ACC DAR Adapting to Climate Change in Coastal Dar es Salaam

INTERIM NARRATIVE REPORT

Project title:	**Adapting to Climate Change in Coastal Dar es Salaam**
Project acronym:	**ACC Dar**
Grant Contract Beneficiary:	**CIRPS Sapienza University of Rome**
Contact Person:	**Prof. Silvia Macchi**
Partner in the Action:	**Ardhi University Dar es Salaam**
Associate in the Action:	**Dar City Council**
Reporting period:	**From 01/02/2011 to 31/12/2011**
Author(s):	**Laura Fantini, Project Manager** **CIRPS Sapienza University of Rome**

Data contribution and reviews to the successful submission of this report have been provided by all the project team members: Silvia Macchi, Liana Ricci, Matteo Rossi, Giuseppe Faldi, Michele Munafò, Luca Congedo, Gabriel Kassenga, Steve Mbuligwe, Olivier Malcor.

The project is co-funded by European Union

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INTERIM NARRATIVE REPORT

1. Description

1.1. Name of beneficiary of grant contract: CIRPS – Sapienza University of Rome

1.2. Name and title of the Contact person: Prof. Silvia Macchi, Project Coordinator

1.3. Name of partners in the Action: Ardhi University of Dar es Salaam (ARU)

1.4. Title of the Action: Adapting to climate change in coastal Dar es Salaam (ACC DAR)

1.5. Contract number: 2010/254-773

1.6. Start date and end date of the reporting period: from 1st of February 2011 to 31st of January 2012

1.7. Target country(ies) or region(s): Tanzania, Dar es Salaam

1.8. Target groups: Dar's municipalities and their wards laying on the Ocean coast

Final beneficiaries: Inhabitants of Dar's coastal areas

1.9. Country(ies) in which the activities take place (if different from 1.7):

2. Assessment of implementation of Action activities

2.1. Executive summary of the Action

ACC Dar project aims at improving the effectiveness of Dar's municipalities initiatives for supporting those coastal peri-urban dwellers partially or totally depending on natural resources in their efforts to adapt to CC impacts. More specifically, the action will improve the capacities of Dar's municipalities by providing them with enhanced methodologies for mainstreaming adaptation into their Urban Development and Environment Management (UDEM) strategies and plans, and by increasing their understanding of adaptation practices. The achievement of these objectives will contribute to the overall aim to improve the implementation of the National Adaptation Programme of Action of the United Republic of Tanzania.

This report covers the period from the beginning of the action (1st of February 2011) until the end of the first year of implementation (31st of January 2012). CIRPS is the project coordinator, Ardhi University is the partner and Dar City Council (DCC) is acting as associate. The three Dar's municipalities of Ilala, Temeke and Kinondoni has been the main stakeholders in the action implementation.

In the framework of the work package 1 "Improve Understanding in Adaptation", two huge surveys have been conducted: first, a questionnaire has been administered to almost 6000 households in Dar's coastal plain (5% of the estimated population) to investigate the livelihoods of the target population and their concern for CC; second, DCC representatives and Dar's municipal services staff have been interviewed to investigate their current activities related to UDEM and to CC adaptation, if any. The foreseen participatory activity will provide the added value of exploring local options of autonomous adaptation and to raise awareness on CC among inhabitants of the target area. The participatory methodology has been chosen and a feasibility study has been successfully concluded.

In the framework of the work package 2 "Develop Methodologies for Designing Adaptation Initiatives", two research teams are working in parallel. One is centred on the development of methodologies to monitor spatial changes in Dar's peri-urban settlements through Remote Sensing and GIS techniques and explore the link between land cover and climate change impacts. The other focuses on methodologies for exploring vulnerability scenarios to a specific environmental phenomena, the seawater intrusion, that is already contributing to the degradation of those natural resources on which a large part of peri-urban livelihoods depend. Both research teams take into account skill and equipment already available at DCC, as well as their financial constraints, to better tailor their work for the benefit of the target group.

Next year the two working groups will continue to work on the methodologies merging and integrating their data with findings from WP1 analysis, to assess CC vulnerability scenarios and develop the methodology for participatory design that will be employed in the third year to define community based adaptation initiatives.

As regards the work package 3 "Build the Capacity of Dar's Municipalities" in understanding CC issues, designing adaptation activities and integrating them in their UDEM strategies and plans, the assessment of the needs to be addressed in the training programme and the identification of the municipal officers and services who will be trained already started. Other progress related to the WP 3 are expected during the second and third project year. The better understanding of actual and practical ways of addressing CC adaptation in coastal areas of Dar es Salaam from the WP1 survey results and

the methodologies developed under WP 2 will provide the basis for the capacity-building activity addressed to Dar's municipalities and the tools for the design of adaptive measures.

The dissemination of the project activities and results, and the project coordination and management run throughout the whole project.

Two factors should be underlined as playing a crucial role for the successful implementation of the project during the reporting period: first, the continuous cooperation between partners and among all personnel carrying on the activities; second, the strong commitment of the local authorities at all institutional levels (DCC, Dar's municipalities, community leaders and street leaders) and their availability to collaborate in the project goals achievement.

2.2. Activities and results

Three work packages have been designed in order to secure success in all the activities of the action and to achieve the expected results. A WP "0" includes management and coordination activities. Each WP consists of several activities. The whole structure of the action and the functional relationship among all the sub-activities is shown by the following flow chart.

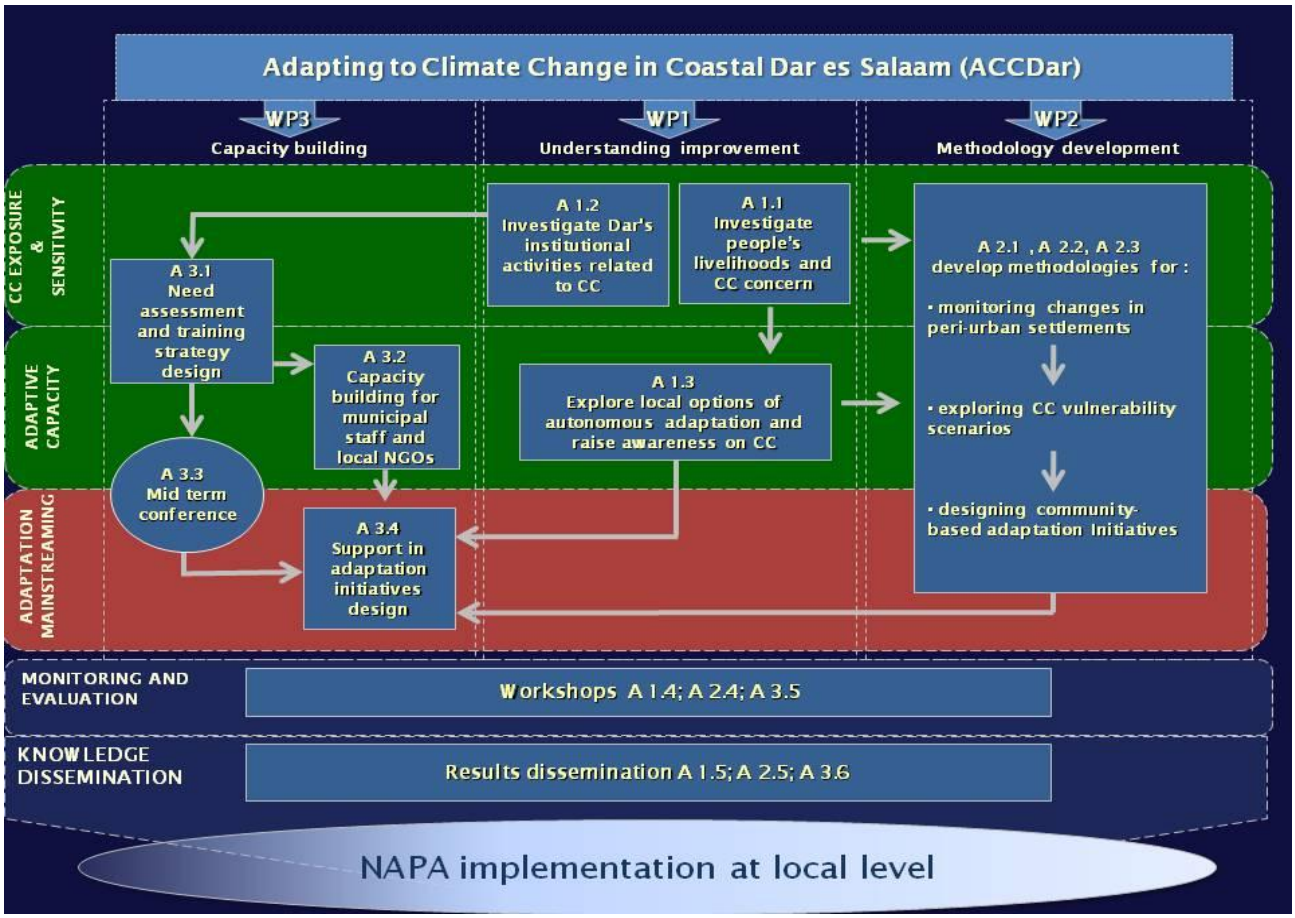

Figure 1. ***Project methodology chart***

WORK PACKAGE 1: "IMPROVE UNDERSTANDING IN ADAPTATION"

The activities foreseen within the WP1 of the project are all devoted to the purpose of increasing knowledge on autonomous local capacity to adapt to CC and raising awareness on adaptation issues.

Activity 1.1 "Investigate the livelihoods of population dependent on natural resources and their concern for CC"

Objectives

The main objective of the activity 1.1 is to provide an assessment of climate related concerns for population living in coastal Dar's unplanned and underserviced neighbourhoods and dependent on natural resources.

Description of the activity

The activity 1.1 has been planned in the following steps:

1. Developing of the Household Questionnaire
    a. Development of a draft version
    b. Review of the draft version
    c. Final validate of the Household Questionnaire format
2. Designing the Sampling Plan (define the population, choose the sampling method, …)
    a. Preliminary survey for sample determination
    b. Preparing a draft version, the revision and the final validation of the sampling plan
3. Training the interviewers on questionnaire objective, administration methods and sample characteristics
4. Planning questionnaire administration and timeframe
5. Administering the questionnaire to the households
6. Entering collected data in the data base system
7. Data Validation
8. Data Analysis
    a. Framework for the analysis to be performed
    b. Training workshop on Data Analysis
    c. Developing the database for data analysis
    d. Analysing data through univariate analysis, bivariate and trivariate analysis and multivariate analysis (where possible)
9. Preparing a toolkit for DCC's officers involved in the capacity-building activity under WP3 to transfer them the outputs of the analysis, the database and the survey methodology.

Achieved results

During the first year project period the baseline survey has been designed and conducted focusing on:

- what natural resources those people have access to,
- how they use natural resources at their disposal,
- what changes in climate and environment at large have been observed by them,
- what strategies they have adopted to cope with those changes,
- what strategies they foreseen to adopt in case of further change,
- gender roles in on-going and foreseen adaptation strategies.

An agreement has been signed between CIRPS and the Institute for Research on Population and Social Policies, National Research Centre (CNR-IRPPS) in Rome, for the collaboration on the household questionnaire validation, on the design of the sampling plan and on the elaboration of the framework for the data analysis.

The household questionnaire has been designed in collaboration by CIRPS and ARU, under the supervision of the CNR-IRPPS, on the basis of a pilot experience which involved 40 households from Kinondoni district, held in Dar in 2009 in the frame of a previous collaboration between the two partners. During this pilot study the features of targeted population have been identified and a household questionnaire has been tested. The project team reviewed that questionnaire format to be tailored for the objectives of the WP1, and validated it by administering it to a sample drawn from the action's beneficiaries.

The target population of the activity is the people who live in coastal Dar's peri-urban areas, which prevalently consist of low-medium density unplanned and underserviced settlements.. Those people, whose livelihoods are partly or totally dependent on direct access to natural resources, are already experiencing a number of environmental changes and their related impacts (decreasing in water availability, loss of land on the seashore, etc.). In response to these changes they autonomously carry out adaptation activities (e.g. changing water sources, crop or livestock, land use, differentiating household activities, etc.).

The target group of the survey was composed by a 5 percent sample of the households living in coastal Dar's peri-urban areas, who have been identified according to the following criteria: socio-economic and cultural heterogeneity (different education, income, etc.), stable settlement in their place (at least 5 years), livelihood dependent on both urban and rural activities and resources. Around 6,000 households were selected randomly throughout the coastal plain.

The main objective of the household questionnaire was to gather information on the livelihood strategies and environmental management practices by peri-urban dwellers, and their autonomous adaptation activities to cope with environmental changes.

The questionnaire has been structured around four main areas of investigation:

- Rural-urban interaction: (including economic flows, the flow of resources, socio-cultural relations and the movement of people): the aim is to explore interdependencies and relationships between peri-urban areas and the city centre as well as between peri-urban areas and rural districts;
- People's access to resources (land, water, energy, shorelines, sea, raw materials, etc.): the aim is to investigate how and at what conditions people access to basic living resources;

- Environmental management (water, waste, etc.): the aim isto identify, on one hand, resource use and the management regime, and on the other hand, obstacles and opportunities in autonomous adaptation to environmental change;
- CC (environmental transformations and autonomous adaptation strategies): the aim is to improve understanding of the environmental changes observed by residents of peri-urban areas, their perception of the causes of these changes and the strategies they have implemented to address them in both the short and medium-term.

The complete format of the questionnaire is in the Annex 1 "Household questionnaire"

All 13 wards that are located in the Dar es Salaam coastal plain were identified as target area for the questionnaire administration and included in the survey. It entailed the necessity to redefine the sample size, the basic sampling unit being the household.

Hence, a Pre-questionnaire Survey Field Work was carried out by ARU staff in Dar es Salaam coastal wards for estimating the number of households living in the target area. According to the latest data collected from the sub-ward offices, the total population size turned out to be a slightly higher than in 2002 National Census (133,920 households instead of 120,000 households).

The sample size (5%) was finally obtained from non-updated data provided by the local government (120.000 households) and the number of households selected for questionnaire administration was increased from 500 (as foreseen in the application form) to 6000. GPS equipments have been purchased for detecting coordinates of the households involved in the survey. Those information are particularly relevant to feed the outcomes of the activity 1.1 into the activity 2.1, to draw land use maps and explore the link between land cover and climate change impacts, and 2.2, for assessing vulnerability scenarios to seawater intrusion. Moreover, the georeferencing of interviewed households will allow to compare data coming from future surveys.

Four interviewers have been trained by ARU on questionnaires reviewing the sections of the questionnaire. They were skilled to identify and classify the survey sub-areas into the three socio-economic brackets ensuring that each of them was well-represented and well-balanced in the survey. 6000 household questionnaires have been administered by the trained interviewers supported by the local officers (at subward and at community level).

An online form of the validate Household Questionnaire has been created, using the source Statistical Survey open source software LimeSurvey, and published on the project web site reserved area. It facilitated the input of the data collected by ARU interviewers and allowed any member of the project team to access remotely to the database. 5885 household questionnaires have been successfully entered in the database.

The framework for the data analysis has been developed by CIRPS in collaboration with CNR-IRPPS and one week training workshop has been delivered by CIRPS staff in Dar to 20 master students and young researchers from ARU on the following topic (the detailed programme is in Annex 2 "Training course on data analysis):

- sampling technique
- use of statistical survey open source software Limesurvey for data collection
- statistical methods for data analysis using statistic software

The database error detection and correction and variables recodification has been carried out by CIRPS staff.

