

“Smart Climate Change” for Professional Societies Workshop

Theme: Is a Climate Smart Kenya Possible?

WORKSHOP REPORT

9th May 2012
Silver Springs Hotel, Nairobi, Kenya

**Prepared by:
Dr. Daniel Olago**

**Funded by:
The Office of the Prime Minister, Republic of Kenya**

**Facilitated by:
The Institute for Climate Change and Adaptation (ICCA) –
University of Nairobi**

MAY 2012

TABLE OF CONTENTS

TABLE OF CONTENTS	II
BACKGROUND	2
1. OPENING OF THE WORKSHOP.....	3
1.1 INTRODUCTION, WORKSHOP OBJECTIVES, EXPECTATIONS (PROF. SHEM WANDIGA, ICCA).....	3
1.2 OPENING ADDRESS (MR. ABDUL MWASERA, FOR PERMANENT SECRETARY OFFICE OF THE PRIME MINISTER, DR. MOHAMMED ISAHAKIA)	4
2. PRESENTATIONS	54
2.1 CLIMATE SMART DEVELOPMENT: THE ROLE OF ICPAC AND NATIONAL WEATHER SERVICES (PROF. LABAN OGALLO).....	4
2.2 CLIMATE SMART ENGINEERING (PROF. MADARA OGOT)	5
2.3 WHAT OBLIGATIONS DO PROFESSIONALS HAVE AS REGARDS CLIMATE CHANGE (MR. ALEX ALUSA) 6	
2.4 IMPACTS OF CLIMATE CHANGE ON NATURAL RESOURCES (DR. ADAN ALI).....	7
2.5 FINANCE AND CARBON MARKETS (MR. OBADIAH MUNGAI)	8
2.6 CLIMATE SMART INFRASTRUCTURE (DR. SIMON DULO).....	10
2.7 QUESTION AND ANSWER SESSIONS	11
3. GROUP DISCUSSIONS	12
3.1 HOW CAN WE INJECT CLIMATE SMART SOLUTIONS IN OUR PROFESSIONS?	13
3.2 HOW CAN WE CREATE SYNERGIES AMONGST OURSELVES?.....	14
4. PANEL DISCUSSIONS	15
4.1 HOW CAN WE CREATE CLIMATE SMART SUSTAINABLE BUSINESS IN KENYA?	15
4.2 HOW CAN WE MOVE TOWARDS A GREEN ECONOMY?	16
4.3 TOP CHALLENGES/OPPORTUNITIES, RESOURCES AND REQUIRED MECHANISMS	16
5. CLOSING REMARKS – PATRICK CHABEDA, OPM.....	17
ACKNOWLEDGEMENTS.....	17
LIST OF PARTICIPANTS	18

“Smart Climate Change” for Professional Societies Workshop

BACKGROUND

Climate change is a reality we have to live with. The frequency of climate phenomena like drought and flooding has shortened. As soon as we come out of one climate related disaster do we enter into another. With no prospect of reaching a global agreement on the stabilization of greenhouse gases in sight it is now very apparent that we have to adapt to the evolving climate scenarios.

The mission of the workshop was to facilitate the sharing of experiences and analysis of best practices in climate proofing mechanisms, designing policy measures for the promotion of climate smart living, innovations and adaptation actions for each sector of our economy and life.

Organizers: The workshop was organized by the [Institute for Climate Change and Adaptation in collaboration with Maseno University and the](#) Office of the Prime Minister, Climate Change Policy Division.

Facilitators: The Institute for Climate Change and Adaptation at the University of Nairobi facilitated the workshop. The Institute, established in 2011, has the mission to build human capacity necessary to address the unique climate change and adaptation needs of vulnerable communities through teaching, action-oriented research, development of innovative technologies and community participation and to provide expert advice for national and regional policy formulation and implementation.

Structure of the Workshop: The workshop consisted of short 20 minutes presentations followed by group and panel discussions. The paper presenters highlighted the major concerns of climate change for professionals. The following questions were addressed at the Workshop:

- How can we inject climate smart solutions into our professional activities?
- How can we create climate smart synergies amongst ourselves?
- How can we create climate smart sustainable business?
- How can we move towards a green economy?

1. OPENING OF THE WORKSHOP

1.1 Introductions, Workshop Objectives, Expectations (Prof. Shem Wandiga, ICCA)

The main aim of the workshop ~~is~~ was to help participants internalize climate change issues and green growth.

The objectives of the workshop ~~are~~ were three fold:

- Create climate change awareness;
- Outline present climate change challenges and opportunities; and
- Map out existing resources that can be used to implement actions.

Climate manifests itself in different ways e.g. floods, droughts, tropical storms and typhoons. Climate controls our lives and hence must be taken seriously. Our climate is now changing, and this is evident through the extreme weather patterns and events that we are experiencing on the planet, and their associated flood and drought disasters. The impacts of the extreme weather patterns and events depend on the magnitude of the event and the vulnerability and exposure of the affected communities. However, some of the disasters aren't even caused by extreme events, for example; in 2009 a climate non-extreme event in Zimbabwe caused a cholera outbreak that affected 90,000 people and resulted in 4000 deaths. The vulnerability of the community and the exposure to climate risk made the outbreak severe.

