

Workshop Report

Reducing the Vulnerability of Rwanda's Energy Sector to the Impacts of Climate Change

UNEP GEF Pilot Project implemented by KIST with support of IISD and ACTS

Preparation of the Implementation Plan for Phase 2:
Field intervention 2007-2009

Prepared by:
Jean Claude Uwizeye (CITT/KIST)
Anne Hammill (IISD)

Venue: Center for Innovation and Technology Transfer (CITT)
Kigali Institute of Science and Technology (KIST)
Kigali-Rwanda

Dates: 14th-15th February 2007



Participants:

1. Prof. Elifas Bisanda, KIST Vice Rector, Academics
2. Mr. Gerard Nyabutsitsi, KIST Vice Rector, Admin& Finance
3. Ms. Anne Hammill, IISD, Project Manager
4. Mr. Aime Bosenibamwe, Mayor Burera District
5. Mr. Robert Komire, Representative of Musanze District
6. Mr. Jean Baptiste Bacondo, CITT Director
7. Mr. Gabriel Ntawuruhunga, MININFRA, Project steering committee Chairman
8. Mr. Charles Uramutse, MINITERRE, Project steering committee member
9. Mr. Sebastien Usabyeyezu, REMA, Project steering committee member
10. Mr. Aimable Sekata, MININFRA, Project steering committee member
11. Mr. Sylvere Munyaneza, PMO, Project steering committee member
12. Mr. Saidi Sibomana, CDF, Project steering committee member
13. Mrs. Colette Ruhamy, KIST, Project steering committee member
14. Mr. Denys Disi, ELECTROGAZ, Project steering committee member
15. Mr. Jean Claude Uwizeye, CITT, Project coordinator
16. Eng. Emmanuel Kanigwa, CITT, Project team member
17. Mr. Richard Mutabazi, CITT, Project team member
18. Mr. Guillaume Sebahutu, CITT, Project team member
19. Mr. Jean Nepo Mutsinzi, CITT, Project team member
20. Ms. Bernadette Nikuze, CITT, Project team member
21. Mr. James Kainamura, CITT Project team member
22. Mr. Joseph Bizima, CITT Project Consultant
23. Mr. Donald Kabanda, CITT Satellite center Manager, Project team member
24. Mr. Antoine Kapiteni, IMCE Coordinator,
25. Mr. Fidele Uwimpaye, COOCASTER, representative

Moderator: Mr. Jean Claude Uwizeye

Secretariat: Mr. Richard Mutabazi
Mrs. Bernadette Nikuze

Workshop Report

Preparation of the Implementation Plan for Phase 2: Field intervention 2007-2009

BACKGROUND

The goal of the *Integrating Vulnerability and Adaptation in Eastern and Southern Africa* project is to reduce the vulnerability of communities to the impacts of climate change, thereby improving their well-being and protecting their livelihoods. The project will also provide global environment benefits by contributing to the mitigation of land degradation and greenhouse gas emissions. In order to achieve this goal, the project will promote the mainstreaming or integration of vulnerability and adaptation to climate change into sustainable development plans and planning processes through pilot projects in Kenya, Mozambique and Rwanda. The intended outcomes of the project are:

- Generation of capacity in each pilot project country to implement adaptation measures in the field that will reduce their vulnerability to climate change;
- Increased capacity in each country to generate and use information about climate change to effect change in relevant development policies; and,
- Increased knowledge of the linkages between development planning and climate change, including policy process and methodologies.

The individual pilot projects will also contribute to the mitigation of land degradation and greenhouse gas emissions. In Kenya, efforts to reduce the vulnerability of Makueni District to the impact of drought through improved land management practices will contribute to sequestration or conservation of carbon in the soil. Community-based fire management in central Mozambique will reduce the area of forests that currently burn on an annual basis, and provide the skills necessary to address the rise in fire outbreaks anticipated as a result of climate change. In Rwanda, increased provision of energy from current and future mini-hydro dams will reduce demand for energy from fossil fuels and biomass sources.