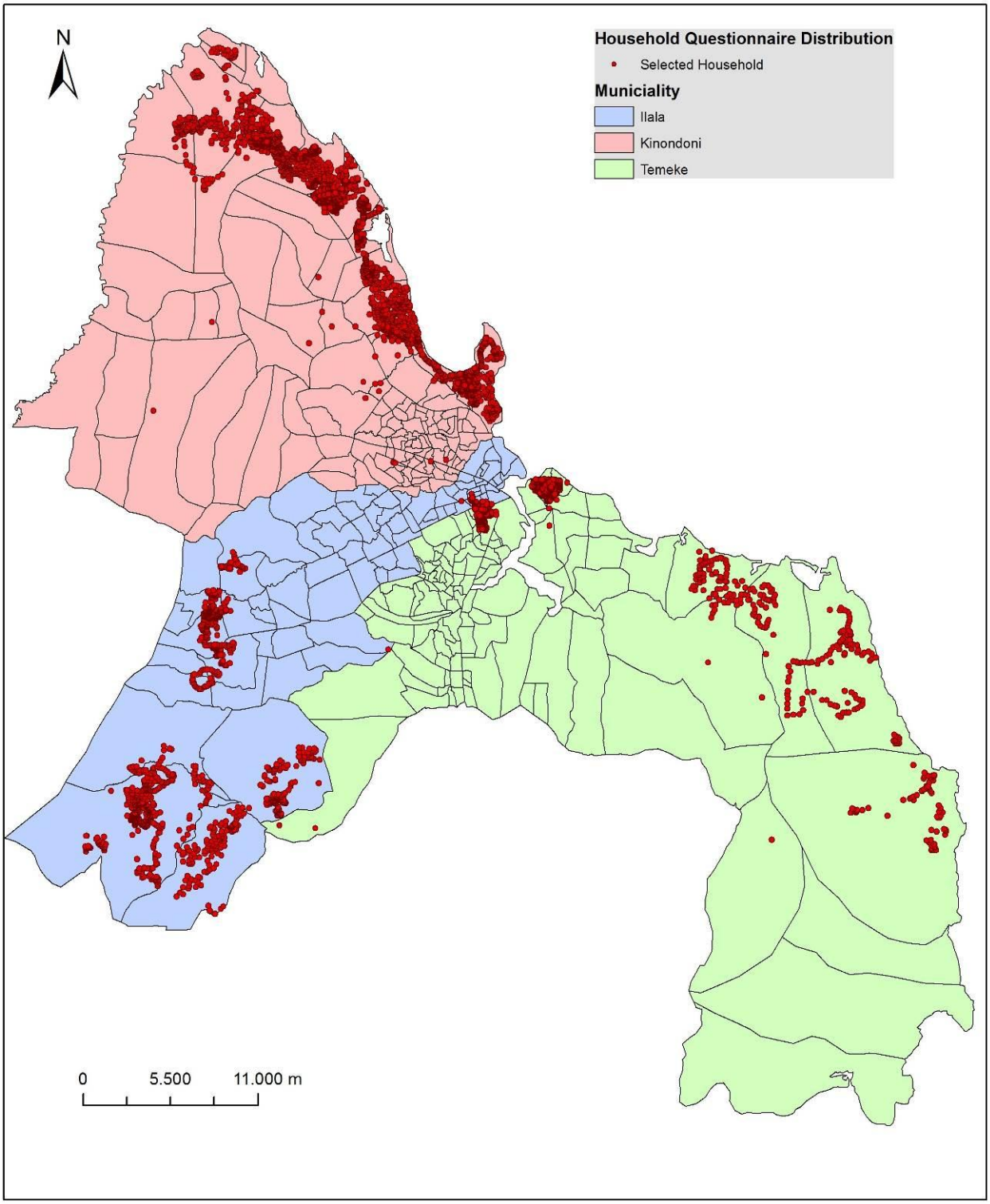

Figure 2. ***Household questionnaire distribution***

At the moment the data analysis is under elaboration by CIRPS staff. Two different methodologies are applied:

- firstly, univariate analysis (frequencies) and bivariate and trivariate analysis (two-way and three-way cross-tabulation) will be completed;
- on the basis of their outputs, at least one multivariate analysis from cluster analysis, simple and multiple regression and path analysis, will be selected and performed

Changes occurred with respect to the original action plan

The work plan for Activity 1.1 changed respect the one proposed in the application form. The implementing period has been extended to February 2012 due to the increasing of the sample size from 500 to 6000 household units. This change also required an increase in ARU personnel's months of work for questionnaire administration and data entry.

Links with other project activities

The Information collected under the activity 1.1, together the participatory activities (performed under activity 1.3) will provide the knowledge on perceived and observed climate change and autonomous adaptation strategies undertaken in the target area.

The outcomes activity 1.1 will feed into activity 2.1 to validate the methodology for land cover mapping through remote sensing and digital mapping, support the elaboration of land use maps and explore the link between land cover and climate change impacts. They will also feed into activity 2.2, as they provide crucial information for assessing vulnerability scenarios to seawater intrusion and other climate change related phenomena. The whole survey procedure will be part of the toolkit for Dar Municipalities' officers involved in the future capacity-building under WP3.

Activity 1.2: "Investigate Dar's institutional activities related to CC"

Objectives

The aim of the activity 1.2 is to investigate the awareness of CC issues at Dar es Salaam City Council (DCC) and municipal levels and to assess strengths, weaknesses, gaps and possibilities for improvement of ongoing UDEM strategies and plans relevant to CC adaptation.

Description of the activity

The activity 1.2 has been performed in the following steps:

1. DCC and Dar Municipalities officers' involvement in the action
2. Development of the survey methodology and tools
   a. Development of the questionnaire form
3. Training for the interviewers
4. Administration of the questionnaire

5. Data analysis
6. Data analysis results reports

Achieved results

The first contact for DCC involvement in the action has been held by CIRPA and ARU with a formal letter before starting the activities. Some meetings between DCC, CIRPS and ARU have been held to introduce with the objectives and the expected results of the whole action and to agree the role of the City Council in its implementation. The team from ARU held a discussion with the City Director on various social-economic and environmental challenges the City is facing. The Director highlighted on projects, which the DCC is implementing on climate change. He notably cited a CDM project on flaring of methane gas generated at Vinginguti dumpsite which, DCC is implementing in collaboration with an Italian company. Other projects related to CC and described by the Director is on production of biogas from organic solid wastes. Regarding, climate change issues, the Director admitted that DCC has not done much on putting in place coping and adaptation measures. In view of this, the ACC Dar project provides an opportunity to enhance the capacity of DCC to deal with CC issues. The City Director attended the kick-off meeting held on 28th April 2011 and emphasized the need to assess climate related concerns for population living in coastal unplanned and unserviced neighbourhoods in search for robust adaptation strategies. It was also reiterated by the City Director the importance for the affected people to be informed about Climate Change impacts on their environment through public awareness campaigns as one of the strategies for building their resilience against its impacts.

During the kick-off meeting held on 28th April 2011, participants from DCC and municipalities were requested to discuss on changes in the environmental conditions, which have been noticed in the past three years and to identify the main causes. They were also requested to identify measures to be used in coping with the identified changes in the environmental conditions. Changes in rainfall pattern, salination of water wells, reduction in agro outputs – agricultural products and disappearance of some species in the ecosystem were identified as some of the changes in the environmental conditions. Global warming due to human activities, increase in population and poor governance were cited as some of the causes for the environmental conditions. Suggested measures for coping with the changes include streamlining of climate change issues into plans/projects, awareness raising on climate change issues and establishment of a monitoring framework at local level. Issues raised and discussed during the kick-off meeting were used during the questionnaire preparation.

The study was carried out at two main administrative different levels. The first was the City council level, which addressed the issues of interest with a focus on municipal council. The second level was the municipal one whereby the issues of interest were separately addressed for each of the three municipalities of Dar as Salaam City.

The study has been carried out primarily through a questionnaire survey augmented by follow up interviews with selected respondents. The questionnaire has been designed in collaboration by CIRPS and ARU on the basis of a pilot experience held in Dar in 2009 in the frame of a previous collaboration between the two partners. The results from the pilot study have been used to improve the questionnaire. The questionnaire form used during the survey is shown in Annex 3 ”Officer Survey guiding questions”

Testing of the questionnaire for ascertaining if it will be able to capture information for which it was intended to acquire. A pilot study was conducted for testing the questionnaire. The main objective of

the pilot study was to determine if the questionnaire is able to capture the desired information from respondents. The final form of the questionnaire has been validated modifying some items.

The target local authorities of the activity 1.2 were the DCC, the Ilala Municipal Council, the Kinondoni Municipal Council, and the Temeke Municipal Council. The target sources of data for this study were city and municipal council officials of services, departments, and sections already involved in CC related issues. Preliminary identification of the officials to be interviewed was done from the list of participants who attended the kick-off meeting held on 28th April 2011. Departments identified for the interviews at DCC are the following:

- Urban Planning, Environment and Transportation
- Waste Management
- Works and Fire Rescue

In the municipal councils, officials from the following departments were identified for the interviews:

- Waste management,
- Works and Water Department
- Lands and Urban Planning
- Natural resources and tourism
- Agriculture and Livestock Development
- Community Development

ARU's junior researchers have been trained by the Local Project coordinator to familiarize with objectives, methodology, content and intended outputs of the survey. Each question has been carefully scrutinised for ensuring that it was properly asked to enable respondents give the intended information.

The questionnaire forms were administered face-to-face. For the officials who had no time for face-to-face interview, the questionnaire forms were left to them for filling and they were collected later. Total number of questionnaires successfully administered and filled was 48. More in particular: 7 for DCC, 13 for Ilala Municipality, 14 for Temeke Municipality and 14 for Kinondoni Municipality. (Tables detailing the target group are in Annex 4 "Personal details of staff interviewed)

The analysis of questionnaire survey results has been done using Microsoft Excel for quantitative results. Qualitative information has been directly extracted from individual questionnaire forms and edited. During editing, precautions have been taken against distortion of the responses.

Since each municipality has unique social, economic and environmental conditions, four different reports have been prepared describing in details the survey findings and the most important conclusions that can be drawn from the information and data collected. The reports grouped the survey findings in the following main points:

- Staff responsibilities and working experience
- Administration linkages between municipal and ward/mtaa
- Policies, plans and strategies for peri-urban (PU) areas
- Social services deliverance in PU areas
- Development changes in PU areas in past years
- Main linkages and interdependences PU areas - city centres and PU areas – rural areas
- Groups of people, networks and organizations operating in PU areas

- Changes in environmental conditions in the past years in PU areas
- Impacts of environmental changes in PU areas
- Strategies undertaken by the municipal council to cope with environmental changes and reducing people's vulnerability to impacts of environmental changes
- Autonomous adaption activities to environmental changes in PU areas
- Baseline study on PU environment, dwellers and livelihood
- Reasons for environmental change

Some conclusions could be already summarized here following.

The DCC coordinates all the administrative, planning and developmental activities that require the participation of the three municipal councils (Ilala, Kinondoni and Temeke). Although several projects, strategies, policies and programs are being implemented at the moment for addressing various social, economic and environmental challenges there are no specific measures for addressing specific challenges, which are encountered by residents of the PU areas. Most of the interviewed officials had the opinion that the observed changes in environmental conditions in PU areas are caused by a combination of factors which are climate variability, irrational changes in the land use and inadequate environmental management. However, their observations could not be scientifically substantiated due to lack of published studies on socio-economic and environmental dynamics of PU areas. More in particular some conclusions for each municipality in Dar could be summarized as following.

- All the respondents of Ilala Municipal Council were not very familiar with issues pertaining to CC and its impacts. Consequently, they could not link activities of their departments and how they can mitigate the impacts of CC. As a result, CC issues have not been mainstreamed in the plans, strategies, programmes and daily activities of the departments of the municipal council. Unless awareness on issues pertaining to CC impacts is raised among the officials of municipal council, mainstreaming of CC issues will not be realized. Consequently, municipal officials will not be able to formulate plans, projects, strategies and programmes, which are responsive to CC impacts for helping people to adapt and cope with them.
- Most of the respondents in Kinondoni Municipal Council seemed to be familiar with the term "climate change". However, they lack the capacity to empower residents of PU areas with necessary tools and skills for enabling them to cope with the changing environmental conditions and the associated impacts. Existing plans, strategies, projects and programs are largely focused on environmental protection and conservation rather than CC and adaptation. Mainstreaming of CC issues in development plans, strategies, programmes, projects as well as routine activities is yet to be done and approaches to effect the same are vaguely understood by the Municipal officials interviewed.
- Many environmental changes which are related to climate effects observed in Temeke Municipal Council include: changes in water availability, change in rain pattern, changes in soil aridity, changes in soil fertility, and changes in humidity. The environmental changes observed in Temeke municipality are mainly attributed to climate variability, land use changes in the municipality, and poor environmental management. There are many cases of autonomous adaptation measures taken by residents of Temeke municipality to cope with CC effects including changes in crops grown and livestock raised and changes in house structure especially with a view to coping with flooding risks. Levels of awareness and general knowledge on CC and

its adaptation needs among Temeke Municipal Council staff is not sufficiently high. This implies that the capacity of the municipality to cope with the needs of climate change effects is inadequate.

It was generally observed that the respondents have a limited analytical capability to effectively analyze CC potential impacts and to develop viable strategies for enabling City dwellers to adapt, cope and recover from CC effects. Therefore, to enable the City and Municipal Council officials implement the National Adaptation Programme of Action there is a dire need to enhance their understanding in issues pertaining to CC to enable them formulate plans, strategies, programmes, which will empower the city dwellers to adapt and cope with the CC impacts.

Changes occurred with respect to the original action plan

The activity 1.2 has been underestimated in the original action plan. To collect the necessary information to fully understand the state of the art of the activities carried out at the two main administrative levels in Dar es Salaam and of their administrative linkages, their awareness and knowledge about CC impacts and adaptation in PU areas it was necessary to involve in the survey officials from several departments and services. It required more efforts (4 months more) by ARU staff in encountering officers' availabilities due mainly to their time constraints.

Data collection performed by ARU staff has been wider then foreseen. It includes part of the need assessment for capacity building planned in activity 3.1

Links with other project activities

Recommendations given on the basis of the findings of study conducted under activity 1.2 will feed into the preparation of the capacity building strategy under WP3 and data analysis results are part of the need assessment to better tailor the training programme. In addition, the activities of WP2 have benefited from the information collected during the survey for better tailoring the methodologies under development to DCC and municipal staff's skills and experience. .

Activity 1.3 "Explore local options of autonomous adaptation and raise awareness on climate change"

Objectives

The third activity included in the WP1 aims to explore the local options for autonomous adaptation and to raise awareness on climate change through an innovative participatory methodology addressed to the target population, Dar's coastal plain inhabitants living in unplanned and underserviced neighbourhoods and depending on natural resources.

Description of the activity

The activity is spread along part of the first year and throughout the second year of the action. Its implementation is following these main steps:

1. Identify a participatory methodology
2. Validation of the methodology with all the relevant stakeholders:
   a. ARU partners and students
   b. Community leaders
   c. People living in Dar PU coastal area
3. Feasibility study in Dar
   a. Pilot exercise with students
   b. Pilot exercise with people living in the target area
4. Participatory activity performed in two main cycles

Achieved results

During the reporting period the issue of what participatory methodology should be used to explore the options of autonomous adaptation to future climate change effects envisaged by the target population was studied and discussed among the project partners.

Finally it was decided to use the "Participatory Theatre (PT)" through the "Theatre of the Oppressed (TO)" tool, following Augusto Boal's teaching. Participatory Theatre is a general term including all types of drama tools used to involve people in participation and Theatre of the Oppressed is considered as a main one. It consists in a set of tools aimed at allowing people to stage their everyday life issues. It involves the audience in a collective research of solutions. The main techniques chosen in the action are the Forum Theatre and the Image Theatre.

The Forum Theatre consists in staging a situation considered by someone as oppressive, showing mechanisms and characters that make it become oppressive. These scenes are then presented to an audience. After seeing the play a first time, and after a short debate, the play will start again and the audience will be allowed to intervene and propose solutions. A facilitator fosters participation through games and questions. After any intervention and at the end the audience debates and decides what are the best solutions, options or alternatives to tackle or avoid the represented situation.

The Image Theatre consists in using the body to create a statue, or an image representing a problematic situation. This is done silently. It allows to find out through the body, what are the oppressive situations, before language intervention, beyond intellectual capacities. This tool is very useful since it allows to communicate very clearly about an issue, even if people speak different languages. Also this tool requires a facilitator.

Even if there were relevant experiences of TO developed in Africa, this methodology is innovative for two reasons. First, seemingly TO tool has never be used to explore people's adaptation strategies to CC effects. Second, although there is a strong popular theatre tradition in Tanzania, no group has claimed to be involved in TO or registered on the yellow pages of the International TO organisations.

Using drama for exploring local options of autonomous adaptation to CC allows to get information about people livelihoods entering in the intimate spontaneity of their everyday challenges. It could also confirm or infirm some information that have been already gathered. The strength of such non-formal methodology is based on the idea that people have more pleasure in staging their lives then in telling about them. If they play a situation it might be more easy to understand how they live on their territory, giving thus information that could escape to questions or a territory study. Theatrical tools also allow to discover through spontaneity matters that would never come unveiled in a conversation. In fact with TO, very problematic issues often emerge without censure and without provoking trouble.

