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The Extreme Climate Facility (XCF) – A Multi-Year Financial Vehicle to Secure Direct Access to Climate Adaptation Funds for Africa

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Abstract – Experts estimate an adaptation investment cost need of $14-17 billion per year over the period 2010-50 for sub-Saharan African countries to adapt to an approximately 2℃ warmer climate forecast for 2050. Climate change is particularly threatening to the future of African agriculture, which impacts global food security and the economic livelihoods of hundreds of millions of Africans. To date, funds have not been forthcoming in the magnitude required. As a result, African leaders have been exploring innovative and diverse ways to address the challenge of providing funding for climate adaptation across the continent. The Extreme Climate Facility (XCF) will be a new, multi-year financial mechanism designed to utilise both public and private capital to secure direct access to climate adaptation funds for African governments to respond to the impacts of increased climate volatility. This paper outlines the XCF concept and the work that will be carried out by African Risk Capacity – a Specialized Agency of the African Union established to improve national capacities to better plan, prepare and respond to extreme weather events and natural disasters – to fully design and establish the financial vehicle for its African Union Member States.

Keywords – *climate change, climate adaption finance, catastrophe bonds, African Union, African Risk Capacity*

1. ARC Background

The African Risk Capacity (ARC) is a Specialised Agency of the African Union (AU). The ARC Agency leads the ARC Group, a development finance institution that provides financial tools and infrastructure to help countries manage natural disaster risk and adapt to climate change. Established in 2012, it currently counts 24 AU countries as members and is supervised by a governing board of African ministers and experts chaired by Nigeria's Coordinating Minister for the Economy and Finance, Dr Ngozi Okonjo-Iweala.

In 2014, ARC launched its initial risk insurance product for member states through its financial affiliate the ARC Insurance Company Limited (ARC Ltd). ARC Ltd is a specialist hybrid mutual insurance company and Africa's first ever disaster insurance pool, aggregating risk by issuing insurance policies to participating governments and transferring it to the international market. ARC Ltd uses the satellite weather surveillance software Africa RiskView, developed by the United Nations World Food Programme, to estimate the impact of drought on vulnerable populations – and the response costs required to assist them – before a season begins, and as it progresses, so that index-based insurance payouts, based on Africa RiskView, are triggered at or before harvest time if the rains are poor. With a USD 200 million initial capital commitment provided by the governments of Germany (KfW) and the United Kingdom (Department for International Development, DFID), ARC Ltd issued drought insurance policies totalling USD 135 million for a total premium cost of USD 17.5 million to a first group of African governments – Kenya, Mauritania, Mozambique, Niger and Senegal – in May 2014, marking the launch of the inaugural ARC pool. Eight additional countries are in the queue to join the next pool in 2015, with a target of up to 20 countries receiving coverage for drought, flood and cyclones totalling over USD 600 million in the next five years.

While African countries are taking action to better manage today's weather, significant additional investments will be required to offset the predicted negative impacts of Africa's future climate and, at the very least,

maintain the current status quo where insurance, together with other risk management and mitigation measures, can be a financially effective tool for managing weather risks (Clarke and Hill, 2011). The capital required for such climate change adaptation investment in Africa is substantial however and funds have not been forthcoming to the scale required. To support the level of international funding available, as well as countries' own investment in resilience and adaptation, the ARC is now developing a new financial mechanism that will track extreme climate shocks and will pay out to countries, already managing their weather risk through ARC Ltd, in the case that extreme event frequency and/or intensity increases. This facility will utilise both public and private sector funds and will facilitate direct access to climate adaptation finance for African governments.

The ARC Agency was mandated to develop the concept of this financial mechanism by the African Ministers of Finance on 30 March 2014.

2. Requirements for Climate Change Adaption in Africa

Africa is widely recognised to be the region most vulnerable to weather risks. Weather-related disasters are already undermining record growth across the continent, threatening hard-won gains and vulnerable populations' lives and livelihoods; increasing climate volatility can only exacerbate this and counteract the investments being made by countries to mitigate, prepare for and manage current weather risks.

