

# R4 Rural Resilience Initiative in Ethiopia

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Africa | Agriculture / Food Security / Financial Services / Disaster Risk Reduction

## INTRODUCTION

The R4 Rural Resilience Initiative, launched by Oxfam America (OA) and the World Food Programme (WFP) is an innovative climate change resiliency project. It builds on the initial success of the “Horn of Africa Risk Transfer for Adaptation” (HARITA) project, an integrated risk management framework developed by OA, the Relief Society of Tigray (REST), and their partners<sup>1</sup> to enable poor Ethiopian farmers to strengthen their food and income security through a combination of risk management strategies that have come to form the basis of the R4 initiative: improved resource management (risk reduction), insurance (risk transfer), microcredit (prudent risk taking), and savings (risk reserves). The risk reduction component of R4 has involved activities such as composting, water harvesting, planting trees, and seed cleaning; the risk transfer aspect has focused on weather index insurance.

As one of the focal risk management strategies within the R4 framework, weather index insurance is a promising tool for facilitating adaptation to climate risk. By enabling access to new resources, index insurance may be used to enhance peoples’ economic and livelihood resilience and can potentially help to buffer them against the direct impacts of the climate. Under the R4 framework, through continuous interaction with the community and local experts, a weather index, such as accumulated rainfall, is created to target specific farmer risks. This can then be linked to an insurance product. The focus on an index for local growing conditions, rather than crop failure explicitly, helps to resolve a number of fundamental problems that make traditional insurance unworkable in rural parts of developing countries. For example, unlike traditional crop insurance, with an indexed product the insurance company does not need to visit farmers’ fields to determine premiums or to assess damages, reducing so-called transaction costs.

The R4 initiative in Ethiopia, formally known as HARITA, has broken new ground by offering index insurance based on satellite rainfall data directly to low-income farmers in Ethiopia. The project has high demand; it has scaled up from a sole initial village in Tigray, Ethiopia in 2009 to 43 sites in 2011, serving over 13,000 farms and representing approximately 65,000 people. The year 2011 saw the weather index insurance product’s first payout for a rainfall deficit in some of the Ethiopian villages. In this case, more than 1,800 farmers in seven villages experienced drought conditions that triggered payouts. Data from the 2012 season has not yet been finalized, but initial results show that coverage is expected to continue to increase in Tigray.

This case study will provide details on the R4 project in Ethiopia, referred to here as “R4 Ethiopia,” and formally known as the HARITA project. Based on the initial work in Ethiopia, the R4 project is now expanding to other countries. These new efforts are discussed further in “Looking towards the Future” at the end of this document.

## SOCIOECONOMIC BACKGROUND

In Ethiopia, over 85% of the population—approximately 67 million people—is vulnerable to climate shocks and weather effects. A large number of this population is dependent on rain-fed farming. Climate shocks can devastate these farmers, affecting economic development, opportunities for education, livelihoods, and food security. Due to extreme poverty and the inability to invest in disaster risk reduction practices, a large percentage of the country’s population is unable to build resilience to climate risk or unlock other development opportunities. If crops fail, farmers may have few or no alternative means to provide food for their families.

The question of how to build rural resilience for climate risk management is therefore critical for addressing global poverty. The frequency and intensity of natural hazards, and the potential for these hazards to increase with climate change, presents enormous challenges to food-insecure communities in developing countries, preventing local residents from improving their lives and livelihoods.

In response to these challenges, the R4 initiative focuses on developing an integrated risk management framework to enable poor farmers in the drought-prone regions to strengthen their food and income security through a combination of improved resource management (risk reduction), insurance (risk transfer), microcredit (prudent risk taking), and savings (risk reserves).

