

Event Proceedings

Climate Change Adaptation in the Context of Post-2015 Sustainable Development Agenda



Maputo, Mozambique
8 June 2015



Seminar on Climate Change Adaptation in the Context of Post-2015 Sustainable Development Agenda

Mozambique, 8 June 2015





Table of Contents

About these Side Event Proceedings.....	7
The Editors.....	9
Acknowledgements.....	10
Preface.....	12
Welcome Speech from the Director of the AGRD, IDB – Dr. Osman El Fiel	15
Opening Remarks by the Vice-Minister, Ministry of Land, Environment and Rural Development, Mozambique - Mrs. Ana Isabelle Senda Coani.	17
Presentation Summaries and Discussion	19
A. Session I: Framing the Issue	19
B. Session II: Responding to the Issues and the Way Forward	21
Case I: Mozambique National Strategy for Adaptation and Mitigation of Climate Change	21
National Strategy for Adaptation and Mitigation of Climate Change (ENAMMC).....	21
1. Adaptation and Climate Risk Reduction	22
2. Mitigation and Low-Carbon Development	22
3. Cross-Cutting Issues.....	23
The information below was adapted from the GCCA+ (2015) Report	23
a. The institutional capacity and technical expertise of key government institutions is strengthened.	23
b. Information sharing and awareness campaigns are carried out, together with dedicated training courses.	23
c. Implementation of the national response to climate change (Environment Strategy for Sustainable Development, National Adaptation Program of Action) is supported by putting into practice a number of pilot projects, mainly in the agrarian and agroforestry sectors.....	23
A case of GCCA+(2012) Mozambique Sector Policy Support Programme	23



The Key Achievements of the GCCA+ for Mozambique National Strategy for Adaptation and Mitigation of Climate Change are: 23

GCCA+ Actions related to the mitigation of climate change were associated with the following thematic areas: 24

Lessons learned: 25

Way forward:..... 25

Case II: Climate-Smart Agriculture by Dr. Hans Hoogeveen, Vice Minister for Agriculture, Ministry of Economic Affairs, the Netherlands. 25

Case III: Rethinking Sustainability and Development in Post-2015 Development Agenda: Mr. Ibrahim Thiaw, United Nations Assistant-Secretary-General and UNEP Deputy Executive Director. 26

 The Agenda for 2015 - Opportunities for Boosting Sustainable Investments 28

 Looking Ahead 28

Case IV: Impact of Public Awareness and Participation on Climate Change Mitigation and Sustainable Development: Professor Usman Umar, Department of

Civil and Environmental Engineering, Faculty of Engineering, Universiti Teknologi PETRONAS, Tronoh, Perak, Malaysia.29

Public Awareness and Participation on Climate Change Mitigation 29

Public Awareness and Participation on Climate Change across Continent 30

Awareness Raising Campaigns for Climate Change Mitigation..... 31

Factors That Determine a Good Awareness and Participation Campaign 31

1. Stakeholder Involvement 31

2. Success and Restrictive Variables 31

3. Value and Rewards 31

Recommendation 32

Conclusion 32

C. Session III: Panel Discussion on ‘Responding to climate change in IDB member countries. Question: How can IDB member countries address climate change? What role can IDB play?32

Discussants32

Questions33

How can we face the challenges of climate change from an agricultural perspective?.. 33

What are the risks from climate change if no action is taken? 33

How much awareness is needed on climate change to make a difference? And what ethical light can be shone on conserving resources? What sorts of program are needed for conservation and rationalization of natural resources? 33

What is the role of data from a scientific perspective? 34

What is happening in Africa to manage greenhouse gas emissions, and energy developments? What are governments doing in this area?..... 34

What is the potential of using wastewater as part of climate change adaptation strategies?..... 34

D. Recommendations for Islamic Development Bank Group and Its Member Countries.....35

References.....36

Biographies of Moderators and Panel Speakers38

Side Event Leaflet42

About these Side Event Proceedings

The Islamic Development Bank (IDB), the United Nations Environment Programme (UNEP) and the International Center for Biosaline Agriculture (ICBA) organized a side event in collaboration with the Ministry of Land, Environment and Rural Development, Mozambique during the IDB Annual Meeting with a focus on climate change adaptation and the sustainable development agenda. International speakers shared and discussed their diverse experiences and practices in this complex area.

The distinguished speakers and officials framed the issues and brought insight and advice on how IDB member countries can address climate change, and what role international financial institutions such as

the IDB can play. The papers presented and panel discussions of the various speakers and discussants have been collated to prepare these proceedings. These proceedings consider ways of governing and maintaining resources in the sometimes marginal environmental conditions of member countries and the practices and ideas that need to be mainstreamed into the sustainable development agenda and work.





The Editors



Mr. Kamal Belhaj-Jrad

(Manager, Water Resources & Environment Division, IDB)



Dr. Rachael McDonnell

(Head, Climate Modeling and Adaptation Section, ICBA)



Mr. Olatunji Yusuf

(Environment Specialist, IDB)

Acknowledgements

The Agricultural and Rural Development Department would like to acknowledge people whose support and contributions have made this report possible. Our heartfelt thanks go to all the speakers, panelists, and participants of the Islamic Development Bank side event meeting on 'Climate Change Adaptation in the context of the Post-2015 Sustainable Development Agenda', held in Maputo, Mozambique. We would like to thank these experts for sharing their ideas, thoughts and recommendations towards solving one of the most critical challenges of our time – climate change, particularly in IDB member countries. We are very grateful to the Government of Mozambique represented by Mrs. Ana Isabelle Senda Coani, Vice-Minister, Ministry of Land, Environment and Rural Development, Mozambique, for her welcome address. Many thanks also go to Dr. Osman El Fiel, Director of Agricultural and Rural Development Department, IDB, for his welcome speech and Dr. Abdulrahman Sultan Al-Sharhan, Chairman of the Board of Directors, ICBA, for gracing the event with his closing remarks. We also owe thanks to the following speakers for presenting papers at the side event meeting:

- Mrs. Ana Isabelle Senda Coani,
- Mr. Ibrahim Thiaw,
- Dr. Hans Hoogeveen,
- Dr. Rachael McDonnell, and
- Professor Usman Aminu Umar

And the panel discussion of the following discussants:

- Mrs. Ana Isabelle Senda Coani, Vice-Minister, Ministry of Land, Environment and Rural Development, Mozambique,
- Mr. Ibrahim Thiaw, United Nations Assistant-Secretary-General and UNEP Deputy Executive Director,
- Dr. Ismahane Elouafi, Director General, International Center for Biosaline Agriculture (ICBA),
- Professor Usman Aminu Umar, Universiti Teknologi PETRONAS, Malaysia,
- Dr. Rachael McDonnell, Climate Change

Modeling & Adaptation Section Head, International Center for Biosaline Agriculture (ICBA), and

- Mr. Munyaradzi Chenje, Director, Regional Support Office, United Nations Environment Programme (UNEP).

We also extend special thanks to the co-organizers – International Center for Biosaline Agriculture (ICBA), Dubai, UAE, the Islamic Research and Training Institute and the United Nations Environment Programme for their excellent contributions to the meeting.

Finally, our gratitude is also extended to Mr. Ahmed Hariri, Division Manager, Country Programs Department, IDB, who intelligently facilitated the discussions and the editors of the proceedings - Mr. Kamal Belhaj-Jrad (Manager, Water Resources & Environment Division, IDB), Dr. Rachael McDonnell (Head, Climate Change Modeling and Adaptation Section, ICBA), and Mr. Olatunji Yusuf (Environment Specialist, IDB) for their relentless effort in preparing the proceedings for publication.

We are forever grateful to everyone.



Preface

It is widely agreed in many quarters that 2015 is an important year for the world's future. For the global community, it is regarded as the year to operationalize a new blueprint for a successor of the Millennium Development Goals (MDGs) to more ambitious Sustainable Development Goals (SDGs), to expand financing for development from billions to trillions and more important, an opportunity to tackle climate change at all levels. The United Nations 2015 Development Agenda offers an opportunity to end poverty, reduce inequality and to avert the destructive effects of a global temperature rise.

Climate change is obviously one of the critical challenges that humanity faces in this age and time. The impact of climate change is already being felt in critical and vulnerable parts of the world. Among IDB member states, the impact of climate change is manifesting itself in the form of extreme drought and desert encroachment in Sahel, Sudan and Sub-Saharan Africa, higher temperatures in the Middle East and North Africa, and excessive rainfall and flooding in coastal cities and rural communities are on the rising trajectory in South Asia, while social and economic infrastructures are rapidly becoming redundant in many regions and importantly, the risk and vulnerability levels of previously known habitable landscapes are becoming more threatened leading to food and water shortage. Based on this conundrum, adaptation is inevitable. These have resulted in increasing support by nations and institutions to substantially include climate change in their post-2015 development agenda.

From a development perspective, development interventions cannot be separated from the environment that hosts it. The climate-development nexus cannot be overemphasized, with convincing evidence on how climate change exacerbates existing threats and environmental aspects relating to our lives and wellbeing. Climate change is not just one of the rhetoric terms used in amplifying the problems or concerns of environmental advocates. The problem of climate change is our common problem, and has the potential of jeopardizing our common future. In a globalized world, our challenges are becoming more common. We are more connected today than at any other point of time in human history and as such our

responses to a common problem like climate change have to be uniquely and consciously geared towards a common goal, hence mainstreaming climate change across all our development strides.

These proceedings set out to provide answers to the 'HOW' question. Importantly, they will help set out how IDB member countries can respond using efficient, cost-effective and sustainable pathways and interventions to meet their obligations at all levels. The presentations in the proceedings are collated from leading experts, academics and policy-makers with expertise on environment internationally and in IDB member countries.





Welcome Speech from the Director of the AGRD, IDB – Dr. Osman El Fiel

Assalamu Alaikum distinguished Speakers, Brothers and Sisters, Ladies and Gentlemen

I am very delighted and honored to welcome you all to such an important event in this year's IDB Group Annual meeting and we could not have picked a better topic than climate change. This is not because climate change is a heavily contested issue in today's world, but it is because environment is at the core of all IDB Group activities, particularly in the AGR department.

It is true that the world's climate is changing, which is abundantly evident from various scientific findings as well as from observations. Climate change is one of the greatest challenges we have come to live with in this age and time. Indeed, development pathways have a major influence on climate change, and climate change can have significant impacts on development, as they can be mutually reinforcing. Based on this conundrum, adaptation is inevitable. Tackling environmental change is an inherently complex problem requiring robust inter-related policies at international, regional, national and local levels. Adaptation is about development under uncertainty, where capacity to manage risk determines progress, hence it is the rationale for this meeting. This meeting is expected to create a knowledge-sharing platform where the various stakeholders would contribute to our on-going effort to strengthen sustainable practices.

As part of the global community, the problem of climate change is our common challenge and must be solved collectively. I am confident that this meeting with such a significant topic as 'Climate Change Adaptation in the context of the Post-2015 Sustainable Development Agenda' and the cohort of speakers will do justice to the 'how' question and consolidate efforts made by our member countries and the global community at the various Conference of Parties meetings organized annually by the United Nations Framework Convention on Climate Change. More so, it would present an opportunity to revisit our development objectives and strategies from a dynamic and robust perspective with the central notion of sustainability. Importantly, it would further strengthen the relationship ties between our various organizations.

On behalf of the IDB Group, I would like to thank the Government of Mozambique for hosting us and every one of you for honoring our invitation. We hold you in high esteem and I wish you a momentous and rewarding meeting. Salaam.



Opening Remarks by the Vice-Minister, Ministry of Land, Environment and Rural Development, Mozambique - Mrs. Ana Isabelle Senda Coani

Good afternoon,

Your Excellency, Representatives of the Islamic Bank,

Your Excellency, Representatives of our Partners, Distinguished Guests, Ladies and Gentlemen.

First of all, my name is Ana and on behalf of the Ministry of Land, Environment and Rural Development, I would like to welcome you to the 'Adaptation to Climate Change in the context of the Post-2015 Sustainable Development Agenda'.

