



From managing crises to managing risks: The African Risk Capacity (ARC)

Lucy Nyirenda, David Goodman, 18 Jan 13

Most weather events, although uncertain in terms of their exact timing and magnitude, are predictable. Dominated by rain-fed subsistence agriculture, production in many parts of Africa is affected by climate variability; and in the future, may be significantly compromised by climate change through the likely higher incidence of drought, erratic rainfall and damaging high temperatures. As currently structured, the international system for responding to natural disasters is not as timely, reliable nor equitable as it could be. Funding is secured on a largely ad-hoc basis after disaster strikes. Only then can relief be mobilised for the people who need it most. In the meantime, assets are depleted, development gains suffer major setbacks and lives may even be lost, forcing more people into chronic destitution in the world's least economically developed countries.

At the national level, disasters result in budget dislocation, as resources initially allocated to development activities are redirected to crisis response, as well as reduced income and economic growth. At the community level, households are often forced to adopt short-term survival strategies in the face of a shock that can undermine their long-term resilience and food security. Early, well-planned and appropriate interventions linked to reliable financing in the event of weather-related emergencies could help reduce the negative impact of a disaster on the lives and livelihoods of the vulnerable, protecting human, social and economic development and reducing the short and the long-term costs of assistance. Contingent funds linked to early warning systems and appropriate contingency plans offer the best solution for delivering more effective and efficient responses to weather shocks in the short term and can facilitate longer-term investments to increase food security, disaster risk reduction and climate resilience.

The African Risk Capacity (ARC) is a treaty-based organisation, recently established as a Specialised Agency of the African Union (AU) by a conference of 41 African states.[1] This groundbreaking project is designed to improve current responses to drought food security emergencies and to build capacity within AU member states to manage these risks. As an African-owned, continent-wide index-based weather insurance pool and early response mechanism, ARC offers an African solution to one of the continent's most pressing challenges. By bringing together the concepts of insurance and contingency planning, ARC aims to create a new way of managing weather risk by transferring part of the burden away from African governments, and their vulnerable populations who depend on government assistance, to international financial markets that are much better equipped to handle the risk. By linking contingency funding to effective response plans, ARC could help African governments reduce negative impacts of droughts on the lives and livelihoods of the vulnerable, while increasing the efficiency and efficacy of external aid.

Drought accounted for an average of 36% of all World Food Programme (WFP) responses between 2002 and 2009 in sub-Saharan Africa – a reasonable proxy for overall international humanitarian aid to the region – the greatest natural disaster driver of WFP operations on the continent. Since 1990, there have been 132 recorded droughts in sub-Saharan Africa, including the most recent events seen in the Horn of Africa and

parts of the Sahel. As such, the ARC will focus initially on drought. However, it has secured funds and is exploring partnerships with expert modelling firms to begin preliminary work on a flood model, and will investigate the feasibility of insuring against additional natural hazards in the future.

Transitioning from managing crises to managing risks

A pan-African risk pool

ARC will enable African countries to secure contingency funds for drought events by capitalising on the natural diversification of weather risk across the continent through a risk pool. A risk pool is a mechanism where individual risks are transferred and combined. That pool then takes on the risk profile of the group rather than the risk profile of each individual risk, combining the uncertainty of individual risks into a calculable risk for the group. By looking at the probability that an event will occur in a year, the correlation of risks, and the likelihood that a drought event will happen at multiple countries in the same year, it is possible to determine the probability of payouts for the entire pool and therefore the funds required to service those payouts. As ARC will cover up to nine discrete rainfall seasons across Africa,[2] a continental risk pool's exposure to covariant drought risk would be significantly smaller than a given country's or region's exposure. Therefore, the sum of the contingent funds each country would need to have in reserve in order to be able to respond to an extreme drought emergency a year is substantially greater than the contingency funds required by a group of countries to respond to its worst case scenario.