It allows to work on personal stories but bringing them to a collective level. Attention never focuses on someone. Stories are build collectively in fact the audience can every time add some details, confirm or infirm some information thus allowing a sort of spontaneous verification.

In the second semester of this reporting period a field visit and a feasibility study have been held in Dar es Salaam with the following specific goals:

- to examine if organizing the whole process was possible.
- to determine if community leaders would collaborate easily.
- to find out if students could be involved, and what risk that would bring.
- to verify if people, and which people, like the PT tools and would be ready to involve in a more demanding process.

The feasibility study was therefore a first taste and a trial. Beyond organisational challenges, the idea was to discover whether some interesting scenes and useful information would come out, in a small workshop, with people not knowing yet TO and PT methodologies.

Other challenges have been also assessed.

- Would people accept to reveal their intimacy and involve in a drama project with a European facilitator, not fluent in Swahili, that would probably disappear after the project?
- Would it be possible to organise workshops and shows without the facilitator, only one knowing the very specific and particular needs of a workshop and a show?
- Would it be possible to mix people. Indeed we were very willing to involve be it people directly affected by CC on the coast, but we also thought involving the students that were leading the questionnaires could be useful. And we were wondering if it could be interesting to invite also community leaders or street leaders. So would all these people accept to play together, to act and re-act their lives, to share knowledge through a methodology were everybody is considered as equally having a treasure of knowledge ?

The feasibility study consisted of two phases. First, a workshop has been held at the Ardhi University with some of the students involved in administering household questionnaire under activity 1.1, to experience them with the methodology and to train them in facilitating future cycles with the population.

The second phase has been held at Mtongani, a subward of Kunduchi ward located on the coast of Kinondoni municipality, with “ice melding” games or so called “de-mechanization” games involving 35 people using both techniques: forum theatre and image theatre. During this second phase officers from Kunduchi ward and community leaders have been a strong point of reference to facilitate the organization of the pilot participatory exercise and to help relationships with the community. They were very collaborative and it was very important to share with them the objectives and tools of the participatory methodology.

Figure 3. ***Workshop held in Kunduchi (photo)***

The feasibility study findings answered positively to the following questions: is the whole process possible? Do the community leaders collaborate easily? Could the students be involved in facilitate the participatory activity? Do target people agree in participating and are they ready to involve in a more demanding process? could the Participatory Theatre generate some interesting knowledge on CC related issues?

A large impact on knowledge on autonomous adaptive capacity is expected from the two next cycles.

Furthermore the methodology has been welcomed in a very enthusiastic way by all the involved stakeholders: by partners from Ardhi University and by its students that will help the process in the next two cycles, by the community leaders and, most important, by the community participating in this pilot experience.

A working paper has been delivered at the end of the study, including some recommendations and the planning for the participatory activity that will be held in Dar es Salaam during the second project year.

Changes occurred with respect to the original action plan

The starting point for the activities 1.3 has been postponed by two months as result of the delay of the kick off meeting. It has been extended in the second year of the project mainly for two reasons. Firstly the feasibility study was necessary due to the innovative methodology chosen and secondly two cycles spread during the whole year will ensure a stronger multiplier effects and consequently a more extensive impact rather than it was planned at the beginning of the action.

Links with other project activities

It is expected a large impact on knowledge on the adaptive capacity of people living in coastal Dar's peri-ruban areas by the information collected through the participatory activities. PT workshops are expected to confirm, infirm or increase data already gathered through the survey performed in the activity 1.1, in particular as regards perceived and observed climate change related impacts and autonomous adaptation practices undertaken in the target area. Moreover, public events using Forum Theatre technique will allow audience to intervene and bring valuable knowledge for exploring future options for autonomous adaptation to CC impacts, thus providing crucial information for the assessment of vulnerability scenarios under activity 2.2. Finally, it is expected that people's participation will be helpful in the identification of the actual obstacles to autonomous adaptation, as a key knowledge that will inform the design of community-based initiatives under WP 3.

As for the activity 1.1 the outcomes and the methodology implemented will be part of the toolkit for Dar Municipalities' officers involved in the future capacity-building under WP3.

WORK PACKAGE 2: "DEVELOP METHODOLOGIES FOR DESIGNING ADAPTATION INITIATIVES"

The activities foreseen within the WP2 of the project are addressed to the specific objective of developing methodologies for integrating adaptation activities into strategies and plans for UDEM in coastal unplanned and underserviced settlements.

Activity 2.1 "Develop methodologies for monitoring changes in peri-urban settlements"

Objectives

The main objective of the activity 2.1 is to develop methodologies to monitor changes in Dar's peri-urban settlements and enhance knowledge on peri-urban dynamics, in order to explore the impacts of urban development on natural resources and how it combines with CC effects in jeopardizing people livelihoods. More in particular the activity aims at improving the DCC's planning services in understanding on-going processes of Land Cover and Land Use change and providing them with a toolbox for keeping updated their spatial database with little efforts through the use of techniques as remote sensing, Geographical Information Systems (GIS), spatial analysis and modelling.

In activity 2.1 remote sensing is used to monitor Dar es Salaam changes through the years, acquiring multispectral images and analyzing data with image processing software for Land Cover classification. LANDSAT and SPOT satellites were chosen because of their spatial and spectral resolution, multitemporal images availability and in particular the very low (or free) data acquisition cost.

Description of the activity

The activity 2.1 has been planned in the following steps:

1. Definition of image analysis methodology and required imagery for semi-automatic Land Cover classification.
   a. Collecting documents and scientific papers about remote sensing imagery and semi-automatic Land Cover classification
   b. Definition of required imagery and software for image processing
2. Image acquisition and data analysis for Land Cover classification and evaluation of urban sprawl.
   a. Acquisition of imagery (LANDSAT and SPOT)
   b. LANDSAT analysis and SPOT analysis
   c. Land Cover Change detection
   d. Assessing Landscape variations and fragmentation
3. Land Cover validation.
   a. Methodology of validation
   b. Land Cover validation
4. Collaboration between CIRPS and ARU for sharing methodology.
   a. Internship in Rome
   b. Workshop in Dar
5. Investigating Land Cover Change correlation with Climate Change.

a. Assessing Land Cover correlation with socio-economic data
b. Assessing Land Cover correlation with environmental data

6. Exploring Land Cover scenarios under CC
7. Creation of a tool kit

Achieved results

A series of documents and scientific papers about remote sensing and pre-processing and processing of satellite imagery, has been consulted in order to design a methodology for Land Cover classifications, including the pre-processing of the images for the atmospheric effects correction and the masking of clouds and their shadows. The methodology developed has the following main characteristics:

- an image based model DOS is used for atmospheric correction (Dark Object Subtraction) because it doesn't need any additional information about atmospheric composition during the image acquisition (many images were acquired over 10 years ago), so it doesn't need any in situ measurements and it is based on the assumption of the existence of dark objects (surface reflectance ≈ 0) in the scene;
- the images have been converted from Digital Numbers (DN) to surface reflectance, which is independent from incident energy and is related to surface materials;
- a supervised classifications has been performed using the Maximum Likelihood algorithm;
- in order to assess urban sprawl trend through the years a set of Landscape Metrics Indices was chosen to be calculated for Land Cover classifications

The necessary imagery and software for image processing were identified accordingly. LANDSAT and SPOT satellites have been chosen because of their spatial and spectral resolution, multi-temporal images availability and the very low (or free) data acquisition costs. In details:

- a number of LANDSAT images has been freely acquired from the USGS (U.S. Geological Survey) archive (http://landsat.usgs.gov/).
- a number of SPOT images have been freely acquired from ESA archive (http://www.esa.int).
- ERDAS Imagine 2011 software has been selected for image processing.
- Esri ArcGIS 10 software has been selected for GIS analysis.
- FragSTATS (free software) has been selected for Landscape Metrics Indices calculation.
- GRASS has been selected as alternative open-source software for image processing.
- Quantum GIS has been selected as alternative open-source software for GIS analysis.

As regards LANDSAT images analysis, the methodology developed consist of the following steps (using ERDAS Imagine software):

- Georeferencing images (not always required).
- To create clouds mask and gaps mask.
- To convert bands 1, 2, 3, 4, 5 and 7 from DN to reflectance, applying atmospheric correction.
- To elaborate vegetation indices.
- To apply clouds and gaps masks to every band converted in reflectance
- To mosaic different (temporal) images converted in reflectance, in order to obtain a cloud-free and gap-free image.

- To create the 6 bands set, ready for classification.
- To perform the Land Cover classification with a Maximum likelihood algorithm.

As for outputs, 5 Land Cover classifications have been performed from LANDSAT images for years 2002, 2004, 2007, 2009 and 2011 (figure 4), and 23 LANDSAT images have been pre-processed in order to mosaic them in a cloud free scene.

Due to the high cloud-cover percentage present in the scene, an high number of images needed to be acquired, in order to mosaic different images and obtain a cloud-free image of the whole area. A semi-automatic mask for LANDSAT images has been implemented in the methodology, identifying clouds from the blue band (where clouds' pixels have higher DN) and the thermal band (where clouds' pixels have lower DN).

After images classification 8 Landscape Metrics Indices for Land Cover change analysis have been calculated using the software FRAGSTATS (figure 5).

As regards SPOT images acquisition, it needs to be completed to allow the Land Cover classification for the whole area.

Land Cover validation and investigation of Land Cover change correlation with CC will take place in next semester.

Collaboration between CIRPS and ARU for sharing methodology started this year. CIRPS hosted a researcher from ARU for a two-months internship. Main outcomes of the internship have been the following:

- training on using of remote sensing methodologies for semi-automatic Land Cover classification and image analysis, and image acquisition and data analysis for Land Cover classification and evaluation of urban sprawl;
- participation in the international conference on Urban impacts on climate change in Africa (Torino, November 2011) and presentation of a paper on "Climate Change impacts and institutional response capacity in Dar es Salaam Tanzania"
- first assessment about possible joint PhD research between CIRPS and ARU.

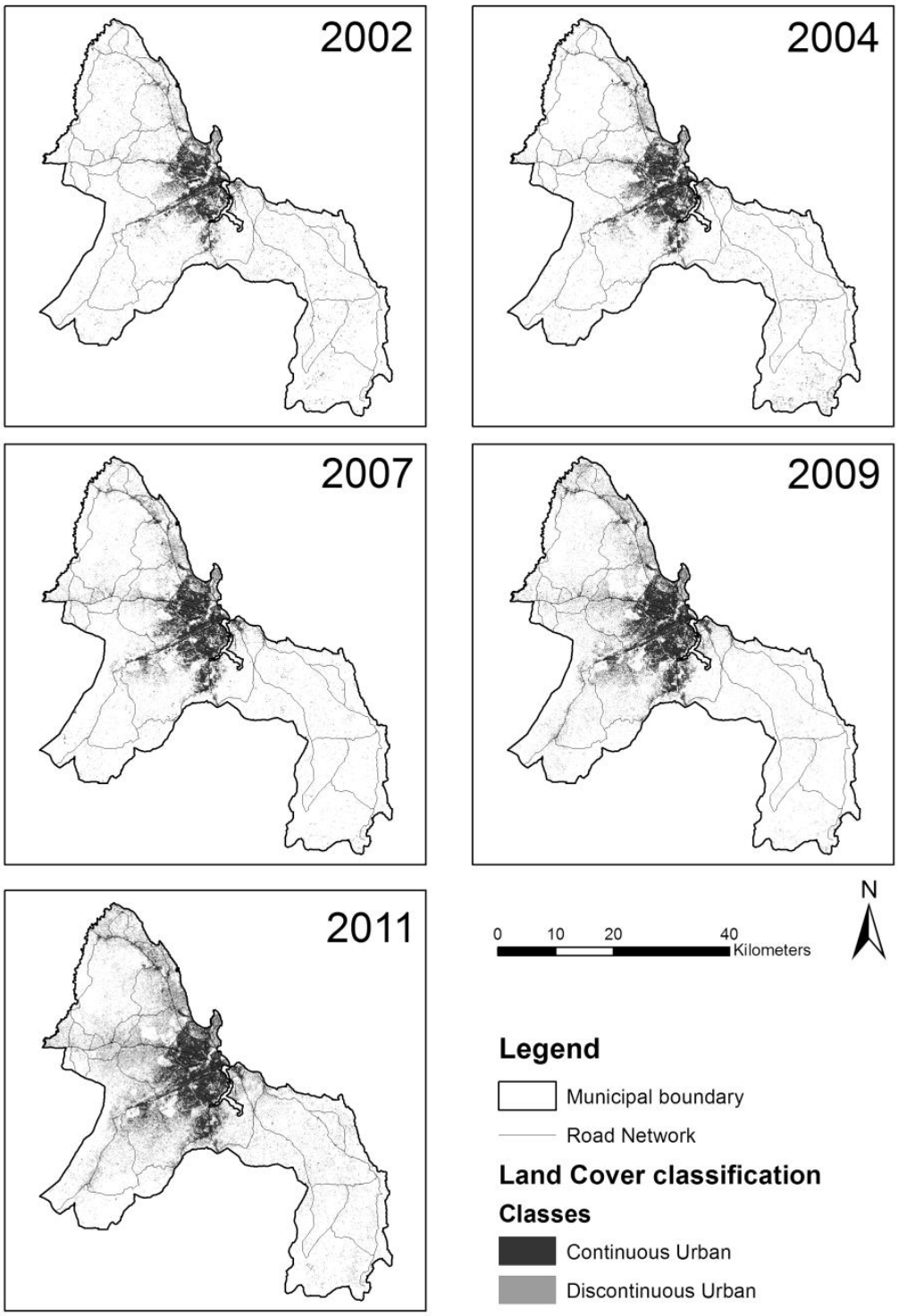

Figure 4. ***Land cover classification***

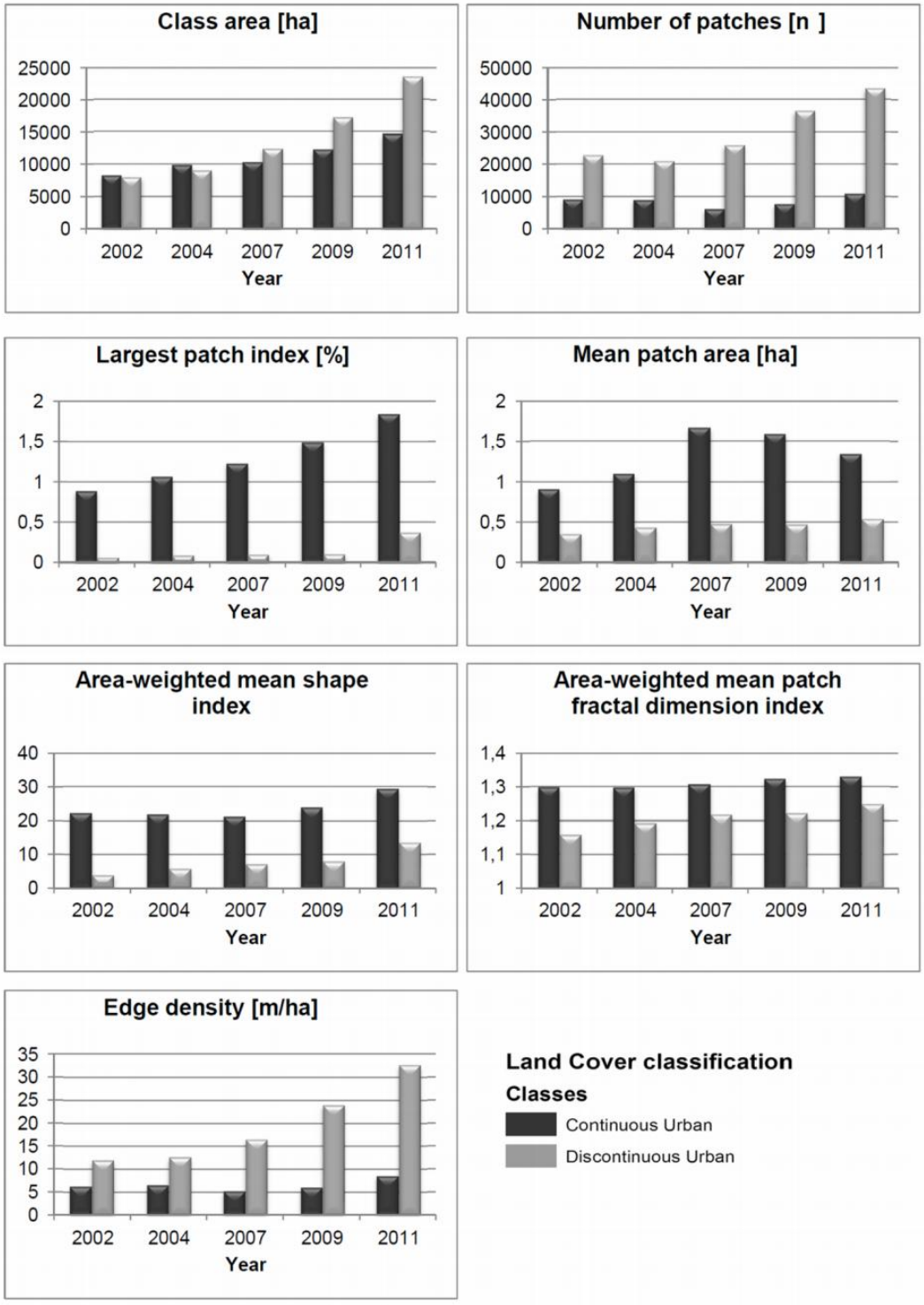

Figure 5. ***Landscape Metrics Indices***

Changes occurred with respect to the original action plan

SPOT images and ERDAS software acquisition suffered a delay because of respectively bureaucratic and importation issues. This produced a delay of three months in the beginning of the activity respect to the original action plan. Furthermore as regards LANDSAT analysis, due to the high cloud-cover percentage in the scene, an higher number of images than the ones planned needed to be acquired and processed. An increase of efforts and a postponement in the deadline of the activity 2.1 have been the direct consequences.