Climate change impacts are felt in different sectors (e.g. agriculture, energy, water, public health, tourism and transport) at local, regional and global scales. The cost of disasters is increasing year to year and insurance is not paying for all the cost so the affected community bears the brunt of the costs of recovery and rehabilitation. This retards the economic growth of most countries. The cost of disasters is higher in developed countries than in developing countries because developed countries have expensive life and infrastructure; however, the fatalities are higher in developing countries.

Normally extreme events used to have a 20 year frequency but now climate models show that in East Africa the frequency of hot years is 1-2 year and 1 year for wet years. This will affect socioeconomic development because countries will always be in a recovery mode. Some examples of disasters from which we can draw lessons include; the heat waves in Europe; hurricane Katrina in the USA; localised flash floods in Nairobi as a result of rapid growth, settlements near rivers and blocked drainages; sea level rise in tropical small islands; and droughts in west Africa that are coupled with high populations, variable rainfall and ecosystem degradation.

It is, therefore, important to monitor, evaluate, plan for climate change, manage climate risks and adapt to climate change. This will involve:

- Improving forecasting and early warning systems;
- Reducing GHGs emission;
- Poverty reduction;

- Better education and awareness;
- Sustainable development; and
- Asset relocation.

Short term actions are not solutions for long term risk reduction: for example, the Kenya for Kenyans initiative [that collected money from Kenyans to buy relief food for the starving Kenyans in the North](#) was just a solution for the 2010/2011 drought. But with climate change these short term actions will not help, thus we need to think outside the box for long term solutions. The climate disasters aren't country bound but are global. This workshop thus offers us a platform to share experiences and chart a way forward.

1.2 Opening Address (Mr. Abdul Mwasera, for Permanent Secretary Office of the Prime Minister, Dr. Mohammed Isahakia)

The impacts of climate change and variability are evident in Kenya. Extreme climate events affect fund allocation and hence slow down development projects, thus climate change is now a development challenge. Climate change threatens the gains that have been made towards achieving Millennium Development Goals and as such calls for participation of all stakeholders.

There is need to work towards de-carbonizing the economy thus the investments taking place should be "green" in nature. A National Climate Change Response Strategy is in the process of being operationalized - it has eight interrelated components that will provide a conducive environment for investment.

Green opportunities need to be exploited by all professionals. There is need for the private sector to understand the opportunities for adaptation to climate change because adaptation is fundamentally about sound, resilient development in areas such as: disaster risk reduction, watershed management, forest management, health care as well as other social systems. The establishment of a clear policy framework will create a conducive environment for private investors. With clear government policies the business community will be confident to undertake low carbon investments.

Professionals have a great role to play in the green economy thus the government is engaging in sensitizing them on impacts of climate change. I hope that in this workshop all participants will work together and find innovative and effective ways to address climate change issues in a sustainable manner. The workshop would also help enhance our understanding of the risks and opportunities in addressing climate change and give recommendations for professional societies to act for a climate resilient and secure future for Kenya.

2. PRESENTATIONS

2.1 Climate Smart Development: the Role of ICPAC and National Weather Services (Prof. Laban Ogallo)

“Climate is blamed for everything yet it gives everything”. Climate is organized, in that in some months it gives too much rain (March-May and October-December) and some too little (January and February), similarly in some years it gives little and others a lot. We have to develop strategies to deal with it. Floods and droughts are recurrent, and human pressure on the climate is aggravating these extremes. Human pressure on the climate includes desertification and GHG emissions.

For climate smart development, all the climate resources in an area should be taken advantage of, for example, when there is too much, store for lean periods (water harvesting). Being climate smart starts with the individual.

Considerations for smart climate development include the following:

- Learn how the climate behaves, master it and take advantage of it;
- Stop sticking to what we know, for example wanting to plant maize in Lodwar just like it's done in Kitale;
- Know and map climate hazards - when they occur, where, and how often;
- Develop multi-hazard strategies;
- Learn the characteristics of climate hazards. For example, drought has a slow onset and floods have a rapid onset;
- Know the status of the communities, poverty levels and vulnerability; and
- Have tomorrow's climate in mind when planning as the future climate may be different, with more floods and droughts.

Tomorrow's climate will be affected by:

- Population growth;
- Economic development;
- Land use;
- Energy production and consumption; and
- Science and technology.

Climate cannot be blamed for everything, instead, there is need to learn to cope with the current climate and adapt to tomorrow's climate. We need to adapt to climate extremes as well as maximize the resources (e.g. water harvesting). Meteorological professionals should determine tomorrow's climate for different regions so that it can be integrated in future planning.

To determine the way forward for climate smart development, some questions should be addressed:

- Does climate pose a threat to development?
- What are the current known impacts of climate?
- Have we integrated climate in development?
- Is there evidence of climate change locally?

- What are the potential impacts on climate change?

2.2 Climate Smart Engineering (Prof. Madara Ogot)

The key to smart engineering is in:

- Smart, clean energy production;
- Reduction of energy use; and
- Adapting technologies to climate change.