The objective of the pilot project in Rwanda is to improve the management of hydro potential in Rwanda. This will involve identifying the causes for reductions in water potential across the country with respect to weather and climate change phenomenon and implementing a pilot project addressing the identified causes. The project will initiate policy change that supports the implementation of appropriate measures that safeguard long-term sustainability of hydropower use in the country and in the region.

A pilot project is therefore proposed on two hydropower stations (Ntaruka and Mukungwa) that are fed by three series lakes (Rugezi, Burera & Ruhondo) in Northern Province. The project will offer an opportunity to undertake an extensive and in-depth investigation of climate change impacts as they relate to agricultural land and farming practices, water catchments, siltation rates in the lake, water quality, flora and fauna, as well as power supply and demand.

The project will run for three and a half years, with a cash funding contribution of US \$313,333 from UNEP GEF and the government of Netherlands. Additional contributions

will be provided by the Government of Rwanda to support community mobilization, institutional coordination and logistical support.

OPENING REMARKS

The workshop started with a welcoming remark by the, **Mr Jean Baptiste Bacondo**, *CITT Director* wishing all the participants a fruitful workshop. He noted that the workshop was of paramount importance, as it was going to lay the foundations for a smooth transition to the second phase of the project. He then asked the KIST Vice Rector to officially open the workshop.

The workshop was officially opened by **Prof. Elifas Bisanda**, *KIST Academic Vice Rector*. He acknowledged the importance of the Rwanda pilot project, as energy is a pre-requisite to development. He also explained that there is a close correlation between climate change and the energy sector. He pointed out the importance of looking for alternative forms of energy because they have a direct impact on addressing climate change.

With those key notes, he invited all participants to make the most of their contribution to the workshop, wishing good deliberations and then declared the workshop officially open. After the official opening, all participants introduced themselves and set the stage for a smooth and cordial discussion.

Mr. Jean Claude Uwizeye, *Project Team Leader CITT/KIST*, briefly highlighted the objectives and aim of this two-days workshop; he said that since the project is at the closing stages of the first phase, we need to sit together as stakeholders and assess what has been achieved to date but more importantly discuss the second phase, which will focus on the field components of the project.

WORKSHOP PRESENTATIONS

1. Current status of Climate Change in Rwanda

Presented by:

Mr. Charles Uramutse, *Project Steering Committee Member*

Ministry of Lands, Water and Natural Resources MINITERE

Mr. Uramutse provided an introduction to climate change and highlighted current observations of climate change in Rwanda. He defined climate change as the change in climate over a time period ranging from decades to centuries resulting from both natural phenomena and human activities.

Overall, Rwanda has a moderate tropical climate with an average temperature of 20°C and an average rainfall of 1000mm/year. The rhythm of rainfalls determines the seasons, and there are two rainy and two dry seasons. Despite some irregularities, rains are generally well distributed over the year.

Looking at the sub-national climate profile, it is observed that average temperatures decrease from East to West due to topography. In low the altitude zones to the East and South East, temperatures are highest (they can reach 30°C in February and July-August) and rainfall is less abundant (700 to 970 mm/year). In the intermediary altitude zones, temperatures vary between 19 to 29°C and the average rainfall is about 1000 mm/year, with irregularities that can lead to dry periods. In the high altitude regions of Congo-Nile crater in the West, average temperatures range between 15 to 17°C and rainfall is abundant.

In terms of observed changes in Rwanda's climate, an analysis of rainfall and temperature records show that rainy seasons are getting shorter and temperatures have been increasing since 1990. The period 1991-2000 was the driest since 1961, with 1992 and 2000 being two of the driest years on record.