This meeting is happening at a time when the country is affected quite often by climate change. I would also like to address special greetings to IDB for their remarkable contributions in the funding of various initiatives in our country. My thanks are due for your effort to make this event come true, and for the numerous advantages that follows. I would like to say that it is a privilege for the country to host such an event. I would also like to greet all the scholars and research institutions whose research offers solutions for sustainable development within the context of climate change to the member countries of the Islamic Bank.

Dear participants,

The issue of adaptation to climate change is one of the priorities on our National Agenda. Climate change affects the country mainly on human and social levels and the different social and economic sectors in our country. The Mozambican government has started the implementation of the agenda on adaptation to climate change. We have identified instruments that would make it possible to fight the effects of climate change by constructing resilient infrastructure that would contribute to the development of the country and I would like to inform you that our country is benefitting from adaptation projects in various capacities. These projects also assist in the definition of the legal framework through policies, strategies and programs of some sector players in all that concerns the adaptation to climate change. We have an endless list of objectives that have been defined within this project and these objectives have to do with the establishment of adaptation mechanism in plan in the long term.

Our policy framework includes resilience in various sectors, including bonuses in the priority sectors that are in line with our economic policies. The priority sectors are infrastructure, education and health. We also have the objective regarding the creation of National Options for funding adaptation to climate change.

The last objective I would like to mention is the implementation of a system for the facilitation of the dissemination of knowledge on climate change, particularly on resilience and climate change.

Ladies and gentlemen, today is a unique moment when we have an opportunity to discuss with the various partners and have a reflection on climate change adaptation. The year 2015 is important towards the implementation of our Sustainable Development Agenda. Without further ado, I would like to thank you all and welcome you to Mozambique.



Presentation Summaries and Discussion

A. Session I: Framing the Issue

Climate Challenges in IDB Member Countries: Challenges and Opportunities
by Dr. Rachael McDonnell, Head of Climate Change Modeling and Adaptation
Section, International Center for Biosaline Agriculture (ICBA).

The IDB covers many different environments and geographies, so climate change is going to bring varying impacts in both extent and scale. The IPCC report, the main source for synthesized knowledge across these different parts of the globe, highlights the many different challenges. Focusing on Africa, here temperature changes when compared to the average values for the last century (1901-2012) are predicted to be 3-4 degrees C by the mid-21st century in many places under scenarios of business as usual (RCP8.5), and even greater by the end. These are average temperature changes and not the extreme heat waves that may be experienced. This will bring challenges to current food production systems, parts of the economy, infrastructure such as roads that can continue to be used, as well as health and water systems. Temperature has important impact on triggering various responses in crops during key stages of the growth cycle. Therefore, changes in timing and values for these critical temperatures can greatly affect yield and crop viability.

The changes to precipitation are likely to be more complex with less certainty in the predicted values from the many models used. As the maps show, in some parts of the continent, particularly in the tropical zones, precipitation will increase, whilst in others there will be less bringing challenges to water security.

The ability to grow rain-fed crops maybe reduced and supplementary irrigation required to maintain production systems. The changes in the climate challenge us to think differently about investments, risk and uncertainty as the longevity and returns on finances maybe enhanced or undermined by the new normal conditions. The flows in a river might be more variable meaning that irrigation and water supplies to different sectors are more challenging to manage. New investments in

Figure 1: Baseline conditions and multi-model predicted changes to temperature under two different greenhouse gas emissions scenarios - RCP2.6 and RCP 8.5 (IPCC AR5 reports)

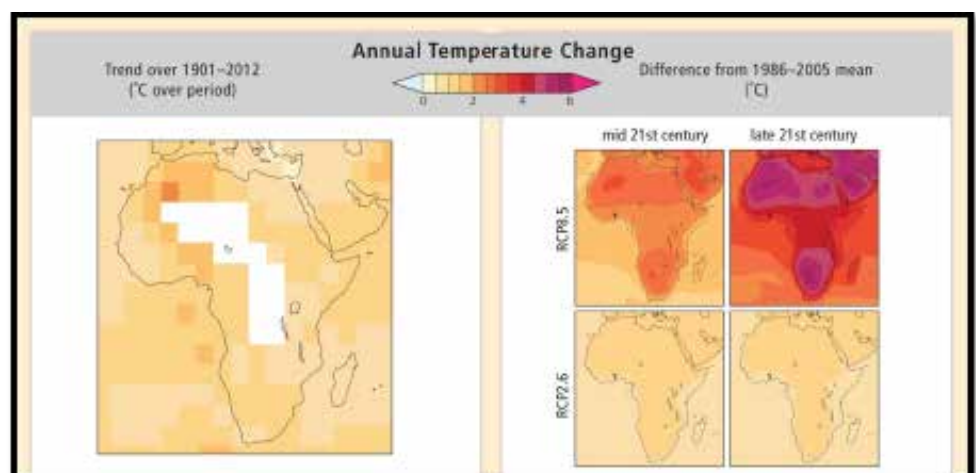
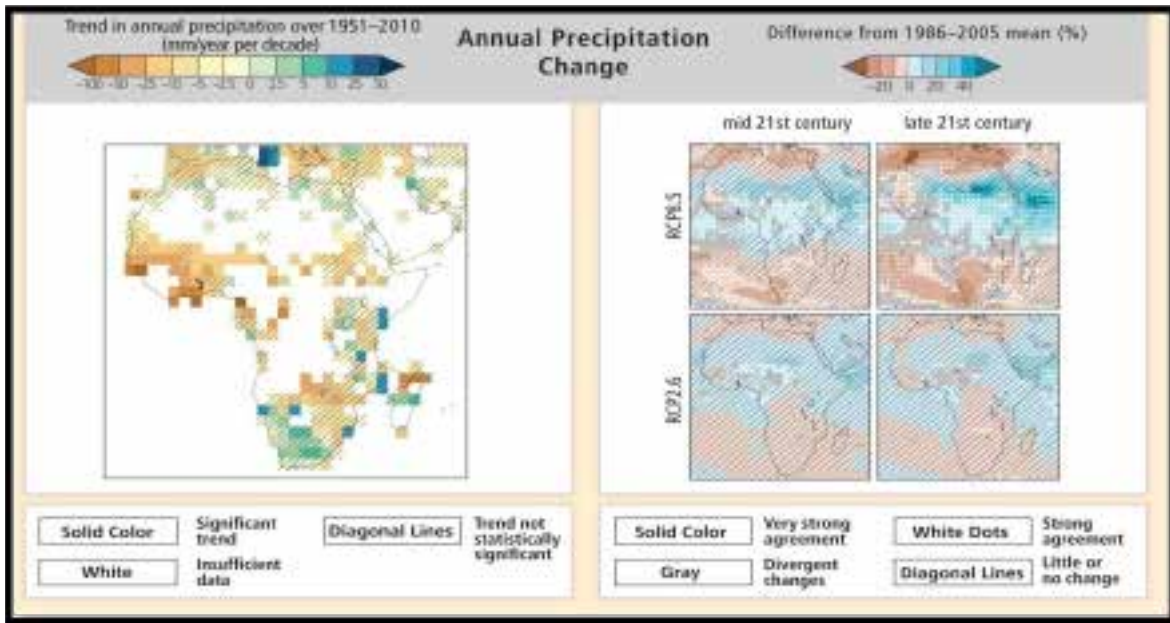


Figure 2: Baseline conditions and multi-model predicted changes to precipitation under two different greenhouse gas emissions scenarios – RCP2.6 and RCP 8.5 (IPCC AR5 reports)



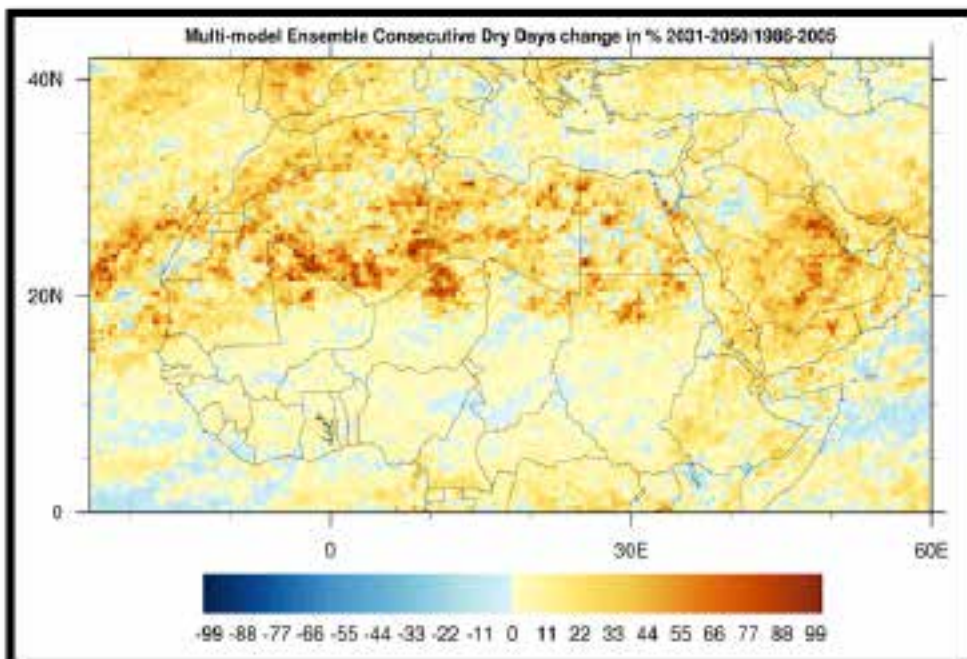
water provision infrastructure or the ability to manage increasing salinity levels may be required on productive lands, whilst some areas will become more marginal and current farming activities cease. Recently, in South Africa larger storms were experienced whilst the average climate conditions remained the same. The increase in wet and dry extreme events is challenging water supplies systems as well as damaging through erosion or desertification land areas.

Some of the climate change work at ICBA has been focusing on droughts in the Middle East and North Africa (MENA). From the results obtained from regional downscaling of global climate change models

that best represent the climatology of the MENA, we have gained a new insight into the likely changes, particularly in precipitation conditions. The findings show an increase in the number of consecutive dry days, a good indicator of growing aridity, and this is likely to increase the challenges of farmers operating under rain-fed conditions. With groundwater irrigation often the only alternative resource to natural inputs, the need for enhanced regulation and management of the aquifer systems will be more pronounced.

Findings of recent research that has just been published give insight on current drought conditions and causes (Bergaoui et al, 2015). From extensive modeling it was

Figure 3: Results of climate change downscaling work at ICBA that highlight the increase in numbers of consecutive dry days (ICBA)



shown that 45% of the cause of the very dry winter of 2013/4 in Jordan/Palestine/Lebanon was human-induced climate change, alongside natural variability in atmospheric systems (55%). This drought had a marked effect in many of the agricultural zones in these countries leading to greater groundwater extractions to support irrigation systems that would normally have been fed by river flows. Many of these aquifer systems are non-renewable, meaning that those water resources are lost to future generations.

Given the predicted impacts in many IDB countries, there is a need to develop adaptation plans so that current and future generations are not adversely affected and resources are managed effectively and sustainably to meet the identified needs. The development of adaptation plans is patchy across the countries, and whilst the developed ideas of Mozambique were presented in the side event, not all are as well prepared and have undertaken the analysis needed. Some of the lagged response can be understood as a mismatch in perceived timing for the effects. With decision-makers needing to concentrate on issues and the political situations of the present, climate change is thought to be something that will impact in twenty years time, so is not an immediate priority. It is also sometimes considered to be something that will affect other countries more such as through sea-level rise and melting ice caps, issues that again are not always a priority in IDB countries.

Considering the likely changes in climate is not just about concentrating on negative impacts and enhanced risks. The impetus and the possible sources of funding also offer opportunities for many sectors to introduce new technologies and management systems to increase resource use efficiency and protect natural systems. For example, agricultural research findings and technologies can bring improvements to irrigation, to crop species selection, to improve efficiency of food chain networks which in turn can help rural livelihoods.