Focusing on the insurance (risk transfer) component specifically, previously existing approaches to providing drought insurance to the poorest have been ineffective, owing to high administrative costs and the inability of cash-poor smallholders to afford premiums. To overcome these socioeconomic challenges in the R4 project in Ethiopia, OA worked with REST and the government of Ethiopia to build an “insurance-for-work” program on top of the government’s “food-and-cash-for-work” Productive Safety Net Programme (PSNP), a well-established program that serves 8 million chronically food-insecure households in Ethiopia. The resulting innovation has allowed cash-poor farmers the option to work for their insurance by engaging in community-identified projects to reduce risk and build

<sup>1</sup> The network of partners brought together R4 in Ethiopia includes: Ethiopian farmers; REST; Nyala Insurance Share Company; Africa Insurance Company; Dedit Credit and Savings Institution (DECSI); Mekelle University; the Government of Ethiopia, the International Research Institute for Climate and Society (IRI); Swiss Re; and Oxfam America. The project’s primary funders include the Rockefeller Foundation and Swiss Re.

their insurance by engaging in community-identified projects to reduce risk and build climate resilience, such as improving irrigation or soil management. In the event of a seasonal drought, insurance payouts are triggered automatically when rainfall drops below a predetermined threshold. This payout can then be used by farmers to afford the seeds and inputs necessary to plant in the following season and potentially protect them from having to sell off productive assets to survive. In partnership with local microfinance institutions, the model also enables farmers' to collateralize credit with insurance.

## TARGET AUDIENCE

The beneficiaries of R4 initiative are low-income, rain-fed subsistence farmers. Those who have been targeted so far under the R4 Ethiopia project have been amongst the most vulnerable segment of Ethiopia's population. Women head about 40% of the projects targeted 50,000 households in Ethiopia, and about 60% of the targeted households are enrolled in the country's Productive Safety Net Project (PSNP)—a well-established social protection program in Ethiopia that serves 8 million low-income people. Data shows that the primary crops grown by program beneficiaries who have purchased weather index insurance include: teff, wheat, barley, maize, and sorghum. Through direct input from involved communities, feedback from local experts, and the work of R4, partners involved in the project, such as REST and the International Research Institute for Climate and Society (IRI), it was determined that these farmers' livelihoods are particularly at risk when the rainy season starts late and/or ends early. Highlighting this specific vulnerability has allowed the project to identify a key component of livelihood risk that was a good candidate for the risk transfer approach provided by weather index insurance.

## CLIMATE AND CONTEXTUAL INFORMATION

The weather index insurance component of the R4 Ethiopia initiative is based on historical and current weather information—specifically rainfall. An important aspect of the R4 project in Ethiopia has been the use of remotely sensed (i.e. satellite-based) precipitation data to establish indices for insurance contracts. The use of satellite data has allowed for the expansion of the project to regions where rain gauges are historically unavailable. This also has helped to address issues such as rain-gauge tampering and missing historical data.

To date, the project in Ethiopia has relied on the Africa Rainfall Climatology (ARC1) remotely sensed rainfall data set, produced by NOAA-CPC, at 10km spatial resolution daily, to design and trigger insurance contracts. The original ARC1 dataset is available starting from 1995. ARC1 has recently been updated to ARC2, which now provides rainfall data going back to 1983.

IRI serves as a technical advisor for the R4 Ethiopia project and facilitates access to and use of the satellite rainfall data for R4 Ethiopia. IRI also provides trainings to R4 Ethiopia partners on how to access, use, and interpret the satellite data. The satellite rainfall products used by the R4 Ethiopia project are freely available and accessible online through IRI's Data Library and Map Room.<sup>2</sup>

In addition to the satellite rainfall data, rainfall information under R4 Ethiopia is also gathered at two additional levels for project support:

1. The Farmer Level: plastic rain gauges have been distributed to sample program participant farmers and trainings have been given to them on how to collect rainfall data, so as to monitor the actual rainfall situation on the ground. The rain gauges are manufactured

locally at low cost. This process has helped the index insurance design team to better understand the rainfall patterns in the area and to better manage challenges, such as reducing basis risk (the chance that satellite-measured rainfall might not accurately reflect drought conditions on the ground). On top of that, working directly with the communities helps to give a greater sense of ownership of the program to the farmers. Furthermore the farmers are able to track rainfall throughout the season so that they have a sense of whether or not there will likely be an insurance payout.

2. The Ethiopian National Metrological Agency (NMA): the Ethiopian National Metrological Agency is responsible for collecting and sharing rainfall information from newly installed automatic rain gauges. These rain gauges are used to help validate the accuracy of the project's satellite-based rainfall indexes. Three automatic rain gauges were initially installed by the project for validating the satellite-based rainfall information. As the project expands, validation exercises will continue using the NMA's rain gauge station networks.