Wind energy is one of the energies that are produced in a smart and clean way. In Kenya, there are 6 wind turbines that were installed on Ngong hills in 2009 that produce 5.9MW of energy. By 2014, the government is planning to put up the largest wind farm in sub-Saharan Africa in Turkana. The wind farm will have 365 turbines, producing 300MW of energy, which will provide 20% of the energy needed in the country. Geothermal power currently produces 225MW, or 15% of Kenya's energy requirements. Expansion of geothermal power exploitation will in future ~~will~~ provide 800MW, or 53% of the country's energy needs. The country has potential for over 10,000MW from geothermal energy. Kenya has the potential to produce clean, smart energy to cater for all its energy needs.

The government has opened up the energy sector to private investors; this means more investors will be able to go into clean energy production instead of waiting on the government to do all the energy projects.

Energy use reduction starts with individuals. An example of South African low housing units in Cape Town was presented. The houses were retrofitted with rooftop solar water heating systems, insulated ceilings and energy saving bulbs. This led to a 56% reduction in electricity costs, and is significant in that most electricity in South Africa is generated by coal-fired plants (not green energy). The use of paraffin lamps also decreased drastically. These modifications thus not only saved on energy used but also reduced respiratory diseases brought about by inhalation of gases from coal and paraffin, and also from breathing damp air because the insulated ceilings eliminated water condensation that occurs on the inside part of the roof particularly during the winter months.

Governments have a role to play in smart energy, by implementing renewable energy projects or creating conducive environments for investors who want to do the same. We all as individuals have a role to play in smart energy. Are we ready to take up the challenge by using energy saving technology and embracing new technologies?

2.3 What Obligations do Professionals have as regards Climate Change (Mr. Alex Alusa)

Architects: Constructions can't continue to be built under business as usual conditions; buildings must be built with systems like solar water heating. Solar heating should be encapsulated in the Building Code. The cost of building should not be used as an excuse; people always find money to do things. Buildings that aren't climate

smart end up losing more for the client in the long run. There is need to change building codes to take into consideration climate smart buildings. Building owners should also carry out energy audits (e.g. hotels).

Structural engineers: They should inspect buildings at all stages to ensure the right building materials are being used; this will prevent buildings from collapsing during extreme weather events.

Government officers: They should be professional about what's right especially in doing procurement. The Procurement Act has raised costs of doing business, because the issue it focuses on is following the rule, not how much it costs, while if one went to the open market, the unit costs of items/materials tendered for may be considerably lower than what the tenderers put in as their minimum price. They should also create an enabling environment for the private sector, because climate change creates business opportunities.

All professions should be able to “see across professions”, that is, integrate issues for better and sustainable management and climate smart development. For example, cement companies can use the heat that is produced during processing to produce electricity. Professionals should generate ideas, not copy ideas from other regions that will not necessarily work in our context. A Climate Innovation Centre will be set up soon in Nairobi to help people with climate ideas to develop them into viable businesses. The key to great innovations is simple ideas, so people with such should not shy off.

2.4 Impacts of Climate Change on Natural Resources (Dr. Adan Ali)

Rural areas are the most vulnerable to climate change because the communities there depend on natural resources. The challenges faced in addressing climate change issues include:

- Limited data;
- Finances - most funding comes from donors who do not address national issues;
- Incoherent policy structures;
- High poverty levels;
- Weak institutions ;
- Professionals acting as closed groups instead of being integrated.

There are a number of important climate changes and related issues that need to be addressed particularly with respect to pastoral production systems in the semi-arid to arid regions of Kenya. These include:

- Water scarcity;
- Siltation in ponds;
- Food insecurity;
- Heritage sites that are endangered because climate change may cause loss of indigenous plants which have medicinal and other values;
- Communities that are becoming climate refugees, especially in Northeastern Kenya, where nomadic families have to camp outside chiefs camps to wait for relief food;

- Shanties in unserviced areas – use of plastic instead of grass (dujus) for roofing due to grass shortage;
- Reduction of natural resources, particularly water and biodiversity resources, which the country is heavily reliant upon;
- Human-wildlife conflict, especially on wildlife migration routes, is increasing as a result of reducing resources (water and pasture);
- Increased vulnerability of pastoral production systems to climate;
- Emergence of new infectious livestock diseases;
- Environmental degradation and soil infertility;
- Appropriate shelter; and
- Bioenergy for domestic use.

Some suggestions for smart climate solutions are as follows:

- Climate smart solutions must respond to local systems, and then they can be up scaled. Carry out strong case studies which can be used to upscale solutions to national level. Such case studies can also be used to seek funding from policy makers;
- Formulate policies that aim at minimizing the impacts of climate change and maximizing the opportunities that it presents;
- Solutions must be participatory and relevant;
- Give the beef production/livestock keeping industry strong policy attention;
- Encourage strong climate change science, and benchmark it with solutions that are applicable elsewhere;
- Regulate consumptive and commercial interests;
- Devise ways of protecting the 75% of natural biodiversity resources that lie outside of protected areas;
- Capacity for resilience should be strengthened among communities.

The way forward would include:

- Building partnerships;
- Basing decision-making on sound scientific knowledge;
- Developing benchmarks with other successful actions; and
- Development of decision support tools to monitor and evaluate natural resource management.

