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A Research Agenda for Africa

Sustainable Urban Development and Environment

Content

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1. Executive Summary

1.1 The Study

There is immense change underway in Africa as urban growth rates rise at a rate far higher than urban development, infrastructure and investment. The result is the increase of urban slums, many lacking the most basic of services. Widespread urban poverty and environmental degradation are visible even to the casual visitor in many African cities and towns. Reversing this trend and improving the lives of the poor in a sustainable way, which has many complex contributing factors, is a goal of the Millennium Declaration. Target 7 of the Millennium Development Goals aims to "ensure environmental sustainability". Doing this in an urban context presents many challenges, but it is critical that Urban Development and Environment are linked in order to make real changes at the local and policy level.

The purpose of this study is to identify research areas and education systems necessary for promoting and implementing holistic sustainable Urban Development and Environment (UDE) in selected Sida countries in Eastern Africa.[1] The study included visits to the capital cities of Kenya, Mozambique, Rwanda and Uganda. The present description of the research situation in the visited countries is based on the study of background documents and publications, and the outcome of meetings with key persons in the countries.[2] Before the journey to the countries, a letter with a questionnaire was sent to the involved universities.[3]

Strengthening the research capacity and access to knowledge of developing countries in areas of central importance for poverty reduction and sustainable development is critical. This study proposes research areas and education systems necessary and identifies key research institutions in the selected countries. Recommendations are presented for future action towards achieving the goal of environmental sustainability in urban development through addressing research gaps.

1.2 Main Findings

The research areas Urban Development and Environment are closely related when it comes to every day urban functions, actions and activities. It should also be noted that special consideration will have to be

[1] See Appendix 6.1

[2] See Appendix 6.3 and 6.4

[3] See Appendix 6.2

given to some issues that are more demanding in densely populated areas than in rural regions, for example economic activities, production and consumption patterns, air quality, eco-cycling and handling of products and waste. Furthermore, the approach has to have a domestic "bottom-up" perspective.

In order to meet a growing impatience among some of the inhabitants in poor areas there is a need to demonstrate how their experience based knowledge can meet scientific knowledge in the areas mentioned above in order to improve living conditions in the every day life.

Through meetings with individuals and institutions in Kenya, Mozambique, Rwanda and Uganda, it was clear that the research and development competence is adequate for conducting relevant research in scientific fields within urban development and environment (UDE). At the same time, there is still a lack of overview on what has been achieved and what is ongoing within the UDE area. No organisation had a database over ongoing research and development (R&D) activities in the field. Institutional memory seems largely lacking and little of what is being done has been shared or transferred between different organisations and institutions.

Even less has been translated to the policy level or has had an influence on research methods in various universities or institutions. None of the four countries has an integrated urban development and environment component in their university curricula, although two, Kenya and Mozambique, are currently developing one.

The questionnaire sent out to university deans, researchers and other organisations received few replies. To a certain extent some of the questions were answered during the visits to the countries. However, there is still a lack of information on quantitative measures of activities such as published papers, scientific reports and number of PhD students within the UDE area. It is difficult to interpret this finding, but a conclusion is that incentives for quantification of results are necessary for future donor support.

There seems to be inadequate systems for reporting and over-viewing research results within the faculties/universities.

Many documents from Sida-SAREC as well as from other donor organisations express the need for a more intensive co-operation between the different bodies. Systematic transfer of knowledge of current research or development projects/programmes between different organisations is necessary for sustainable development.

Interest in taking part in a new development of integrated research within UDE and improving knowledge management was expressed by those who took part in this study, and abundant documentation from international and national policy documents points in the same direction.

However, research within the UDE area can become even more useful to society by:

- expanding the academic research into new fields of "bottom-up", integrated R&D.
- expanding the academic research results into practice.
- improving south-south co-operation between the African countries in order to ensure knowledge transfer of academic as well as practical know-how, and re-inforce the capacity building.
- creating incentives for communication of research results for the individual researchers as well as for the responsible persons at academic levels.

There are a number of international organisations with research activities which could play an important part in promoting research within UDE, for example TWAS, TWOWS, EAU, IFS, IDRC, UNESCO, UNDP, UNEP and UN-HABITAT.[4] Important partners are the African Academy of Sciences and the Inter-University Council for East Africa, which could be major facilitators in stimulating research in UDE across the African continent. The respective roles of these need, however, to be analysed carefully. Furthermore the co-operation between these bodies needs to be strengthened.

UN-HABITAT, with headquarters in Nairobi, Kenya, has projects and programmes in these countries and in the region overall[5]. The global programmes have a variety of information on their practices and research in publications and electronically[6].

Researchers in developing countries also have a special challenge in meeting the expectations of the general public and developing a new research paradigm in which t hey see themselves as the "servants to society", with their knowledge forming an asset for the community. This challenge is an opportunity to become forerunners in creating new scientific and popular knowledge within UDE, integrating "traditional" research and development with knowledge based on personal experience and African traditions.