The World Bank estimates an adaptation investment cost need of USD 14-17 billion per year over the period 2010-2050 for sub-Saharan countries to adapt to an approximately 2℃ warmer climate by 2050 (World Bank, 2010). To date, funds have not been forthcoming in the magnitude required and it is recognised that innovative and diverse sources of financing will be required to meet the identified needs of the continent. Moreover, in the event of large climate shifts, actions and funds assessed today may become insufficient. As adaptation finance investment grows, it will also be critical to have a fair and objective mechanism for the allocation and distribution of funds to help prioritise the geographical location of the available investment flows.

The ARC Group provides an ideal platform from which to develop and operationalise a new facility that can meet such needs. Such a facility would use public funds to leverage private capital in order to diversify the sources and increase the amount of international funding that will be made available. It would secure direct access for African governments to climate finance based on the demonstrated need for enhanced adaptation measures. To attract capital, this facility would be data-driven, tracking extreme climate events across Africa and paying out to eligible countries to undertake adaptation should event frequency and intensity increase over a longer-term period. In this event, payments from the facility could certify that changes are occurring and signal the need to boost implementation efforts.

While already within its mandate[1], the ARC Agency was specifically requested by African Union Conference of Ministers of Finance in March 2014 to develop a proposal for a mechanism by which African states can gain access to financing to respond to the impacts of increased climate volatility.[2] Called the Extreme Climate Facility (XCF), this paper outlines the XCF concept and the work that will be required by the ARC Agency to fully conceptualise and design such a mechanism for its Member States.

3. The Extreme Climate Facility (XCF)

The XCF is envisioned as a data-driven, multi-year financial vehicle that will track the frequency and magnitude of extreme weather events in Africa and will provide additional financing for countries already managing their current weather risks through ARC Ltd should the frequency and/or intensity of extreme weather events increase. Payments to countries would be entirely data-driven over a 30-year, or a predetermined long-term, adaptation period; if there are no significant increases in the frequency or magnitude of extreme weather events over current climatology, then no payments would be made. Where payments are made, countries would use those funds to invest in climate change adaption measures specified in pre-defined country-level adaptation plans. Payment size would increase with extreme event number and magnitude over and above a specified threshold, corresponding to the degree of confidence that extreme events are increasing, the climate has changed and that intensified adaptation is needed.

In order to attract private capital in particular, XCF payments would be based on an objective, multi-hazard Extreme Climate Index (ECI). This index would be based on meteorological data, specified by climatic region and designed to capture the severity and frequency of heat, drought, flood and other extreme weather events important to particular regions, such as cyclones. Similar to the insurance contracts issued by ARC Ltd, the XCF payment triggering mechanism would be index-based. In contrast to ARC Ltd insurance products, which pay one country based on a specified weather event trigger, XCF payments would be given to all eligible countries in a region, irrespective of whether the triggering event(s) happened in a country's territory should the ECI in a given year exceed a pre-defined threshold, indicating an increase of severe weather across that region. The threshold would be

[1]Agreement to Establish the African Risk Capacity (ARC) Specialized Agency of the African Union, (accessible online at `http://www.africanriskcapacity.org/c/document_library/get_file?uuid=0d84749f-c44e-4554-8206-e638acf4fdfc&groupId=350251`)

[2]Report of the Committee of Experts of the seventh Joint Annual Meetings of the Economic Commission of Africa Conference of African Ministers of Finance, Planning and Economic Development and African Union Conference of Ministers of Economy and Finance, Resolution L15/Rev.1. (accessible online at `http://www.africanriskcapacity.org/documents/350251/757534/283485644632920COM14_Committee+of+Experts+Report+ARC_EN.pdf`)