Using multiple sources of climatological information (such as different satellite-based climatological products, as well as the Ethiopian NMA's rain gauge network and local farmer-based rain gauges) has been key to developing and validating the weather index insurance products designed through the project. By incorporating multiple sources of climatological data, project partners are attempting to verify that existing indices accurately capture local drought conditions experienced by farmers, and are looking to improve these indices where possible. The use of better climate data allows for better index insurance products, and therefore can hopefully improve decision-making by and protection for farmers faced with and/or constrained by climate risk.

The R4 Ethiopia project has been strategically aligned with Ethiopia's national Productive Safety Net Program (PSNP) to target the country's poorest farmers; those dependent on rain-fed agriculture who are the most vulnerable to drought and limited in their ability to take productive risk. In addition, socioeconomic information such as landholding, crop selection, sowing decisions, and crop values are necessary for calculating the insurance coverage. Such data is gathered through continuous interaction with farmer community design teams and during farmer enrollment in the insurance service. In addition, the project has established a follow-up system through which progress is regularly monitored and impact is assessed through farmer surveys, which collect socioeconomic information from the program participants.

## INFORMATION TAILORING

The weather index insurance contracts designed for the R4 Ethiopia process are unique, in that they have incorporated local farmer feedback directly into the contract design process. Farmers and project partners have collaborated directly to collect and customize information in order to create insurance contracts that try to address the specific climate and production risks that each region faces. The index insurance contracts designed through the R4 process are therefore intended to be very flexible and can be tailored to the requests of each community where they are implemented in Ethiopia.

The process followed under R4 Ethiopia has involved first soliciting farmers for input on the risks that they face at certain times of the year. For example, some farmers are concerned about a late start to the agricultural season, and some are concerned about an early end to the rainfall. Community leaders and representatives form a community design team, which works with project partners to identify

<sup>2</sup> <http://iridl.ldeo.columbia.edu/maproom>

# IMPLEMENTATION

## PROCESSES AND MECHANISMS

### STAKEHOLDER AND ISSUE IDENTIFICATION

The R4 Ethiopia project targets low-income farmers as project stakeholders, and aims to offer satellite rainfall indices directly to them. These farmers were identified as project stakeholders specifically so that the R4 Ethiopia project partners could work at solving the problems of climate risk management for this population.

Other stakeholders in the network of partners brought together by the R4 Ethiopia project include: International and local insurance, credit and savings companies which play a financial role in the insurance process (e.g. Swiss Re, Nyala Insurance Share Company; Africa Insurance Company; Dedebit Credit and Savings Institution (DECSI)), research institutions and universities which play a technical role in the project (e.g. IRI and Mekelle University), NGOs and humanitarian organizations which play a project coordination role (e.g. OA), community organizations and extension offices which facilitate community interaction and involvement in the project (e.g. REST). REST was identified due to its extensive networks, on the ground resources, and communication channels among the targeted farmer communities.

Ethiopia is characterized as a Phase I priority country for the US Government's Global Hunger and Food Security Initiative, as well as a focus country for IRI. Furthermore, the Intergovernmental Panel on Climate Change (IPCC) reports that Ethiopia will be particularly heavily impacted by climate change. R4 Ethiopia focuses its efforts on aiding those most vulnerable to the effects of climate change and climate risk.

In addition, Ethiopia provides a good setting to research the viability of providing successful index insurance strategies to the world's most vulnerable, in the context of a highly variable climate and data poor environment. R4 in Ethiopia has a strong research component, which looks at longstanding research questions relating to such topics as index insurance, remote sensing and economics.

Once the overall scope of the project was refined, a series of discussions and consultation meetings with the primary partners, as well as representatives of the potential beneficiaries was held in 2008 before the initial R4 Ethiopia project, HARITA, was launched in 2009. The northern region of Ethiopia, Tigray, was selected as the project's initial focus since drought is a major risk and can potentially be targeted by an index, and because of REST and OA's longstanding relationships with the farming communities there. In addition, the idea to align the program to the existing national food for work program (PSNP) was an outcome of initial farmer consultation meetings. From the onset, the program emphasized participation of stakeholders, at the local, regional, and national level.