2.5 Finance and Carbon Markets (Mr. Obadiah Mungai)

The key milestones in the evolution of climate change negotiations are: adoption of the UNFCCC in 1992 and its ratification in 1994; the adoption of the Kyoto Protocol (KP) in 1997 and its ratification in 2005; the end of the Kyoto first commitment period in 2012. The KP introduced three flexible mechanisms:

- Carbon Trading (Article 17) => ETS for Annex 1 countries;
- Clean Development Mechanism (Article 12); and
- Joint Implementation (Article 6).

During COP 17 that was held in Durban, South Africa in December 2011, Governments adopted a comprehensive package of decisions—including:

- An agreement to initiate a second commitment period for the Kyoto Protocol;
- The “Durban Platform” to negotiate a long-term, all inclusive future mitigation regime that includes a process to address the “ambition gap” for stabilizing average global temperature increases at 2°C over pre-industrial levels;
- Adopting a range of decisions designed to implement the 2010 Cancun Agreements, including launching a new Green Climate Fund and developing stronger requirements for the reporting and review of countries’ mitigation efforts;
- An agreement on rules for activities to reduce emissions from deforestation and degradation (REDD), as well as standards for verifying national performance in mitigating emissions; the rules for “carbon capture & storage” projects under the CDM; a process to further consider the loss and damage faced by the most vulnerable countries; and
- A work programme on unintended consequences of climate change policies.

In 2010 the global carbon market value declined to 142 billion USD due to uncertainties associated to the Kyoto Protocol. The bulk of trade took place within the EU ETS followed by CDM. There are 7 CDM Projects registered and Trading in Kenya (details on NEMA website), with 1,236,469 reductions traded as of March 2012. The CDM activities in Kenya are:

- “35 MW Bagasse Based Cogeneration Project” by Mumias Sugar Company Limited (MSCL);
- Olkaria II Geothermal Expansion Project;
- Olkaria III Phase 2 Geothermal Expansion Project;
- Aberdare Range and Mt. Kenya Small Scale Reforestation Initiative Kirimara-Kithithina Small Scale A/R Project;
- Aberdare Range and Mt. Kenya Small Scale Reforestation Initiative Kamae-Kipipiri Small Scale A/R Project;
- Lake Turkana 310 MW Wind Power Project; and
- Redevelopment of Tana Hydro Power Station Project.

There are currently 17 CDM Projects under Validation, with 698,945 reductions expected as of March 2012.

The “Climate Finance” is a leveraging fund. The so-called “Fast Start Finance” allocated \$30 billion for the period 2010 to 2012, but so far only \$6 billion has been disbursed as the process is very rigorous. The goal is to raise the fund to \$100 billion per year by 2020. Funding for adaptation will flow through the Green Climate Fund. Public sector climate funds are scarce and there is need to leverage with the private sector. The African Development Bank under Scaling up Renewable Energy Program (SREP) has been awarded 50M USD for developing the Menengai Geothermal project. In addition to these 60M USD is in the reserve.

To effectively tackle climate change, more than half of the additional global investment and financial flows would be needed in developing countries. The Ministry of Finance is formulating a policy for climate financing and emission trading in order to establish a climate change fund and carbon trading platform (to be completed by June 2012). It has also established a Carbon Finance Desk and has increased communication campaigns on climate change and related risks and

opportunities. It is also enforcing regulatory instruments and fiscal incentives for making climate related investment relatively more attractive.

To which extent climate finance can catalyze a transition to a low-carbon economy, will, among others, depend on the existence of national-level institutions that are able to deliver emission reductions as well as adaptation benefits and in effective, efficient, and equitable ways. While international support may help to induce policy changes in developing countries and to enable accurate monitoring and reporting of the results achieved, it is essential that low-carbon development strategies be country driven and nationally specific in order to duly account for the particular needs and priorities of each country.

2.6 Climate Smart Infrastructure (Dr. Simon Dulo)

Climate change will modify rainfall, temperature, sea level, and extreme events. The climate impact pathways can be: direct, short term or long term. There are added pressures from external factors e.g. demography, migration etc. For example, safe water supply has reduced at the same time that demand for water has gone up in urban areas.

There are a number of potential economic opportunities when developing climate smart infrastructure, for example:

- Seek to develop innovative approaches to adaptation, e.g. developing dual use and smart infrastructure and using the natural environment;
- Develop new technologies, skills and expertise on climate change adaptation for infrastructure to be used domestically and exported;
- Develop innovative approaches to climate risk, climate modelling and financing.

The focus should be on identifying: the potential impact areas and reducing vulnerability; improved information sharing and disclosure of risk evidence, and; evaluating risks of climate change to infrastructure.

Some strategies that can be applied to reduce vulnerability include:

- Protection through structural measures for property/land from sea level rise and floods;
- Access to good quality information, and early warning system that can help to mitigate disaster impacts;
- Reducing vulnerability of resource base to climate change, variability and extreme events (e.g. embankment to protect from floods, cyclone centre, etc).