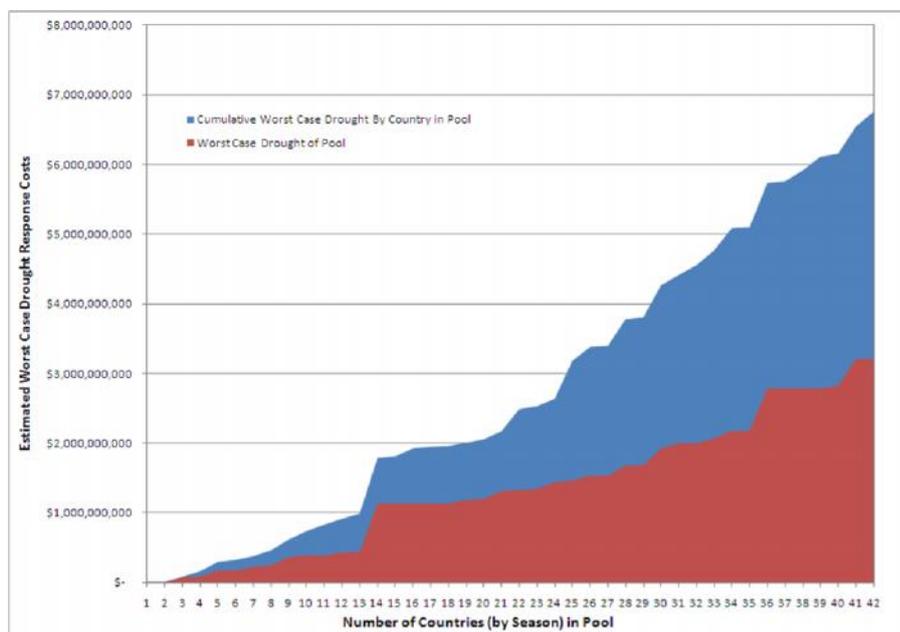


Figure 1: Pooling more than halves fund requirement

Preliminary findings indicate a 50% saving from diversification of drought-related losses across Africa, ie a 50% reduction in the contingent funds needed if the risk is pooled among nations and managed as a group rather than borne by each country individually. Approaching the market as a group will therefore significantly reduce the individual premiums required to maintain the solvency of the facility. These are savings that can then be invested in longer term development projects, as outlined below.

Africa RiskView

Africa RiskView (ARV) is the technical engine behind ARC. It is a software application, developed by WFP, which provides a transparent system to estimate drought-related crop losses and the impact on populations' food security from future droughts for sub-Saharan African countries. It then translates that impact into equivalent financial terms to provide an estimate of the total response costs required to assist those populations that are potentially affected. In this way ARV provides member governments with a tool that can be used to estimate their financial drought risk and therefore to determine the appropriate amount of risk to transfer to the ARC risk pool. It also provides the basic infrastructure needed to establish and manage an index-based insurance pool that can access the international risk markets and trigger early disbursements to countries.

ARV combines a number of different disciplines including crop monitoring and early warning, vulnerability assessment and mapping, financial planning and risk management into one software tool that provides a standardised approach for estimating drought response costs systematically across a large number of African

countries. ARV uses data from leading operational sources (eg Food and Agriculture Organisation, Famine Early Warning Systems Network, National Oceanic and Atmospheric Administration, WFP) for 32 countries to estimate high-level food security needs and response costs. ARV layers three discrete components of data, converting rainfall and crop monitoring data to estimate populations affected, which in turn can be used to estimate response costs based on budgeted response plans.

By working through all three components of ARV, member states could determine how changes in rainfall would ultimately result in changes in the water requirement satisfaction index (an indicator of crop performance), its effect on vulnerable populations, and estimate the ultimate cost of different events. Quantifying risk through ARV and identifying the financial losses associated with different drought events can assist governments in understanding the funds they require, given their contingency plans, to respond to drought events of varying magnitudes. The government can then select the response cost level beyond which they would want coverage through ARC to support these plans, thereby establishing objective triggers for payouts from the risk pool should a drought of such magnitude, or greater, occur. Specifically, governments could select the deductible (the risk the country wants to retain and manage using other resources), the limit (the maximum payout a country can receive in the case of an extreme drought), and the ceding percentage (the percentage of the total modelled risk the country wishes to transfer to the pool) to customise their participation profile. The premium a country will have to pay to transfer this risk to ARC will depend on how these parameters are selected.