2. Rwanda hydropower challenges and prospects for the future with a focus on Mukungwa & Ntaruka power stations

Presented by

Mr. Gabriel Ntawuruhunga, *Chairperson of the Project Steering Committee.*

Ministry of Infrastructures (MININFRA)

Mr. Ntawuruhunga discussed the Ntaruka and Mukungwa power stations. Ntaruka power station has been in operation since 1959, initially with two turbines of 3.75 MW each. In 1976 a third turbine of 3.75 MW was added, bringing the total installed capacity of the power plant to 11.25 MW. Unfortunately, Ntaruka's total annual production is only 22 GWh. Due to changes in rainfall patterns and erosion from inadequate agricultural practice, the level of Burera lake fell by 4m (from 1864 to 1860 m of altitude). This has reduced Ntaruka's authorized production to only 1 MW.

As far as Mukungwa Power station is concerned, he mentioned that it was operational from 1982 with an installed capacity of 12.5 MW for the annual production of 48 GWh. Due to the reasons stipulated above for Ntaruka, Mukungwa can only produce at present 3 MW.

In order to overcome the energy crisis caused by the decrease in production of the two power plants **Mr Ntawuruhunga** presented to participants different measures and strategies adopted by the Government of Rwanda, including:

- Restricting the population from cultivating within 50 m from Burera and Ruhondo lakes shores
 - Halting energy production at Mukungwa and Ntaruka power stations for at least one year in order to allow the rise of water levels in Burera and Ruhondo lakes
 - Government investment in a vast micro hydro construction programme with different partners including the government of Belgium (through the Belgium technical cooperation agency, BTC) involving the construction of three micro hydropower plants with a total capacity of 1.8 MW. Soon two more hydropower plants are to be constructed at Rukarara (9.5 MW) and Nyabarongo (27.5 MW)
 - An ongoing project on power generation from methane gas extracted from Lake Kivu
- 3. Introduction to Adapting to Climate Change in Eastern and Southern Africa (ACCESA) and Reducing the Vulnerability of Rwanda's Energy Sector to the Impacts of Climate Change pilot project.**

Presented by

Ms. Anne Hammill, *Project Manager*

International Institute for Sustainable Development (IISD)

She started by introducing the Adapting to Climate Change in Eastern and Southern Africa project (ACCESA), which has a main goal of reducing the vulnerability of communities to the impacts of climate change, thereby improving livelihoods. This will be accomplished through the integration of vulnerability and adaptation to climate change into sustainable development plans and planning processes through three demonstration projects.

The project timeline is June 2005 to September 2009. The total budget consists of a US \$1,000,000 cash contribution from UNEP GEF and approximately US \$ 1,065,000 in co-financing. Key Partners in the project include UNEP and ACTS. The project has three main components: Three Pilot Projects, Regional Meetings and Outreach and Engagement activities.

Ms. Hammill provided a summary of the three pilot projects:

- **In Kenya** the pilot project is entitled "*Increasing Community Resilience to Drought in Makeni District*" and is being undertaken by the Kenya National Academy of Sciences
- **In Mozambique** the pilot project is entitled "*Community-based Fire Management Strategy in Central Mozambique*" and is being undertaken by the Germany Technical Cooperation Agency (GTZ), and
- **In Rwanda** the pilot project is entitled "*Reducing the Vulnerability of the Energy Sector to Impacts of Climate Change*" and is being undertaken by the center for Innovation and technology transfer of the Kigali Institute of Science, Technology.

Ms. Hammill went on to provide further details on the Rwanda pilot project and presented the implantation plan of activities, which is organized in two phases as follows:

- *Phase 1* of the pilot project (February 2006 to February 2007) includes project preparations; initiating engagement with policy makers and local stakeholders;

conducting baseline surveys; and initiating field activities. The budget for this phase was \$65,000 (cash) and an in-kind contribution equivalent to \$30,509

- *Phase 2* of the pilot project (March 2007 to March 2009) includes extensive field activities; continued policy engagement and policy up-scaling. The total budget is \$248,333 (cash) and an estimated in-kind contribution equivalent to \$130,000

Ms. Hammill concluded her presentation by mentioning that there are three areas in which this project would like to affect change: (a) community vulnerability, where peoples' vulnerability to climate stress is reduced through improved livelihoods and ecosystems; (b) energy, both in terms of increased supply and more efficient use, and (c) policy, where climate change is integrated into national and sub-national policy strategies.