Green and climate resilient infrastructure are necessary for sustainable adaptation to climate change, and specific measures will be needed. With respect to water supply, irrigation and drainage systems, for example, one can target: technologies and management methods to increase irrigation efficiency and reduce problems of soil degradation; economic incentives to reduce wasteful practices; increase use of drainage systems to avoid flooding and water-logging of soils; and improve drainage allowing for increases in rainfall intensity. New drainage standards for new works and renewals have to be introduced to spur adaptation. Other more generic examples would include:

- Enhancing adaptation expertise and skills;
- Integrate adaptation into infrastructure investment decisions, in particular assets with a 20 year+ lifetime;
- Look at innovative financial approaches to incentivise adaptation in long-life assets;
- Work with infrastructure owners to increase climate resilience to reduce exposure risk;
- What we can do - Adaptation and mitigation?
- Develop infrastructure so that it can perform two or more functions, such as: using reservoirs for flood control as well as water storage, and road/rail embankments as flood defences;
- Make use of near-term climate predictions, e.g. accurate six-month to one-year forecasts could possibly reduce losses due to weather variability. For example, predictions of El Niño events have proven useful in regions where El Niño strongly affects weather.
- Make management adjustments:
 - Virtually all components of the infrastructure system from planning to development to maintenance should be modified to adjust to climate;
 - Holistic approach to natural and development infrastructure/ resources management and climate change;
 - Address governance and political economy issues;
 - Scaling-up support to reach the MDGs;
 - Enhance coordination of donors;
 - Improve quality of fiscal spending; and
 - Develop technical capacity to absorb incremental resources.
- On technologies, for example in water engineering, energy, and transport, smart decisions from lessons learnt elsewhere are needed.

New infrastructure can be climate resilient by ensuring that an asset is located, designed, built and operated with the current and future climate in mind. Existing infrastructure can be climate resilient by ensuring that maintenance regimes incorporate resilience to the impacts of climate change over an asset's lifetime. One should also ensure that investment decisions take account of changing patterns of consumer demand as a result of climate change, as well as build in flexibility so that infrastructure assets can be modified in the future without incurring excessive cost. The result will be a more resilient and robust infrastructure network able to cope with projected climate impacts e.g. increased flexibility to cope with uncertainty without massive failure and economic cost.

2.7 Question and Answer Sessions

Questions	Response	Comments
Ogalo Presentation		
Why is China asking its airlines to ignore carbon issues?	The European Union is trying to reduce emissions; hence it introduced a carbon charge for all airlines flying to and from the EU skies, for the period 1 st January 2012 to March 2013.	

	These would increase the cost of doing business, so some countries including China and USA, are objecting it.	
How robust is our warning system?	The atmosphere is chaotic thus there are uncertainties, both human and natural, in forecasting so sometimes it may not be very accurate. However, these uncertainties are addressed by issuing the forecast in probabilities. Also the longer the forecast period the more the uncertainties, hence short term forecasts are more accurate.	Kenya Meteorology Department provides local forecasts that have been downscaled from regional models.
Ogot Presentation		
Where can people dispose old electronic equipment?	There are some companies which buy old fridges but how they dispose of them is not known. Old electronic equipment can also be sold to jua kali artisans who reuse them. For old Nokia handsets there is collection centre at Hilton.	NEMA, CCK and Ministry of Communication have come up <u>with</u> guidelines for dealing with e-waste. Disposal of such waste is a global problem.
Why is it that energy saving bulbs intensity appears to be low and they sometimes flicker thus causing visual problems?	There is a wide array of companies producing these bulbs some of which are of low quality and cheap leading to some of the mentioned problems.	This may be due to the failure of KEBS to enforce standards.
Alusa Presentation		
How far are we from having the climate bill? Will we have the right environment for smart climate change?	The environment policy is nearly done and climate change is in it. However, it's widely felt that climate change is not all about the environment, but is cross-cutting. There is concern some aspects (water, energy) will be left out.	There is a climate change bill that will be presented in parliament soon; the bill will be passed as a private members bill then it'll find its domicile either in the ministry of environment or the prime minister's office. Climate change is a development challenge and is, therefore, beyond environmental issues only.
Ali Presentation		
Mungai Presentation		
Is there competition between the various ministries for the climate change funds?	No. Though climate change is cross cutting though there is no harmonized approach to access the funds.	Clean technologies are very expensive, so businesses should lobby for concessional financing and for policies on e.g. tax incentives.

3. GROUP DISCUSSIONS

The participants broke out into five groups to consider the following two questions:

1. How can we inject climate smart solutions in our professions? and
2. How can we create climate smart synergies amongst ourselves?

The outcomes of these discussions are presented below.

3.1 How can we inject climate smart solutions in our professions?

Proposed Actions	G1	G2	G3	G4	G5
• Waste management and recycling which reduces the waste burden.					
• Environmental conservation and application of NEMA laws, e.g. avoid constructing in wetlands, blocking drainage systems - don't tire in sensitizing people; e-maps can help people know where wet lands are.					
• Make use of various bodies such as NEMA; Environmental Impact Assessment reports should be done with local solutions.					
• Policies should be used to enforce what should be done especially in the construction industry; awareness creation of policies, laws and practice codes (e.g. building code) is important in this respect.					
• Climate change should be included in the school curriculum from a tender age to tertiary level.					
• Weather information should be centralized with satellite offices e.g. at county level.					
• Professionals and communities should be involved in policy formulation.					
• Advocacy - tell people about available green technologies. For example, the cooking basket has reduced energy use in households by about 50%.					
• Green buildings: design buildings with the environment in mind. A key challenge is where information on green buildings can be obtained.					
• Constructing buildings with appropriate designs and smart energy solutions in mind e.g. solar water heating systems.					
• Professionals should lobby for enactment of laws and demonstrate benefit of laws e.g. building codes, to communities.					
• Organisations should have measured deliverables with respect to enhancing green economy practices.					
• Timely intervention of activities.					
• Use reliable information from the meteorological department.					
• Engage in business activities that are environment friendly.					
• Everybody should get information on climate change then they can					