International organizations such as the IDB have an important role to play in helping countries adjust to climate change. They have access to experience and knowledge from working across the globe and they can bring the international and regional to the local to build on lessons learnt and innovations that have been useful. Given that many of their funded projects involve technology and engineering solutions, their expertise in procuring, building and operating projects is invaluable to countries that are using these in their adaptation strategies. And of course economic and policy solutions are equally important as well as the ability to mobilize finance to support developments are all key dynamics in any programs for managing climate change.

The challenges and opportunities of a changing climate are increasingly being acknowledged in IDB member countries. The rich pool of expertise with and between the different nations, their researchers and decision-

makers in tandem with knowledge from international finance organizations and centers of excellence means there are real opportunities to develop adaptation strategies that will help manage the impacts and secure economic and social development for all, including the most vulnerable.

B. Session II: Responding to the Issues and the Way Forward

Case I: Mozambique National Strategy for Adaptation and Mitigation of Climate Change

Mozambique is prone to natural disasters and extreme weather events, especially droughts, floods and storms. Geographically located on the south-east coast of Africa, the country extends from the Rovuma River (10o30'S) to the border with South Africa (26o49'S). It has a coastline of about 2,500 km that spans seven (7) of its 10 provinces. This makes the country highly susceptible to the effect of ocean currents and air-sea interactions on its marine ecology and resources, as well as on food production and security in the coastal zone. Most people in Mozambique depend on agriculture for their livelihoods, with severe drought occurring every three to four years. Many regional river basins also converge in Mozambique, making flooding a perennial threat, especially when coupled with tropical cyclones. Having recognized the major environmental challenges as climatic shocks and seasonal variability, overharvesting of marine and timber resources, and uncontrolled fires, Mozambique urgently needs a coordinated approach to tackling climate change. In response to this plethora of environmental challenges facing the country, the Government of Mozambique adopted a National Strategy for Adaptation and Mitigation of Climate Change (ENAMMC).

National Strategy for Adaptation and Mitigation of Climate Change (ENAMMC)

The National Strategy for Adaptation and Mitigation of Climate Change (ENAMMC), is an inter-sectoral program led by MICOA, the Ministry for Environmental Coordination, and coordinated by an inter-ministerial body, CONDES, the National Council for Sustainable Development. The strategy was approved by the Council of Ministers in November 2012. This plan grew out of a National Action Plan for Adaptation to Climate Change (NAPA) that was agreed with UNFCCC, of which Mozambique is a signatory.

ENAMMC is broadly aligned with the Strategic Program for Climate Resilience (SPCR), an international finance facility approved in 2010, and operated in Mozambique by the World Bank. The SPCR seeks to support the mainstreaming of climate resilience through piloting and demonstration investments in programs designed within the context of sustainable development and poverty reduction. Most of the climate change adaptation and mitigation activities currently underway in Mozambique originated under the NAPA or in specific initiatives by other Ministries, sector bodies funded through the UN system (UNEP, UNDP etc.) or through the SPCR budget for pilot activities, or in some cases by NGOs. The actions undertaken in the ENAMMC Plan fully align with the following specific objectives of NAPA as follows:

- Strengthen the early warning system in the country;
- Strengthen the capacities of family farmers to deal with the adverse effects of climate change;
- Improve the knowledge and strengthen the management of river water;
- Promote actions to limit erosion and to develop sustainable fishery activities;
- Promote public education activities and information dissemination on climate change;
- Improve the coordination between the various groups that work on issues related to the evaluation of climate change vulnerabilities and hazard risk reduction;
- Promote the integration of climate change into decentralized district planning.

The overall objective of ENAMMC is to establish guidelines for action to build resilience, including the reduction of climate risks, communities and the national economy and promote the development of low carbon and green economy through its integration in the sectoral and local planning process. The specific objectives are: (i) make Mozambique resilient to the impacts of climate change, while minimizing the climate risks to people and goods, restoring and ensuring the rational use and protection of natural capital and buildings; (ii) identifying and implementing opportunities to reduce GHG emissions contribute to the sustainable use of natural resources and access to financial resources, technology at affordable prices and the reduction of pollution and environmental degradation by promoting a low-carbon development; and (iii) build institutional and human capacity as well as exploring opportunities to access technical and financial resource for implementing ENAMMC.

The strategy presents a national priority to adaptation and mitigation of climate risk, while recognizing the need to seize the opportunities that the country has, without prejudice to the development of actions to reduce the

impacts of climate change through a set of mitigation measures and low carbon development. Additionally, it recognizes the need to adjust policies and matching institutions, build capacity for implementation at all levels, generate knowledge and spread it to society in general with a view to making informed scientific decisions.

The strategic actions of ENAMMC are thus grouped within two main pillars and cross-cutting issues indicated below:

1. Adaptation and Climate Risk Reduction

- i. Strengthen the early warning system,
- ii. Response preparedness capacity to climate risks,
- iii. Increase the management capacity of water resources,
- iv. Increase access and the ability to capture, store, and process water supply,
- v. Increase the resilience of agriculture and livestock,
- vi. Increase the resilience of fishing,
- vii. Ensure appropriate levels of food safety and nutrition,
- viii. Increase adaptive capacity of vulnerable people,
- ix. Reduce people's vulnerability to disease transmission vectors associated with climate change,
- x. Ensuring protection of biodiversity,
- xi. Promote tree planting and establishing mechanisms for local forest use,
- xii. Develop resilience mechanisms in urban areas and other settlements,
- xiii. Tailor the development of tourism and coastal areas to reduce impacts of climate change.

2. Mitigation and Low-Carbon Development

- i. Improve access to renewable energy,
- ii. Increase energy efficiency,
- iii. Ensure compliance of regulated standards for emissions in the activities of extractive industry,
- iv. Promote low-carbon urbanization,
- v. Controlling emissions from industrial processes, including waste and effluent,
- vi. Develop low-carbon agricultural practices,
- vii. Reduce the rate of deforestation and uncontrolled fires,
- viii. Plan and manage biodiversity and coastal

ecosystems,

- ix. Manage and enhance waste.

3. Cross-Cutting Issues

- i. Adjust the existing legal framework in line with the national climate change strategy,
- ii. Adjust the existing institutional framework in line with the national climate change strategy,
- iii. Develop research on climate change,
- iv. Strengthen institutions that collect data that feed the GHG inventories and National Communications,
- v. Develop and improve the level of knowledge and intervention capacity on climate change,
- vi. Promote the transfer and adoption of clean technologies resilient to climate change.

The information below was adapted from the GCCA+ (2015) Report

The main expected results and activities of the Mozambique National Strategy for Adaptation and Mitigation of Climate Change are as follows:

a. The institutional capacity and technical expertise of key government institutions is strengthened.

This involves reviewing relevant sectoral development strategies to improve the mainstreaming of environmental and climate change themes. These reviews are to be set against the most recent legal and policy framework. Actions are also undertaken to strengthen MICOA's leadership and mandatory role as a focal point in environmental affairs; and to improve the coordination and monitoring of both government and donor-relevant interventions.

Other courses of action include strengthening the environmental monitoring system to adequately measure sector performance; promoting good governance practices; improving compliance with relevant legal and regulatory framework; and providing a clear reference for enhanced coordination and linkages between all government and non-state actors, at central, provincial and district levels.

b. Information sharing and awareness campaigns are carried out, together with dedicated training courses.

This involves activities to increase the understanding of climate change issues amongst key stakeholders, including civil society and learning institutions at secondary and university levels; as well as actions

aimed at improving responsiveness to climate change amongst key development agents at all levels from central to local. On-the-job training for relevant staff at the local level, and the identification of information networks to promote climate change awareness through the cross-dissemination of local knowledge, are also being undertaken.

c. Implementation of the national response to climate change (Environment Strategy for Sustainable Development, National Adaptation Program of Action) is supported by putting into practice a number of pilot projects, mainly in the agrarian and agroforestry sectors.

Environment-related institutions are invited to conduct applied research and studies supporting the development of innovative solutions to climate change.

Actions are also being undertaken to identify appropriate adjustment and coping strategies linked to land use in the rural environment, in support of the adaptation of traditional farming and livelihood systems to the changing climatic conditions in vulnerable areas.

Concrete adaptation measures are being implemented in selected vulnerable areas to reduce the vulnerability of the local productive systems and improve resilience to climate change amongst target rural communities.

A case of GCCA+(2012) Mozambique Sector Policy Support Programme

The Key Achievements of the GCCA+ for Mozambique National Strategy for Adaptation and Mitigation of Climate Change are:

- An institutional performance study has been completed, followed by finalization of a training needs assessment.
- Phase II of the National Institute for Disaster Management (INGC)'s study on the impact of climate change has been completed (reports are available in EN and PT).
- One of the flagship activities in the National Climate Change Strategy (ENMMC 2013-2015) is the development of Local Adaptation Plans (PLA). The support to the Ministry of Land, Agriculture and Rural Development (MITADER) and the ex-Ministry of Planning and Development (MPD) began in early 2013. 10 staff members from the central level and 32 people from the provincial departments of MITADER and ex-MPD and 35 district staff were trained in four separate training events on Climate Vulnerability Capacity Assessment and elaboration of Local Adaptation Plans with involvement of communities. In 2014 key staff

members at the central and provincial level were trained in the use of “Theory of Change” in a Training of Trainers approach in order to assist the districts in developing their PLA. In parallel, the team at central level consisting of staff from several institutions developed the Methodological Guideline on Elaboration of Local Adaptation Plans. In 2014 this guideline was used to support districts in preparing their PLA. Seventeen local adaptation plans (PLA) at district level received support in 2014. By the end of 2014, 13 districts had draft PLAs. The District of Guija was the first to approve its PLA. The preparation of eleven more PLAs will be supported in 2015.

- Seventeen local adaptation plans at district level have received support and are expected to begin implementation in 2015. Ten more local adaptation plans will be supported in 2015.
- MITADER has supported implementation of over a hundred of small to medium-scale activities which are carried out by provincial or district authorities in most vulnerable areas based on the ENMC approved in 2012.
- In 2012, the Government of Mozambique (GoM) assumed a commitment towards the Green Economy. In October 2013 the Council of Ministers approved the Plan of Action for the Green Economy 2013-2014.
- The “Strategic Environmental Assessment of the Coastal Zone of Mozambique” was finalized in the first half of 2013. It is considered as a key document for environmental management and climate change adaptation.
- The program is taking the lead in the introduction of a monitoring system with a fully aligned performance based on achievement of targets combined with monitoring of financial execution in relation to the achievement of these targets, linking planning with implementation and budget execution. The monitoring system provides a basis for monitoring cost-effectiveness in implementation and budget discipline in relation to the use of funds as specified in the approved annual plans.
- The National Institute for Disaster Risk Management (INGC) is a key beneficiary of this program. During the last two years, the planning and monitoring process has been considerably strengthened with six provinces (out of 10) being covered. Key planning staff at the central and provincial levels received training in planning, monitoring and evaluation.
- Also, the program supported data collection and mapping of areas at risk of droughts, floods, cyclones, and earthquakes. Risks maps for 11 districts are ready for printing while data

collection has been completed for another 6 districts. Furthermore, a topographical study has been carried out in part of the Zambezi Basin that aims at improving forecasting of the impacts of various magnitudes of floods. These activities will enhance the capacity of INGC and other institutions to plan better and reduce vulnerability to climate change.

- The program is also supporting the development of early warning systems in the Messalo Basin in the northern part of the country and in Chokwe town in the Limpopo Basin in the southern part of the country.
- Activities under implementation at provincial and district levels on adaptation and risk management include:
 - » Planting and rehabilitation of 229 ha of mangrove. An overall Action Plan for Mangrove Rehabilitation is also under elaboration with support from the IUCN;
 - » Installation of 105 rainwater harvesting facilities varying in size from 68m³ to 2500 m³;
 - » Creation and revitalization of a large number of local risk management committees of which 59 benefited from risk management kits that enable prevention of loss of life and possessions during floods;
 - » Conservation agriculture and more drought resistant crops such as cassava and sweet potatoes were promoted by creating demonstration fields of a ½ to 1 ha each;
 - » Two major excavated reservoirs for water storage in areas with water deficit were constructed;
 - » A feasibility study was carried out and a business plan developed for creating artisanal production of amarula oil for the cosmetic industry. Such a production can potentially improve local income and job opportunities in very vulnerable semi-arid areas by using a local and abundant resource.