Links with other project activities

Activity 2.1 at the state of the art needs to cross its analysis with data gathered under activity 1.1 to be completed.

A semi-automatic procedure and a related toolkit is under development for land cover analysis. This is the main innovation for activity 2.1 and it will allow DCC for easily updating land cover and land use maps in the future. It is worthy to be mentioned that the production of updated maps by the DCC GIS unit will not require additional costs for acquiring new satellite imageries as the procedure has been tailored to data provided by Landsat and SPOT for free or at very little expense. Also in this case, the developed toolkit will support the transfer of the procedure to DCC officers during the capacity building activities under WP 3.

Activity 2.2 "Develop methodologies for exploring CC vulnerability scenarios"

Objectives

The activity 2.2 has the main objective to develop methodologies for exploring CC vulnerability scenarios with particular reference to the seawater intrusion into the Dar es Salaam coastal aquifer, a phenomenon which is already contributing to the degradation of those natural resources on which a large part of peri-urban inhabitants depend.

To achieve its goal, the activity involves the performance of different subtasks all aimed both to understand the local dynamics ruling the environmental phenomena and to study its temporal evolution through specific indicators.

Description of the activity

In particular the activity 2.2 action plan foresees the following steps:

1. Historical data collection
2. Hydrogeological survey campaign
    a. Definition of a methodology for conducting groundwater monitoring campaigns in Dar es Salaam coastal aquifer
    b. Design a borehole monitoring network
    c. Perform field measurements

3. Organizing a digital geo-database
   a. Database architecture definition and creation
   b. Data entry in the database
4. Studying seawater intrusion evolution in Dar es Salaam coastal aquifer
   a. Definition of a methodology for the analysis of seawater intrusion phenomenon
   b. Seawater intrusion mapping
5. Review and choose methodology for exploring vulnerability scenarios under CC
6. Short training course in Ardhi University
7. CC vulnerability scenarios as regards seawater intrusion phenomenon
   a. Assessing seawater intrusion phenomenon correlation with environmental characteristics under CC effects (execute hydrogeological balance and study tidal effect)
   b. Assessing seawater intrusion phenomenon correlation with socio-economic characteristics of the settled population (evaluate community dependence on groundwater)
   c. Develop vulnerability scenarios
8. Creation of a tool kit

Achieved results

A series of documents and reports provided by public authorities, academic researchers and international cooperation agencies have been collected. Historical data collected for analyzing seawater intrusion phenomenon and CC effects on seawater intrusion evolution have been the following:

- Precipitation and Temperature, from Dar es Salaam meteorological stations. Data have been collected for three gages with reference to last 50 years.
- Tidal excursion, obtained from Tanzania Ports Authority (http://www.tanzaniaports.com) and from the Sea Level Center of Hawaii University (http://uhslc.soest.hawaii.edu/). Tidal excursion data (annual, monthly and daily) have been collected with reference to last 10 years
- Hydrogeological characteristics, got by academic studies, JICA reports (Japanese International Cooperation Agency), and DDCA Borehole Reports (Drilling and Dam Construction Agency). Almost 280 DDCA Borehole Reports (groundwater physical and chemical parameters and geological stratigraphy corresponding to the date of borehole construction) have been collected and digitized.
- Groundwater physical and chemical characteristics, obtained from DDCA Borehole Reports.

A methodology to analyze groundwater physical and chemical characteristics has been defined in order to have a set of current data useful for evaluating the evolution of the seawater intrusion phenomenon. Different types of monitoring campaigns are required to establish the boundary conditions, to be used in the analysis of correlation between seawater intrusion and CC. After

designing the monitoring boreholes network, the future monitoring campaigns will be performed following this scheme (type of data to be collected and different temporal scales for survey activity):

Monitoring campaigns	Temporal scales	Data to be collected
Long term monitoring activity involving the whole boreholes network	2 times in about 9 months: at the beginning (after the "little rainy season") and at the end (before the "little rainy season")	SWL measure, Phys-Chem parameters in situ measure, water samples collection for the laboratory analysis.
Monthly monitoring activity involving only a sub-group of boreholes	Each month	SWL measure, Phys-Chem parameters in situ measure
A short term monitoring activity just for few boreholes located strictly near the coastline (in order to study the tidal effect on groundwater salinity)	2 times per day during an entire week, but not necessary in a specific month	SWL measure, Phys-Chem parameters in situ measure

According to the methodology for conducting groundwater monitoring campaigns, a borehole monitoring network has been designed in three steps. Firstly, the study area boundary has been defined starting from the morphological and geological characteristics of the Region of Dar es Salaam. It only includes the coastal sandy plain (the focus of the study is on Dar es Salaam coastal aquifer, located in Quaternary sand deposit), extending from the Indian Ocean towards inland, including the whole metropolitan area and some peri-urban areas (not located in the plateau). Secondly, since the analysis of seawater intrusion phenomenon will be conducted in a GIS environment, 133 boreholes were localized on field and georeferenced by GPS coordinates. Thirdly, a sub-group of georeferenced boreholes, 90, have been selected following these criteria:

- Availability of groundwater historical data in the same water point(DDCA Reports);
- Uniform spatial distribution of the monitoring boreholes inside the study area;
- Borehole depth: the monitoring borehole has to tapped from the study coastal aquifer;
- Boreholes accessibility: owners availability to use their boreholes for the monitoring campaign, and borehole characteristics (borehole diameter, presence of pump, etc.), in order to perform easily the in situ measures.

The boreholes monitoring network was designed by CIRPS staff in collaboration with ARU staff in Dar es Salaam. Due to the fact that in Temeke and Ilala municipalities the boreholes are community ones, CIRPS and ARU staff have been supported during the field visits by the officers of the Water Division (Planning Department) of the Municipality. This was not necessary in Kinondoni where almost all the boreholes are private.

Figure 6. ***Georeferencing boreholes (photo from field work activity)***

Figure 7. ***Selecting boreholes to be included in the monitoring network (photo from field work activity)***

The network is composed by 90 boreholes uniformly distributed with a frequency of about 1 boreholes per Square Mile (study area surface is about 256 km^2).

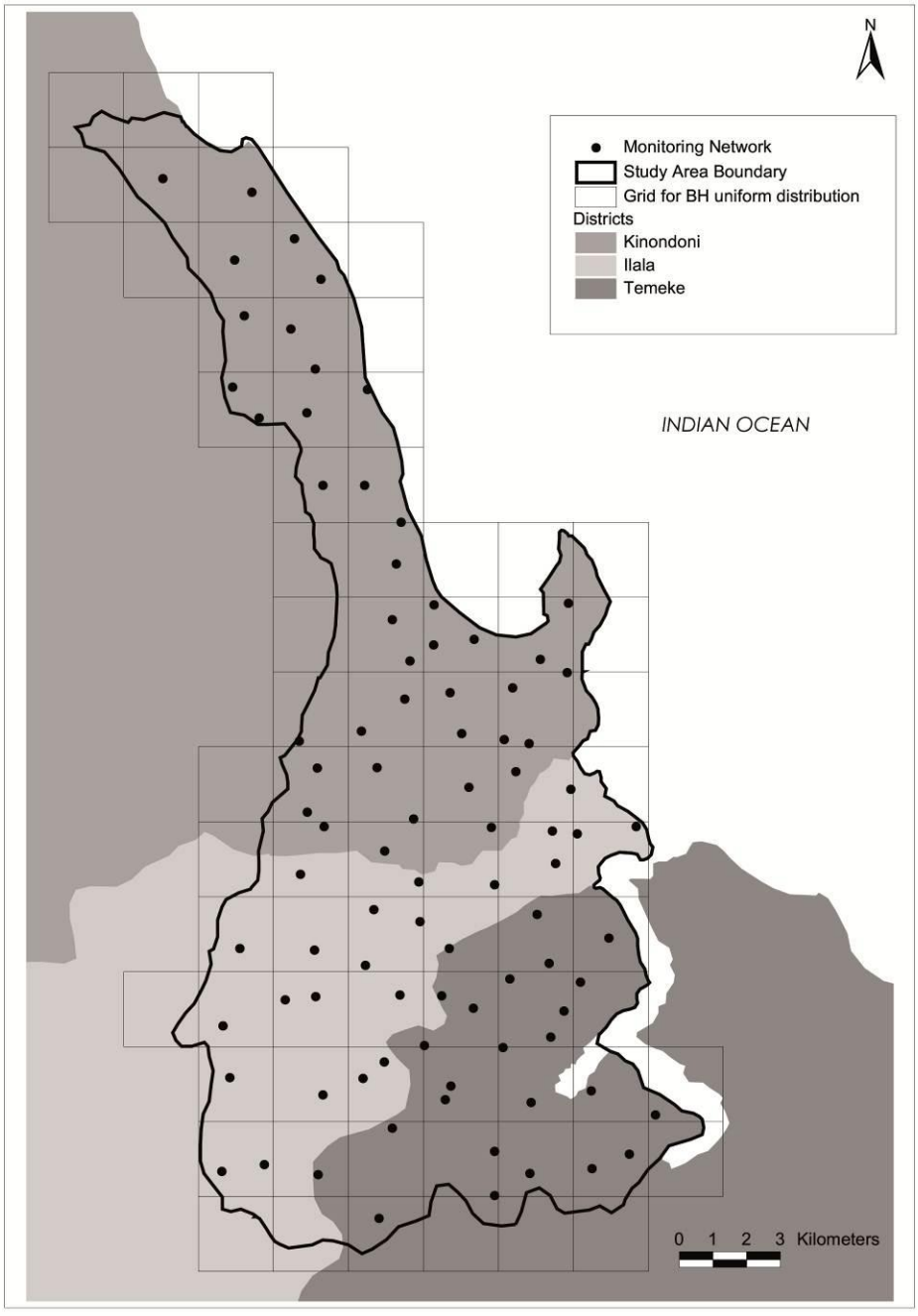

Figure 8. ***Designed borehole monitoring network***

To manage the thousands of data coming from the monitoring campaign during the phase of seawater intrusion analysis, a specific relational database for the boreholes network storage have been created on MS Access environment.

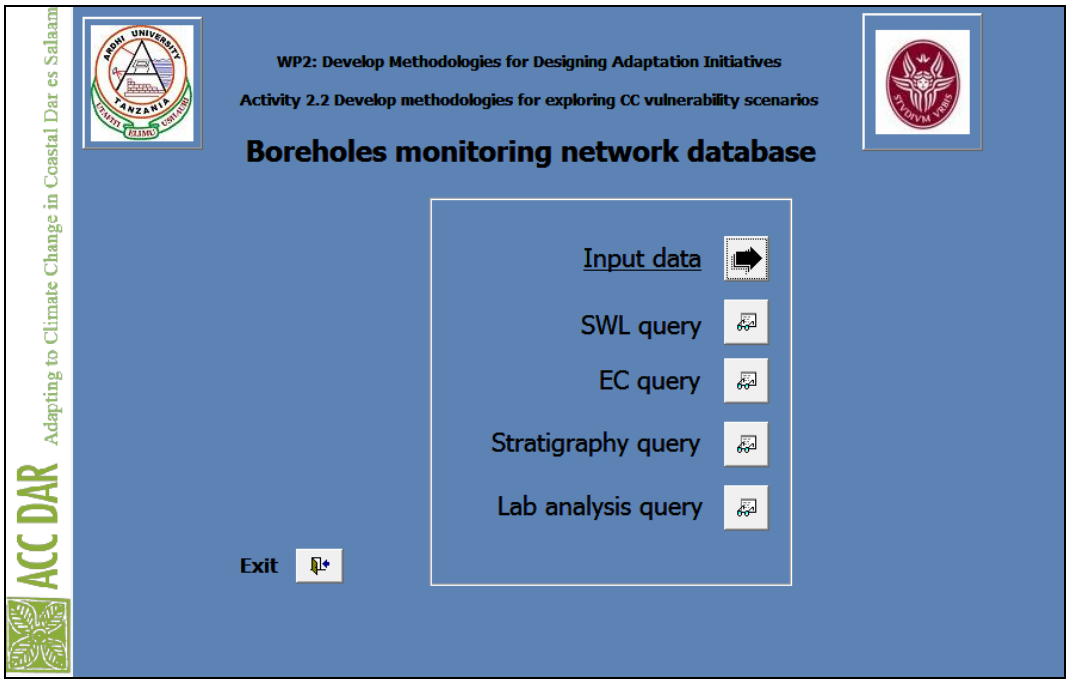

Figure 9. ***Designed Database title-page***

The monitoring campaign will require about 9 months of field measures performed by ARU technicians and some ad hoc instruments. For this reason some specific equipments have been purchased by ARU and one week training workshop has been held by CIRPS staff in Ardhi University. Main Workshop topics were climate change and groundwater, seawater intrusion theory and modelling, GIS theory and practise (using Q-GIS software), data management and basic of MS Access, groundwater measures instruments theory and practise. 7 Ardhi Master students attended the workshop. The detailed programme of the training is in the Annex 5.

Figure 10. ***Training Workshop: groundwater measurements in a well test (photo from practise exercise)***

Changes occurred with respect to the original action plan

The activity 2.2 was planned to end in the third semester of the project implementation. Because of bureaucratic issues in purchasing the instruments for groundwater monitoring campaigns the end of the activity has been postponed by 6 months..

Links with other project activities

Methodology will consider both the physical and socio-economic factors that combine to determine community vulnerability to CC. For this reason the results of the activity 2.2 are strictly related with the ones expected from the activities 1.1 and 2.1 in order to evaluate socio-economic characteristics and community dependence on groundwater.

The methodology developed as results of the activity 2.2 to perform the hydrogeological monitoring campaigns will be part of the tool kit necessary to perform the capacity-building and the design of sustainable adaptation measures by Dar's Municipalities under the WP3.

Dar Municipalities' officers will be trained also to monitor the seawater intrusion phenomena in time and to assess new CC vulnerability scenarios in order to build adapting strategies for the Dar's inhabitants.

DISSEMINATION

Since the start of the project, a considerable effort has been put into the dissemination of its activities and results in order to spread information about the ongoing activities, to enlarge networking, to involve new stakeholders interested, to share knowledge about the scientific findings.

The project logo and the project web site have been designed and validated during the kick off meeting with ARU, where EC Delegation representative and Dar's municipalities and Dar City

Council representatives were invited. The project logo has been used for headed paper, minutes, reporting and working paper templates, for the web site and the newsletter, and will be used for all the future project visibility and dissemination tools. The project web site is online at the following address: http://www.planning4adaptation.eu A reserved area is available to the project team for exchanging reports, minutes of meeting, internal documents, maps, etc. in order to be updated and to share information in a quick and easy way. As for free access website pages, some are already online while others are still under construction. Both will be in development and updated during the whole duration of the project.