use it to influence the community.					
<ul style="list-style-type: none"> Policy alignment across sectors is important. For example, the KEBS and Ministry of Agriculture policies on fruit juices are not synchronized. Such policies should be climate smart. 					
<ul style="list-style-type: none"> Adopt renewable energy and technologies that don't conflict with climate. 					
<ul style="list-style-type: none"> Professionals should be in the frontline of climate change information dissemination, propagation of requisite skills to grassroots level, and public interest litigation. 					
<ul style="list-style-type: none"> Professionals should lobby relevant authorities to initiate or institute climate smart practices. 					
<ul style="list-style-type: none"> Professionals should be proactive not reactive. 					
<ul style="list-style-type: none"> There should be a climate change desk in all government institutions. 					
INDIVIDUAL RESPONSES					
<ul style="list-style-type: none"> Establish businesses that address the short-term concerns of poor communities. It is prudent to protect natural resources integrity while at the same time addressing community short-term needs such as food security and poverty. 					
<ul style="list-style-type: none"> An integrated business venture that addresses drought risk, food insecurity and poverty concerns can create climate sustainable business. 					
<ul style="list-style-type: none"> Enable Kenyan society to document indigenous knowledge, technology and innovations – build on this as a bridge to smart climate business. 					
<ul style="list-style-type: none"> Improve research funding to create smarter solutions. 					
<ul style="list-style-type: none"> Initiate carbon credit projects in all sectors. 					
<ul style="list-style-type: none"> Adopt mechatronics, automation robotics for industry. 					

3.2 How can we create synergies amongst ourselves?

Proposed Actions	G1	G2	G3	G4	G5
<ul style="list-style-type: none"> Networking and information sharing across all professions; sharing information in workshops, and integrated systems in organizations. 					
<ul style="list-style-type: none"> Implement more smart practices for example green building, and encourage green energy solutions. Those in that profession should lead by example. 					
<ul style="list-style-type: none"> Revise policies and practice codes especially in the construction sector and procurement. 					
<ul style="list-style-type: none"> Weather information should be centralized. 					
<ul style="list-style-type: none"> Include indigenous knowledge in policy formulation. 					
<ul style="list-style-type: none"> Create awareness. 					

• Conduct energy audits in buildings.					
• Walk the talk, implement ideas that are raised in forums, lead by example.					
• Support laws from other professions.					
• Aid in cultural change.					
• Teach the young generation how to cope with climate change – include it in education.					
• Professionals should coalesce into mega-bodies that will have muscle to push for climate change issues.					
• Professionals should organize training sessions and common activities.					
• Professionals should pool together funds to tackle climate change issues.					
• Promote a climate friendly nation by supporting each other, harmonizing laws and advocating for cultural and behavioural change.					
INDIVIDUAL RESPONSES					
• Borrow from best practices including technologies and concepts.					

4. PANEL DISCUSSIONS

4.1 How can we create climate smart sustainable business in Kenya?

- Create more awareness on carbon trading and hence encourage more investors in it;
- Enforce the current laws e.g. for land owners who have 2 acres of land and above 10% of it should be under forest cover;
- Review policies and legislation to take climate change issues into account;
- Integrate ICT technologies in activities undertaken e.g. using digital maps would help one look at things holistically;
- Drive for a change in culture with respect to environment and practice sustainability;
- Mind emission levels in all businesses;
- Give renewable energy priority;
- Embed smart climate principles in organizations vision and mission;
- Embrace cultural change with respect to environment stewardship and practice sustainability;
- Reduce emission levels at business premises;
- Encourage the use of renewable energy;
- Educate staff on climate change and global warming issues;

- Institute knowledge documentation systems to generate smart ideas from local/indigenous knowledge; and
- Be more aggressive in information sharing and in responses to issues/problems.

4.2 How can we move towards a green economy?

- As more people move to urban areas we need to plan cities especially the transport systems. Kenya is currently emitting more from transport, thus with better systems the emission would reduce;
- Have strict measures to control urbanization;
- Better planning of cities through tools, measures and policies on urbanization especially transport which is the source of greatest emissions;
- Borrowing from Rwanda; campaign against plastics and have something to replace them;
- Adopt policies that reward green technology adoptions;
- Lobby government and financial institutions to give assistance to develop green technologies that are expensive;
- Carry out digital mapping for a holistic overview of how to effectively develop green businesses;
- Understand what appeals to the farmers in the ground;
- Educate on entrepreneurship and greening is encouraged;
- Avail research funding for climate change since we have what it takes to do the projects for green economy;
- Have incentives for alternative ecosystem uses;
- Good networking and collaboration among stakeholders; and
- Focus on demand driven areas.