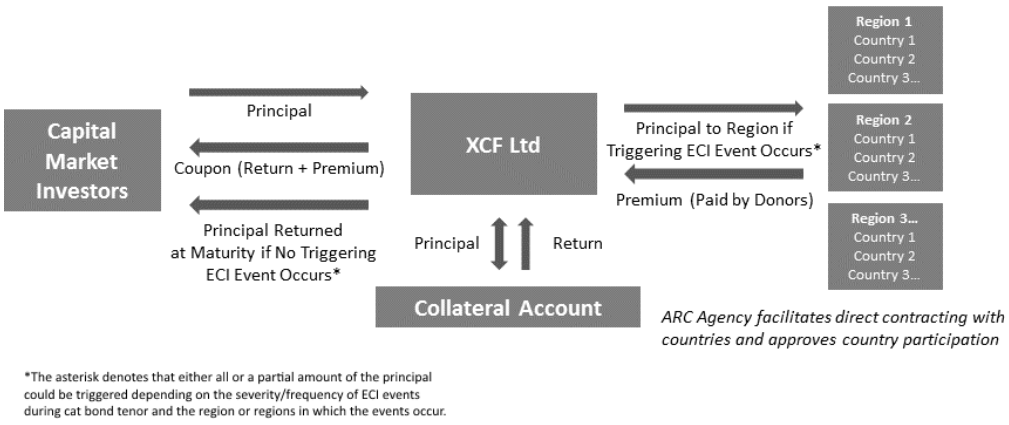

Figure 1: Example of possible XCF structure and funds flow

set to identify extremes in the ECI time series, subsequent breaches of which could indicate a potential shift to a new climate regime with a heightened risk of intense weather events occurring.

Payments from the XCF would start small, and while early disbursements could lead to false positives in the initial years, payments would increase in size with subsequent breaches of the threshold growing alongside increasing evidence, as the years go by, of observed deviations in the ECI from the current baseline climatology. Should the trend in increasing extreme events continue, countries could stand to receive a predetermined maximum dollar amount over the facility's adaptation period, e.g. 30 years. Payments would not be linked to the underlying losses of those events – those would be covered by ARC Ltd insurance contracts with each participating country – but rather would be set at a meaningful level to directly support a country's climate adaptation plan pipeline.

Specifically designed to access private capital, the XCF would be structured along the lines of a catastrophe bond programme, where the XCF's financial obligations over a series of three to five year financing windows[3] would be securitized, issued as a bond and financed by capital provided through private bond investors. Donors would support the annual bond coupon payments to investors, thereby leveraging public capital to access larger private funds. Should no ECI-based payment events occur during the bond's tenor, the capital provided would be returned to investors at the bond's maturity, in addition to the yield collected through the annual coupon payments; should an ECI-based payment event occur, some or all of the bond's capital – depending on the frequency and severity of the triggering event or events – would be triggered and channelled to participating countries to implement adaptation plans (see Figure 1). The ARC already has the infrastructure in place to establish such a financial facility, with scope for the XCF to become the second financial affiliate of the ARC Agency (the ARC Ltd insurance company being the first).

Should extreme events continue to occur and payments from the XCF become very likely, reflected by a decrease in premium affordability or interest from the private sector for the catastrophe bond programme, donor capital may be required to directly support XCF payments. Therefore, in this model, the XCF would leverage private capital to fund the uncertain risk, particularly during the start of the 30 year adaptation period, with public money reserved to fund the more certain and frequent risk should it be required. See Figure 2 for an illustration of how the XCF could work in practice, using a 3-year tenor bond series and a worked example for one region[4].

4. XCF Research & Development

To be effective, the following three elements must be central to XCF's design: 1) implementation-ready country-level adaptation plans conforming to a set standards for

[3]To date catastrophe or "cat" bonds usually have a maximum tenor of three to five years to match investor appetite, hence currently the envisioned 30 year XCF adaptation period would have to be broken down into non-overlapping shorter periods over which bonds would be issued. With time, investor interest in longer-term investments could increase making longer-term bond issues a possibility and there is increasing evidence that longer-time horizons are becoming more popular with some bonds having been issued for a period of 10 years. There are some advantages to, at least initially, breaking down the adaptation period into smaller time increments. For example, the underlying ECI could be revisited and improved with each new issuance, more countries could be added and the payment event threshold revised given the new ECI data reported. However longer tenor cat bonds are increasingly allowing annual resets that might accommodate updates and improvements, for example, to the ECI. This is an option that will also be explored in the XCF research and development work programme outlined in Section 4.

[4]As discussed in the main text, should severe events occur, cat bond attachment levels could shift up to reflect the heightened risk in a potentially new climate regime (as shown in the Figure 2 example). Risk below this level, but above the ECI threshold, would be funded through an insurance sub-layer (shown in green). Donor capital may be required to fund this sub-layer should the affordability or interest from the private sector for the cat bond programme and/or insurance sub-layer provision decrease. Work example for illustration purposes only: Payments begin only after second exceedance event, indicating a potential climate regime shift; Year 9 payment of USD 30m/Country triggered to all participating countries in the region; Years 17-18, severe weather events during protection period managed through ARC Ltd; Year 23, payment of USD 50m/Country triggered from sub-layer; Year 25, payment of USD 140m/Country triggered from sub-layer and cat bond; Year 29, payment of USD 220m/Country triggered from sub-layer (USD 160m) and cat bond (USD 80m).