### STAKEHOLDER INVOLVEMENT

The farmers are included throughout all parts of the process. To begin with, representatives from the community make up the design team and provide project partners with valuable information regarding the growing season, when the rains are the most important, identification of historically "bad" and "good" years, primary crops, and local risk management strategies. The design team provides a link between the

project partners and farmers, helping to ensure that the index is useful to the farmers, that the index covers the highlighted vulnerabilities, and that it is economically sound. A design team is created at each project site, so each community has its own representation in the project.

REST acts as the in-region implementation partner, linking the farmers to the rest of the project partners. They are highly active in community outreach, the community design teams, and transacting the final insurance products.

IRI acts as the technical advisor for R4 Ethiopia and provides climate expertise, current and historical climate information, which is critical in designing and triggering indices, and capacity building materials and trainings for all project stakeholders. IRI also facilitates the development of the indices, with heavy input from project partners, especially REST, local experts, the community design teams and financial institutions.

OA coordinates the R4 Ethiopia project and oversees the additional risk reduction components, in conjunction with REST and the Ethiopian government. The financial institutions play an important role in finalizing the insurance products, pricing the contracts, insuring the farmers and determining payouts as appropriate. All the project partners, ranging from the community design teams to OA to the insurance companies must approve the indices before they are finalized and transacted for a particular season. This is done separately for each project site, as the indices are tailored to meet each specific community's needs.

One important aspect of the R4 project is that information is disseminated in two directions: climate services from the scientific community, and feedback from local farmers about the risks that they face. Farmers are at the beginning and end of this process of information dissemination. They articulate their climate management needs and constraints through community design teams, facilitated by REST, expressing the specific risks they face. This information is then passed on to other project stakeholders, such as IRI, which uses the farmers' input to create indices, which are meant to target specific needs of each village. Once the index is created, REST takes it back to the farmers, verifies that it addresses their needs, and provides them with the option to buy the insurance.

REST plays an essential role as the organization that mediates this information in both directions; providing the crucial link between farmers, community organizations, insurance companies and climate researchers – the latter of which have access to the current and historical climatological information used in the index design process.

### FUNDING MECHANISMS

Currently, R4 in Ethiopia is primarily funded by the Rockefeller Foundation, Swiss Re, OA, the United Nations Labor Organization (ILO), and National Oceanic and Atmospheric Administration (NOAA).<sup>\*</sup> While the project's alignment to the productive safety net program has greatly contributed to its success, the continued financing of this linkage will be key to the sustainability of the project. This has been possible so far thanks to the support of project stakeholders and funders. However, part of the R4 project objective is to enable farmers to take productive risks and improve their livelihoods, which, if successful would allow them to eventually graduate from the PSNP program. This will significantly curb the costs and ensure greater sustainability.

In the long run, the project expects to see continued growth, since R4 Ethiopia has already grown exponentially in the past five years. This previous up-scaling was possible because the project was able to use existing development program networks and infrastructures. REST, as a project partner, was essential in this regard. Now, preparations are ongoing to replicate the model in other regions of Ethiopia and globally. In addition, R4 in Ethiopia is working to improve the use of satellite techniques to help validate current index insurance products. This approach can potentially enable rapid scale up by bypassing the manual processes currently required for physical validation on the ground at the project sites.

## MANAGEMENT AND DECISION MAKING

Various governmental and non-governmental institutions are involved in R4 Ethiopia. The regional bureau of agriculture, regional agricultural institution, Mekelle University, the regional met bureau and NMA are among the governmental institutions that are directly and indirectly involved in the project. These institutions play a variety of roles, including providing local expertise and information, assisting in project research and linking project stakeholders.

The finance institutions- DECSI, Nyala Insurance Company, Africa Insurance Company and Swiss Re (the global re-insurer) are major private sectors partners in the project, which are mainly responsible for providing the insurance coverage. The current arrangement is that Nyala and Africa Insurance Company insure DECSI on behalf of the farmers, while Swiss Re provides the re-insurance for these institutions.

OA coordinates the different components of the project, while IRI is responsible for managing the technical aspects of the project related to weather index design and climate information.