GCCA+ Actions related to the mitigation of climate change were associated with the following thematic areas:

- National inventory system for greenhouse gases.
- With the objective of elaboration of an energy flow diagram which will permit the calculation of greenhouse gas emissions data from the energy sector, the Ministry of Energy collected

data on biomass in Nampula and Cabo Delgado provinces. The first report on the data collection and development of the database is expected in early 2015.

- In relation to the establishment of a National Inventory of Greenhouse Gas Emissions, a course was held for staff in key ministries on the Intergovernmental Panel on Climate Change methodologies of setting up a national inventory system for greenhouse gases. The course was organized on a thematic basis which permitted the addressing of the issue on energy, forests, waste and agriculture with the relevant staff from different government institutions.
- Low energy housing with local materials.
- The Foundation for Low Cost Housing under the Ministry of Public Works and Housing leads a project on building a model house with low energy consumption and application of renewable energy technologies.
- Reduced emission initiatives include activities to reduce uncontrolled forest fires, promotion of improved cooking stoves, sustainable energy technologies, forest rehabilitation and planting.
- Sustainable use of biomass.
- The Strategy on sustainable use and conservation of biomass for energy prepared by the Ministry of Energy was approved by the Council of Ministers in November 2013. In 2014 the strategy was disseminated at events in seven provinces.
- A large number of awareness-raising campaigns were launched across the country to reduce the incidence of bush fires. An additional initiative was the creation of honey production associations and the distribution of over 3500 bee hives to support the development of sustainable incomes without the use of fire to clear lands for cropping.
- In order to improve the efficiency of firewood usage, more than 1600 improved charcoal cook stoves and 79 improved institutional stoves for firewood have been handed out. These initiatives were accompanied by a large number of awareness-raising events.

Lessons learned:

- The process of developing the national climate change strategy has highlighted the importance of allocating appropriate resources to support analysis and discussion between the various stakeholders involved in institutional arrangements associated with climate change actions.

- The program has enabled MITADER to implement environmental and climate adaptation activities on the basis of a cross-sectoral, decentralized approach involving a range of sectors at provincial level and with an average of three districts in each province. Monitoring efforts must now focus on gathering relevant experience and providing recommendations that can lead to the necessary adjustments in procedures, implementing arrangements and the focus of activities. Lessons learned should be communicated across all relevant partners.

Way forward:

Although still at the early implementation phase, the Mozambique National Strategy for Adaptation and Mitigation of Climate Change has been regarded as successful in many quarters. To facilitate more effective implementation of this strategy, cross-sectoral participation of actors at different levels from national to community should be further strengthened. So far, the program implementation is proceeding with a focus on strong government coordination and ownership, timely budget approval and execution and faster availability of funds via government systems but private sector and civil groups full engagement can further enhance far-reaching outcomes.

Case II: Climate-Smart Agriculture by Dr. Hans Hoogeveen, Vice Minister for Agriculture, Ministry of Economic Affairs, the Netherlands.

Since 2010 the NL government has worked very hard to bring the issues of agriculture, food security and climate change together. Why? Because if addressed separately, we are convinced, we can't address the challenges of a growing population in a changing climate.

One of the greatest leaders of our time, Nelson Mandela, said: "We must use time wisely and forever realize that the time is always ripe to do right." As we are faced with war, terrorism, and deadly diseases such as Ebola, bold action is needed now more than ever. We need bold action to stop the moral outcry that almost 1 billion people still go to bed hungry every night. We need it to achieve food security and to feed over nine billion people in 2050. And we need it to overcome the devastating impact of climate change. And we know what bold action implies. We know what the solutions are to achieve global food security. We have to increase our agricultural production in a sustainable way, by at least 60 percent. And we have to double our efforts to reduce our use of natural resources. Even more importantly, we have to deal with climate change, which has devastating effects especially in Africa.

However, the question is: are we really willing to take this bold action today? Agriculture is nowadays rightly considered a key part of the solution. Farmers are key to increasing production, to promoting sustainable change across the entire agricultural system, and putting fairness and the environment at its heart. These words spoken by Kofi Annan symbolize climate-smart agriculture.

In the run-up to the Climate Summit last September we helped facilitate the evolution of a new working coalition: the Alliance for Climate-Smart Agriculture. This alliance is built on the fundamental principle that no nation can address these issues alone. The alliance is designed to support:

- A sustainable and equitable increase in agricultural productivity and income;
- Greater resilience of food systems and farming livelihoods to climate change; and
- Reducing greenhouse gas emissions, wherever possible.

All stakeholders need to get on board and do what they can do best. Governments should provide policy conditions and enabling environment.

- The private sector needs to invest in climate.
- Civil society makes sure all interests are heard.
- And science provides the necessary evidence base.

The launch of the CSA Alliance can be seen as a new beginning for agriculture. By resetting the button, agriculture can be at the heart of the solution for climate change and food productivity. However, there is no need for complacency. The jury is out to see whether we collectively can and will deliver on our commitment of 500 million farmers practicing climate-smart agriculture by 2030.

In September in New York for the SDG discussions and later this year when the eyes are on Paris for a climate deal, we have an opportunity to further advance the CSA agenda. For starters, the CSA Alliance needs to give a signal for economic transformation. An economic system in which growth of agricultural productivity is decoupled from growth in carbon emissions. We have seen examples where this has been done - from smallholder farming in Kenya to rice paddy fields in Vietnam. But these are just examples, and we need transformational change at scale.

The recent droughts in different regions have made clear that the impacts of climate change are not a future event - it's happening now. It also tells us that all countries face the brunt of climate change - this is no longer an issue in faraway places. This requires a whole suite of interventions.

Partnerships between the private sector, research

institutions, civil society and governments will be crucial. Let us also focus on increasing the capacity of farmers to cope with external challenges, particularly climate change. That is why we have been so active in putting climate-smart agriculture firmly on the international agenda. We need the insurance industry stepping in to provide those who are most at risks with better seeds, products and more market access. We need the retailing industry to drive out inefficiency - food loss and food waste - from their value chain. The Netherlands government is hosting an important agenda setting conference on this next month and we count on your support. And we need the alliance to overcome bureaucratic stumbling blocks. At the same time we also need a clear policy signal from New York and Paris that the agricultural system of the past is not fit for purpose for the future.

The solutions are there. Political momentum bolstered by action and innovative solutions such as those stemming from your dialogue today are crucial to our collective journey.

Case III: Rethinking Sustainability and Development in Post-2015 Development Agenda: Mr. Ibrahim Thiaw, United Nations Assistant-Secretary-General and UNEP Deputy Executive Director.

As we gather today, here in Maputo, the Earth is on the verge of systemic changes unlike any we have seen before. We have entered into what some have called the "Anthropocene" - an era in which our intensive use of the planet's finite resources has a significant and measurable impact on the Earth's ecosystems. Looking at it from a Muslim point of view, we are still not living up to the "trusteeship" (khalifa) and "responsibility" (Akhirah) that God has given us upon the earth and our environment.

Climate change is arguably the most dramatic consequence of our way of life. Greenhouse gases from anthropogenic emissions - over 30 gigatons a year and rising - are causing widespread negative impacts on societies, economies and the environment.

Some Islamic scholars are of the view that Quran makes reference to climate change, notably in Surah 21, Aayaa 44 and Surah 13, Ayaa 41. Ahmad Hassan, for example, holds the view that the current extensive melting of the ice cap was anticipated by God when he refers to `Nuqs` (decrease, lessen) of `Al Atraaf` (edges or tips) of `Al Ardh` (Earth).

In the run-up to the climate conference in Paris, much of the world's attention focuses on how strongly nations commit to a framework for cutting greenhouse

gas emissions—a crucial step in ensuring that the global temperature rise this century is kept below 2° Celsius compared to pre-industrial levels. Key preoccupations from member countries of the Islamic Development Bank most likely center on how they will cope with climate change. How will climate change affect development? How will the additional costs be covered? How to mobilize the necessary financial and human resources? Even if we limit global temperature rise, climate change is here to stay. Countries are already facing more extreme and frequent droughts, sometimes alternating with floods, land degradation and other disastrous events. In the Middle East, the red flag has already been raised on the consequences of increasing sandstorms and their severe effects on health, economy and quality of life.

Climate change will hit hard. While the poorest countries and the weakest populations will be suffering the most, let us be clear: all countries and all classes of our society will be affected. Therefore, all countries, regardless of their level of development need to prepare themselves. A broader involvement of the international financial sector will be crucial to addressing that challenge, recognizing that the coping abilities of the developing countries, Least Developed Countries and Small Island Developing States are incomparably lower than those of high-income nations, making them particularly vulnerable to the impacts of climate change.

This is especially true for Africa as evidenced in the 2015 Africa Adaptation Gap report published by UNEP. The report argues that the costs for Adaptation in Africa can soar to USD 50 billion per year. The report indicates that Africa is the continent where a rapidly changing climate is expected to deviate earlier than across any other region from “normal” changes, having a severe impact on agricultural production, food security, human health and water availability. And, like for most of the human and sustainable development issues, the question is going back to: yes, but who will be paying? The answers point to challenges but also many opportunities.

Investing in adaptation is critically important to save humanity from catastrophic consequences of climate change. But there are serious funding gaps. UNEP published in 2014, at the Lima COP, the first Global Adaptation Gap Report. The report looked at three main gaps, including the finance gap. It found that there will be a significant funding gap after 2020 unless new and additional finance for adaptation is made available.

It is estimated that adaptation costs may reach USD 250 to 500 billion annually by 2050, even if the 2 degree temperature limit is met. The current amount of public finance committed to activities with explicit adaptation objectives (estimated for the period 2012-2013) ranges between USD 23 billion and USD 26 billion, of which 90 per cent was invested in developing countries. That's how significant the gap is.

At the climate meeting in Lima last year, a major boost was given to the Green Climate Fund as it got capitalized at more than USD 10 billion. It is however still too early to have a clear picture of how much will effectively be spent on concrete adaptation actions on the ground. Notwithstanding the wide funding gap, it is encouraging to note a large increase in resources allocated for adaptation over the recent years; this indicates how climate change concerns are increasingly integrated in sustainable development, green economy and climate resilient development strategies.

Indeed, there is growing awareness of adaptation needs at national and local levels as the impacts of climate change are factored into budgets—although further steps are needed to ensure funding, technology and knowledge gaps are addressed fully in planning and budgeting. The largest remaining gap is in the investment in combating climate change, especially in adaptation measures. Unless current barriers for private investments in climate-resilient societies are removed, financing for adaptation is likely to largely depend on public funds. International finance can contribute to developing countries' efforts to cope but will not suffice. Indeed, costs for adaptation will have to be borne by poor nations forcing them to divert scarce domestic resources from essential sustainable development investments.

The good news is that options exist for a comprehensive global response to climate change. Climate finance opens great prospects for the participation of capital markets which control trillions of dollars in assets. Following the financial crisis, it has finally been widely acknowledged that the financial system needed reform, and be part of the solutions to serve the long-term health and sustainability of the global economy, responding to the direct challenges facing our ecosystems and changing climate. If brought to scale, the global financial system could help close the widening gap in climate change adaptation and sustainable development investment.

This issue has been at the heart of the research conducted since 2014 by the UNEP inquiry into the Design of a Sustainable Financial System. Its work in over 15 countries, so far, reveals the need to speed the transition to an inclusive sustainable economy, which requires the channeling of trillions of dollars annually into green investment and many more trillions away from pollutant and natural resource intensive investment, which will also require enablers, policy reforms and incentives for the financial markets.

An encouraging example is being set by the UNEP Finance Initiative's Principles for Sustainable Insurance (PSI) - the largest collaborative initiative between the UN and the insurance industry. Its 80 members representing more than 15 per cent of world premium and USD 9 trillion in assets have pledged concrete actions on risk management, insurance products,

investment and partnerships that promote disaster risk reduction, climate change adaptation and mitigation, financial inclusion and sustainable investment. However, the overall participation of the global financial system in funding climate adaptation is still modest, compared to its potential.

