases, this process identifies gaps in existing information or in the scientific understanding that is needed to address the issue at hand. This is how our climate and sectorial research priorities are often defined: through a problem-driven, real-world context.

Our staff work with providers of climate information such as national meteorological services, local practitioners (water managers and agricultural extension officers), and decision and policy makers such as government ministry officials. IRI also collaborates with institutions that have a global reach like the United States Agency for International Development and development banks. These partnerships can offer development professionals a better appreciation of how climate information could be brought into their projects to create more effective and sustainable outcomes in the developing world.

Could you outline the main objectives of the Environmental Monitoring Program at IRI? What is the current focus of the Program?

The goal of the Program is to provide IRI clients and partners with state-of-the-art data and products to facilitate their work in climate-sensitive sectors such as public health, disaster management and food security. We ensure our partners have access to the most reliable and relevant information to aid their decision making and planning.

We currently focus on monitoring satellite-derived and on-the-ground estimates of vegetation, rainfall, surface temperature, surface water,

atmospheric dust, land cover, and evapotranspiration. IRI develops new products in partnership with national meteorological agencies around the world, as well as US institutions such as the National Aeronautics and Space Administration. We make them freely available online through our data library and map rooms. These products feed into operational early-warning systems for health, natural disasters, agriculture and food security, to name a few.

How is IRI demonstrating its commitment to training and education?

We understand that simply providing products and tools or publishing papers is not enough to affect real operational change. Every year, we hold numerous training workshops around the world and at Columbia University to train scientists and decision makers, for example, on how to generate seasonal forecasts for their countries based on state-of-the-art techniques and how to convert those forecasts into usable information such as rainfall, crop and river flow estimates. The participants come from national meteorological agencies, regional climate centres and universities.

We train public-health professionals from the World Health Organization (WHO) and national health ministries on how to understand and utilise climate information to make planning decisions for malaria, dengue and other climate-sensitive diseases. We are also deeply committed to education; we train graduate students in Columbia University’s Earth and Environmental Sciences Department and its Master’s programme on Climate and Society. The Environmental Monitoring Program is also a node for NASA’s DEVELOP programme, hosts and mentors students to work on applied science research projects.

Where would you like to see IRI in the future? Are there any particular goals that you would like to achieve?

I would like IRI to become a primary supporting partner on climate research, decision support systems and training programmes for the international-scale work of UN institutions such as the World Meteorological Organization (WMO) and WHO, humanitarian institutions such as the International Federation of Red Cross and Red Crescent Societies, as well as development agencies. Our collaborations with these organisations over the past 15 years, in many cases, has led to real operational change and a more sophisticated understanding of climate risk management as it pertains to sustainable development and adaptation. I see enormous opportunity in taking these initial successes to a higher level, significantly expanding the scale of impact.

To address the broad audiences these organisations serve, we are working toward the systematisation of many successful elements of our work. This includes information across timescales, which connects both shorter and longer timescales to the seasonal forecast information we already produce. It includes the development of financial tools that can be understood, trusted and implemented at local-to-regional levels, so that climate information can be used optimally. A range of training and educational materials and programmes that we have developed are also included here.

In terms of new areas for our work, I would like to strengthen our connections to other climate-sensitive sectors, such as ecosystems and energy. Training and capacity building are also key components of our mission – as important as collaborative development of information. The balance of these activities varies with country or region, but both elements exist in all our work.

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