4. Reducing the Vulnerability of Energy Sector to the Impacts of Climate Change Rwanda pilot project achievements, phase 1

Co-presented by:

Mr. Emmanuel Kanigwa, *Project Team Member*

Mr. Joseph Bizima, *Project Consultant*

Center for Innovations and Technology Transfer (CITT)

Kigali Institute of Science and Technology (KIST)

Mr. Kanigwa and Mr. Bizima summarized the activities and results from Phase one of the project. **Mr. Kanigwa** highlighted the methodology used for **the Engagement and information Needs assessment of decision makers**, which involved identifying and interviewing key people in relevant government ministries, institutions and agencies and people in the community. Information was also collected through document reviews and Internet research.

Particularly relevant to the Rwanda pilot project is the national energy policy, which was passed in 2004. It has the goal of ensuring the availability of reliable and affordable energy supplies and their use in a rational and sustainable manner in order to support national development goals. The national energy policy, therefore, aims to establish an efficient energy production, procurement, transportation, distribution and end-use systems in an environmentally sound and sustainable manner. The main priorities in the energy sector are to increased electricity supply and distribution; streamline/improve petroleum imports; establish regional interconnection; expand rural electrification; and reach rural households.

Mr. Kanigwa also described activities related with the **Initiation of engagement with communities located in the watershed area**, the objective of which was to inform provincial, district and community officials, as well as other relevant stakeholders, about the project and gather some preliminary social and environmental information on the proposed project area. Communities are living and undertaking unsustainable livelihood activities in the marshland, placing a lot of pressure on the natural environment. Over- population and shortage of land in the area have forced some people leave/flee and settle elsewhere. Communities are keen to learn new methods of crop and animal husbandry and innovative technologies that will advance their living conditions and provide income for basic needs. Concluding his presentation **Mr Kanigwa** said that the community engagement activities

have been useful in raising awareness about the project and that local stakeholders are now looking forward to participating in its implementation.

Mr Bizima introduced the **Energy Baseline**, the purpose of which is to allow for the monitoring and evaluation of the pilot project's impact on energy production, use and efficiency in Rwanda. Information for the baseline was gathered through questionnaires and interviews with the hydropower technicians, review of district data from Musanze, Burera and ELECTROGAZ headquarters in Kigali, and consultations with relevant institutions such as the Rwanda Meteorological Department and Water Department.

Mr. Bizima presented some of the key findings from the energy survey, including:

- Only 0.1% of the Rwandan population use electricity for cooking (mostly due to the drastic increase in the price of electricity in the country)
- Household energy consumption patterns positively correlate with household income.
- Over 99% of the rural population depend on energy sources other than electricity for lighting/illumination (about 70% on lampions, 18% and 10% on firewood and kerosene lamps, respectively.)
- Only 0.5% of rural households depend on electricity for lighting, whereas the corresponding figure for the urban population is 23%.
- The Mukungwa and Ntaruka hydropower stations are not running efficiently and operate at less than 40% efficiency due to a number of reasons including:
 - The demand for energy has increased drastically in comparison with the production capacity (more in the urban area than in rural areas of Rwanda)
 - The fall in water levels of Lakes Ruhondo and Burera, leading to insufficient water for hydroelectricity generation (between 1995–2006, Lake Burera water level fell by 3.95m and Lake Ruhondo by 2.2 m)
 - Insufficient rainfall water exacerbated by drought
 - Inadequate servicing and maintenance of the hydropower stations, particularly Mukungwa

The survey recommended that both hydropower stations be relieved to allow water levels in Lakes Ruhondo and Burera to rise and that alternative sources of energy such as methane gas from Lake Kivu and other renewable energy such as biogas, solar and micro-hydro, peat and wind should be prioritized in order to overcome the energy crisis.