The Agenda for 2015 - Opportunities for Boosting Sustainable Investments

The advent of the Sustainable Development Goals (SDGs) to be adopted at the UN New York summit in September offers an opportunity to bring the necessary commitments and implementation tools to achieve a sustainable development and fight climate change. The new agenda, which will set the path towards 2030, integrates all three fundamental dimensions of sustainable development: the economic, environment and social. In order to be achieved, it will need a strong means of implementation, mainly finance, technology facilitation and innovation.

The proposed list of SDGs suggests notably that climate mitigation and adaptation will be mainstreamed across the Post-2015 Development Agenda, incorporating them into the global development roadmap, towards which the majority of development financing, both public and private, will be directed in the 15 years to come. This mainstreaming offers incredible opportunities for climate change to be at the heart of trade, innovation, technology and infrastructure development plans.

Financing is critical to the success of this globally agreed pathway. The billions of dollars required for climate change adaptation are just the tip of the iceberg. Globally, investment required in water, agriculture, telecommunication, power, transport, buildings, industrial and forestry sectors is estimated to be roughly USD5-7 trillion annually. To significantly reduce the climate change risks, through mitigation efforts, an additional investment of USD13 trillion is needed between 2015 and 2030. This scale of capital mobilization is certainly possible. For instance, since 2004 around USD2 trillion of financing have gone into the renewable energy sector globally, with investment levels rising from almost nothing to nearly half of all power sector investment today. However, the capital mobilized over a decade for renewables will now be needed annually to finance the SDGs in developing countries where the annual investment gap is USD2.5 trillion.

But to focus on these incremental costs alone would be short-sighted. Reforms within the financial system are also necessary. UNEP's ongoing research indicates that a fundamental shift in the way financial markets are geared and governed for delivering on investment is required. The entire financial system - comprising more than USD 300 trillion dollars in assets - needs to be deployed to making our economies green, inclusive,

and fit for purpose in delivering on improved human wellbeing and equitable development.

In this process, Islamic finance, Islamic banking regulations can play a central part, with its assets growing at an annual rate of 17 per cent during the 2009-2013 period and estimated to exceed USD2 trillion in a couple of years. The principles of Islamic finance, based on collective responsibility, support a socially inclusive development with the aim of preserving the wealth by circulating it and protecting its value. Islamic financial institutions in society such as alms (Zakat) and endowment (Waqf) can contribute to the institutional overhaul of the global financial system necessary to enact the world's development and climate action agenda.

The road to financing climate change and more broadly sustainable development, leads through institutional innovation. Multiple new solutions have already been identified by the UNEP inquiry into the Design of Sustainable Financial Systems. From Russia's energy-saving policies and India's ambitious renewable energy targets and forest-based budgeting to South Africa's Green Fund, Brazil's Sao Paulo sub-national green economy initiative and China's articulation of the Ecological Civilization. BRICS nations are already pioneering the green economy transition in their domestic contexts.

In the Islamic region there are more honed innovations, such as green "Sukuk" - a form of equity instrument used in Islamic banking. There is much to be gained by learning more from and upscaling of local financial instruments that come naturally from the Islamic world and that is why UNEP is very pleased to be included in meetings such as the one today.

Looking Ahead

What is evident from the challenges and opportunities I have highlighted is that we need to change the way we do business. States, international organizations and the public sector in general are expected to push commitments and show genuine political will to help countries affected by climate change, disasters and environmental degradation, carrying forward agendas and policies that preserve our environment, create jobs and leave no one behind.

The task at hand is too complex, too urgent and too large to handle alone. It is by working together that we will achieve our sustainable development and climate action goals. Cooperation among like-minded institutions will enhance our collective impact. There is a growing number of international and regional institutions that are championing the green growth and green economy agenda. The Asian Development Bank, the African Development Bank and others have adopted the green growth agenda as part of their core

strategy in recent years. The creations of the BRICS Bank and of the Asian Infrastructure Investment Bank follow the same path. They all pledge to be green. Countries around the world are taking the initiative to transform their economies into more sustainable, more resilient and more inclusive, shaping their growth trajectories around a sustainability framework.

The public and private sectors have to create meaningful partnerships in order to achieve a sustainable development that leaves no one behind. And there are ample opportunities for joining forces in delivering technical, policy and capacity support to the countries of the region, building on multi-stakeholder partnerships and alliances. UNEP is facilitating cooperation and partnerships among interested institutions, including those at the national level, and welcomes the chance to engage further with the Islamic Development Bank.

Let us join together to realize what will potentially be one of the most important changes in our international economic landscape - the reshaping of the global financial system, such that it plays a productive and emphatic role in financing sustainable development and climate action. A simple message brought from the heart of Africa says: if you want to go fast, go alone; if you want to go far, go with many. Let us go together!

Case IV: Impact of Public Awareness and Participation on Climate Change Mitigation and Sustainable Development: Professor Usman Umar, Department of Civil and Environmental Engineering, Faculty of Engineering, Universiti Teknologi PETRONAS, Tronoh, Perak, Malaysia.

Let me start with the statement of Sir David Anthony King, the former Chief Scientific Adviser to the British Government who said and I quote “climate change is the most brutal problem we are facing today more serious than the danger of terrorism”. We are all climate change activists. Climate change will have far-reaching consequences with regard to the health, wealth and well-being of many people. The greater percentage within our population is susceptible to the impact of excessive climatic conditions events like droughts and flooding which are related to climate change. Climatic change poses the present challenges associated with poverty, disease, and insufficient housing more severe. Addressing climate change implies changing our behavior and the way we feel regarding natural resources (Matthews, 2015). Everyone has a role to play in making his immediate associates aware about the problems as well as encouraging constructive behavioral change. Organizations and labor have a

vital role to play in responding to climate change.

As a business environment both domestically and globally seems increasingly aimed towards responding to climate change, it makes effective business sense to be positive. Several international organizations have strongly recommended the development of techniques to accomplish the sustainability of environments. Generally, such approaches depend on information and facts from professional teams about factors that cause degradation and policy alternatives to tackle them. However, these strategies seldom take into consideration assessed information about public awareness, participation, issues and main concerns. This particular strategy includes a step that encourages awareness for the changed circumstances in climate change and adaptation. Nevertheless, not all stakeholders fully understand the extent of vulnerability and the precautions they should consider to vigorously adapting to climate change in a positive way.

Considering widespread initiatives to raise general public participation in several areas of environmental management, the call for designing a strategy to confront subsequent climate threat has been a sensible action. This is specifically so for climate change adaptation, that is possible to be prepared habitually at a non-global scale (Adger, 2001). Adaptive measures tend to be context- and place-specific, with implication for comparatively delimited sets of stakeholders and demanding a knowledge-based designed to nearby surroundings. Therefore, a wide-ranging element in forming adaptive approaches is equally a moral as well as a realistic benefit. Awareness rising thus remains an essential element of the adaptation strategy to cater for the effects of climate change, increase adaptive ability, and minimizing the total vulnerability. Public outreach can additionally motivate voluntary changes in behavior, address the misunderstandings of those people who oppose certain decisions and assist in preparing younger people for surviving in the climate-change planet which they will eventually inherit. Hence, the objective of this article is to highlight the momentous effect of public awareness and participation on climate change mitigation for sustainable development and highly recommend the best possible strategies to implement this action into the mind of policy-makers and younger generation.

Public Awareness and Participation on Climate Change Mitigation

Climate change is a growing area of complicated environmental and ecological applications, which often are determined by intricate human devices, such as economic, political, cultural and social systems. The awareness of climate change then should magnify that complexity and remain multidimensional and versatile, instead of concentrating on just one variable like carbon dioxide emissions (Lander and Green, 2015).

Primarily, climate change awareness must be the type of effective awareness that can assist individuals in coping with uncertainty and making judgments which can be inline both with the most effective available information and facts as well as their own moral values. The demands for public awareness and participation in the creation of adaptable reactions are generally unambiguous, if not always well known, in numerous vital policy reports on climate change. Certainly, public participation policy is contained in Article 6 of the 1992 United Nations Framework Convention on Climate Change, which requires parties to encourage and assist in public participation in tackling climate change and its consequences and developing sufficient responses (UNFCCC, 1992). In the Third Assessment Report of the Inter-governmental Panel on Climate Change, the circumstances outlined for improving adaptive capacity consist of vigorous participation by concerned parties, particularly to guarantee that measures match local needs and resources (Smit et al., 2001).

The United Nations Development Programme has recently completed Adaptation Policy Frameworks for the formulation of climate change adaptation strategies (Lim and Spanger-Siegfried, 2004). These guiding principles highlight stakeholder commitment at every stage, including grassroots stakeholder participation (Wilbanks, 2003). In their collaborative statement, the International Institute for Sustainable Development and others decide on the necessity to establish climate change adaptation ways to guarantee the successful participation and empowerment of necessitous communities in crucial adaptation decisions (IISD et al., 2003), also Huq et al., strengthening the idea that participation of stakeholders in adaptation is very important (Huq et al., 2004). An incredibly essential aspect in climate change awareness and participation is social justice, considering that those people who are probably the most susceptible to changes in climate, individuals who are undoubtedly struggling with the impacts of climate change, are the communities that usually cause least to the challenge. A particular issue with common climate change awareness is that it seems to concentrate barely on the particular variable of carbon dioxide emissions instead of taking into account the broad variety of elements that have a direct impact on climate change. It is very essential for individuals to have a holistic insight into the numerous drivers of climate change, for instance, comprehending the concept of carbon dioxide equivalent (CO₂e) that takes into consideration some other greenhouse gasses such as Oxide of Nitrogen (NO_x) and Sulphur dioxide (SO₂). This has a direct impact on everyday decisions since other gasses like methane can have a much more effect on climate change than CO₂. For instance, methane particularly is emitted in massive amounts by meat manufacturing, so a preliminary thoughtful analysis of CO₂e can assist individuals in making the vital judgments concerning what sort of food items to purchase or recommend. Additionally,

there are various responses to finding the seriousness of the matter by which humankind finds itself in, from total rejection on one side to entire despair on the other.

Public Awareness and Participation on Climate Change across Continent

Gallup carried out the first extensive study of international view regarding climate change, showing two questions to participants in 128 nations: on how much they know about climatic change or global warming? Secondly, how severe the threat of climatic change to you personally and your relatives? Gallup (2007) found that a vast majority of the global adult population is aware about the climate change challenge, but a considerable minority was not. Moreover, those people who are aware have a tendency to state climate change presents a life-threatening risk to themselves as well as their immediate families. Results, which differ by county and amongst each of the top five greenhouse gas-emitting nations, highlight the challenge leaders encounter in making a universal climate consensus. Regionally, public in European Union (EU) countries and the Americas are the most expected to be aware about climate change. More than eight in ten adults in EU countries and the Americas state they understand at least something pertaining to climate change. Moreover, these regions have the highest number of people that report understanding a great deal regarding the problem.

Low awareness level can be seen in Asia, Sub-Saharan Africa, and the Middle East and North Africa (MENA) regions. Marginally more than 50% of people in the MENA and Asia nations reveal basic understanding of climate change. Awareness is also low amongst people in Sub-Saharan Africa with about 44% of adults revealing understanding at least a little regarding the subject. People in Asia are considered the least likely to state and consider climate change is a really genuine danger; more than one third, about 32%, view the danger in this way. People in the Americas and EU are most likely to be mindful of global warming and view it as an extremely or rather grave risk to themselves and their relatives. In Asia, MENA and Sub-Saharan Africa regions, where communities will probably be vulnerable to the impact of climate change, they regard danger as still quite small and much lower when compared to the Americas or EU. This could be linked to low understanding and lower possibility of figuring out that climatic change will have severe implications. Based on the Gallup surveys, 36% of adults in Africa perceive climate change as a serious threat to themselves and their families. In general, the area has the least carbon emissions globally, although several researchers acknowledge its people will probably be affected most from global warming.