Finally, if governments do choose to participate in ARC, ARV allows them to monitor rainfall and crop data through the season and provides an estimate of potential payouts at each point in the season based on the risk transfer parameters selected. Rainfall data in ARV is updated every ten days and with this input ARV can allow governments to see, in near real-time, the likelihood that there could be a payout from ARC and, more generally, the likelihood of a potential need for an emergency response. This can lead to improved planning of responses and taking steps to address a potential crisis even before it begins.

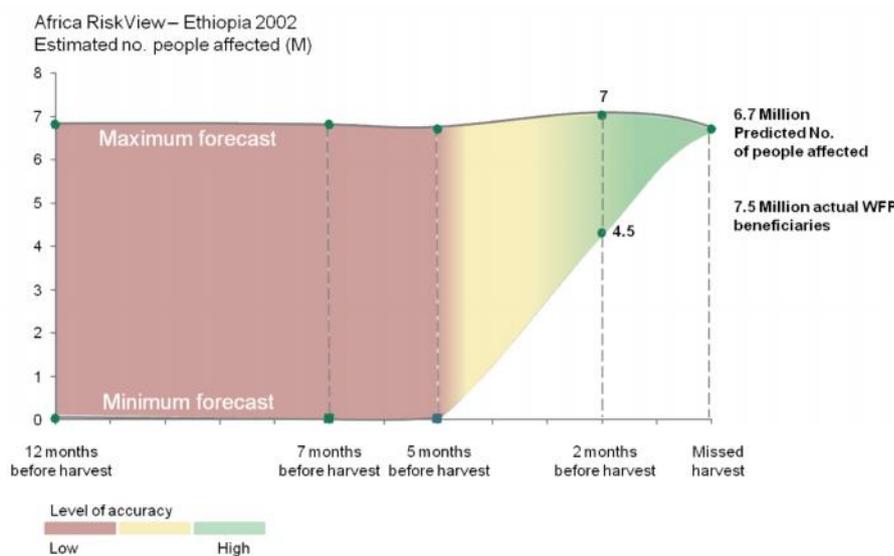


Figure 2: Drought impacts can be predicted with relatively high accuracy

As Figure 2 shows in the case of Ethiopia in 2002, ARV provided estimates of the population affected by the drought and its associated costs throughout the season.

It is important to note that all countries that participate in the ARC will work with a team of technical experts and a multi-disciplinary in-country group to fully customise ARV to the specific national context. This, to the extent possible, will mitigate the basis risk inherent in any index-based insurance transaction, and allow policymakers to reach a better understanding of the functions and limitations of the model on which the risk is being transferred.

Costs and benefits

In January 2012, the ARC project commissioned a cost-benefit analysis[3] (CBA) to examine the economic advantages and disadvantages of establishing such a risk pooling facility as an early response mechanism to severe drought in sub-Saharan Africa. The work was completed in June 2012, and serves as an important piece that adds new information and perspectives to the on-going discourse on disaster risk management in

the context of food security for the continent. The study sheds new light on the value of early and predictable action in assisting those affected by livelihood shocks, such as drought, and the cost-effectiveness of scaling up existing in-country mechanisms to identify and respond to such needs.

Two major potential advantages of the ARC are the provision of financing for the government and the enabling of early disbursement of emergency response services to those living in affected areas. As mentioned previously, early disbursement of assistance derived from ARC participation could potentially provide higher welfare benefits to countries and their vulnerable households than traditional aid channels. To help assess these potential benefits, the CBA documents the existing evidence regarding the timing of household coping actions when faced with a drought and the likely long term cost impacts of these actions. From this baseline the study then estimates the economic costs of a delayed response per household by calculating the potential economic benefits in acting early and thus protecting a household’s economic growth potential. Simply put, that is intervening in time to prevent households’ negative coping actions such as reduced food consumption, livestock death, and distressed productive asset sales which, in the absence of external assistance, have increasingly pronounced negative consequences.