4.3 Top Challenges/Opportunities, Resources and Required Mechanisms

Challenges/Opportunities Kenya Needs To Take	Existing Resources	Required Mechanisms that should be used
Inability to implement and enforce laws/policies (C)	Skills at all levels	Corporate social and environmental responsibility and franchising
Not self sufficient in food, water and energy (C)	Human resource (innovative)	Need for good will
Lack of proper waste disposal and recycling technology (C)	Land; especially the 80% non-arable land that can be harnessed with the right technology	Harness public-private partnerships
Wind, solar and water resource energy (O)	Knowledge, human capital, institutions and communities	
Planning infrastructure for future (O)	Innovative society	
The biggest polluters aren't in our control (C)	Many universities	
Fast track carbon trading and carbon projects (O)	Indigenous crops and seed varieties	
Use renewable energy resources (O)		

External influence on internal issues e.g. control by donors (C)		
Cultural; e.g. taste for exotic food especially maize rather than traditional foods (C/O)		
Land use planning, use, efficiency and conservation of natural resources (C/O)		
Duplication of efforts (C)		
Funding (C)		

5. CLOSING REMARKS – Patrick Chabeda, OPM

There should be more forums that bring together professionals from different backgrounds. Continuous engagement is necessary if we have to tackle climate change issues. To this end, the OPM is open to support multidisciplinary programs and activities.

The information from the workshop will be synthesized and a report shared with all participants so that they can act on ideas from the workshop.

Vote of Thanks.

ACKNOWLEDGEMENTS

We thank the Office of the Prime Minister of Kenya for having the foresight to recognize the importance of sensitizing professionals in various key sectors to climate change issues and climate smart thinking, as well as for funding and organizing the Workshop. Those involved in the organization included: Dr. Alexander Alusa and Mr. Patrick Chabeda. We also thank the Institute for Climate Change and Adaptation (ICCA), University of Nairobi, for facilitating the Workshop and producing the Workshop Report. This team comprised of Prof. Shem Wandiga (Acting Director), Dr. Maggie Opondo, Dr. Gilbert Ouma, and Dr. Daniel Olago. Special thanks go to the Provocateur, Mr. XXX and to the speakers: Prof. Laban Ogallo (IGAD Climate Prediction and Application Centre - ICPAC) Prof. Madara Ogot (University of Maseno and ICCA), Mr. Obadiah Mungai (Ministry of Finance), Dr. Simeon Dulo (University of Nairobi and ICCA), Dr. Ali Adan Ali (National Museums of Kenya), and Mr. Alexander Alusa (Office of the Prime Minister). We would also like to acknowledge the very good efforts of the Group Chairs and Rapporteurs, as follows: Group Chairs – [need names of group chairs]: Rapporteurs - Dr. Lydia Olaka, Ms. Christine Omuombo, Ms. Emmah Mwangi, Ms. Purity Mwirigi, Mr. Eric Guantai, Ms. Leyden Onyango, Mr. Mwaniki [list is incomplete]. We also acknowledge the workshop secretariat staff, XXX and YYY from the Office of the Prime Minister, and, Ms. Rita Muriuki and Ms. Marianne Mulinge from University of Nairobi Enterprises and Services (UNES) for their sterling support in ensuring that the workshop logistics went smoothly and that participants were well taken care of. Last but not least we applaud all the participants for availing the time to attend the workshop and for their contributions to the very focused, spirited and fruitful deliberations whose outputs are contained in this report.

LIST OF PARTICIPANTS

	NAME	INSTITUTION	EMAIL
1.	Kelengwe, Edward Sumba	IEK	kelengwe@yahoo.com
2.	Dulo, Simeon Otieno	ICCA-UoN	otienodulo@yahoo.co.uk
3.	Mwaniki, Robert	KDPN	radenterprises.limited@gmail.com
4.	Oludhe, Christopher	UoN	coludhe@uonbi.ac.ke
5.	Opongo, Maggie	ICCA-UoN	maggie@swiftkenya.com
6.	Ouma, Gilbert	ICCA-UoN	gouma@uonbi.ac.ke
7.	Mwangi, Emmah	UoN	mwangiemmah@gmail.com
8.	Oduor, Leyden Onyango	Premier TL	leyden@pt.co.ke
9.	Lwannia, Joseph	Budalang'i Floods	lwanniajoseph@yahoo.com
10.	Tawuo, Sidney	Kenya Coalition for Wildlife Conservation	squimtai@yahoo.com
11.	Njaywe, Patrick	Alive and Kicking Kenya	ongusnjaywe@gmail.com
12.	Musilu, Bahati	KMS	Bahati@meteo.go.ke
13.	Mwangi, Michael	Eclat Consult	info@eclatconsult.com
14.	Wainaina, Jack	CISDEP	cisdepkenya@gmail.com
15.	Theuri, Eric	LSK	erictheuri@yahoo.com
16.	Miguda, Joseph	Envirosan International	Joseph.miguda@envirosan.net
17.	Obuta, Michael	MoA	michaelobura@yahoo.com
18.	Wandiga, Shem	UoN-ICCA	wandigas@uonbi.ac.ke
19.	Gatundu, John	KISM	jgatundu@gmail.com
20.	Olwera, Julius	Clarion-Kitale	juliusmusoliza@yahoo.com
21.	Thande, Mugure	LSK Member	mthande@kembigituradv.com
22.	Mwaura, Nelson	Arch. Soc. of Kenya Member	Nelson.mwaura@gmail.com
23.	Munywe, Simon	KEMA Environmentalists	-environmentalist@yahoo.com
24.	Mukoma, Charles	Galaxy Valuers Associates	Mukoma3@yahoo.com
25.	Oundo, Steven	AAK	oundo@wananchi.com
26.	Adan, Ali	NMK	aadan@museums.or.ke
27.	Guantai, Eric	FICO Kenya	guantaierick@gmail.com
28.	Momoi, AlaisLenana	MatonyoikOrganisation	matonyokorg@gmail.com
29.	Mburu, TirusKariuki	KISM	tkmburu@yahoo.com
30.	Ogallo, Laban	ICPAC	logallo@icpac.net
31.	Mathenge, Gilbert	Kenya Valuers Association	gilma@yahoo.com
32.	Alusa, Alexander	OPM	alexalusa@gmail.com
33.	Mugo, Mary	OPM	Marymugo28@yahoo.com
34.	Diang'a, Stephen	AAK/JKUAT	sdianga@yahoo.com
35.	Mwirigi, Purity	Huzza Ltd./KISM	puritymmw@yahoo.com
36.	Otok, Bernard	DKA	otokbernard@yahoo.com
37.	Wambua, M.S.K.	Public Service/KISM	saidmartin@yahoo.com
38.	Machel, Samora M.	AGES Group	Samora-machel@agesgroup.org
39.	Omengo, Stephen	ISK/Tyson's Ltd.	somengo@tysons.co.ke
40.	Njuguna, Mugwima	AAK/JKUAT	mugwima@yahoo.com
41.	Muigua, Kariuki	ICPSK	muigua@kmco.co.ke
42.	Odhiambo, George	M&E Consulting Eng.	george@mandeconsultingeng.com
43.	Mumbi, James Kaguthai	Ministry of Trade	jamesmumbi@gmail.com