Mr. Bizima then went on to present the **Community Vulnerability Baseline**, which was conducted to provide a basis upon which to monitor and evaluate the success of the project on peoples' livelihoods. Surveys were conducted, gathering information on household characteristics (including level of education, health, fertility, non-wage household income), livelihood characteristics (including cash income sources, farming acreages, crop type and production rates), and household energy use (including the type and quantity of energy presently used.) The survey covered 10% of the watershed community – 40 farmers taken from 19 cells in 13 sectors from 2 districts of Musanze and Burera were interviewed for the baseline report.

Results of the survey show that communities in the watershed area of Mukungwa and Ntaruka hydropower stations are poverty-stricken compounded by:

- A shortage of land exacerbated by large families (9 people per family)

- Communities not being able to produce enough to meet family food needs and sell agricultural produce
- The over-utilization of land leading to a decline in soil fertility, poor land management and thus very little crop yields
- Predominantly little or no cash crops
- Insignificant livestock production
- Dependency on fuel wood and kerosene for energy, which perpetuates deforestation and the loss of vegetative cover

Concluding his presentation, Mr Bizima said that the survey indicated that land degradation in the watershed area has serious consequences to the hydropower stations of Mukungwa and Ntaruka. In order to reverse this situation he suggested that adaptation measures, such as supporting communities in the watershed area in better land management techniques, can be adopted to restore ecosystem and thus safeguard the lakes and hydropower stations. Specific activities could include training communities in better soil erosion control practices, tree planting and intensive livestock production as part of an integrated soil fertility management approach.

5. Activities of the Integrated Management of Critical Ecosystems Project (IMCE)

Presented by

Mr. Antoine Kapiteni, Project Coordinator

Integrated Management of Critical Ecosystems (IMCE)

Mr. Kapiteni's presentation started with a background introduction to the Integrated Management of Critical Ecosystems (IMCE) project, which is a MINITERE tutorship under REMA and is funded by the World Bank (GEF PPG TF 055471) with a budget of 4.3 million US dollars. Its pilot phase was implemented from 14th June 2001 to 31st January 2004.

The project's goal is to achieve "a better protection and conservation of natural resource base through the promotion of an integrated approach to land resource management" and its specific objectives include:

- Rehabilitation of farmed wetlands and hill-side areas by providing incentives to farmers and farmers organizations with the aim to induce an adoption of soil and water conservation technologies
- Promote an environmentally friendly farming technologies to help increase food production and rural income

In order to achieve the above mentioned objectives the project has adopted guiding principles based on the following four themes:

- Bottom-up planning involving the cellules and sectors
- A participatory M&E system that integrates the leadership of cellules, sectors and districts
- Provision of capacity building to the CDC
- Adoption of a much stronger participatory approach using community-based ecosystem management plans

The main project components include:

- Development of a policy and regulatory environment for sustainable wetland and natural resource management
- Capacity building and institution strengthening in decentralized integrated ecosystem management
- Development and implementation of community-based integrated ecosystem management plans for critical ecosystems

Mr. Kapiteni continued by highlighting the IMCE project achievements to date, which include:

- Studies involving a biodiversity evaluation of four complex wetlands (Rugezi, Kamiranzovu, Rweru-Mugesera and Akagera)
- Development of a policy and legislation framework for the sustainable management of wetlands
- Terms of reference for the establishment of an environmental data system and the design of all systems
- Recruitment of staff
- Field visits, construction of terraces

He also gave an overview of planned project activities for 2007, which include:

- Study on policy and regulatory framework
- Baseline survey of the four critical ecosystem watersheds
- Socio-economic studies for the 4 critical ecosystems
- Integrated watershed management plans of the four project sites
- Creation of biodiversity information system (BIS)
- Establishment of a bamboo and Pennisetum belt
- Put in place a system to decrease the speed of water flow through the central channel of Rugezi marshland
- Inventory of marshlands and their categorisation into protected marshlands and productive marshlands
- Mainstream biodiversity and environmental conservation aspects into sector-based policies and local development plans
- Develop environmental education, information and communication plan to be approved by the beneficiaries

During the implementation of the project some problems and constraints were encountered. Among others, Mr. Kapiteni discussed illegal occupation of wetlands due to high population pressure and reluctance of the population to stop agricultural exploitations in the marshland. Also, there have been delays with the World Bank (sometimes up to two months), and working relationships with partners at the district level are not yet fully established. This has slowed down the implementation of some planned activities.