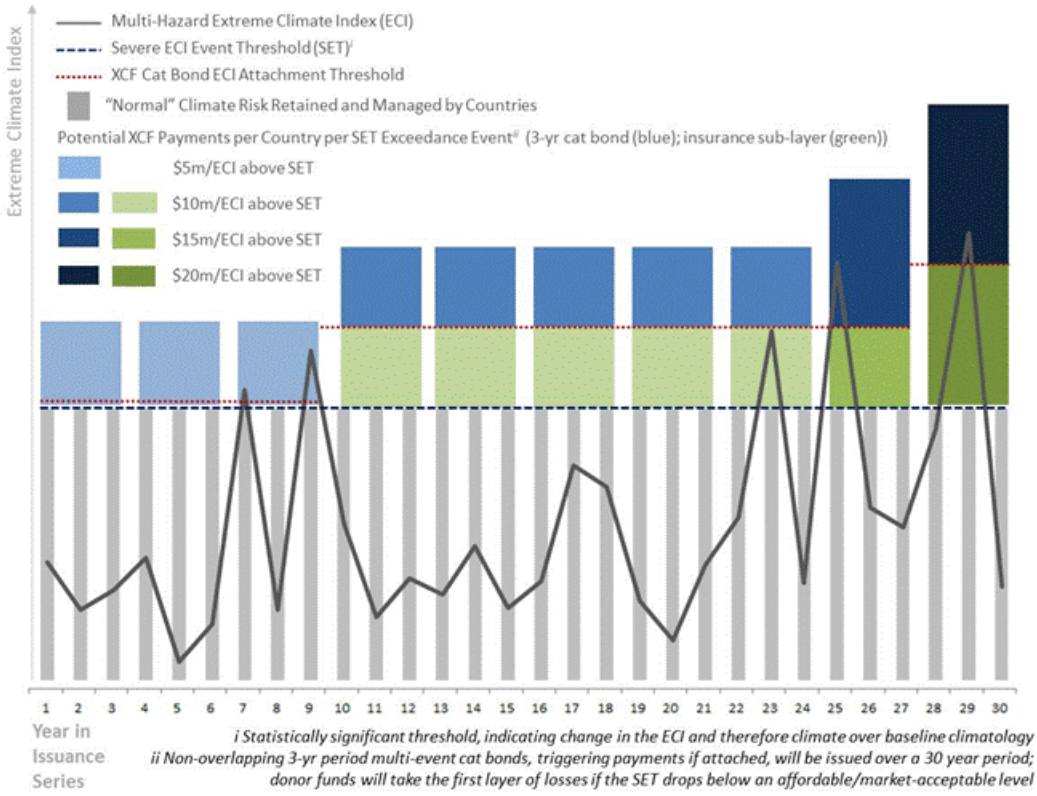

Figure 2: Illustration of a potential XCF in action, using a 3-year tenor bond series and a worked example for one region.

climate-resilient investments, or, at the very least, a credible channel through which these additional climate adaptation funds could be directed to participating countries; 2) a data-driven mechanism to track extreme weather events across the continent in an objective manner over time, with established indices, thresholds and criteria for triggering XCF payments to regions; 3) an efficient financial vehicle that could finance XCF's obligations to African governments over time. To fully conceptualise and design the XCF outline presented above, a research and development (R&D) programme based on these three pillars will be required. Each of these pillars, outlined below, will be structured to explore a set of design questions as part of a multi-disciplinary work programme to be led and managed by the ARC Agency.

Expertise to carry out some of this work programme (such as Pillar 3) exists within the ARC Group. For Pillars 1 and 2, ARC will need to partner with leading experts in the fields of climate change adaptation and climate researchers with significant experience in regional climate modelling and in extreme event detection in Africa. Throughout the R&D process ARC will have to work closely with interested donors to ensure the recommendations are compatible with securing donor support for XCF's ultimate establishment and annual premium payment costs (see Section 5 for premium cost estimates). In addition, to ensure the work-stream outputs meet market requirements, the ARC will convene an informal advisory group composed of experienced catastrophe bond investors to periodically review and comment on intermediate results. The R&D programme will prepare the groundwork for establishment of the XCF vehicle targeted for 2016.