Awareness Raising Campaigns for Climate Change Mitigation

This action involves measures that encourage understanding for the improved circumstances under climate change and adaptation. Not all stakeholders are aware and educated concerning their vulnerability and the actions they can choose to actively adapt to climate change. Awareness raising thus remains a vital element of the adaptation strategy to cope with the effects of climate change, improve adaptive aptitude, and lower entire vulnerability. Community awareness and participation is essential to enhance commitment and aid to promote self-mobilization and actions, and promote local awareness and solutions. Intensified political awareness is crucial as policy-makers and political figures are usually principal actors in the policy mechanisms for adaptation. Awareness raising needs techniques of powerful message to achieve the required result.

The purpose of awareness raising movement or campaign usually varies between circumstances but ordinarily involves increased responsibility, educating the focus group, developing an optimistic illustration, and tries to change their perceptions. Although awareness raising is sometimes regarded as significant in the initial phases of the adaptation process, studies have shown that levels of awareness vary over period affected by external variables. As a result, raising awareness isn't just essential at the beginning of the process, yet is fundamental through the entire process to sustain and maximize the widespread level of awareness. Furthermore, awareness raising and public participation explains the knowledge of people and organizations. It is designed to guarantee that the whole related regional and sub-regional agencies comprehend the impacts of climate change, and to become self-sufficient to respond to certain climate impacts. However, they can also focus on a particular impact that is thought to be the most significant. For example, during a flood occurrence there are numerous kinds of mass media by which the message can be disseminated, e.g. television programs, internet, and newspapers. Additionally, many instruments are already designed to maximize decision-makers' awareness.

Substantial climate change awareness campaigns in many cases are considered as a combination of energy efficiency, mitigation, and sustainability actions instead of adaptation initiative. For instance, the campaign 'You Control Climate Change' (Maja Rotter et al., 2006) of the European Commission is designed to enlighten individuals regarding climate change, inaugurate practical discourse, and strives for behavioral shifts without having affected people's normal life by providing them a sense of empowerment and confidential obligation. The focus groups are specifically those people who are occasionally energetic in environmental issues. The Commission's approach is to address the skepticism of this focus

group by decreasing their skepticism and persuade them that individual actions are useful and can result in huge assistance to minimize climate change. To succeed in this purpose, the EU actively runs programs like publicity, website, exhibition, media relations, events, and schools programs both at European and nationwide levels. In addition, the EU funded national awareness campaigns in its member states. In 2008, EU launched efforts in Hungary, Poland, the Czech Republic, Romania and Bulgaria, where national awareness campaigns have yet to be executed.

Factors That Determine a Good Awareness and Participation Campaign

1. Stakeholder Involvement

Adaptation to climate change necessitates the joint efforts of people, industries, business, government authorities and other players that are confronted with the effects of climate change. Awareness efforts in many cases are more successful if appropriate stakeholders or environmental Non-Governmental Organizations (NGOs) take part in the development and roll-out of the strategy. They typically know their clients far better and the most effective way to get in touch with them. Incorporating them also usually enhances the reliability of the campaign and provides an alternative for influence.

2. Success and Restrictive Variables

Households are normally unacquainted with climate change effects and adaptation alternatives. Awareness campaigns can triumph over these problems when focal points for establishing the target audience are evaluated by being familiar with who is most susceptible and who are most expected to gain. For example, there ought to be straightforward communication to be able to gain the target's attention. The message needs to be conveyed in the language that the target audience comprehends, the messages must concentrate on exactly what can be gained or what may possibly be wasted if adaptation doesn't occur, the message must be quite specific with regard to what that person can perform to minimize that particular threat and lastly campaign method and communication strategies can be chosen wisely to maintain the information unique and fascinating.

3. Value and Rewards

Awareness campaign is a sophisticated process with outcomes difficult to forecast. Even though it is extremely hard to determine the efficiency of awareness campaigns as there are a few consequences, regularly executed qualitative and quantitative reports can offer useful information when sufficient monetary resources are put constantly in place.

Recommendation

1. Address gaps in knowledge and recognize that lack of knowledge and misconceptions about global warming are very common, and that some involvement basically requires promoting information and facts. Furthermore, it is crucial for you to understand that information only doesn't give adequate motivation to change behavior.
2. Acknowledge uncertainty and be truthful about the uncertainty linked to climate forecast whilst doing awareness campaign. However, strive to simplify this through figuring out what is basic to the several circumstances and predictions, and also by illustrating comparisons to uncertainties in other parts. It could be important to deliver measures in response to climate change as a risk management factor rather than implying that global warming is proven.
3. Address skepticism and interact intensively with powerful individuals of the neighborhood to resist skepticism concerning climate change. There is little possibility that entrenched skepticism can be changed, nevertheless it is important to present information that specifically addresses the assertions and arguments of skeptical people. Speaking about the nature of scientific examination, and discussing prior examples of both skepticism and overreaction brought about by past scientific work could be useful.
4. Address emotional and psychological reactions in talking about climate change issues, particularly in the strategy of encouraging ideas of personal vulnerability, individuals may feel powerless and/or frightened, which can hold up or restrict behavioral change. This sort of feeling could be overcome by determining constructive and concrete measures that individuals can consider, and by motivating them to concentrate on being part of a collective response.

Conclusion

In conclusion, both researchers and professionals embraced the thought that advocating sustainable development can be a main concern which will incorporate climate change awareness and public participation guidelines. Stakeholder participation can be most effective when included in present democratic, accountable decision-making systems. Numerous nations possess legal conditions for public participation which should be considered when building climate change adaptation interventions. Public awareness and participation can employ a wide variety of participatory applications at different phases of the decision-making process. Each and every structure is equipped differently to disseminate information,

collect information, and make decisions. Moreover, several formats are suitable mainly for a certain level of participation.

Responding to the impact of public awareness and participation on climate change mitigation and sustainable development, however, must be designed in a manner that will encourage a durable, alternative understanding on how easiest to accomplish a balance between local, regional advancement objectives and climate change adaptation and mitigation. Both professionals and researchers concluded that to be successful in connecting climate change and sustainability, planning and policy information need to point out local development challenges in a way that will visualize sustainable future from the perspective of local demands and ambitions.

The desperation of responding to local development concern can bring local professionals collectively with policy-makers and researchers to concentrate on going towards planning questions on the ground. Furthermore, stakeholder participation happens within a bigger institutional and legal framework. When planning participation, professionals must look at situating participation within recent or emergent processes and strengthening current democratic and accountable institutions. In many nations around the world, legal and administrative needs for participation in decision-making will form the bottom for any minimum standard of participation in adaptation-decision making. The participation process must be described actively at the beginning of an adaptation planning process. Such a process will comprise of consideration of most important stakeholders, identification of stakeholder preferences, hiring or training professionals in facilitation, identification of suitable forms of participation, and developing an educative element to participation.

C. Session III: Panel Discussion on 'Responding to climate change in IDB member countries. Question: How can IDB member countries address climate change? What role can IDB play?

Discussants

Mrs. Ana Isabelle Senda Coani, Vice-Minister, Ministry of Land, Environment and Rural Development, Mozambique

Mr. Ibrahim Thiaw, United Nations Assistant-Secretary-General and UNEP Deputy Executive Director

Dr. Ismahane Elouafi, Director General, International Center for Biosaline Agriculture (ICBA)

Professor Usman Aminu Umar, Universiti Teknologi PETRONAS, Malaysia

Dr. Rachael McDonnell, Head of Climate Change Modeling and Adaptation Section, International Center for Biosaline Agriculture (ICBA)

Questions

How can we face the challenges of climate change from an agricultural perspective?

Dr. Elouafi: Agriculture is an emitter as well as sequester contributor to climate change, so it puts the sector in a good position to make a positive contribution to any adaptation and mitigation strategies. As an emitter, we need to acknowledge that some of the investments in agriculture in the last few decades have made a contribution to the climate change situation, such as putting an emphasis on animal production for red meat. Beef cows emit methane and this has a strong radiative forcing effect, even more than carbon dioxide. The moves towards intensive agriculture with little respect to natural resource systems have also contributed to the problem. There is a need to rethink how we manage our crop and animal production systems, and this could involve reducing the emphasis on inputs, such as fertilizers and insecticides/pesticides, and increasingly taking into account natural functioning systems in day-to-day operations. In terms of sequestration, it is important to acknowledge the roles of agriculture and forestry. Preserving the important natural forestry systems in Africa, for example, needs policies and financial support if their role is to be maintained in carbon sequestration.

At a practical level, one important role agriculture could play in facing the challenges of climate change is to reduce the sector's consumption of water. The water-energy-food nexus shows how intertwined the three areas are and by managing water more effectively, we can have an impact on the other two key variables. IDB and ICBA's work on marginal lands and waters brings important insight on how this can be achieved and how it will make a difference. ICBA's work promotes a different agriculture using different crops. Key staple crops like maize, wheat and rice are demanding of natural resources, yet alternative ones that are little used such as quinoa can bring important nutrition to communities. The crop can be grown using more saline water, and in hot and even drought climate conditions.

It is also important to recognize that local crops can provide important nutrition inputs and that we do not all need to eat the same foods.

What are the risks from climate change if no action is taken?

Mr. Thiaw: It is both an easy and difficult question to answer. If we take no action, we are moving into a catastrophic situation. The good news is that actions are being taken in many countries, by many companies, and many societies. There are success stories such as the major investments in new technologies, important attempts to reduce de-forestation such as in Brazil and China, and agricultural developments such as the work at ICBA, which all bring hope.

The negotiations at the international level need to focus on the impacts on the economy, especially in the major growing economies. If a short-term view is taken, discussion focuses on issues such as the relatively low emission of countries such as India that only emits 4 tons of CO₂ per capita, whilst more developed ones contribute 7 tons per capita. This does not help the global challenge being faced. Moves to keep emissions in these fast-developing countries low by limiting economic development there may have impacts today on vulnerable people as the droughts and floods taking place in different parts of India at the moment only too readily show. The impacts of extreme events in countries such as the Philippines are affecting thousands of people. Unfortunately, these events also highlight what will happen if there is no action.

The question therefore is how ambitious the climate change negotiations and agreements are going to be in Paris and other meetings. Actions will be taken and there is a growing pressure from many communities and their representatives including cities and states to do so as they feel it day to day.

How much awareness is needed on climate change to make a difference? And what ethical light can be shone on conserving resources? What sorts of program are needed for conservation and rationalization of natural resources?

Professor Usman: Awareness in communities is a major issue concerning sustainable development and this is particularly so for the challenges of climate change. In surveys undertaken by this organization it showed that 70% of respondents were unaware of climate change. The organization has thus introduced various programs working with national governments to raise awareness on this particular problem. They are also working with the private sector, with some major

companies welcoming this engagement and organizing social events that alerted people, particularly the young, on this issue. This organization has also acknowledged the important role of religious leaders and has engaged them in the awareness-raising on climate change in Africa and some Asian countries.

What is the role of data from a scientific perspective?

Dr. McDonnell: Data are just numbers and figures yet they are very powerful. One of the challenges has been convincing people that climate change is taking place especially in light of seemingly contradictory data. For example, over the last 15 years there has not been an increase in temperature in many parts of the world, even though greenhouse gas levels have been rising. A recent paper published in *Nature* has however been able to show that this heat, generated through the trapping of solar energy by greenhouse gases, has been absorbed into the Indian Ocean. There is therefore an urgent need to research the potential impacts of this increase in ocean heat as heightened ocean temperatures can influence many aspects of the climate system including typhoons/cyclones, heat waves and the strength of the monsoon.

It is data that will give us the understanding we do not have of the complex reactions resulting in enhanced greenhouse gas levels, and the subsequent analysis of impacts on communities. This is vital if robust adaptation strategies are to be developed to support all people especially the most vulnerable. It is also important that the data generated includes economic and social data not just natural scientific information. With this integrated analysis of data, investment can be stimulated and directed more effectively and efficiently.

What is happening in Africa to manage greenhouse gas emissions, and energy developments? What are governments doing in this area?