In conclusion, he informed participants that near future project activities include developing integrated watershed management plans, creating awareness at all levels, and strengthening the capacities on environmental approach. He presented some of the documents produced by the project and said they were available to researchers and decision makers. These included (a) the terms of references for the 4 integrated watershed management plans, and (b) a report on the Integrated Watershed Management (IWM) approach prepared by the “Institut des Sciences Agronomiques du Rwanda” (ISAR), which was used in the three major (altitude-

based) agro-ecological zones in Rwanda in an effort to combat natural resources degradation and the subsequent decline in system productivity and increasing poverty among the rural communities.

6. Activities of the Cooperative for Conservation and Soil Improvement through Radical Terracing “COOCASTER” in the project area.

Presented by:

Mr. Fidel Uwimpaye, Managing Director

Coopérative de Conservation et d’Amélioration de Sol et Terrassement Radical (COOCASTER).

Mr. Uwimpaye started by introducing COOCASTER, which is a Cooperative that was founded after a prolonged observation of the overexploitation and resulting deterioration of land by different means. A group of professionals felt that it would be good, useful and appropriate to participate in the conservation and improvement of land through the use of radical terracing technology in order to increase agricultural production and reduce poverty.

The overall goal of COOCASTER’s activities is the conservation and improvement of soil in order to increase agricultural production and protect the environment. Its mission is to fight against erosion through field interventions such as:

- planning and constructing radical terraces
- creating contour trenches
- digging anti-erosive ditches
- planting anti-erosive and agro forestry species to hold soil and provide fodder for livestock
- developing management plans for swamps to allow agricultural exploitation
- ensuring the availability of the agricultural lime, mineral and other agricultural inputs to farmers
- providing revolving credit to farmers using radical terraces to support small-scale livestock acquisition so they can produce and use organic matter in agricultural activities
- Establishing tree nurseries for fruits and agro-forestry species to support the slopes of radical terraces and the contours of the progressive terraces.

Among other activities COOCASTER focuses on is training farmers and others on the following topics: creation or planning of radical terraces; marshlands development planning; maintenance or management of radical terraces and other structures constructed in the marshland; rational exploitation radical terraces (slopes and plateaus); production of organic matter (compost, farm manure, green manure, households residues); organic and mineral fertilization; modern agriculture; agro forestry, forestry; and topography.

Mr Uwimpaye concluded by adding that COOCASTER plays the role of mediator between farmers and governmental projects or other state or private institutions in the Northern Province in general, and in Burera and Musanze in particular.

7. Reducing the Vulnerability of Energy Sector to the Impacts of Climate Change in Rwanda Pilot Project Phase 2, Implementation Plan: 2007-2009

Presented by

Mr. Jean Claude Uwizeye, *Pilot Project Team Leader*
Center for Innovations and Technology Transfer (CITT)
Kigali Institute of Science and Technology (KIST)

The presenter reminded participants that the project's goal is to reduce the vulnerability of communities to the impacts of climate change, thereby improving their well-being and protecting their livelihoods; and that its objectives focused on reducing the vulnerability of Rwanda's energy sector to the impacts of climate change in the short- and long-term through improved resource management in the watershed that supports the Ntaruka and Mukungwa hydropower stations and contributes to poverty alleviation in the participating villages within this region.