The REST plays a critical role in linking farmers and the rest of the project stakeholders, and implementing the project on the ground in Ethiopia. REST works as a liaison in the communities to help facilitate the process of identifying climate risks, designing and approving indices, and transacting index insurance sales.

The program decisions are made by the different teams operating at all levels. At the local level, the project has established the community design teams, which are composed of farmer representatives and community leaders in each village. This committee is consulted and signs off on decisions related to the design of the index, as well as the type of risk reduction work the farmers would be interested in as part of the insurance for work arrangement. REST plays a key role in interactions with the community design teams.

Similarly, there are two technical teams whose members represent the different project partners. The first is the financial supply team, which is responsible for the index design and insurance product provision. The second team is responsible for the design of the risk reduction activities. Both teams operate in consultation with the community design team. Finally, there is a project steering committee that coordinates the various teams.

## EVALUATION

The R4 Ethiopia project has focused on including local feedback as to the climatological risks faced. Farmers have helped identify the times of the agricultural season at which they are most vulnerable, and this information is used to construct weather indexes that aim to protect against those risks. In most villages, farmers help design insurance options where they have the choice of buying coverage for

the beginning and/or the end of the growing season to mitigate the effects of a drought, should one occur. The goal is to develop a type of product that allows the farmers to take agricultural risks without being penalized if a drought happens, which can help give them the opportunity to have a more productive farming season.

The project is jointly assessed on a regular basis using progress reports and field visits, as well as through performance monitoring by project participants. In addition, project partners have undertaken an impact assessment study, based on farmer surveys and economic analysis of the resulting data. This process is necessary for tracking changes in farmers' behavior in terms of their ability to manage climate risk and undertake prudent productive risks. The value of decisions informed by the service will include not only farmers' ability to withstand local drought events through payouts from the insurance product, but also their ability and willingness to undertake risky investments with the potential to improve their livelihoods in "good" years. Accordingly, some of the success indicators tracked by the farmer surveys include farmer decisions to invest in improved input use: such as increased fertilizer application, or the purchase of high-yielding seed varieties.

Community design teams are the key source of user feedback. Farmers are consulted and provide feedback on key aspects of the project. REST also plays an essential role in this process, since it has established trusted relationships with the farmer groups through years of local development activities. These networks are essential for soliciting farmer feedback about the project.

**Climate change adaptation:** R4 Ethiopia inherently helps build resilience to near- and long-term climate change. Local experts, in consultation with the community, design strategies to address the local adaptation needs at the village level. Over the years, households that are covered by weather index insurance and who pay a premium under the insurance-for-work arrangement have undertaken adaptation strategies such as agroforestry, water harvesting, transplanting, forage and pasture production of waste land, and composting, among others.

In addition to undertaking physical adaptation strategies, index insurance may help farmers to adapt to climate change by making better use of good years and proving protection in bad. Often, given the risk of drought, smallholder farmers are reluctant to invest in agricultural inputs and technologies that limit their productivity even in the good years. The goal of the R4 Ethiopia project is to cover a farmer's household in bad years, which can help provide a farmer with the confidence to take greater risk and invest in inputs such as fertilizer or high yielding variety seeds thereby unlocking their productive potential and benefiting more in good years. In this sense, this project can help influence climate change adaptation at the community level.

## CAPACITIES

### EXISTING CAPACITIES

A key element for the success of the project has been its ability to use existing institutions and infrastructures. The project was able to bring together financial institutions, agricultural bureaus, research institutions and universities, local NGOs, met offices and international organizations. Key to linking these existing institutions together was the incorporation of a strong local partner (REST), which was able to leverage its existing connections within farmer communities to link them with established stakeholders at the national and international level. In addition, access to satellite rainfall data that has a sufficient historical record, provided by IRI, is a vital part of this weather index insurance project.

IRI is the primary source of climate information for R4 in Ethiopia and has extensive experience working with remotely sensed satellite climatological data. As part of R4 Ethiopia, IRI has developed and conducted a series of capacity building workshops tailored to a variety of project stakeholders, including REST, OA, and Mekele University, which focus on climate information and climate risk management in the context of index insurance. In addition, the IRI Data Library has been important to the project's success, as it is a primary source of climate information used to design indices and trigger insurance contracts.