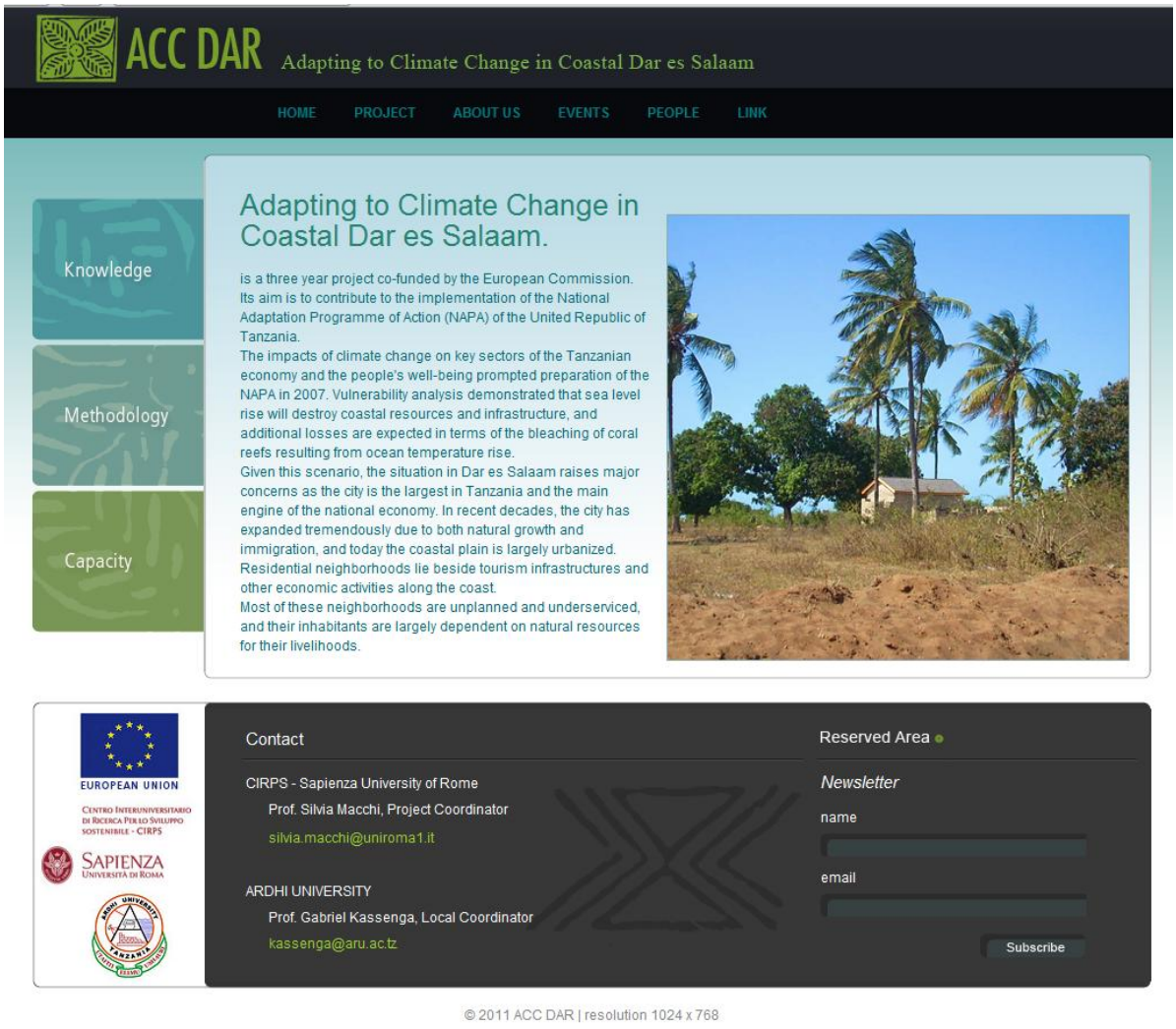

Figure 11. ***ACC DAR web site home page***

A newsletter was designed and sent to the project mailing list for the first time at the beginning of November in order to disseminate information. The newsletter will be sent each three months and the mailing list is growing. (See Annex 7)

During the kick off meeting held in Dar es Salaam in April 2011 objectives and future plans have been presented to the audience composed by representatives of the DCC and the three municipalities, local NGOs and representatives of local media. Also the pilot study held in Dar es Salaam in 2009 and the plan of the preliminary survey foreseen for the activity 1.1 have been presented.

The project activities and the first results have been disseminated by the team members at several national and international events:

- Seminar within the Master program in "International Cooperation Aid and Project Design", CIRPS Sapienza University of Rome, Rome, February 2011;
- 5th AESOP Young Academics Network Meeting, February 16th - 18th 2011, Delft University of Technology, Delft, the Netherlands
- International Ph.D. Workshop in Sustainable Development, Columbia University, New York City, May 2011;
- 5th Forum on Developing the Regions of Africa and Europe. How the new North African outlook is changing Europe – Africa relations, 6-7 October 2011, Fondazione Banco di Sicilia in collaboration with The European House – Ambrosetti, Taormina, Italy
- International Conference on "Urban Impact of Climate Change in Africa", Polytechnic of Turin, Turin, November 2011. Abstracts and ppt presented are the following:
    - "Planning for Adaptation"
    - "Climate change impact in Dar es Salaam, Tanzania"
    - "Autonomous Adaptive Capacity to Environmental Change in Peri-Urban Dar es Salaam" (activity 1.1)
    - "Land cover change and urban vulnerability to CC in Dar" (activity 2.1)
    - "Groundwater Sensitivity to CC in coastal Dar es Salaam" (activity 2.2)

Scientific papers related to the results achieved by the activities 1.1, 1.2, 2.1 and 2.2 are under development by the working groups' members to be submitted to international journals for publication. Some working papers have been already drafted.

WP0 PROJECT MANAGEMENT

The project management and coordination is a daily activity. Structure and responsibilities are described as following.

The *Project Coordination Team* is entitled for political and strategic orientation of the project; budget modification and detailed breakdown for each year; work plan adjustment; validation of the project deliverables; monitoring of the joint working group results.

It is composed by:

- CIRPS: the Project Coordinator and a research staff member from Sapienza University
- ARU: the Local Coordinator and a research staff member from Ardhi University

It is chaired by the Project Coordinator.

The *Management Team* is entitled for the executive management (organization and scheduling of activities, meetings, inputs and outputs; direct support to the PCT; communication with the EC for all management issues; project communication plan; internal project monitoring) and for the financial management (general administration; financial execution and financial reporting)

It is composed by:

- CIRPS: the Project Manager and an administrative staff member from Sapienza University
- ARU: an administrative staff member from Ardhi University

It is chaired by the Project Manager.

The Project Coordination Team has met twice so far in Dar es Salaam. The first was the kick off meeting on April 2011 and the second was the project meeting held on September 2011. All project meetings are organized to coincide with other project milestones. During the kick off meeting, a round table involving DCC and Dar's municipalities personnel has been organized in order to present the project, to create awareness about adaptation and CC issues and to start the negotiation about their involvement in future implementation of the action. The second meeting has been held in conjunction with the pilot exercise of the participatory methodology in order to have it validated and agreed upon by the Project Coordination Team.
Next project meeting is planned for next April in conjunction with the first annual international workshop foreseen by the project.

Two *Joint Working Groups* have been established to carry out the activities related to the WP1 and WP2. They are composed by ARU's and CIRPS' junior and senior researchers. They are headed by a member of the WP leader (ARU is leading WP1 and CIRPS is leading WP2). Their scientific results are evaluated jointly by the Project Coordinator and the Local Coordinator; their interim reporting and their missions in Rome and in Dar es Salaam are supported and monitored by the Project Manager. Next project meeting is planned for next February in conjunction with the first annual international workshop foreseen by the project.

The WP1 Joint Working group has met twice, once in April 2011 in conjunction with the kick-off meeting and once in September-October 2011 to perform the pilot exercise of the participatory methodology and the training workshop on data analysis. Next meeting is foreseen in March 2012, in conjunction with the first cycle of participatory activity, aimed at planning for the second cycle and to draw first conclusions on options for autonomous adaptation to future climate change effects by the target population.

As for the WP2 Joint Working group, they held a number of meetings during September-December 2011. Throughout that period, a junior researcher from ARU spent two months at CIRPS while a junior researcher from CIRPS spent one month at ARU. Moreover, the travel to Dar by a researcher from CIRPS for holding the training workshop on seawater intrusion monitoring provided the team members with a further opportunity to discuss in depth the work plan for future activity under WP2.

The *internal communication flow* between the two partners and among the working group members has been on almost daily basis through internet tools and by phone. Exchange of documents took place mainly by email and uploading them in the reserved area of the project web site.

2.3. Activities planned and postponed to the second year.

The first International Workshop on "Addressing climate change adaptation in coastal areas of fast growing African cities" (activity 1.4), planned at the end of the first year, has been not realized during the reporting period. The event will be held in Dar to present and discuss the methodology applied and results achieved by the whole survey activity under WP 1. Due to the increasing of the sample size for the household questionnaire survey conducted under activity 1.1, final results are still under review. The workshop has been postponed to April 2012.

The preparatory phase of the WP3 has been postponed to the second year project, even if part of the necessary information relevant for the needs assessment for the capacity-building will be extracted by the survey conducted under activity 1.2

2.3.1 Observations on the performance and the achievement of outputs, outcomes and impact in relation to specific and overall objectives.

Project objectives and expected results planned in the Logframe remained relevant during the reporting period. Many achievements have been reached as already described above and some new detailed indicators have been defined (please, find attached the results-tracking table in the Annex 6 of this report).

Some *innovative activities* have been carried out during the first year of the project.
First of all the pilot exercise to test the participatory methodology (activity 1.3) deserves to be mentioned. The methodology used was the "Participatory Theatre (PT)" through the "Theatre of the Oppressed (TO)" tool. Its innovation is already detailed above. The relevant results obtained through the feasibility study and the pilot experience held in Dar es Salaam, in terms of involvement of Dar's community leaders and of people from the target area, convinced the project team to adopt this methodology for the participatory workshops foreseen under activity 1.3 and to plan two cycles of PT workshops and public events for next year.
As regards the activity 1.1, some changes have been proposed and agreed by both partners. First, a preliminary survey has been conducted in order to estimate the population of the target area; data collected from ward officers show that around 120,000 households live in Dar's coastal plain. As a consequence, the sample size for the household questionnaire survey has been increased from 500 to 6000 units (5% of the whole population). Second, to facilitate the data entry an informatics tool was created and uploaded on the reserved area of the project web site. It automatically eliminates inconsistent data and allows for accessing the data base in any time by any member of the work team. Third, a joint workshop has been held in Dar at the end of September 2011 to share the methodology to be used for statistical data analysis, which is presently ongoing and will conclude by February 2012. During the workshop it was agreed to develop a semi-automatic procedure which will allow DCC for easily repeating the survey in the future. A toolkit will be developed in the next months to transfer the procedure to DCC officers involved in the capacity building activities under WP 3.
An analogous semi-automatic procedure and related toolkit is under development for land cover analysis. This is the main innovation for activity 2.1 and will allow DCC for easily updating land cover and land use maps in the future. It is worthy to be mentioned that the production of updated maps by the DCC GIS unit will not require additional costs for acquiring new satellite imageries as the procedure has been tailored to data provided by Landsat and SPOT for free or at very little

expense. Also in this case, the developed toolkit will support the transfer of the procedure to DCC officers during the capacity building activities under WP 3.

The development of the action did not encounter any relevant obstacles because there have not been changes in the project operating context since the start of the project. All the assumptions described in the logframe have been fulfilled.

In particular the following considerations should be relevant:

- The institutional commitment.

  DCC, which is participating in the project as associate, was involved by CIRPS and ARU since the beginning of the activity implementation. An official letter was sent in March to the DCC to share the project aim and a meeting among the Project Coordination Team and the City Director has been held in April.
  During the kick off meeting the City Director, in his opening remarks, underscored the link between the action proposed to be carried out and the reality on the ground in Dar es Salaam, where local authorities are encountering some limitations in addressing CC effects and impacts.
  The strong commitment shown by the DCC and the three Dar's municipal councils is the *condicio sine qua non* for the project to reach positive effects and to make feasible and successful many of the activities planned.
  This relation between project partners and local authorities is getting more and more stronger, as DCC and municipal councils' officers have been involved on permanent basis in the project activities.
- Community involvement.

  The willingness of residents to participate in the project activities has been demonstrated as they were highly cooperative during the administration of the questionnaire related to the activity 1.1. Almost 6000 households accepted to participate in the survey and answered the questionnaire.
  Furthermore, in the pilot experience of "Participatory Theatre (PT)" held in Dar es Salaam during the feasibility study, people were very well disposed and curious to try PT, and very enthusiastic to be part of this process.
- International regulation.

  Travel regulation and organization did not encounter any problem or visa restriction. Many travels have been organized to allow CIRPS personnel for participating in the project meetings, realizing the two short training courses and carrying on the feasibility study for PT in Dar es Salaam. As regards ARU personnel mobility, one internship of two month has been held in Rome. Two other internships are planned for next year in the framework of the WP2.
  Some not relevant delays have been caused by the internal universities regulations to purchase necessary technical instruments, specialized software and other scientific tools.

2.3.2 Potential risks during the implementation of the activities already tackled.

Some technical difficulties have been encountered during the implementation of the activities and they have been tackled immediately by the Project Coordination team. The most relevant decisions made were the following: to collect population and household data from the sub-ward offices for defining the correct sample size relevant to the survey (activity 1.1); to conduct individual interviews

with the officers involved in the survey on Dar's institutional activities related to CC, as foreseen focus group method resulted inapplicable (activity 1.2); to perform a feasibility study for choosing the suitable methodology for participatory activities (activity 1.3); to explore the feasibility of Dar's land cover mapping over the last decade through the processing of satellite imagery free available from ESA Spot and USGS Landsat archives in order to minimize the cost for images purchase for DCC in future (activity 2.1); to acquire and digitalize the existing borehole reports from the DDCA (Drilling and Dam Construction Agency) to ensure the available information is fully utilized (activity 2.2).

2.3.3. Year 2 Action Plan

Activity	Year 2												Implementing body
	Semester 3						Semester 4						
	13	14	15	16	17	18	19	20	21	22	23	24	
01 Executive and Financial Management													CIRPS & ARU
02 Project Coordination													CIRPS & ARU
Preparation Activity 1 1.1 Investigate the livelihood of population dependent on natural resources and their concern for CC													ARU & CIRPS
Execution Activity 1 1.1 Investigate the livelihoods of population dependent on natural resources and their concern for CC													ARU & CIRPS
Preparation Activity 2 1.2 Investigate Dar's institutional activities related to CC													ARU

Execution Activity 2 1.2 Investigate Dar's institutional activities related to CC													ARU
Preparation Activity 3 1.3 Explore local options of autonomous adaptation and raise awareness on CC													ARU & CIRPS
Execution Activity 3 1.3 Explore local options of autonomous adaptation and raise awareness on CC													ARU & CIRPS
Preparation Activity 4 1.4 Organize the 1st International Workshop													ARU
Execution Activity 4 1.4 Organize the 1st International Workshop			**(*)**										ARU
Preparation Activity 5 1.5 Disseminate WP1 results													ARU & CIRPS
Execution Activity 5 1.5 Disseminate WP1 results													ARU & CIRPS
Preparation Activity 6 2.1 Develop methodologies for monitoring changes in peri-urban settlements													CIRPS & ARU

Execution Activity 6 2.1 Develop methodologies for monitoring changes in peri-urban settlements													CIRPS & ARU
Preparation Activity 7 2.2 Develop methodologies for exploring CC vulnerability scenarios													CIRPS & ARU
Execution Activity 7 2.2 Develop methodologies for exploring CC vulnerability scenarios													CIRPS & ARU
Preparation Activity 8 2.3 Develop a methodology for designing community based adaptation initiatives													CIRPS & ARU
Execution Activity 8 2.3 Develop a methodology for designing community based adaptation initiatives													CIRPS & ARU
Preparation Activity 9 2.4 Organize the 2nd International Workshop													CIRPS
Execution Activity 9 2.4 Organize the 2nd International Workshop													CIRPS
Preparation Activity 10 2.5 Disseminate WP2 results													CIRPS & ARU

Execution Activity 10 2.5 Disseminate WP2 results													CIRPS & ARU
Preparation Activity 11 3.1 Prepare a capacity building strategy													ARU
Execution Activity 11 3.1 Prepare a capacity building strategy													ARU
Preparation Activity 12 3.2 Develop and implement a training programme													ARU
Execution Activity 12 3.2 Develop and implement a training programme													ARU
Preparation Activity 13 3.3 Organize the mid term International Conference													ARU & CIRPS
Execution Activity 13 3.3 Organize the mid term International Conference							**(*)**						ARU & CIRPS
Preparation Activity 14 3.4 Support Dar's municipalities in designing adaptation initiatives													ARU & CIRPS

Execution Activity 14 3.4 Support Dar's municipalities in designing adaptation initiatives													ARU & CIRPS
Preparation Activity 15 3.5 Organize the 3rd International Workshop													ARU
Execution Activity 15 3.5 Organize the 3rd International Workshop													ARU
Preparation Activity 16 3.6 Disseminate WP3 results													ARU & CIRPS
Execution Activity 16 3.6 Disseminate WP3 results													ARU & CIRPS

3. Partners and other Co-operation

CIRPS, a public research centre of the Sapienza University of Rome (Italy), is the applicant of the action. Ardhi University of Dar es Salaam (Tanzania), a public university since 2007, is the partner.