Expected outcomes:

Mr Uwizeye described how the outcomes of second phase of the pilot project could be grouped into three categories, namely those associated with the watershed, those with the hydropower stations and then those linked to policy up-scaling. Specifically, the anticipated outcomes of the second phase were stipulated as follows:

- a) Outcome 1: The watersheds will be ecologically restored and better managed through the following outputs and activities:
 - Output 1.1: Watershed communities will be supported in implementing agro-forestry activities through sensitization and training meetings, establishment of tree nurseries for climate resilient species, and reforestation and afforestation activities.
 - Output 1.2: Watershed communities will supported in establishing erosion control systems though sensitization and training meetings and the construction of erosion control structures.
 - Output 1.3: Watershed communities will be supported in protecting and better managing water resources through sensitization and training meetings, establishment of rainwater harvesting systems, rehabilitation or/and protection of water springs.
 - Output 1.4: Watershed communities will be supported in alternative energy and energy efficiency strategies through sensitization and training meetings, a feasibility study on household biogas systems, a feasibility study on solar charging stations, and the provision of support to watershed associations in manufacturing energy efficient cook stoves.

- b) Outcome 2: Capacity will be increased for assessing and managing climate change-related risks to hydropower stations through the following output and activities:
 - Output 2.1: Hydropower station managers are supported in operation and maintenance activities through training seminars, the collection and analysis of data on station operation and maintenance, collection and analysis of climate and environmental data in catchment areas, and exchange visits of station operators within and outside of Rwanda

- c) Outcome 3: Capacity will be increased to generate and use information about climate change at the District level to adjust and better implement relevant national policies. This will happen through the following outputs:
- o Output 3.1: Policymakers and policy forums are furnished with information on energy and climate.
 - o Output 3.2: Development and presentation of a policy reform or revision plan for integrating climate change into the National Energy Policy.
- d) Project Management and logistics: The management of this project shall be achieved through three main aspects, including:
- Project Steering Committee meetings
 - Regional meetings
 - Financial and narrative work plans and reports

Mr Uwizeye concluded his presentation by providing a list of equipment required in order to achieve the pilot project objectives and to be used by the implementation team and the beneficiaries in undertaking field activities. These include:

- 2 Laptop computers with wireless internet connection.
- 1 Laser jet printer.
- 1 Scan jet scanner.
- 1 Digital Theodolite (Total station)
- 2 set of portable GPS
- 2 set of portable water quality testing kits.
- Assorted GIS software and models
- Assorted Surveying equipment and tools
- Assorted agriculture equipment and tools
- 1 Digital video camera
- 1 Digital photo camera
- 1 LCD Projector

DISCUSSIONS AND RECOMMENDATIONS

One of the elements to be taken into consideration in implementing the 3 GEF pilot projects is that lessons-learned will hopefully influence the planning and implementation of other medium and long-term adaptation projects in Africa. In the case of Rwanda, lessons from Mukungwa and Ntaruka power stations could be taken into consideration for other hydropower plants in the region and feasibility studies could inform micro hydropower projects undertaken by the Government of Rwanda **Ms Hammill** suggested.

The workshop participants were reminded of the difference between climate change mitigation measures, which involve reducing greenhouse gas levels in the atmosphere (either through emissions reductions or sequestration activities), and adaptation measures, which try to increase capacity to deal with impacts. However, it was noted that some activities address both mitigation and adaptation at the same time, and the Rwanda project is a good example of this.

Asked about the next step of the project after phase two, **Ms. Hammill** declared that that it is up to the Governments and other stakeholders to use the recommendations proposed by pilot projects to implement larger and long-term projects and integrate climate change into policy making.

Mr Bizima informed the workshop participants that the water level has raised one meter since sensitization and afforestation activities in the watershed area started. However, much more needs to be done in the watershed area for a durable and sustainable solution.

Mr Uwizeye suggested that it is important to make use of GIS so that we can obtain an accurate database for decisions. The Rwanda Gateway GIS Center based in National University of Rwanda could be one of the source of data to be exploited and would contribute to the systematic coordination of activities and provide a communication tool to the decision makers and the whole population. Workshop participants requested that the project team use the services of information and communication experts in implementing the project.