Mr. Thiaw: Africa contributes very little to greenhouse gas emissions. However, that does not mean that Africa should not have mitigation programs. A major focus of activities on the continent is on renewable energy with major plans and programs being presented this year to the COP meeting in Paris. It is a subject being discussed at the ongoing G7 meeting in Germany (June 2015) as well as at the upcoming Africa Union Summit. The African continent has a huge potential for renewable energy – solar, wind, geothermal, small hydro – but the situation today is that 65% of the population do not have access to reliable electricity supplies, and those that do suffer multiple interruptions. This is a paradox that needs to be addressed. This is one of the common positions taken by the African

countries to Paris – the need to finance renewable energy – as part of the negotiations. The intention is to double the capacity in renewables in Africa in the next 5 years. There is a need for public funding to contribute to these developments to alleviate some of the risks associated with investing in technologies in a continent that is unknown to many investors. This funding will need to come from developed countries, green climate funds as well as from domestic resources from the continent itself. In addition to the probable 25% of public funding, the remainder should come from private sector investments – the money is there and people are looking for good projects. To provide 10,000 MW in the next 10 years investment of \$20 billion is needed. Energy is needed for any development in Africa, so it is essential to invest in this area.

A good example to learn from is the cell phone systems in Africa. Twenty years ago there was no investment in ICT. One entrepreneur invested in it even though the critics said Africans had no money to pay for the services. Today African villages all over the continent have access to mobile phone signals, and the penetration rate is 300% which is unprecedented. Renewable energy investment and development can learn from this example.

Dr. Elouafi: The small-scale examples given are important for us to consider. If we want to increase agricultural production by 50% to feed the world, the major difference between the rest of the world and Africa, is access to irrigation. Only 7-8% of the land in Africa is irrigated, whereas in Asia it is 48%. In Africa we cannot do it with grand scheme irrigation methods as they are too costly and too difficult to manage. This is why we need small-scale irrigation which is managed at the community level and it could make a huge difference especially as part of adaptation strategies to climate change. The likely increasing variability under new climate conditions will be more challenging to farmers than the predicted changes to average values. Being able to support farmers during longer periods of dry days with supplementary small-scale irrigation could bring big changes to rural livelihoods with less impact on the environment.

What is the potential of using wastewater as part of climate change adaptation strategies?

Dr. Elouafi: Water is one of the biggest limitations in agriculture, and in the bigger picture, the World Economic Forum has named it as one of the top risks globally in terms of likelihood and impact. Wastewater offers an important alternative to pumping groundwater that is at the present being underutilized. It is also a resource that is likely to increase as cities and towns grow. Government programs in partnership with the private sector are needed to develop the water resources

so it has no impact on human and environmental health. Management plans to use this water efficiently and effectively can bring real opportunities to countries today as well as being an important part of their climate change adaptation strategies.

Mr. Thiaw: Wastewater should be called wasted water. Today the population is urbanized with more than 50% living in urban centers. It is found once people live in cities they use more water than when they lived in rural areas, so the world is generating more wastewater than ever before. Most of that wastewater is dumped, untreated, into rivers, lakes and coastal areas. Over 90% of wastewater generated in developing countries is untreated. The possibilities from treating this and then reusing it in various sectors including agriculture and industry are huge and likely to bring considerable win-win returns.

Solid waste is also being wasted. In Africa most is dumped. This, after treatment, is a very valuable resource if you are able to manage it well. In both cases, investment is needed from organizations such as the IDB, to develop these treatment facilities. The opportunities for investment are huge and if health, and sanitation costs are factored in as well as the income you can generate from the treated products, this is profitable.

Prof. Usman: There are so many good examples of re-using water in the private sector that can be used to show how these resources can be harnessed. Multinationals are continuing to embrace these ideas.

- iv. Develop mutual partnership with other multilateral development financial institutions to avail concessional financing of environmental projects.

D. Recommendations for Islamic Development Bank Group and Its Member Countries

After an in-depth panel discussion, the session generated the following recommendations for the IDB Group and its member countries based on the focus of the seminar:

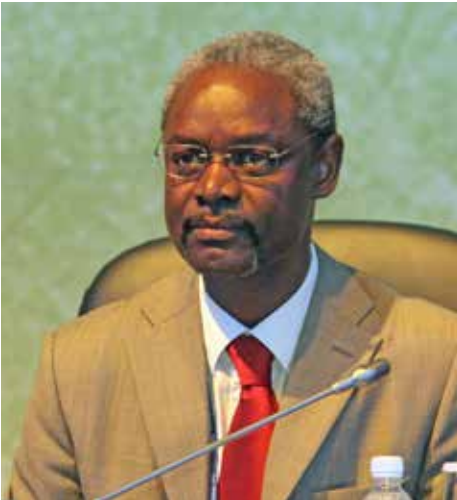
- i. The panelists proposed that cooperation between IDB, UNEP and ICBA should be further strengthened, to create a knowledge exchange and sharing platform on sustainable environment.
- ii. The panelists further encouraged member countries to gain from ICBA's innovative climate change expertise in the use of marginal water and soil resources.
- iii. Advise IDB to support environmental friendly projects and factor environmental risks in all development projects financed by IDB.

References

- Adger, W. N. (2001). Scales of governance and environmental justice for adaptation and mitigation of climate change. *Journal of International Development*, 13(7), 921-931.
- Bergaoui, K, Mitchell, D., Zaaboul, R., Otto, F., and Allen, M. (2015). The contribution of human-induced climate change to the unprecedented drought of 2014 in the Southern Levant Region, *Bulletin of American Meteorological Society*, DOI:10.1175/BAMS-D-15-00129.1
- Burton, I., & UN Development Programme. (2005). *Adaptation policy frameworks for climate change: developing strategies, policies and measures*. (p. 258). B. Lim (Ed.). Cambridge: Cambridge University Press.
- Cary F., Anna F., (2013) *Stakeholder Participation in Climate Change Adaptation Planning: African and Latin American Resilience to Climate Change (ARCC)*. Through a Task Order under the Prosperity, Livelihoods, and Conserving Ecosystems.
- CC-Dare. (2011). *Climate change adaptation and development program (cc dare): lessons for adaptation in Sub-Saharan Africa*. UNEP, UNDP.
- Estratégia Nacional de Adaptação e Mitigação de Mudanças Climáticas (2013-2025) República De Moçambique Ministério Para A Coordenação Da Acção Ambiental, United Nations Environment Programme.
- European Commission. (2015). *Sustainable Development Goals and the Agenda 2030*. Retrieved from http://europa.eu/rapid/press-release_MEMO-15-5709_en.htm (30 September 2015).
- Few, R., Brown, K., & Tompkins, E. L. (2006). *Public participation and climate change adaptation*. Tyndall Centre for Climate Change Research Working Paper, 95.
- Food and Agriculture Organization of the United Nations (FAO). (2012). *Adaptation to Climate Change in Semi-Arid Environment: Experience and Lessons from Mozambique*. Environment and Natural Resources Management, Series 19, FAO Publication, Rome.
- Gallup. (2007). Gallup's pulse of democracy: Environment. Retrieved 25 July 2015.
- GCCA+. (2015). *Global Climate Change Alliance+: support project to the Government of Mozambique for the mainstreaming of climate change into policies and strategies and to adapt to climate change impact*. Retrieved from <http://www.gcca.eu/national-programmes/africa/gcca-mozambique> on 27 September 2015
- GTZ Climate Protection Programme. *Adapting to Climate Change: Federal Ministry for Economic Cooperation and Development*.
- Huq, S., Reid, H., Konate, M., Rahman, A., Sokona, Y., & Crick, F. (2004). Mainstreaming adaptation to climate change in Least Developed Countries (LDCs). *Climate Policy*, 4(1), 25-43.
- Ian L., Cathy G. (2001). *Green and Climate Change Awareness: the ability to factor climate change into decision-making*, Vision 21.
- IISD, I., & SEI, S. Inter-cooperation. (2003). *Livelihoods and Climate Change: Combining disaster risk*.
- Kgomotso, M. (2015). *Environmental affairs: department of environmental affairs of South Africa*. Retrieved 25 July, 2015, from <http://www.climateaction.org.za/our-role>

- Parkinson, V. (2013). Climate Learning for African Agriculture: The Case of Mozambique, *Climate Learning for African Agriculture: Working Paper No.6*. AGEMA Consultoria, Maputo, Mozambique.
- Rotter, M., Hoffmann, E., Hirschfeld, J., Schröder, A., Mohaupt, F., & Schäfer, L. (2013). *Stakeholder Participation in Adaptation to Climate Change—Lessons and Experience from Germany*. UBA: Dessau, Climate Change, 12.
- Smit, B., & Pilifosova, O. (2003). Adaptation to climate change in the context of sustainable development and equity. *Sustainable Development*, 8(9), 9.
- U. A. Umar, M.F Khamidi.(2012).“Determined Level of Green Building Public Awareness Strategies”. *In: International Conference on Civil, Offshore and Environmental Engineering (ICCOEE)*, Kuala Lumpur, Malaysia.
- U. A. Umar, A. Sadauki, M. F. Khamidi, Hassan Tukur.(2014).“Global Warming Variation Tracks For Malaysian Residential Green Building”. *In: Al-Zaytoonah International Engineering Conference on Sustainability in Design and Innovation (ZEC)*, Amman, Jordan.
- Umar, U. A., Khamidi, M. F., & Alkali, A. U. (2012). The repercussions linked with a changing macroclimate for green building. *In Humanities, Science and Engineering (CHUSER), IEEE Colloquium* (pp. 392-397).
- UNFCCC. (1997). United Nations framework convention on climate change. Kyoto Protocol, Kyoto.
- Wilbanks, T. J. (2003). Integrating climate change and sustainable development in a place-based context. *Climate Policy*, 3 (sup. 1), S147-S154.
- Wingqvist, G.Ö. (2011). *Environment and Climate Change Policy Brief – Mozambique: Generic Outline, SIDA's Helpdesk for Environment and Climate Change*. Retrieved from www.sidaenvironmenthelpdesk.se

Biographies of Moderators and Panel Speakers

Name and office	Details
 <p data-bbox="124 1193 338 1220">Mr. Ibrahim Thiaw</p> <p data-bbox="124 1249 582 1339">UNEP Deputy Executive Director and Assistant-Secretary-General of the United Nations</p>	<p data-bbox="598 678 1460 992">Mr. Ibrahim Thiaw took office in August 2013 as the Deputy Executive Director for the United Nations Environment Programme (UNEP) upon his appointment by United Nations Secretary-General Ban Ki-moon. Following the decision of Rio +20 to strengthen and upgrade UNEP, Mr. Thiaw will continue to play a critical role in the implementation of UNEP's mandate and its Medium Term Strategy and Programme of Work, as well as catalyzing UNEP's political engagement with governments and intergovernmental processes on the first and further sessions of the United Nations Environmental Assembly. Mr. Thiaw's role also includes advancing the ongoing internal performance and reform agenda.</p> <p data-bbox="598 1021 1460 1238">Prior to his appointment as Deputy Executive Director, Mr. Thiaw served as the Director of the Division of Environmental Policy Implementation (DEPI). As Director for DEPI, Mr. Thiaw was responsible for conceptualizing and managing UNEP's activities in two of its core thematic areas of focus - ecosystem management and services and conflicts and disasters. He also managed the adaptation component of UNEP's climate change sub-theme.</p> <p data-bbox="598 1267 1460 1451">Before joining UNEP in 2007, Mr. Thiaw worked as the IUCN Regional Director for West Africa and later as the Acting Director-General of IUCN. With more than 30 years of experience in the field of natural resource management at the national, regional and international levels, Mr. Thiaw's specific contributions have been in the successful development and implementation of large-scale environmental programs and projects.</p> <p data-bbox="598 1480 1460 1568">Mr. Thiaw started his career with the Ministry of Rural Development of Mauritania and holds an advanced degree in Forestry and Forest product techniques.</p>



Dr. Ismahane Elouafi

Director General of the International Center for Biosaline Agriculture (ICBA)

Dr. Ismahane Elouafi has been Director General of ICBA-Agriculture for Tomorrow since 2012. Before joining ICBA, she had led the Research and Partnerships Division at the Canadian Food Inspection Agency (CFIA). Ismahane holds a PhD in Genetics (Cordoba University, Spain) and has a passion for science; its management; and its integration with policy. She believes that, in order to gain efficiencies and alleviate discrimination and poverty, science has to be the basis of our decisions and development plans. Over her 15 years of work experience in agricultural research, Dr. Elouafi developed a good understanding of agricultural research, its potential, and its challenges. She has successfully built strategic partnerships with governments, institutions, academia, and private organizations in the national and international scientific research arena. Prior to joining ICBA, Ismahane held management positions with CFIA and Agriculture and Agri-Food Canada (AAFC). She also worked as a scientist with several international research organizations such as ICARDA (International Center for Agricultural Research in the Dry Areas), JIRCAS (Japan International Research Centre for Agricultural Sciences), and CIMMYT (International Maize and Wheat Center).