4.1. Pillar 1: Country Eligibility & Standards for Country-Level Climate Adaptation Plans

Pillar 1 of the research will ascertain to what extent implementation-ready country-level climate adaptation plans exist, and compile best practice for the development of investment-ready adaption plans. This work will result in: a set of standards that investment plans should meet for XCF funding and the development of an XCF investment plan template; recommendations on plan approval, implementation and monitoring standards and guidelines; country-level eligibility criteria for participation in the facility with respect to climate adaption plan quality; an assessment of country readiness for participating in a first round of XCF financing, country capacity to absorb XCF funding and therefore recommendations on XCF's optimal payment size; and recommendations on the investments required to enhance readiness across the continent for initial and subsequent XCF financing windows.

To be cost effective the XCF would need to build on and support existing initiatives to develop climate adaptation programmes in Africa. Specifically the objective of Pillar 1 will be to:

a Ascertain to what extent implementation-ready country-level adaptation plans already exist across

Africa and the size, in dollar terms, of such investments;

b Identify best practices for the development of implementation-ready adaptation plans;

c Identify any additional work required by ARC Member States to develop appropriate adaptation investment plans ready to absorb and deploy XCF funding and provide recommendations on potential partners that could assist ARC Agency in preparing countries for XCF participation; and

d Outline feasible criteria and a mechanism for evaluating and approving country-level adaptation plans for XCF participation and reviewing subsequent implementation (African Risk Capacity, 2013).[5]

The work will need to include a component to understand the extent to which existing plans (or pipeline of plans) are flexible to address country-level needs under various climate scenarios and to define which scenarios could require further scale-up or increased investment in specific plans. It should aim also to understand the feasibility of developing a XCF investment plan template that could be used as the basis for several funding tranches to a country, should evidence of increasing severe and frequent extreme weather events emerge over time. Should it emerge that investment-ready plans are not developed, the work could focus on identifying alternative and credible channels through which XCF's climate adaptation funds could be directed toward participating countries.

The research for Pillar 1 will focus on ARC countries that could be candidates for initial XCF participation, i.e. in ARC member states already working with the ARC Agency, with a focus on those countries in the first insurance pool or those preparing to join in the near term.[6] Such in-country work will help refine the initial research and would inform the final recommendations on the realistic size of the XCF facility and the work required to prepare countries for an initial phase of operation, given the status and capacity of countries with respect to preparedness and implementation of climate adaptation plans.

4.2. Pillar 2: Extreme Climate Indices & Thresholds

A key feature of XCF would be an underlying analytical, data-driven mechanism that could track extreme weather events across Africa and objectively trigger payments to countries should their frequency or intensity increase, indicating a significant deviation in extreme event frequency and severity from the current baseline climatology. The ARC Group already has significant experience in developing weather indices for risk financing purposes and successfully meeting the criteria required for transferring risk to the international markets.[7] Africa RiskView (ARV), ARC Group's software platform, provides a standardized methodology for quantifying weather-related food security costs in Africa.[8] It is currently used to underpin parametric insurance contracts issued by ARC Ltd and this technology can be expanded to include other climate indicators to be used by XCF.

Pillar 2 will have the following four research and development sub-components, outlined below: a) defining an Extreme Climate Index (ECI) for the climatological regions corresponding to ARC Member States; b) defining an ECI baseline and a threshold setting methodology to trigger a sequence of XCF financing in an objective manner should an increasing frequency and magnitude of severe weather shocks be reflected in the index; c) conducting a risk modelling analysis to investigate the probability of ECI thresholds being breached in the years ahead in each region and across all regions; d) expanding ARV to include the historical and near real-time calculation of the ECI and ensuring it is market-ready to underpin XCF contracts.

In addition to meeting the shorter-term XCF design and establishment needs the Pillar 2 work will also need to consider the longer-term time horizon to help ensure that, once established, the XCF will continue to evolve and improve in step with the underlying climate knowledge base with respect to the indices, baselines and thresholds it uses.