The Ethiopian NMA has also been an essential partner, and their willingness to work with the project to link their rain gauge network with the remotely sensed satellite data has been extremely valuable. REST has also been key to linking national and international project partners to the farmers and community organizations, who are expert in their own climate and in assessing the climate risks faced by the community. REST has allowed the information obtained from the farmers regarding their local climate to flow up to international research institutions and established climate scientists, who have the technical capacity to develop weather index insurance products.

## CAPACITY GAPS

A main focus of the R4 Ethiopia project is in regional capacity building activities to strengthen the technical capacity of project stakeholders. IRI has developed educational and training activities for project partners, in particular REST staff, to increase their capacity for index insurance and climate risk management activities. These trainings have acted as a foundation for project technical training, and the project partners then work with farmers to ensure that they too understand the insurance, how the indices work, how the satellites work, and how the information is used.

REST has also played a significant role in helping to overcome traditional barriers to index insurance implementation, such as lack of farmer understanding of products and lack of trust in products, by having community outreach programs and by generating community involvement and feedback in the design process.

One of the main challenges in the R4 Ethiopia project is building robust indices that appropriately provide coverage for farmers. In order to achieve this, the project relies on the community design team, which work with the project partners to identify the risks and vulnerabilities that the farmers face that cannot be appropriately addressed through other risk reduction means. The design team provides feedback on which crops and times of year it is most important to have index insurance coverage. The farmers also make decisions about the amount and types of payouts that would have been appropriate in the past. Using historical information to set a precedent for the future; they describe under which type of historical conditions an insurance payout would have made a significant difference in their coping strategies. Through this collaborative process, more accurate and tailored products can be designed to meet the needs of the farmers.

The core innovation for the project has been the insurance-for-work element that allows smallholder farmers to pay an insurance premium by working on different risk reduction activities, which ultimately reduce their vulnerability to climate risk. This aspect of the project has made insurance available to low-income farmers, where previously it was assumed that a market for such products did not exist, while at the same time helping them to better manage their climate risks.

R4 Ethiopia has also been innovative in meeting infrastructural and climate information capacity gaps by offering insurance policies based on remotely sensed (satellite-based) precipitation data. Using satellite-based data has helped to resolve climate information availability constraints in rural areas, where rain gauges are usually sparse, and historical climate information is lacking. This strategy has helped to make the project scalable throughout Ethiopia. Since remote sensing is only a very rough approximation of what is happening on the ground, a cornerstone of the initial insurance activities has also been to validate the satellite rainfall estimates for each project village to assure they are of sufficient accuracy to proceed with developing robust insurance products for the farmers in each site. This work has led to the first satellite-based rainfall index products sold to low-income farmers.

## LOOKING TOWARD THE FUTURE

### GOALS

WFP and OA have joined forces to build on the successes of R4 Ethiopia and expand the project to other regions of the world through a global R4 effort. R4 will now help accelerate the scale-up and testing of this approach in Ethiopia, Senegal, and two other countries in the next five years. This effort constitutes a first step toward developing a sustainable insurance market for poor people, an essential factor in ensuring farmers' livelihoods and food security over the long-term.

R4 aims to leverage the respective strengths of its partners: Oxfam's capacity to build innovative partnerships, and WFP's global reach and extensive capacity to support government-led safety nets for the most vulnerable people. The long-term vision of R4 is to leverage the project's core innovation—the insurance-for-work model that integrates disaster risk management—to transform the safety net programs from just delivering basic goods to delivering risk management services.

### PROJECT EXPANSION

The R4 project in Ethiopia has demonstrated a capacity to rapidly scale up. It has been met with high demand, and has already grown dramatically from a sole initial village in Tigray, Ethiopia in 2009 to forty-three sites in 2011, serving over 13,000 farms, representing approximately 65,000 people. Data from the 2012 season is still being collected, but based on initial results additional expansion is expected. WFP and OA have joined forces to launch a global R4 effort and build on the R4 Ethiopia model for participatory design and capacity building. Expansion of the project is expected within Ethiopia, as well as to Senegal and two other countries in the next five years.