Dr. Ismahane is a recipient of many international awards, including the 'Excellence in Science' award from the Global Thinkers Forum (2014), and the National Reward Medal by His Majesty Mohamed VI, the King of Morocco (2014). In 2014, Muslim Science ranked Dr. Ismahane among the 20 Most Influential Women in Science in the Islamic World under the Shapers category, and the CEO-Middle East Magazine listed her among the World's 100 Most Powerful Arab Women in the Science category.



Dr. Rachael McDonnell

Water Policy and Governance,
International Center for Biosaline
Agriculture (ICBA)

Dr. Rachael McDonnell is the water policy and governance scientist at the International Center for Biosaline Agriculture (ICBA). She has examined water and food security policies, and the formal and informal governance systems and legal/regulatory frameworks around these key areas, in a number of countries. This work has also encompassed developing climate change adaptation strategies to address future insecurities in water and food. Linking science to policy, she is currently the MAWRED (Modeling and Monitoring Agriculture and Water Resources Development) program leader at ICBA, a USAID-funded initiative in partnership with NASA's Goddard Space Flight Centre, under which regional- and country-scale modeling of water resources and agricultural water use is being developed using scenarios of current and future climate change conditions.



Dr. Hans Hoogeveen

Vice Minister for Agriculture, Ministry of Economic Affairs, the Netherlands

Dr. Hans Hoogeveen was born in The Hague on 5 September 1959. He was appointed Director-General Agro, first at the Dutch Ministry of Agriculture, Nature and Food Quality, and then on 1 September 2011 at the newly formed Ministry of Economic Affairs, Agriculture and Innovation. He is responsible for agriculture and horticulture, agribusiness, food safety, veterinary and plant health, international affairs, including the European Common Agricultural Policy and the Common Fisheries Policy, international food security, the FAO and other UN affairs, trade liberalization (WTO) and market access. On 1 January 2009 he became Visiting Professor of Practice in Natural Resource Policy at The Fletcher School of Law and Diplomacy.

Hans Hoogeveen has held several international positions and was involved in European negotiations on the Common Agricultural Policy and in other international negotiations. Between 2004 and 2006 he was Acting President for the Biodiversity Convention, EU negotiator during the Dutch Presidency of the European Union in 1997 and 2004, and president of the UN Forum on Forests. Under his presidency, an international instrument for sustainable forest management was adopted in 2007 after 15 years of negotiations. He received a UN award for his work the same year. He also serves as facilitator on agricultural and climate issues for the Meridien Institute based in Washington, D.C.

Hans Hoogeveen holds a number of other positions. He serves on the boards of the Sustainability Challenge Foundation, an international organization that facilitates international management training in sustainable development, and of Forest Trends, a leading international NGO for policy and innovation in the field of natural resources in Washington, D.C. He is also political advisor to the World Bank and special advisor to the UN Task Force on agriculture and food security. He also works as a core teacher at the Netherlands School of Public Administration.

He has written a number of articles on sustainable development and natural resources policies and is currently writing a book on 'Sustainable Development Diplomacy'. He obtained a law degree in 1984, a Master's Degree in Public Management and received a doctorate degree from The Fletcher School of Law and Diplomacy (Boston) and Wageningen University in early 2010. He also completed a programme for Senior Managers in Government at the Harvard Kennedy School of Government.



Mr. Munyaradzi Chenje

Director, Regional Support Office,
UNEP

Mr. Munyaradzi Chenje is the Director for the UNEP Regional Support Office (RSO). He has many years of experience in environmental assessment, policy and governance at sub-regional, regional and international levels. Prior to this appointment, Munyaradzi was the Deputy Director of UNEP's New York Office at UN Headquarters, where he was integral to supporting UN member states during the General Assembly's consultations on resolutions on UNEP as a follow-up to the Rio +20 conference outcome document - The Future We Want. He was a member of the UNEP team to the Rio +20 Conference in Brazil and active in the post-2015 follow-up processes in New York.

Munyaradzi's technical and global and sub-global expertise in environmental assessment saw him head the UNEP Global Environment Outlook (GEO) Section at UNEP Headquarters in Nairobi, Kenya. He was responsible for facilitating and coordinating the comprehensive and scientifically-credible, policy-relevant assessment on the state and trends of the global environment – the fourth GEO in the integrated assessment series. This assessment report, launched in 2007, pays special attention to the role and impact of the environment on human well-being as well as to the use of environmental valuation as a tool for decision-making.

At the sub-regional level, Munyaradzi was the UNEP Africa Regional Coordinator for early warning and environmental assessments, implementing the Africa Environmental Information Network (AIEN). As Africa Regional Coordinator, he led the team which produced the second integrated assessment report – Africa Environment Outlook: Our Environment, Our Wealth.

Before joining UNEP in 2000, Munyaradzi was the founding Director of the Musokotwane Environment Resource Centre in Southern Africa based in Harare, Zimbabwe, and produced the first State of the Environment report in southern Africa. Munyaradzi is a member of the Zimbabwe Academy of Sciences, the Integrated Assessment Society (TIAS) and the IUCN Commission on Education and Communication.



Professor Aminu Usman

Department of Civil and Environmental
Engineering, Universiti Teknologi
PETRONAS, Malaysia

Professor Usman Aminu Umar is a PhD scholar and research officer in the Department of Civil and Environmental engineering, Universiti Teknologi PETRONAS, Malaysia. He obtained a Bachelor's Degree in urban and regional planning, M.Sc. and Ph.D. in civil engineering. His research interest is in the area of green building, building information modeling, climate change and sustainable development. He has authored several journals and presented articles at various international conferences in the aforementioned fields.

Side Event Leaflet



Flamingo Bay, Mozambique

Who should ATTEND?

Government Agencies, Ministries and Parastatals, Research Institutions, Youths as well as University Researchers and students and Interested Persons from Mozambique are invited to join the Forum. Guests of the IDB Annual Meeting are also encouraged to participate.

Translation Facility

Simultaneous translation services from English to Portuguese, French and Arabic will be provided.

Date

8th June, 2015

Time

1:00pm – 4:00pm

Venue

Joaquim Chissano International Conference Center, Maputo.

About Us

The Islamic Development Bank is an international financial institution established to foster the economic development and social progress of member countries and Muslim communities individually as well as jointly in accordance with the principles of Shari'ah i.e. Islamic Law. The present membership of the Bank consists of 56 countries spanning across Africa, Asia, Europe and Latin America.

"As a major development financing institution of the Muslim world, the IDB is expected to take a leading role, and rightly so, in not only contributing towards correcting the negative image haunting the Muslim world, but also in addressing the daunting challenges facing our countries and bringing about real change in people's lives, and also working towards building a positive image about our member countries in the world arena".

Dr. Ahmad Mohamed Ali
Chairman, IDB Group



Islamic Development Bank
P.O.Box 5925, Jeddah
Kingdom of Saudi Arabia
web: www.isdb.org
Providing Resources, Fighting Poverty,
Restoring Dignity



40th IDBG Annual Meeting
Maputo, Mozambique

IDB, ICBA and UNEP

present a seminar on

Climate Change Adaptation
in the context of Post-2015
Sustainable Development
Agenda

8th June, 2015 (1:00pm - 4:00pm)



Climate Change?

Climate patterns play a fundamental role in shaping of natural ecosystems, the human economies and cultures that depend on them. In recent times, the climate we have come to expect is not what it used to be, because the past is no longer a reliable predictor of the future. Our climate is rapidly changing with disruptive impacts, and that change is progressing faster than any seen in the last 2,000 years.



How Climate Change works

Source: US EPA

Climate Change Adaptation means anticipating the adverse effects of climate change and taking appropriate action to prevent or minimize the damage they can cause, or taking advantage of opportunities that may arise.

"IDB recognises the necessity, and the daunting challenge, of aligning the development and climate change agendas, not least because this will require substantial additional resources, as presented in the groundbreaking Stern Review"

Dr. Ahmad Mohamed Ali, President IDBG

Agenda

	Opening Session
13.30pm	Recitation from the Holy Quran
-	Welcome Note by Dr. Osman El Fiel , Acting Director, AGRD, IsDB
13.45pm	Opening Remark by the Ministry of Land Environment and Rural Development, Mozambique
	Session I: Framing the Issue
13.45pm	Paper I: Climate Challenges in IDB Member Countries: Challenges and Opportunities by Dr. Rachael McDonnell , Climate Change Modeling & Adaptation Sectional Head, International Center for Biosaline Agriculture (ICBA)
-	Paper II: Climate-Smart Agriculture by Dr. Hans Hoogeveen , Vice Minister for Agriculture, Ministry of Economic Affairs, The Netherlands (on video).
14.10pm	Session II: Way Forward
14.10pm	Case I: Mozambique's Climate Change Strategy
-	Case II: Rethinking Sustainability and Development in Post-2015 Development Agenda: Mr. Ibrahim Thiaw , United Nations Assistant-Secretary-General and UNEP Deputy Executive Director
14.30pm	Session III: Panel Discussion on 'Responding to Climate change in IDB member countries'
-	Facilitator: Mr Ahmad Hariri , IsDB
15.10pm	Discussants: Ministry of Land Environment, Mozambique Mr. Ibrahim Thiaw , United Nations Assistant-Secretary-General and UNEP Deputy Executive Director
-	Dr. Ismahane Elouafi , Director General, International Center for Biosaline Agriculture (ICBA)
15.10pm	Professor Usman Aminu Umar , Universiti Teknologi Petronas, Malaysia
-	Dr. Rachael McDonnell , Climate Change Modeling & Adaptation Sectional Head, International Center for Biosaline Agriculture (ICBA)
-	Mr. Munyaradzi Chenje , Director, Regional Support Office, United Nations Environment Programme (UNEP)
15.10pm	Questions and Answers from the audience and Wrap Up: How can IDB Member countries address climate change? What role can IDB play?
-	
15.25pm	Closing remarks
-	Dr Abdulrahman Sultan Al Sharhan , Chairman of the Board of Directors, International Center for Biosaline Agriculture (ICBA)
15.30pm	



ADAPT or DIE!

Who should ADAPT?

Adaptation is the responsibility of all. However, the greatest challenge is **'how to adapt'**. Attending this seminar will broaden our knowledge on not just **'who needs to adapt'**, but also on **'HOW'** and **'AT WHAT POINT'** should individuals, institutions, businesses, communities, states, nations, regions as well as the global community adapt.

What to expect in this seminar?

- ✓ The unusual and untold about climate change adaptation explained by experts and leading professionals.
- ✓ Experience-based discussion rather than theoretical seminar.
- ✓ Action-driven and Action-provoking seminar.
- ✓ Intellectually stimulating discussion
- ✓ Broader perspectives to the climate change debate.



For more information, please contact:

International Center for Biosaline Agriculture (ICBA)

PO Box 14660, Dubai, United Arab Emirates
Tel: +971 4 336 1100, Fax: +971 4 336 1155
Email: icba@biosaline.org.ae
Website: www.biosaline.org

Islamic Development Bank (IDB)

8111 King Khalid St. Al Nuzlah Al Yamaniah Dist.
Unit No. 1; Jeddah 22332-2444, Saudi Arabia
Tel: +966 12 636 1400, Fax: +966 12 636 6871
Email: idbarchives@isdb.org
Website: www.isdb.org