4.2.1. Defining the ECI

A suitable ECI should have the following properties. It be should be: i) multi-hazard, targeting the extreme events that are likely to have the gravest impact on Africa's vulnerable populations and economic growth potential, with, at a minimum, the ability to reflect extreme dry, wet and heat events with the possibility of adding region-specific risks events such as cyclone frequency and intensity; ii) able to capture individual extreme events and be suitable for monitoring changes in extreme climate event frequency and intensity over a 30-year or so timeframe; iii) standardised, so that it could be aggregated and compared across larger geographical regions; and iv) reflect the large-scale climate picture of a region. Finally it should be constructed from data satisfying risk transfer criteria, that is data with a consistent, sufficiently long, high-quality historical record that will also be produced objectively and consistently in near real-time going forward.

The work for Pillar 2 will build on and adapt indicators already in use to identify and monitor climate ex-

[5] ARC Agency Peer Review Mechanism's standard and guidelines for contingency planning with respect to ARC Ltd insurance payouts for countries participating could be a starting point for this work component (see African Risk Capacity, 2013).

[6] A list of countries that have signed a Memorandum of Understanding with the ARC Agency to work towards insurance pool participation is accesible online at `http://www.africanriskcapacity.org/countries/mou-countries;jsessionid=CCC672D82CB9B5633B080CB5633EE8F0`

[7] `http://www.africanriskcapacity.com/documents/598532/681674/Press+Release+ARC+Pool+I+Launch+14th+May+2014+Final.pdf`

[8] ARV is a software application developed by the UN World Food Programme (WFP) for ARC that estimates drought-related crop losses and the impact of droughts on the food security of populations in sub-Saharan Africa. Its repository of climate data stretches from 1983-present (for more information see `http://www.africanriskcapacity.org/africa-risk-view`)

tremes (e.g. WMO, 2009; Karl et al. 1996; Gleason et al. 2008) for XCF purposes in Africa, with indictors such as the Standardized Precipitation Index (SPI), which can monitor both wet and dry conditions (Bordi and Sutera, 2012), likely candidates for forming the backbone of each regional ECI.

4.2.2. *Defining Baselines & Thresholds*

This sub-component will define a baseline and threshold-setting criteria appropriate for the defined ECI timeseries (see above) to detect significant changes in the index, and therefore in climate behaviour, from current levels over time. These findings will inform how index thresholds should be set to trigger a sequence of XCF financing in an objective manner should an increasing frequency and magnitude of severe weather events be detected by the index.

Building on the existing literature on signal detection and, in particular, the detection of time-dependent climate change (e.g. Bordi and Suter, 2012; Hasslemann, 1993; WMO, 2009), the work will begin by testing different criteria and methodologies against an ECI computed from data produced by long-running meteorological stations[9] to assess the performance and stability of various approaches over long timescales and historic trends and climate variability. Timeseries analysis methods to be tested will depend on the ECI's properties, but could include approaches such as: extreme-value theory[10] and Empirical Orthogonal Function Analysis, to understand the modes of variability within the ECI, identifying modes associated with high extreme event probabilities, and defining indicators or thresholds that could signal the climate moving into such modes (regimes). Different approaches will then be tested against the ECI computed from data that would be used to underpin XCF financing and, if necessary, modified to accommodate historical data availability constraints.[11]

The work will primarily focus on developing a methodological framework required to operationalize the facility in the near-term for the first three or five year financing window, but will also outline how the proposed threshold-setting criteria could be refined and modified over the XCF's longer-term protection period as additional meteorological information is reported. In addition it will need to consider the messaging around the setting and potential breaching of thresholds and how such aspects should be clearly communicated to future XCF stakeholders and beyond.

4.2.3. *Risk Modelling*

This sub-component will focus on simulating future ECI scenarios over the proposed XCF protection period in order to: i) test the robustness of the ECI baseline and threshold-setting criteria proposed by the work outlined above and ii) investigate the probability of ECI thresholds being breached in the near-term, for a first round of XCF financing, and also over the long-term to estimate the possible financing flows from the facility.

To the extent possible existing climate model output will be used to simulate future ECI scenarios and payment events, illustrating how such a system could work in practice and investigating the expected frequency and magnitude of XCF payouts to each region and across the continent. This risk modelling work will also present an opportunity to investigate the potential limitations and uncertainties of the proposed financing mechanism, in particular with respect to triggering (or not) funds as a results of false positives (negatives) and the possible mismatch between country-level needs and triggered finance flows at the regional level that could be expected.