CIRPS gathers high level, interdisciplinary competences from eleven Italian Universities and has a strong expertise in international research networking and institutional capacity building, both at local and national level. A pioneer in high education on Sustainable Development Technologies and Planning, CIRPS currently offers a MA program and a PhD program.

The *Ardhi University* (ARU) was established as a public university in 2007 following the growth in size and scientific relevance of the University College of Lands and Architectural Studies which was part of the University of Dar es Salaam. Coherently with the UCLAS' tradition, ARU is acting as a provider of high education, scientific research and technical consultancy in the field of Urban Planning and Environmental Engineering at national and regional levels.

The partnership between CIRPS and ARU grew up in the frame of their PhD programs, where a joint research has been developed in 2009 on "CC adaptation in Dar's peri-urban areas". That research activity disclosed the potentiality for further collaboration, leading to the "Adapting Climate Change in Coastal Dar es Salaam" Project.
Both the applicant and the partner agreed from the beginning of the action in being directly responsible for the implementation of the project activities, with CIRPS taking the responsibility for the coordination and the management of the action. All the decisions related to the activities planning and development have been agreed by the two partners during the whole reporting period. At the beginning of the project a consortium agreement has been signed among them to regulate sharing of finances and responsibilities, ownership and use of knowledge.
Collaboration between CIRPS and ARU staff is very strong and effective. The sharing of responsibilities in implementing each one of the project activities and in achieving of all the project results have been required efforts by both partners as described in the above paragraph.
The communication flow among the technical staff and the management staff of the two universities is almost on a weekly basis.

Dar City Council is associate in the project. DCC and Dar municipal councils' representatives have been involved since the beginning of the project. An official letter was sent at the beginning of March to the DCC to share the project aim and a meeting with CIRPS coordination staff and with the local coordinator of the project has been held in April 2011 in Dar es Salaam.
The kick-off event of the project has been held on 28th April 2011 at the International Conference Centre – PPF Tower. In this occasion a workshop has been organized with the aim to start a fruitful dialogue among the key stakeholders on the central themes of the project. The participants were drawn from the local government institutions, non-governmental organizations and the research institutions. The event has been well-advertised through two newspapers, "The Guardian" of 2nd of May 2011 and "Nipashe" of 1st of May 2011, respectively in English and in Swahili, and the tv "channel 10".
The workshop provided an opportunity to exchange ideas about the project purposes and to do first assessment about the awareness of municipal officers on CC issues and the need to support people living in peri-urban Dar in their efforts to adapt. During the event, in his opening remarks, the City Director underscored the link between the action proposed to be carried out and the reality on the

ground in Dar es Salaam and some limitations encountered by the local authorities in addressing CC effects and impacts.

The processes of decision-making and the process by which decisions are implemented have been agreed step by step between the project partners and the DCC. Its involvement in the project is crucial to ensure its success in order to facilitate the communication between the project staff, Dar's municipal services and the people living in the targeted areas, and to ensure the action to be consistent with DCC's strategies for UDEM.
It happened during the whole first year project. DCC has been a useful provider of documents and data and has given constant support to the project working teams by ensuring the collaboration of its officers at district, ward and sub-ward levels. The availability of Dar's municipal services have been crucial for the surveys conducted during this year, in particular in activity 1.2 where they have been the direct target group of the survey and allowed to interview 48 target persons among municipalities and DCC officers. The community leaders have been a strong point of reference to facilitate the organization of the pilot participatory exercise and to help relationships with the community during the feasibility study under activity 1.3. DCC helped the activity 2.1 providing a set of GIS data and remote sensing imagery related to Dar Municipality. Furtheremore during the boreholes networking under activity 2.2 the officers of the Water Division (Planning Department) of the Municipality have been supported CIRPS and ARU staff during their field visits due to the fact that in Temeke and Ilala municipalities the boreholes are all community ones.

The strong commitment shown by the DCC and the three Dar's municipal councils is the *condicio sine qua non* for the project to reach positive effects and to make feasible and successful many of the activities planned.
This relation between project partners and local authorities is getting stronger more and more.
This should be considered one of the more relevant achievements of the first project year because it is the premise to the next activities of capacity-building and to the final one to design adaptive strategic measure. It is the main assumption to assure the future impact and sustainability of the action.

Other stakeholders involved in the project activities until now were the following:

- NGO's representatives as Sustainable Cities Iternational Network Africa;
- the Environmental Protection Management Services (EPMS), an environmental consultancy firm which has implemented a number of project on CC and disaster risk reduction;
- the Dar es salaam Water and Sewerage Corporation (DAWASCO), the sole provider of water supply and sewerage services in Dar es Salaam city and parts of Coast region;
- the National Environment Management Council (NEMC); and
- the Programme officer in charge of environment, climate change and energy in the EU delegation in Dar es Salaam.
- Institute for Research on Population and Social Policies, National Research Centre (CNR-IRPPS) in Rome.

All these institutions participated in the kick-off event and they have been involved in the related working groups:

- Contacts with the Drilling and Dam Construction Agency (DDCA) allowed to collect almost 280 Borehole Reports to obtain boreholes groundwater physical and chemical characteristics.

The final beneficiaries of the action are those inhabitants of Dar's coastal plain living in unplanned and unserviced neighbourhoods and whose livelihood depending on natural resources are already experiencing environmental changes and the related impacts (decreasing in water availability, lost of land on the seashore, etc.). Their willingness to participate in the project activities has been demonstrated by their strong collaboration during the administration of the questionnaire related to the activity 1.1. Almost 6000 households accepted to participate in the survey and answer the questionnaire.

Furthermore, in the pilot experience of "Participatory Theatre (PT)" held in Dar es Salaam during the feasibility study, people were very well disposed and curious to try PT, and very enthusiastic to be part of this process.

4. Visibility

EU visibility has been ensured for each of the above mentioned dissemination activities following the rules of the "Communication and Visibility Manual for European Union External Actions" (Europeaid, 2010)

The EU logo appears in the web site, in the newsletter and in all the communication and dissemination materials and communications. It appears also in all the internal technical reports and working papers developed by the project staff and in the training materials used in the short courses delivered by CIRPS staff in Ardhi University.

For image acquisition there was the need to register to USGS and ESA websites; during the registration many information about the project activity were sent, explicating that is a project co-funded by the European Commission.

The European Commission may wish to publicise the results of Actions. Do you have any objection to this report being published on EuropeAid Co-operation Office website? If so, please state your objections here.

Name of the contact person for the Action: Prof.ssa Silvia Macchi

Signature:

Location: Rome, Italy

Date report due: 7th February 2012

Date report sent: 12th March 2012

ANNEX 1

HOUSEHOLD QUESTIONNAIRE SURVEY (Activity 1.1)

OBJECTIVE

The main objective of the questionnaire is to gather information on the livelihood strategies and environmental management practices used by peri-urban dwellers, and their autonomous adaptation strategies to environmental changes.

The questionnaire is structured around four main areas of investigation:

1. Rural-urban interaction (economic flows, the flow of resources and socio-cultural relations, movement of people): interdependencies and relationships between peri-urban areas and the city centre and between peri-urban areas and rural areas (regions);

2. Access to resources (land, water, energy, shorelines, sea, raw materials, etc.);

3. **Environmental management**: The aim, on one hand, is to identify resource use and the management regime, and on the other hand, to identify obstacles and opportunities in autonomous adaptation to environmental change in peri-urban areas;

4. **Climate change**: environmental transformations and autonomous adaptation strategies. The aim is to improve understanding of the environmental changes observed by residents of peri-urban areas, their perception of the causes of these changes and the strategies they have implemented to address them in both the short and medium-term.

WHO AND WHERE

The targeted households are those in the coastal plain, with socio-economic and cultural heterogeneity (different education, income, etc.), who are stably settled (at least 5 years), and whose livelihoods are dependent on both urban and rural activities and resources. The households are selected randomly throughout the coastal plain.

Peri-urban areas are areas with a prevalence of low-medium density settlements where livelihoods are partly or totally dependent on direct access to natural resources.

GPS POSITION OF HOUSE: Nothings_____Eastings _____

QUESTIONS

STRUCTURAL DATA/SAMPLE CHARACTERISTICS
LOCATION
Q1. IN WHICH SUB-WARD (MTAA) DO YOU LIVE?
HOUSEHOLD CHARACTERISTICS
Q2. WHAT IS YOUR GENDER? 1. Female 2. Male
Q3. HOW MANY PEOPLE ARE IN YOUR FAMILY? (no. of people, including the interviewee)
Q4. HOW OLD ARE YOU? (in years as of the date of the questionnaire survey)
CASH-NONCASH INCOME GENERATING ACTIVITIES
Q5. HOW MUCH IS YOUR INCOME OR MONTHLY CASH FLOW OR MONTHLY EXPENDITURE?(*Specify whether income/expenditure)* (TZS*)

Q6. WHAT IS YOUR MAIN SOURCE OF INCOME?

1. Agriculture (specify crop) (*kilimo na aina ya mazao*)
2. Livestock (specify livestock you keep) (*ufugaji na aina ya mifugo*)
3. Charcoal making (*uchomaji mkaa*)
4. Fishing
5. Shop/small business
6. Employment in an urban area (institution; shop, etc.)
7. Other (*nyinginezo*)

Q7. (a) DO YOU WORK IN FARMING AS A SECONDARY JOB?

1. Yes
2. No

Q7.(b). DO YOU WORK IN EXCHANGE FOR FOOD OR GOODS?

1. Yes
2. No

EDUCATION

Q8. WHAT IS YOUR EDUCATION LEVEL?

1. Form IV
2. STD I

3. STD IV

4. STD VII

5. Bachelor's

6. Master's

7. Other certificate

RURAL-URBAN INTERACTIONS

Migration

Q9. HOW LONG HAVE YOU LIVED HERE?

(years)

Q10. WHERE WERE YOU LIVING BEFORE COMING TO THIS AREA?

1. The same district (*ndani ya wilaya ya Kinondoni, Ilala or Temeke*)

2. The same region (Dar Es Salaam) (*ndani ya mkoa wa Dar es Salaam*)

3. Other regions (*mikoa mingine*)

4. Other (*kwingineko*)

Q11. WHICH REGION OF TANZANIA DO YOU COME FROM?

Q12. WHY DID YOU MOVE HERE?

1. Looking for more space for animal husbandry and/or agriculture
2. Bought a piece of land
3. Looking for job/employment
4. Transfer (employment)
5. Looking for self-employment
6. Because of the Government decisions
7. Business purposes
8. Family (to visit relatives)
9. Other

Q13. DID YOU MOVE HERE ALONE OR WITH YOUR FAMILY?

1. Alone
2. With family

RURAL ACTIVITIES

Q14. WHAT ACTIVITY DO YOU MOSTLY UNDERTAKE IN YOUR PLACE?

1. Agriculture (specify crop) (*kilimo na aina ya mazao*)
2. Livestock (specify animal) (*ufugaji na aina ya mifugo*)
3. Charcoal making (*uchomaji mkaa*)

4. Fishing (*Uvuvi*)

5. Shop/small business (*Duka*/*Biashara ndogondogo*)

6. Other (*nyinginezo*)

Q15. WHAT OTHER ACTIVITIES DO YOU REGULARLY DO IN YOUR PLACE?

1. Agriculture (specify crop) (*kilimo na aina ya mazao*)

2. Livestock (specify animal) (*ufugaji na aina ya mifugo*)

3. Charcoal making (*uchomaji mkaa*)

4. Fishing (*Uvuvi*)

5. Shop/small business (*Duka*/*Biashara ndogondogo*)

6. Employment in urban area (institution; shop, etc.) (*Ajira mjini*)

7. Other (*nyinginezo*)

Q16. WHAT CROP DO YOU GROW?

1. Cassava

2. Maize

3. Potato

4. Orange

5. Mango

6. Banana

7. Coconut

8. Pawpaw

9. Mchicha

10. Sugar cane

11. Tomato

12. Pumpkin

13. Rice

14. Pineapple

15. Other vegetable(s)

16. Other fruit(s)

Q17. WHAT LIVESTOCK/ANIMALS DO YOU RAISE?

1. Cattle

2. Goat

3. Pig

4. Chickens

5. Donkey

7. Dog

8. Duck

9. Sheep

RELATIONSHIP WITH THE CITY

Q18. HOW OFTEN DO YOU GO TO THE CITY CENTER?

1. About once a day (*Kama mara moja kwa siku*)
2. About once a week (*Kama mara moja kwa wiki*)
3. About twice a month (*Kama mara mbili kwa mwezi*)
4. Rarely (*kwa nadra*)

Q19. FOR WHAT REASON DO YOU GO TO THE CITY CENTER?

1. Work
2. Selling
3. Shopping
4. Health services
5. Education
6. Other

Q20. WHAT MEANS OF TRANSPORTION DO YOU USE MOST TO GO TO THE CITY CENTRE?

1. Daladala (or other bus/minibus) (*Daladala*)
2. Motorcycle (*pikipiki, bajaji*)
3. Car (*gari*)
4. Bicycle (*baiskeli*)

5. On foot (*kwa miguu*)

6. Other means (*njia nyingine kama zipo*)

Q21. WHAT OTHER MEANS OF TRANSPORTION DO YOU USE?

1. Daladala (or other bus/minibus) (*daladala*)

2. Motorcycle (*pikipiki, bajaji*)

3. Personal Car (*gari binafsi*)

4. Bicycle (*baiskeli*)

5. Foot (*miguu*)

6. Other (*njia nyingine kama zipo*)

Q22. WOULD YOU LIKE TO MOVE TO THE CITY CENTRE?

1. Yes

2. No

ACCESS TO RESOURCES

Land Characteristics and Land Tenure

Q23. DO YOU OWN LAND?

1. Yes
2. No

Q24. DID YOU BUY THE PIECE OF LAND YOU LIVE ON? 1. Yes 2. No
Q25. DO YOU HOLD A TITLE DEED FOR YOUR LAND? (*Je! Una hati miliki ya kiwanja*?) 1. Yes 2. No
Q26. HOW LARGE IS THE PIECE OF LAND ON WHICH YOU LIVE? (hectares)
Q27. DO YOU PAY ANY TAXES/FEES ON YOUR LAND/HOUSE? 1. Yes 2. No
Q28. HOW MUCH DO YOU SPEND IN LAND/HOUSE TAXES A MONTH? (TZS)
ACCESS TO WATER RESOURCES
Q29. DO YOU PAY ANY TAXES/FEES FOR WATER? 1. Yes

2. No

Q30. HOW MUCH DO YOU SPEND ON WATER A MONTH?

(TZS)

ACCESS TO SOLID WASTE COLLECTION SERVICES

Q31. DO YOU PAY ANY TAXES/FEES ON WASTE COLLECTION?

1. Yes

2. No

Q32. HOW MUCH DO YOU SPEND ON WASTE COLLECTION A MONTH?

(TZS)

ACCESS TO ELECTRICITY

Q33. DO YOU PAY ANY TAXES/FEES ON ELECTRICITY?

1. Yes

2. No

Q34. HOW MUCH DO YOU SPEND ON ELECTRICITY A MONTH?

(TZS)

Q35. DO YOU PAY ANY TAXES/FEES ON WASTEWATER COLLECTION?

1. Yes

2. No

Q36. HOW MUCH DO YOU SPEND ON WASTEWATER COLLECTION /SEPTIC TANK/PIT LATRINE DISLUDGING A MONTH?