44.	Naserian, Mercy	OPM	mercynaserian@yahoo.com
45.	Munyi, Lillian	Plan International	Lillian.munyi@plan-international.org
46.	Nyaberi, Amos	CHD	nyaberios@yahoo.com
47.	Argwings, Clement	S KMTC Siaya	Kodhek2001@yahoo.com
48.	Nyongai, Obadiah	Ministry of Finance	Okungu@treasury.go.ke
49.	Maweu, Elizabeth	OPM	emaweu@gmail.com
50.	Patel, Mukesh	AAK	Archeus2@gmail.com
51.	Nyaranga, Carey	Pest Management	pititek@yahoo.com
52.	Kambury, Lwambe	ENERMAP	lkambury@gmail.com
53.	Ondiek, Christopher	AAK	chrisondiek@gmail.com
54.	Gitahi, Mark	AAK	mgitahi@gibbinternational.com
55.	Mui, Peter	DPI	disabledkenya@yahoo.com
56.	Lago, Daniel	Sidede Wind Farm	jasidede@yahoo.com
57.	Murasserah, Abdul	OPM	amurasserah@primeminister.go.ke
58.	Gikungu, David	Kenya Met. Society	dqikungu@gmail.com
59.	Otieno, Miriam	Kenya Girl Guides Association	Ohmariahm84@yahoo.com
60.	Litondo, John	M&E Consulting Eng.	jmlitondo@mandeconsultingeng.com
61.	Mutisya, Andrew	DIP Kenya	Disabled international
62.	Mwendwa, Samuel	DIP Kenya	Disabled international
63.	Opere, Alfred	UoN	aopere@uonbi.ac.ke
64.	Musei, Peter	PACEF Kenya	petermusei@pacefkenya.org
65.	Chepkorir, Joynellen	PACEF Kenya	joycheps@yahoo.com
66.	Nyaga, Immaculate	PACEF Kenya	nyagaimmaculate@yahoo.com
67.	Kamau, Stephen M.	PUEA	Kamaustephen45@yahoo.com
68.	Makumi, Gideon	BAT/KISM	gmakumijnr@gmail.com
69.	Ochieng, Seth	BAT/KISM	Ochieng.seth@yahoo.com
70.	Wetende, Linet	BAT/KISM	wetendelinet@gmail.com
71.	Wambui, Cecelia	BAT/KISM	Ceceliawambui350@gmail.com
72.	Gathecha, Waweru	AAK	wg@waweru.com
73.	Kungiha, Catherine	IMAP International	ckungiha@gmail.com
74.	Obiero, Eugene	Visagio	Eugene.obiero@visagio.com
75.	Omari, Evans	Green Initiative Africa	Moevens2009@gmail.com
76.	Olago, Daniel	UoN-ICCA	dolago@uonbi.ac.ke
77.	Chabeda, Patrick	OPM	pachabeda@gmail.com
78.	Odero, Kenneth	KIP/AAK	kennethodero@gmail.com
79.	Omuombo, Christine	UoN	omuombo@uonbi.ac.ke
80.	Olaka, Lydia	UoN-ICCA	lydiaolaka@uonbi.ac.ke
81.	Muriuki, Rita	UNES	Rita.muriuki@uonbi.ac.ke
82.	Mulinge, Mariana	UNES	Mariana.mulinge@uonbi.ac.ke