Implicit in this work will be a review of the proposed ECI and threshold setting methodology, and the associated messaging, leading to modifications to the index, narrative or payment triggering mechanism, if required. In addition it will also provide recommendations on how best to improve on and update these climate-related aspects of XCF over time as the underlying climate science knowledge base continues to evolve.

As a final step, the risk modelling work produced under this sub-component will most likely have to be reviewed and validated by a leading market risk modelling firm in preparation for potential market-based XCF transactions. The informal investor advisory group could advise whether such a step would ultimately be required.

4.2.4. *Africa RiskView*

The final activity of the Pillar 2 work-stream will be to include the defined regional ECIs, and the data from which they are constructed, into Africa RiskView (ARV) so that they could be tracked over time and used to underpin XCF transactions. A secondary activity of this sub-component would be to outline the investments required for the XCF climate indices, and their underlying meteorological data, to be produced and developed independently in Africa in the longer-term.

4.3. *Pillar 3: Financial & Legal Structure*

To be viable the XCF will need an efficient financial structure that can use both public and private funds to finance its obligations to African governments. The ARC Group offers a unique opportunity to quickly set-up a new facility as a second financial affiliate of the ARC Agency, leveraging the experience and significant work that went into establishing the existing ARC institutional structure.

[9] Several weather stations in Africa date back to the 1930s or earlier and would be ideal for this analysis.

[10] A branch of statistics dealing with the extreme deviations from the median of probability distributions. For more background see Embrechts et al, 2013.

[11] Given the potential size of the proposed XCF facility, and the reality of limited station coverage and quality across the continent, the meteorological data that would be used to underpin XCF financing contracts would need to be produced by an independent third party or parties using remotely sensed, e.g. satellite-based rainfall estimates (as used in ARV), and/or reanalysis sources.

Mirroring the ARC Agency and ARC Ltd arrangement whereby ARC Agency acts as the gateway for countries to participating in the ARC Ltd insurance pool by enforcing certain standards and best practices, it is envisaged that ARC Agency would play the same role for XCF with respect to climate adaption plan approval, determining a country's eligibility to participate in the new facility and facilitating country participation. As key part of Pillar 3 will be specifically to outline how such an approval process would work, the full criteria that would define eligibility and the additional capacity or strategic partnerships that ARC Agency would need to be able to carry out this gate-keeping function effectively. In order to be financially effective it is expected that any capacity building work to prepare countries for participation would be outsourced to ARC partners already working on country adaptation plan and climate resilience investments. Such partnership options will also be explored in Pillar 3 and informed by the findings of Pillar 1.

In order to issue catastrophe bonds, it is likely that XCF would take the form of a special purpose company with a catastrophe bond shelf programme that would allow it to issue a series of notes indexed to XCF's ECI-based financial obligations to participating countries. For each three or five year financing window within the 30 year adaptation period, the company's function would be to enter into ECI-based contracts with participating countries for that financing round, issue catastrophe bonds – fully replicating the payment triggering arrangements of these contracts – to investors and then investing the corresponding principal across a series of pre-agreed high-quality securities (to minimize credit risk) until the principal is triggered by an ECI threshold event – thereby generating payments to participating countries – or returned to investors at bond maturity.

The second component of Pillar 3 will be to explore the legal and financial structuring options that could be considered for XCF to fulfil these functions as a second financial affiliate of the ARC Agency. The goal would be to identify the most capital-efficient structures with respect to establishment and operation of such an entity. The work will have to consider the jurisdiction where such an entity should domiciled, how premiums will be paid by donor partners and the entity's specific operating and governance arrangements to meet investor, donor and country requirements. This work will also outline the steps and funds required to establish and operationalise the proposed facility. Most risk-linked securities have a maximum term of three to five years; this Pillar 3 subcomponent will also explore options for reconciling the longer-term vision of XCF commitments to countries over a 30-year adaptation period vis-á-vis a sequence of shorter financing windows.