(TZS)

RESOURCE MANAGEMENT

Water Management

Q37. WHAT IS YOUR MAIN WATER SOURCE?

1. Street vendors

2. Neighbour's source (e.g. pipeline)

3. Spring/stream or ground pit

4. Well

5. Pipeline

5. Other

Q38. WHERE DO YOU STORE WATER?

1. Tank (*tenki*)

2. Bucket (*Ndoo ya lita* 20)

3. Concrete (underground tank)

4. Other containers (*vyombo vingine*)

Q39. HAVE YOU ANOTHER WATER STORAGE SYSTEM, IF YES WHICH ONE?

1. Tank (*tenki*)

2. Bucket (*Ndoo ya lita* 20)

3. Concrete (underground tank)

4. Other containers (*vyombo vingine*)

Q40. WHAT IS YOUR WATER STORAGE CAPACITY IN LITRES?

(litres)

Energy Management

Q41. IS YOUR HOUSE CONNECTED TO THE ELECTRICITY SUPPLY NETWORK?

1. Yes

2. No

Q42(a). WHAT SOURCE OF ENERGY DO YOU USE FOR COOKING?

1. Charcoal

2. Kerosene

3. Electricity

4. Gas (LPG)

5. Other

Q42(b). DO YOU USE ANY OTHER SOURCE OF ENERGY SUCH AS WOODFUEL, ETC?

1. Yes

2. No

Q42(c). WHAT SOURCE OF ENERGY DO YOU USE FOR LIGHTING?

1. Electricity

2. Kerosene lamp

3. Charcoal

4. Other

Solid Waste Management Services

Q43. WHO COLLECTS YOUR SOLID WASTE (GARBAGE)?

1. Company (public or private collection) (*Serikali au kampuni binafsi*)

2. Street collectors

3. Individual collection (*binafsi*)

4. Other (*nyinginezo*)

Q44. WHERE DO YOU DISPOSE YOUR SOLID WASTE (GARBAGE)?

1. Crude dumping
2. Burning
3. Burying
4. Landfill
5. Don't know
6. Other (*nyinginezo*)

Q45. HOW MUCH SOLID WASTE (GARBAGE) DO YOU PRODUCE A DAY?

1. 1 bucket (20 L) [up to one] (*ndoo 1*)
2. 1-3 buckets [from 1 to 3] (*ndoo 1-3*)
3. More than 3 buckets (*zaidi ya ndoo 3*)

Q46. DO YOU RECYCLE/REUSE/SELL YOUR SOLID WASTE (GARBAGE) IN WHOLE OR IN PART?

1. Yes
2. No

Resource Management (wastewater)

Q47. WHO COLLECTS YOUR WASTEWATER?

1. Public or private collection (*serikali au kampuni binafsi*)
2. Individual collection (*binafsi*) (pit latrine/Septic tank)
3. Sewerage System
4. Other (*nyinginezo*)

Q48. WHERE DO YOU DISCHARGE YOUR WASTEWATER?

1. Pit latrine
2. VIP latrine
3. Septic tank
4. Sewerage System
5. Other

Q49. DO YOU RECYCLE/REUSE/SELL YOUR WASTEWATER/SUDGE IN WHOLE OR IN PART?

1. Yes
2. No

CLIMATE CHANGE ADAPTATION

Observed Climate Changes

Q50. HAVE YOU NOTICED ANY CHANGES IN WATER AVAILABILITY IN THE PAST YEARS?

1. No
2. Yes, increasing
3. Yes, decreasing
4. Yes, decreasing a lot

Q51. HAVE YOU NOTICED ANY CHANGES IN SOIL FERTILITY IN THE PAST YEARS?

1. No
2. Yes, increasing
3. Yes, decreasing
4. Yes, decreasing a lot

Q52. HAVE YOU NOTICED ANY CHANGES IN SOIL ARIDITY IN THE PAST YEARS?

1. No
2. Yes, increasing
3. Yes, decreasing
4. Yes, decreasing a lot

Q53. HAVE YOU NOTICED ANY CHANGES IN AIR HUMIDITY IN THE PAST YEARS?

1. No
2. Yes, increasing
3. Yes, decreasing
4. Yes, decreasing a lot

Q54. HAVE YOU NOTICED ANY CHANGES IN RAINFALL PATTERNS IN THE PAST YEARS?

1. No
2. Yes, increasing
3. Yes, decreasing
4. Yes, decreasing a lot
5. Yes, changes in seasonal rainfall patterns

Q55. HAVE YOU NOTICED ANY OTHER ENVIRONMENTAL CHANGES (SEA LEVEL RISE, BIODIVERSITY CHANGES, ETC) IN THE PAST YEARS?

1. No
2. Yes
3. Yes, a lot

AUTONOMOUS ADAPTATION STRATEGIES
Q56. HAVE YOU MADE ANY CHANGES IN THE TYPE OF ACTIVITY THAT YOU USUALLY DO IN YOUR PLACE AND/OR IN THE AMOUNT OF TIME THAT YOU USE TO DO IT? 1. Yes 2. No
Q57. HAVE YOU MADE ANY CHANGES IN THE TYPE OF CROP(S) YOU GROW? 1. Yes 2. No
Q58. HAVE YOU MADE ANY CHANGES IN THE TYPE OF LIVESTOCK YOU RAISE? 1. Yes 2. No
Q59. HAVE YOU SWITCHED TO OTHER INCOME GENERATING ACTIVITIES? 1. Yes 2. No
Q60. HAVE YOU MADE ANY CHANGES TO YOUR HOUSE/LAND?

1. Yes

2. No

Q61. DO YOU HAVE ANY STRATEGY TO COPE WITH FUTURE ENVIRONMENTAL CHANGES THAT COULD THREATEN YOUR LIVELIHOOD/SPACE (DROUGHT, FLOODING, ETC)?

1. Yes

2. No

Q62. WHAT TYPE OF STRATEGIES DO YOU HAVE?

1. Start a business

2. Get a Loan (credit)

3. Continue with the same changes (in livestock and crop)

4. Intensify or engage in agricultural activities/livestock keeping

5. Look for a temporary job

6. Move to another place

7. Other

CAUSES OF CLIMATE CHANGE

Q63. IN YOUR OPINION, ARE THE CHANGES YOU NOTICED MAINLY RELATED TO CLIMATE CHANGE?

1. Yes

2. No

Q64. IN YOUR OPINION, ARE THE CHANGES YOU NOTICED MAINLY HUMAN-RELATED? 1. Yes 2. No
Q65. IN YOUR OPINION, ARE THE CHANGES YOU NOTICED MAINLY RELATED TO INADEQUATE ENVIRONMENTAL MANAGEMENT BY LOCAL INSTITUTIONS? 1. Yes 2. No
Q66. IN YOUR OPINION, ARE THE CHANGES YOU NOTICED MAINLY RELATED TO OTHER CAUSES (LIKE EL NINO, TSUNAMI, ETC)? 1. Yes 2. No

ASANTE SANA

ANNEX 2

Short training Programme on data analysis
September 27th – October 1st 2011

Date (hours)	Themes
27/09/2011 (4h)	• Sampling plan and discussion on the questionnaire administration and criteria for selecting household and areas • Open source software Limesurvey
28/09/2011 (4h)	Transforming and Manipulating Data with SPSS syntax: • Software introduction • Type of variables • Labeling variables • Specify values for missing data • Recode of Variables and descriptive statistics • Analysis of sub-groups (filters)
30/09/2011 (6h)	Data analysis with SPSS syntax: • Contingency tables (double and triple entrance) • Compare Means • Exercise on analysis implementation
01/10/2011 (3h)	• Treatment of Multiple responses questions • Exercise on analysis implementation

Materials

Pietro Demurtas's slides
SPSS handbook (included in *PASW Statistics 18* suite)
LimeSurvey manual available at
http://docs.limesurvey.org/English+Instructions+for+LimeSurve

ANNEX 3

OFFICER SURVEY (Activity 1.2)

TARGER GROUP

Staff of services already involved in climate issues (e.g. Environment, Urban Planning, Waste Management and Sanitation). Interviews to DCC officers, Municipal officers, Ministry officers according to their institutional position and willingness to participate, in order to assess existing initiatives at DCC and municipal levels.

AIM

To investigate current activities to prevent, cope with or recover from climate effects

OUTPUTS

- current ways of addressing CC issues at DCC and municipal levels
- strengths, weaknesses, gaps and possibilities for development of existing methods

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* **Peri- urban** (PU) *areas are areas with prevalence of low-medium density settlements and where people livelihood is partly or totally dependent on direct access to natural resources. In PU areas urban and rural activities are juxtaposed, and rural and the urban landscape features are highly intertwined.*

Autonomous Adaptation: *Individual or collective actions, initiatives or strategies spontaneously and independently undertaken to adjust to actual or expected environmental changes. It include all the initiatives not planned or promoted by institutions.*

GUIDING QUESTIONS

Personal data *(maelezo binafsi)*	
name *(Jina)*	
gender *(Jinsia)*	
age *(umri)*	
job (institution and position) *(kazi-cheo)*	
education *(elimu)*	
contact *(mawasiliano)*	
place*(mahali)*	
date*(tarehe)*	

1. How long have you been working here? *(umefanya kazi hapa kwa muda gani?)*
(Years)

2. What are your competences and responsibility? *(Kwa uzoefu ulionao, eleza majukumu yako na uhusiano kati ya wilaya na mitaa/vitongoji)*
a. Phisical boundaries *(mipaka)*
b. Natural resources management *(usimamizi wa rasilimali)*
c. Land use planning *(mpango wa matumizi bora ya ardhi)*
d. Development planning *(mpango wa maendeleo)*
e. Other *(mengineyo)*

3. Describe the main relationship between your institutions and the other institutions (higher-level and lower-level; eg. with District and Subwards, Ministries). **What are their competences?**

4. Could you describe any strategy and/or programme or plan you know (or are you working on) in the following sectors in peri-urban areas*?
a. Environmental risck management *(usimamizi wa hatari za mazingira)*
b. Sustainable natural resources management (water, soil, …) *(mikakati katika usimamizi wa rasilimali mfano maji na udongo)*
c. Land-use planning *(mpango wa matumizi bora ya ardhi)*
d. Facilities supply *(utoaji huduma za jamii)*
e. Urban and/or rural development *(maendeleo ya mjini na vijijini)*
f. Other *(nyinginezo)*

5. Are there specific policies and strategies for peri-urban areas? What? Are there examples of planning in PU areas? *(Je mabadiliko ya maeneo ya nje ya mji yanazingatiwa wakati wa mipango?) Mnazo sera na mikakati mahususi kwa maeneo ya nje ya mji? Ni zipi? Kuna mifano ya mpango wowote katika maeneo ya nje ya mji?)*

6. Where do the financial resources for the projects implementation of come from?

7. How do you consider the facilities supply system in PU areas? *(vipi kuhusu utolewaji wa huduma za jamii katika maeneo ya nje ya mji?)*

a. Transport system *(mfumo wa usafiri)*

b. Electricity *(umeme)*

c. Water *(maji)*

d. Waste management *(usimamizi na uzoaji taka)*

e. Education *(elimu)*

f. Health *(afya)*

b. Other *(nyinginezo)*

8. Have you noticed changes in PU areas in the last years? If yes what? *(kuna mabadiliko yoyote yameonekana katika maendeleo ya maeneo ya nje ya mji kwa miaka ya nyuma?)*

9. In your opinion, what are the main linkages an interdependencies between PU areas and city centre and between PU areas and rural areas? Are these relations changed in the last period? If yes, why? *(kwa maoni yako binafsi, kuna uhusiano gani kati ya maeneo ya nje ya mji na mjini/vijijini? kuna mabadiliko kwenye haya mahusiano ukilinganisha na miaka iliyopita?)*

(eg Flows of goods, resources *(upatikanaji wa bidhaa); People (watu); job oppotrunities; etc)*

10. Do you know any informal or formal network, group of people, organization, relations of trust and mutual support operating in PU areas? What they do and how your institution interact with them? (Are they involved in any decision making process?)

11. Have you noticed changes in environmental conditions in the last years? If yes, in which of the following sector? *(Kuna mabadiliko yoyote ya kimazingira umeyaona katika kipindi cha miaka iliyopita?)*

a. Water availability *(upatikanaji wa maji)*

b. Soil fertility *(rutuba kwenye udongo)*

c. Soil aridity *(ukavu kwenye udongo)*

d. Humidity *(unyevunyevu kwenye hewa)*

e. Rain pattern *(mzunguko wa mvua) yes*

f. Other *(mengineto)*

12. Have you evaluated the impact of those changes in PU areas? *(Kuna tathimini yoyote imefanyika kuhusu madhara ya mabadiliko ya kimazingira katika maeneo ya nje ya mji?)* If yes, how?

13. Is you institutions implementing (or implemented) some strategies to cope with environmental changes and to reduce people vulnerability? *(Kuna utekelezaji wa mikakati yoyote ili kukabiliana na hayo mabadiliko na pia kupunguza uwezekano wa kuathirika zaidi kwa maeneo ya nje ya mji?)*

14. Have you observed the autonomous adaptation actions to these changes? For example, have you noticed changes in PU activities due to the environmental changes *(umeshaona namna yoyote ya asili katika kukabiliana na hayo mabadiliko? Mfano mabadiliko ya shughuli za maeneo ya nje ya mji)***

a. Change in crop system *(mabadiliko ya mfumo wa mazao)*

b. Change in livestock *(mabadiliko katika ufugaji)*

c. Change on house structure *(mabadiliko katika ujenzi wa nyumba)*

d. Other

15. Do you have any information or baseline study on PU environment, dwellers and livelihoods? *(Mna takwimu au tafiti zozote kuhusu watu na maisha katika maeneo ya nje ya mji).* If yes what?

a. Employment *(ajira)*

b. Population *(idadi ya watu)*

c. Type and house dimension *(aina na ukubwa wa nyumba)*

d. Other *(nyinginezo*

16. What are the reasons of the environmental change *(Nini sababu hasa ya haya matatizo ya kimazingira?)*

a. Climatic variation *(mabadiliko ya tabia ya nchi)*

b. Human land use *(Matumizi ya ardhi)*-

c. Inadequate environmental management *(mapungufu katika usimamizi wa mazingira)* ***yes***

d. Other *(nyinginezo)*

ANNEX 4

PERSONAL DETAILS OF STAFF INTERVIEWED AT DAR ES SALAAM CITY COUNCIL

S/N	Name	Gender	Age	Education Level	Department/Section	Position	Experience (N. of years)	Remarks
1	Martha Mkupasi	Female	44	MSc UPM	Urban Planning, Environment and Transportation	Coordinator Safer Cities		
2	Grace B. Mbena	Female	31	BSc. URP	Urban Planning, Environment and Transportation	Town planner Officer and Acting EPM coordinator		
3	Mr. Membe P. Membe	Male	56	Adv. Dip. Health and Vector Control	Waste Management	Ag. Head of Department		
4	Samwel Buberwa	Male	48	PGD Urban Waste Management	Waste Management	Ilala Municipal Waste Manager		
5	Mr.Richard K. Matari	Male	30	Dip. Environmental Health	Waste Management	Env. Health Officer		
6	Nati	Male	49	MSc. Holder	Works and Fire Rescue	Head of Department		
7	Fikiri S. Salla	Male	49	Adv. Course on Fire Safety Mgmt	Works and Fire Rescue	Chief Fire Officer		

PERSONAL DETAILS OF STAFF CONTACTED AT ILALA MUNICIPAL COUNCIL

S/N	Name	Gender	Age	Education Level	Department/Section	Position	Experience (N. of years)	Remarks
1.	Kheri A Sultani	Male	31	Diploma, FTC	Works and Water Department	Hydrology Technician II	7	
2.	Wilfred Kavishe	Female	44	Full Technician Certificate	Works and Water Department	Water technician	11	
3.	Halima Chodry Kahema	Female	48	Bachelor Degree	Works and Water Department	Senior Development officer	6	
4	Fransisca Pius	Female	39	Bachelor Degree	Lands and Urban Planning	Municipal Land Surveyor	6	
5	Robin Wambura	Male	37	Masters Degree	Lands and Urban Planning	Land Officer	2.5	
6	Moiston Mwakyoma	Male	37	Bachelor Degree	Lands and Urban Planning	Municipal Valuer	8	
7	Samwel Buberwa	Male	48	Post graduate Diploma	Waste Management Department	Municipal Waste Manager	8	
8	Cosmas Mwaitete	Male	39	Diploma	Waste Management Department	Health officer	3	
9	Charles Wambura	Male	45	Form IV	Waste Management Department	Health officer	2	
10	Abdon Mapunda	Male	38	Masters Degree	Environmental Department	Municipal Env. Mngt. Officer	9	
11	Fatuma Maduhu	Female	52	Bachelor Degree	Health Department	Municipal Health Officer	13	