Cost, by household (based on an average household of six individuals), of delaying response until ... months after harvest								
1	2	3	4	5	6	7	8	9
USD negligible			USD 49			USD 1,294		

Figure 3: Household coping mechanisms and the benefits of early response

The CBA calculates the economic benefits of getting aid to households in the critical three months after harvest could result in nearly USD 1,300 per household assisted in terms of protected economic gains; no small sum. Assuming conservative response cost and targeting estimates, the CBA indicates that response plans linked to ARC payouts could deliver a value of approximately USD 3 to households for every dollar invested in ARC, as a result of early response and improved national risk management through risk transfer and risk pooling.

Even though these estimates do not include the additional benefits of saving lives, nor direct cost savings, the study shows substantial speed, cost and targeting gains can be achieved through improved contingency planning. However, the study shows that the magnitude of benefits is much greater when the contingent plans involve scaling up existing programmes – such as safety net programmes – on account of both improved targeting and gains in speed. Conversely, an ARC payout plan that has no contingency planning, and therefore no speed advantages, offers no economic gains over traditional response mechanisms and therefore no benefits that would outweigh the cost of running a facility like ARC.

In order to ensure maximum benefits for participating countries, any country that wishes to participate in the insurance risk pool will be required to submit its contingency plans to the ARC Governing Board for review. The guidelines for such plans are still under development, however the CBA has highlighted a 120-day period as the target for making contingency plans operational, ideally though scaling up existing systems that already target and support vulnerable households.

ARC’s contribution to long term resilience and growth

For many countries in Africa, including several in the Sahel in 2012, a small shock in terms of a rainfall deficit or elevated food prices can precipitate a call for a major humanitarian intervention and emergency response. The resilience in such countries is sufficiently low that they struggle through most years, let alone during a drought. For example, in a country such as Niger, where households currently display very low resilience, the ARC team has calculated that to withstand a 1-in-5 year drought event, the income of the most vulnerable households would have to grow by an annual average of 3.4% over the next five years in real terms to build sufficient resilience in order to adequately cope without requiring external assistance.[4] In the meantime, insurance is not the correct tool to deal with this chronic risk. Indeed, the CBA concluded that a tool like ARC would provide the greatest welfare benefits when making larger payments for more extreme, infrequent events. Such events, with a return period of more than five years, currently drive 66% of WFP’s drought assistance in Africa.[5] In order to improve such countries’ resilience to natural disasters, thereby enabling sustained growth on the continent, two key elements are required: risk management and investment.

Investments that support long term resilience against food insecurity (eg supporting productive safety net programmes) can address chronic risks and provide a base of predictable on-going assistance that can support poor and vulnerable households to build assets and livelihoods, which will in turn develop resilience to cope with normal and somewhat frequent, mild shocks (eg every two to four years) without external assistance. Some countries have made significant progress already, including Ethiopia with the launch of the Productive Safety Net Programme (PSNP) in 2005. The PSNP is an example of a predictable investment to provide vulnerable households the support and assistance they need to manage year-on-year risks, thereby reducing the need for humanitarian interventions for what had become chronic development problems. This does not mean that ARC offers no value to countries that lack investments into a framework to deal with frequent risks – the value of timely action in emergency situations as a result of early contingency funds can still bring benefits – however the mechanism can provide greater benefits where there are existing systems that can be quickly scaled-up to address transient needs.

From this base level of investment, in which chronic risks are addressed and households are able to begin to accumulate assets and secure livelihoods, sound risk management becomes critical. In order to protect the resilience achieved through investments, countries need to ensure that future shocks, mild or severe, do not erode such gains, and that the number of households falling into poverty, or depleting their assets, does not grow. This is where a tool such as ARC can offer the most value, providing dedicated contingency funds that can scale up safety net systems in a reliable, timely manner, allowing them to remain solvent and sustainable, protecting hard-won gains for households, and reducing the country’s reliance on emergency appeals. Consequently, with a sound investment and risk management framework, countries such as Niger have reason to be optimistic about their long term prospects vis-à-vis disaster risk management and resilience.