The achievements of phase 1 of the pilot project were appreciated and for the successful completion of Phase one and a smooth start (and running) of Phase two, participants recommended that the project team establish a better forum for communication between the project and decision makers, including having Steering Committee members deliver pilot project updates to their respective Ministers

In terms of establishing priorities and developing activities for Phase two field implementation, **Mr Aimé Bosenibamwe**, Mayor of Burera District explained that project activities should be in-line with the District Performance Contract “IMIHIGO”, which is signed between the Mayor and the President of the Republic. In it, priorities are taken into consideration. **Mr. Komire Robert** gave a brief review of the links between district priorities and ongoing projects in Burera and Musanze district respectively, as well as the need to work through and support each District’s Joint Action Forums and contribute to institutional capacity building. Workshop participants suggested these elements be included in the project implementation plan for Phase two (2007-2009.)

It was suggested that a strong collaboration be established between IMCE and the CITT/KIST project team since the two projects share similar goals and activities.

Emphasizing this **Mr Kapiteni** said that the Rugezi wetland is large enough to receive all stakeholders' contributions, and it would be more effective if CITT/KIST could complement IMCE with activities focused on energy, technology dissemination and so forth, although any other field of intervention is also most welcome.

With respect to activities at the policy level, participants noted that conditions such as longer dry seasons, more intense rainy seasons, and higher temperatures should be taken into consideration in agricultural, energy and infrastructure (and other sector) decision-making. For example, strategies must not increase vulnerability through the promotion of inappropriate seed or tree varieties and housing construction projects but should reduce it through livelihood diversification and environmental management, among other things.

Finally, in order to facilitate the sensitization of local communities, workshop participants suggested that project documents, or at least their summaries, be translated into Kinyarwanda.

Appendix 1: WORKSHOP PROGRAMME

Days	Time	Activity/Theme	Responsible/Presenter
Day 1 : 14 th February 2007			
	08:30	Registration	Ms. Bernadette Nikiuze
	09:00	Official opening	Vice Rector Ac, KIST
	09:30	Presentations on Climate Change in Rwanda	Mr. Charles Uramute. MINITERE
	09:45	Mukungwa and Ntaruka Hydropower Plant Situation	Mr. Gabriel Ntauruhunga. MININFRA
	10:30	Discussions on the Climate change and Hydropower	All participants
	10:30	Tea break	Ms. Bernadette
	11:00	Introduction to the Vulnerability and Adaptation Project	Ms Anne Hammill, IISD
	11:30	Discussions on the Vulnerability and Adaptation Project	All participants
	12:00	Lunch break	Ms. Bernadette NikuzeCITT
	13:00	Presentation of the Project achievement (phase I)	Mr. Emmanuel Kanigwa, CITT, Mr. Joseph Bizima.
	14:00	Discussion on the project achievements (phase I)	All participants
	15:00	Summary of the First day	Secretariat:
Day 2: 15 th February 2007			
	08:30	Presentation of IMCE/COOCASER activities	Mr. Kapiteni IMCE/Mr. Fedele COOCASER
	09:30	Discussion project activities Burera/Musanze Districts	All participants
	10:00	Presentation of the project phase II (Field interventions)	Mr. Jean Claude Uwizeye CITT/KIST
	12:00	Group discussions on review of project field interventions	All participants
	13:00	Tea break	Ms. Bernadette Nikuze
	14:00	Group presentations on review of project field interventions	All participants
	12:00	Lunch break	Ms. Bernadette
	15:00	Discussions on the revised implementation plan and budget	All participants
	16:00	Summary of the Second day	Secretariat:
	16:30	Closing remarks	Vice Rector AF., KIST
	17:00	Cocktail	Ms. Bernadette Nikuze

Facilitator:

Jean Claude Uwizeye CITT/KIST

Workshop Secretariat:

Richard Mutabazi and Bernadette Nikuze CITT/KIST