S/N	Name	Gender	Age	Education Level	Department/Section	Position	Experience (N. of years)	Remarks
12	Juma Nyabenda	Male	41	Bachelor Degree	Agricultural Department	Livestock Officer	9	
13	Haroun M. Chacha	Male	42	Masters Degree	Drainage Engineer	Municipal Drainage Engineer	11	

PERSONAL DETAILS OF STAFF CONTACTED AT TEMEKE MUNICIPAL COUNCIL

S/N	Name	Gender	Age	Education Level	Department/Section	Position	Experience (N. of years)	Remarks
1.	Jumanne A. Mhogo	Male	51	Secondary	Health Department	Health Officer		
2.	Ramla A. Mwasha	Male	28	BSc.LMV	Lands and Urban Planning	Land Officer		
3.	Salum A. Urembo	Male	33	Secondary	Lands and Urban Planning	Land Surveyor		
4.	Dr. Mathis A. Lyaruu	Male	49	Masters	Health Department	Programme Coordinate		
5.	Mary Mgaya	Female	58	Secondary	Health Department	Mental Health Cordinator		

S/N	Name	Gender	Age	Education Level	Department/Section	Position	Experience (N. of years)	Remarks
6.	Rwegasira D.Kayemamu	Male	49	Adv.Dip URP PGD Housing	Lands and Urban Planning	Urban Planning Officer		
7.	Cosmas Kimati	Male	49	BSc.Zoology	Agriculture/livestock	Agriculture/livestock Officer		
8.	Primy Damas	Male	33	BSc. Civil & Water Resources Eng.	Works and Water Department	Municipal Water Engineer		
9.	Robert J.Chenge	Male	36	FTC Water Resources	Works and Water Department	Senior Technician		
10	Teddy P.Chuwa	Female	48	BSc.Environment	Natural resources and tourism	Fisheries Officer		
11	Mtumbalia Said Seif	Male	48	BSc. In Animal Sc.& Production	Agriculture/livestock	Livestock Officer (Head)		
12	Mamuya E.H	Male	55	EA Dip. In Heath Science	Waste Management Department	Principal Health Officer-Waste Management		
13	Jeseph M. Mlungwana	Male	38	Master level	Agriculture/livestock	District Extension Officer		
14	Helbert A Mwoleka	Male	40	University level	Lands and Urban Planning	Valuer I		

PERSONAL DETAILS OF STAFF CONTACTED AT KINONDONI MUNICIPAL COUNCIL

S/N	Name	Gender	Age	Education Level	Department/Section	Position	Experience (N. of years)	Remarks
1	Baltary ndomba	Male	53	Form IV	Agriculture/livestock	Livestock specialist	15	
2	Ezra mabiki	Male	52	MA. Demography and applied statistics	Agriculture/livestock	Principal Agricultural training officer I	16	
3	Kebelezo Mpitabakana	Female	48	MBA. Agro business	Agriculture/livestock	Agricultural officer (marketing)	12	
4	Fredrick ndibalika	Male	57	B.Sc. Botany and Zoology	Natural resources and tourism	Principal forest officer	13	
5	Bupe Mwansasu	Female	39	Advanced Diploma Sociology	Natural resources and tourism	Community development coordinator	10	
6	Idda Mballa	Female	45	STD VII	Natural resources and tourism	Bee keeping officer II	11	
7	A. J. Kagaruki	Female	52	M.Sc. Sociology and Social works	Community development	Community development officer	23	
8	Kawa kafuru	Male	27	B.Sc. Environmental. Health	DMO office	Environmental Health officer	5 months	
9	Nuru tedy	Female	50	M.Sc. Regional Planning	Urban planning	Head of urban development section	7	

S/N	Name	Gender	Age	Education Level	Department/Section	Position	Experience (N. of years)	Remarks
10	Maggy alban	Male	32	B.Sc. Env. Health	DMO office	Environmental Health officer	5	
11	Mary komba	Female	45	M.Sc. Env. Planning	Urban planning	Environmental Planning officer	15	
12	Gonsalves R. Rutakyamirwa	Male	48	M.Sc. Environmental and Water Resources Management	Works and Water Department	Municipal water engineer	11	
13	Francis mugisha	Male	38	MSc. Env. Engineering	Works and Water Department	Water Engineer	9	
14	Ngowi J.	male				Municipal Land officer		

ANNEX 5

TRAINING COURSE ON MONITORING SEAWATER INTRUSION IN COASTAL GROUNDWATER

14 Nov 2011	WP 2.2 activity presentation; Climate Change effects on groundwater in coastal areas; Seawater intrusion theory and modeling
15 Nov 2011	Introduction to GIS; Practice with Q-Gis software on Dar es Salaam data
16 Nov 2011	Practice with Q-GIS software on Dar Es Salaam data - Spatial analysis; Monitoring boreholes database presentation; Data management
17 Nov 2011	Monitoring activity: instruments, data to be collected, how to perform hydrogeological measures, how to manage data; Execution of measures on a sample borehole

ANNEX 6

RESULTS-TRACKING TABLE

Result Description	Result Indicator (OVI)	Target	Performance Rating (Red, Yellow, Green)	Progress/Arising Issues	Action Required by the which implementing partner/s
1.1 Livelihoods of population dependent on natural resources and their concern for CC investigated	N. households questionnaire administered/ Households questionnaire validated in the data entry	6000/5885	Traffic Light		
	N. people involved in the Data Analysis training course	26	Traffic Light		
	N. Data Analysis Methodologies implemented	3	Traffic Light	The whole Data Analysis procedure has not been finalized yet	CIRPS
1.2 Dar's institutional activities related to CC investigated	N. officers participating in the kick off meeting	10	Traffic Light		
	N. officers interviewed	48	Traffic Light		

Result Description	Result Indicator (OVI)	Target	Performance Rating (Red, Yellow, Green)	Progress/Arising Issues	Action Required by the which implementing partner/s
1.3 Local options of autonomous adaptation and raise awareness on CC explored	N. people involved in the feasibility study	28	Traffic Light		
	Participatory cycles realized	2	Traffic Light		CIRPS & ARU
	N. people involved in the participatory cycles	At least 100 people for each cycle	Traffic Light		CIRPS & ARU
1.4 1st International Workshop organized	N. Background papers	2	Traffic Light		CIRPS & ARU
	N. papers presented	4	Traffic Light	Working papers are now under development	CIRPS & ARU

Result Description	Result Indicator (OVI)	Target	Performance Rating (Red, Yellow, Green)	Progress/Arising Issues	Action Required by the which implementing partner/s
	N. people attending the workshop	10 researchers from universities of each partner country (Tanzania and Italy); 3 seniors from EU universities; 3 seniors from EAC/SADC universities	Traffic Light		CIRPS & ARU
2.1 Methodologies for monitoring changes in peri-urban settlements developed	N. methodologies developed for monitoring Land Cover changes	1	Traffic Light	2 (two similar methodologies, respectively for LANDSAT images and SPOT images)	CIRPS
	N. LANDSAT images acquired/ N. LANDSAT classifications/ N. LANDSAT images processed	5 images acquired 5 classifications 5 images processed (period 2002-2010)	Traffic Light		CIRPS

Result Description	Result Indicator (OVI)	Target	Performance Rating (Red, Yellow, Green)	Progress/Arising Issues	Action Required by the which implementing partner/s
	N. Landscape Metrics Indices calculated for Land Cover change analysis	8	Traffic Light		CIRPS
	N. people involved in the training short course on land cover classification and landscape metrics analysis	20	Traffic Light	It will be provided in the 3rd semester	CIRPS
	N. methodologies developed for Land Cover validation	1	Traffic Light	Validation activity will start in 2012	CIRPS & ARU
	N. methodologies for investigating Land Cover Change correlation with Climate Change	1	Traffic Light	The scenarios will be built once the survey activity has finished	CIRPS & ARU
2.2 Methodologies for exploring CC vulnerability scenarios, as regards seawater intrusion phenomenon, developed	N. methodologies for conducting groundwater monitoring campaigns in Dar's coastal plain/ N. georeferenced boreholes / N. boreholes selected for the monitoring network	1 methodology/ 133 georeferenced boreholes/ 90 boreholes selected for the monitoring network	Traffic Light		CIRPS

Result Description	Result Indicator (OVI)	Target	Performance Rating (Red, Yellow, Green)	Progress/Arising Issues	Action Required by the which implementing partner/s
	N. groundwater monitoring campaign conducted	1 (consisting of 2 annual and 12 monthly surveys)	Traffic Light	The preparation phase is concluded and the survey activity will start in January 2012	CIRPS leader of the activity Ardhi responsible for monitoring
	N. methodologies for the analysis of seawater intrusion / N. maps produced	1 methodology / 9 maps (SWL maps, EC maps, Seawater intrusion maps for 1997, 2002, 2012)	Traffic Light	The seawater intrusion analysis will start after the monitoring campaign beginning	CIRPS
	N. methodologies for exploring vulnerability scenarios under climate change / Number of scenarios explored	1 methodology / 3 scenarios explored	Traffic Light	The scenarios will be built once the survey activity has finished	CIRPS & Ardhi
2.3 Methodology for designing community based adaptation initiatives developed	Toolkit for the design methodology	200 copies	Traffic Light	The toolkit will collect the methodologies from 2.1 and 2.2	CIRPS & ARU

Result Description	Result Indicator (OVI)	Target	Performance Rating (Red, Yellow, Green)	Progress/Arising Issues	Action Required by the which implementing partner/s
2.4 2nd International Workshop organized	N. Background papers	2	Traffic Light		CIRPS & ARU
	N. papers presented	4	Traffic Light	Working papers are now under development	CIRPS & ARU
	N. people attending the workshop	10 researchers from universities of each partner country (Tanzania and Italy); 3 seniors from EU universities; and 3 seniors from EAC/SADC universities	Traffic Light		CIRPS & ARU
3.1 Capacity building strategy prepared	N. Need assessment report of the training needs of municipal staff	1 need assessment for each municipality (Kinondoni, Ilala, and Temeke)	Traffic Light	The need assessment is ongoing	ARU
	N. Officers involved in the need assessment	At least 40	Traffic Light		ARU & CIRPS

Result Description	Result Indicator (OVI)	Target	Performance Rating (Red, Yellow, Green)	Progress/Arising Issues	Action Required by the which implementing partner/s
	N. capacity-building action plan	1	Traffic Light		ARU & CIRPS
3.2 Training programme developed and implemented	N. learning curricula / N. evaluation procedures	2 learning curricula / 1 evaluation procedure	Traffic Light		ARU & CIRPS
	N. Training resource book	1	Traffic Light		ARU & CIRPS
	N. Officers involved in the training	20	Traffic Light		ARU & CIRPS
3.3 Mid term International Conference organized	N. submitted papers	12	Traffic Light		ARU & CIRPS
	N. People attending the Conference	100	Traffic Light		ARU & CIRPS
	N. Press release	At least 2	Traffic Light		ARU & CIRPS

Result Description	Result Indicator (OVI)	Target	Performance Rating (Red, Yellow, Green)	Progress/Arising Issues	Action Required by the which implementing partner/s
3.4 Dar's municipalities supported in designing adaptation initiatives	N. Adaptation initiatives designed	At least 4	Traffic Light		ARU & CIRPS
3.5 3rd International Workshop organized	N. Background papers	2	Traffic Light		CIRPS & ARU
	N. papers presented	4	Traffic Light		CIRPS & ARU
	N. people attending the workshop	10 researchers from universities of each partner country (Tanzania and Italy); 3 seniors from EU universities; and 3 seniors from EAC/SADC universities	Traffic Light		CIRPS & ARU

Result Description	Result Indicator (OVI)	Target	Performance Rating (Red, Yellow, Green)	Progress/Arising Issues	Action Required by the which implementing partner/s
Dissemination results	N. scientific papers submitted to academic journals	At least 2 related to the result 1.1; At least 1 related to the result 1.2; At least 3 related to the result 2.1; At least 3 related to the result 2.2	Traffic Light	Draft working papers are ready; Draft working papers are ready; Some draft are under development It will start in the 5th semester	CIRPS & ARU
	N. evaluation reports	6 (2 evaluation reports for each international workshop)	Traffic Light		CIRPS & ARU
	N. Proceedings (international workshop and conference)	4 proceedings (1 for each international workshop and 1 for the international conference)	Traffic Light		CIRPS & ARU

Result Description	Result Indicator (OVI)	Target	Performance Rating (Red, Yellow, Green)	Progress/Arising Issues	Action Required by the which implementing partner/s
	N. Booklets reporting on designed adaptation initiatives	500 copies	Traffic Light		CIRPS & ARU
	N. Posters on the identified adaptation initiative	100 copies	Traffic Light		CIRPS & ARU
	N. Web sites	1 web site with a public and a reserved area	Traffic Light	Updating of the contents during the whole project	CIRPS
	N. Newsletters	10 (three-monthly based)	Traffic Light	Newsletter will be sent during the whole project	CIRPS
	N. Promotional material kit	1 brochure + 1 bag + 1 CD Rom	Traffic Light	Design of the promotional material is at the moment under development	ARU

ANNEX 7

ACC DAR Adapting to Climate Change in Coastal Dar es Salaam

ACC DAR

Is a three year project co-funded by the European Commission within the "Thematic programme for environment and sustainable management of natural resources, including energy". The initiative is coordinated by CIRPS, Sapienza University of Rome (Italy) and it is implemented in collaboration with Ardhi University and with the support of the Dar City Council.

Other details

Background

The impacts of climate change on key sectors of the Tanzanian economy and the people's well-being prompted preparation of the National Adaptation Programme of Action (NAPA) in 2007. Vulnerability analysis demonstrated that sea level rise will destroy coastal resources and infrastructure, and additional losses are expected in terms of the bleaching of coral reefs resulting from ocean temperature rise. Given this scenario, the situation in Dar es Salaam raises major concerns as the city is the largest in and the main engine of the national economy. In recent decades, the city has expanded tremendously due to both natural growth and immigration, and today the coastal plain is largely urbanized. Residential neighborhoods lie beside tourism infrastructures and other economic activities along the coast. Most of these neighborhoods are unplanned and underserviced, and their inhabitants are largely dependent on natural resources for their livelihoods.

Climate change (CC) represents a further threat for people who are already faced with coastal erosion, watershed salinization, periodic inundations, as well as sea and land pollution. Moreover, their land tenure is unsecure and they are at risk of displacement by more economically valuable urban activities.

Other details

News

***16 November 2011**: Urban Impact of Climate Change in Africa. Conference at the Turin University.

***January 2012**: Addressing climate change adaptation in coastal areas of fast growing African cities. First annual International Workshop in Dar.

Objectives

ACC Dar project's overall objective is to contribute to implementation of the National Adaptation Programme of Action of the United Republic of Tanzania, focusing mainly on two of its priority sectors for adaptation strategies: human settlements and coastal and marine resources.

The action's specific objective is to improve the effectiveness of Dar municipalities initiatives for supporting coastal peri-urban population in their efforts to adapt to Climate Change.

Regarding the relationship between poverty and climate change actions contributes to:

1. Reduction of poverty in urban areas by enhancing the implementation of land use and development plans;
2. Reduction of vulnerability from environmental risk by supporting community-based natural resource management and enhancing district level planning;
3. Enhancement of systems of governance by strengthening local level institutions while focusing on increased participation of women and men in decision making.

Other details

Kick-off Meeting

EUROPEAN UNION

CENTRO INTERUNIVERSITARIO DI RICERCA PER LO SVILUPPO SOSTENIBILE - CIRPS

SAPIENZA UNIVERSITÀ DI ROMA

The kick-off event of the project was held on 28th April 2011 in Dar es Salaam at the International Conference Centre – PPF Tower.

The workshop was organized by Ardhi University of Dar es Salaam with the support of CIRPS Sapienza University of Rome with the aim to start a fruitful dialogue among the key stakeholders on the central themes of the project. The participants were drawn from the local government institutions, non - governmental organizations and the research institutions.

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