5. The Way Forward

ARC Governing Board Chair Dr. Ngozi Okonjo-Iweala, Coordinating Minister of the Economy and Finance of Nigeria, announced the XCF at the UN Climate Summit in New York on September 23rd 2014. Over the next 18 months the ARC Agency will lead the XCF R&D programme outlined above, working with Member States and research partners. The research will build on existing work where possible, bringing together disparate disciplines to fully conceptualise and design the XCF as a viable climate risk financing proposition for African countries and their partners. The ARC is working towards the goal of having an effective and fair XCF design in place when nations convene in Paris in 2015 for the UN Climate Change Conference, with the aim of issuing the first catastrophe bonds in 2016.

Initial discussions with catastrophe bond investors indicate a market appetite for between USD 100-500 million of African extreme climate risk in a first three or five year XCF financing round could be feasible if all market requirements are met, indicating the potential for the facility to issue billions of dollars of catastrophe bonds over its 30 year or so lifetime. However this must be balanced by country capacity to absorb and effectively implement such funds; Pillar 1 of the R&D programme will review this capacity. The on-going cost to donors in terms of premium payments to the facility would depend on the size and expected loss of the bonds to be issued. These costs will be determined by the R&D work programme, but will also depend on donor appetite for supporting the XCF programme once it is defined. However, for a sense of magnitude, initial costs could range from USD 3 million up to USD 15 million per year depending on the size and expected funding flows from the facility.[12]

An African-led initiative, the XCF concept has global potential and, in addition to the work outlined above, how a supra-regional XCF could be structured, and the extent to which the XCF concept outlined above would have to be modified to allow for a global XCF mechanism, will also be investigated during the R&D programme. To do this ARC will collaborate with its sister insurance pool, the Caribbean Catastrophe Risk Insurance Facility, and reach out to other regional insurance initiatives to ascertain country-level interest for an expansion of the XCF concept beyond Africa and to assess the additional work required to develop such a global mechanism.

Africa is leading the way in innovative climate finance, diversifying the sources and increasing the amount of international funding available for climate adaptation for the continent. Leveraging ARC's existing infrastructure, the XCF would ensure that African countries and the international community properly monitor climate shocks and are financially prepared to undertake greater adaptation measures should their frequency and intensity increase.

[12] A rough working estimate, an annual coupon of USD 3 million could be expected for a USD 100 million catastrophe bond with an expected loss of 1%; an annual coupon of USD 15 million could be expected for a USD 500 million catastrophe bond with an expected loss of 1% or for a smaller bond with a higher expected loss.

References

African Risk Capacity, 2013: Contingency (Operations) Planning Standards and Guidelines, African Risk Capacity, Johannesburg, South African (accessible online at http://www.africanriskcapacity.org/documents/350251/389546/Operations+Plans+Standards+and+Guidelines+EN.pdf)

Clarke, Daniel and Ruth Hill, 2013: Cost-Benefit Analysis of the African Risk Capacity Facility, IFPRI Discussion Paper 01292, Markets, Trade and Institutions Division, International Food Policy Research Institute, Washington, DC, USA (accessible online at http://www.ifpri.org/sites/default/files/publications/ifpridp01292.pdf)

Bordi, I., Sutera A., 2012: Drought Assessment in a Changing Climate, Department of Physics, Sapienza University, Rome, Italy

Embrechts, Paul, Claudia Klüppelberg, and Thomas Mikosch, 2013: "Modelling External Events for Insurance and Finance", Springer, (2 January 2013), Hardcover, 655 pages

Gleason, Karin L., Jay H. Lawrimore, David H. Levinson, Thomas R. Karl, and David J. Karoly, 2008: A Revised U.S. Climate Extremes Index. J. Climate, 21, 2124–2137

Hasslemann, K., 1993, "Optimal Fingerprints for the Detection of Time-Dependent Climate Change", J Climate, 6, 1957-1971

Karl, Thomas R., Richard W. Knight, David R. Easterling, Robert G. Quayle, 1996: Indices of Climate Change for the United States. Bull. Amer. Meteor. Soc., 77, 279–292

World Bank, 2010: Economic of Adaptation to Climate Change: Synthesis Report, World Bank, Washington, DC, USA (accessible online at http://documents.worldbank.org/curated/en/2010/01/16436675/economics-adaptation-climate-change-synthesis-report)

World Meteorological Organization, 2009: Guidelines on Analysis of Extremes in a Changing Climate in Support of Informed Decision for Adaptation, Climate Data and Monitoring, WCDMP-No. 72, World Meteorological Organization, Geneva, Switzerland

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