The new R4 partnership hopes to enable thousands more poor farmers and other food insecure households to manage weather vulnerability through an affordable, comprehensive risk management program that builds long-term resilience. R4 will focus on mechanisms that can be integrated into social protection systems, including productive safety nets, so that the results can be applied at a much larger scale by governments and international organizations, if successful. For example, insurance for work - a key part of the R4 approach and an innovative food assistance tool - can be used not only to expand access to insurance, but can be added to labor-based safety nets to protect beneficiaries and reduce costs for governments and donors from the disruptions caused by climate disasters.

## LESSONS LEARNED

Their efforts on the R4 project has allowed project partners to learn several key lessons, including:

- Involvement of the community is key to designing robust indices tailored to meet user needs.
- Insurance should be integrated into a larger risk-management package.
- Trainings and workshops are crucial part of building capacity in the region and helping to transfer knowledge to partners on the ground, making the project more sustainable.
- It is important to work with strong local partners that have a good relationship with communities and have established trust in the region, such as REST and OA. This has helped the project to scale up and allowed R4 Ethiopia to leverage previous relationships and networks within the communities that often takes time to establish.

The extensive involvement of farmers in the project designs and identification of user needs, as well as the heavy focus on capacity-building efforts have been critical to R4 Ethiopia's success. These are important lessons learned that could be transferred to other sectors and/or locations. In addition, the ability to transfer lessons learned from this project to other location is being demonstrated by the emerging global R4 framework and project up-scaling.

## THE WAY FORWARD

Some main challenges moving forward include:

- The project has been challenges by limited access to historical rainfall information, which is needed to design reliable index products in other regions. However, this challenge has been primarily met by the use of remote sensing products, such as ARC, that have historical records.
- As the project expands to new regions it will be critical to collaborate with an implementation partner that has long-established networks and relationships in the communities.
- As the project continues to expand, it will be critical to further develop methods and technologies to make the development and validation of indices less time intensive. A more automated and less manual process, overseen by experts, needs to be put in place. IRI is currently working to achieve this goal, using remote sensing to validate indices and developing software to help automate the index design process.

## PRINCIPLES OF THE GFCS

**Principle 1: All countries will benefit, but priority shall go to building the capacity of climate-vulnerable developing countries.**

R4 focuses its efforts on helping the poorest farmers in drought-prone regions of developing countries, where it works with some of the most climate-vulnerable farmers in the world. However, the lessons learned in these regions can be applied elsewhere as well.

**Principle 2: The primary goal of the Framework will be to ensure greater availability of, access to, and use of climate services for all countries.**

The use of satellite-based indices demonstrates the potential to develop index insurance products for poor farmers in developing countries who previously had no access to this type of climate service (due to poor local climate records, potential of index vs. traditional insurance, etc.).

**Principle 3: Framework activities will address three geographic domains; global, regional and national**

**Principle 4: Operational climate services will be the core element of the Framework.**

**Principle 5: Climate information is primarily an international public good provided by governments, which will have a central role in its management through the Framework.**

The satellite-based indices developed as part of R4 Ethiopia are based on freely available public information. The Ethiopian NMA has played an active role in this project, working with IRI to provide rain gauge information and develop new merged rain gauge/satellite-based products.

**Principle 6: The Framework will promote the free and open exchange of climate-relevant observational data while respecting national and international data policies.**

R4 Ethiopia utilizes freely available satellite-based data for index design. In addition, the IRI has provided capacity building materials and workshops to educate stakeholders and project partners about the use of and potential applications for these satellite-based observational climate data.

**Principle 7: The role of the Framework will be to facilitate and strengthen, not to duplicate.**

Index insurance is a potential method of providing stakeholders with insurance that may be able to facilitate climate risk management and adaptation to climate change, while also strengthening farmer capacities by improving their ability to undertake livelihood-improving productive risks. The use of remote sensing climate information to design index insurance products is also being used to facilitate the design of such insurance products for extension to regions with poor climate-data records, opening up new possibilities for climate risk management in regions where such projects were not previously possible.

**Principle 8: The Framework will be built through user – provider partnerships that include all stakeholders.**

R4 Ethiopia is established upon the principal of participation of stakeholders, in this case farmers, for the creation of the indices. The stakeholders are involved in all levels of the design process.