When countries achieve these key components of investment and risk management, they can enjoy the benefits of a virtuous cycle of attracting further investment by always protecting the benefits investment brings with prudent risk management. A country with a stable social protection system, not relying on emergency appeals every year or diverting national resources frequently to deal with emergencies, can focus rather on additional investments into agriculture and food security to increase productivity and resilience to shocks (eg irrigation schemes), alongside other investments that will diversify the country’s economy away from reliance on rain-fed agriculture.

The stability fostered by investment and sound risk management will increase private sector investment, in addition to creating space for donors to back programmes that focus on long term growth, rather than supporting costly humanitarian interventions. All of this will drive increased resilience, whereby households become less vulnerable to shocks, enjoy increased productivity and subsequent food security, and the country as a whole develops a more diversified economy and an associated taxpayer base. The country will, as a result, be able to withstand greater shocks internally without needing as much insurance coverage or external emergency assistance.

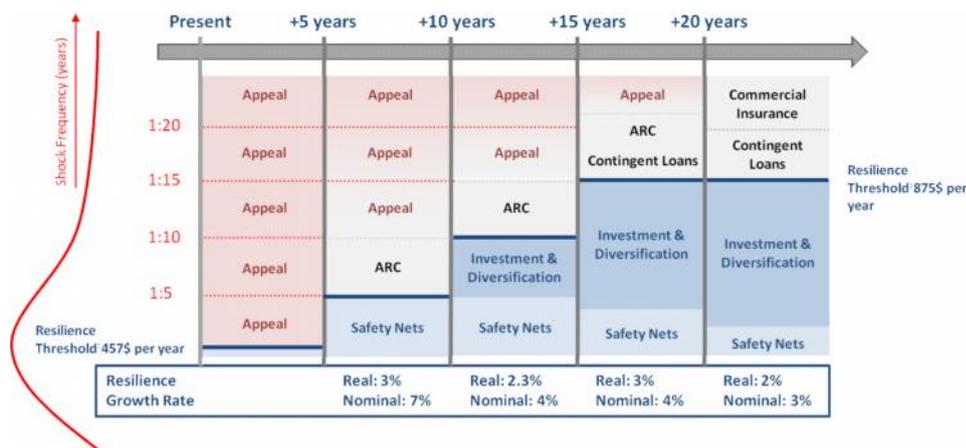


Figure 4: Risk management and investment increase resilience and growth in the long run

As the process continues in the long run, resilience at the national and household level will be increased, the safety net programmes reduced and ARC can be phased out as countries suffer setbacks only from less frequent shocks, which can be more affordably managed via the commercial market. Countries would also be able to utilise growing and diversified revenue streams to employ contingent loans and other innovative products to manage these risks. To that end, one of the principal goals of ARC is to catalyse this transformative process from managing crises to managing risks, setting the stage for improved growth on the

continent.

[1] African Union, 2012, Final Act of the Conference of Plenipotentiaries on the Agreement for the Establishment of the African Risk Capacity Agency.

[2] The number of seasons covered will depend on which countries elect to engage in an insurance transaction with ARC and the risk transfer parameters that they select.

[3] IFPRI, 2012, Cost Benefit Analysis of the African Risk Capacity Facility. Additional work, to build on the results of the IFPRI 2012 analysis, was conducted for the ARC Project by the Boston Consulting Group.

[4] The analysis measures resiliency as a household's distance from the international poverty line, in this case assumed to be USD 1.25, and uses a scaling factor of 1.5 to quantify the loss of agricultural income from a given deviation in an area's drought index from normal conditions (based on *Africa RiskView* default model settings). Using 1-in-5, 1-in-10 and 1-in-15 year events as estimates for different drought severity, the minimum loss of livelihood in dollar terms associated with all three frequencies of event in each region of the country is estimated, and then averaged across all areas to calculate a national figure. Finally, the required income today to withstand those losses 5, 10 and 15 years ahead is calculated in order to determine the annual growth rate (ie the geometric average) to reach such levels.

[5] Boston Consulting Group, 2012, African Risk Capacity Cost Benefit Analysis.

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