At the same time, there is the added time pressure of responding to the urgent needs to those living in poverty. Working together with communities to link experience-based knowledge with scientific knowledge could provide powerful tools in improving living conditions within a limited resource base.

The recommendations given below are based on discussions and on abundant documentation from international and national policy documents pointing in the same direction.

1.3 Recommendations

Improving the quantity, quality and usefulness of research in addressing the Millennium Declaration Goal of environmental sustainability means expanding academic research so that Urban Development and Environment are linked and that they incorporate a "bottom up" approach. Academic research results must be put into practice and practice must also inform research. An urban development and environment programme is mainly focused on the ecological environment and its impact on the design of urban areas and the conditions of people's daily life. Complex environments include Life Support Systems (LSS). In this study the LSS is identified as water, energy, air, and soil/nutrition and their integration with the people and the physical urban environment. LSS are flows that can be seen as natural resources that are contributing to human living. Miss-use, overuse or lack of resources can lead to environmental degradation like flooding, soil erosion, deforestation, air pollution, wastes, water and land contamination, illness and cramped unhealthy living conditions.

[4] Third World Academy of Sciences (TWAS), Third World Organization of Women in Science (TWOWS), East African University (EAU), International Foundation for Sience (IFS), International Development Research Center (IDRC), Education Sience (UNESCO), UN Development Programme (UNDP), UN Environmental Programme (UNEP), UN Human settlements Programme (UN HABITAT).

[5] Reference to www.unhabitat.org: Programmes such as the "Urban Management Programme", the "Sustainable Cities Programme", the "Global Urban Observatory (GUO)" the "Global Campaigns on Good Urban Governance and Secure Tenure" and the "Rapid Urban Sector Profiling for Sustainability (RUSP)" are some examples, which a wide range of documentation attached as an example of the outputs.

[6] See UN-HABITAT specific programme research documents, brochures, publications and other information in Appendix 6.5

The following recommendations are made:

- Since the study has not found any database on research in sustainable development and environment Sida-SAREC and other donors are encouraged to promote the formation of a high quality database primarily on research activities and results in the African countries which is accessible to universities, municipalities, and other stakeholders.
- Donors are encouraged to co-operate more intensely within the UDE-area, not only by extensive exchange of information but also by joint funding for:
  - common workshops, symposia and seminars within the different scientific sub-fields in the UDE-area representing various thematic urban issues to cover the inter-disciplinary approach
  - exchange of researchers, teachers, masters- and PhD-students between the African countries
  - development of common curricula for BSc, MSc and PhD levels in the African countries (compare the European Bologna-process)
  - allocating means for travelling funds within the African universities by which researchers/technicians jointly can assist each other in conducting R&D at the "Model Research Areas" as described in this report.
- Donors are also encouraged to establish common policies on issues of reporting R&D results, not only in the UDE area but also in other fields of R&D. There are sometimes complaints about duplication of funding for some purposes on one hand and lack of funding for other important issues on the other. These difficulties can be avoided if donors set up reporting systems harmonising and adapting to the actual situations. Research results can be reported and disseminated in various ways but should fulfil requirements on transparency, transferability and relevance.
- The study recommends that Sida-SAREC together with the ministries of science, technology and education in Kenya, Mozambique, Rwanda, Tanzania[7] and Uganda together with one or more major universities in their respective countries approve the establishment of one or a few Model Research Areas within the field of Urban Development and Environment. The areas selected in the countries could have somewhat different characteristics and thus have complementary profiles relative one another. However, they should have the common aim of demonstrating in practice – at the household, city and regional levels – how design, science, technology and tradition can meet and solve some of the most important problems for people living in urban or semi-urban areas. The selection of Model Research Areas will have to be approved by the local authorities and stakeholders (inhabitants, municipality and researchers). The Model Research Areas will have a size and complexity that is determined by the involved partners, preferably rather modest in the beginning but with the possibility to grow with time. The time frame planned for should be long term covering a decade but renewed every three years after external evaluation.
- The study recommends that steering groups, Nodes, are established in the studied countries. The status of the Nodes should be equivalent

[7] Tanzania was not visited due too limited respons.

to faculties although they work interdisciplinary and across different sectors. The Nodes are composed of representatives for universities, civil society, private sectors and other actual stakeholders. The Nodes are suggested to be responsible for organisation of research activities within the UDE research areas, as well as for BSc-, MSc- and PhD-education. The Nodes would also have the full financial responsibilities for the activities and for following-up and reporting to donors, stakeholders and the general public on the achievements and R&D results. The Nodes are responsible for the production and dissemination of research results from the Model Research Areas.

– In discussions on support to the African universities Sida-SAREC should point out the importance to develop undergraduate as well as masters and PhD education within the scientific fields related to urban development and environment.
– Sida-SAREC should also recognise the need for funding of adequate equipment for analytical work in university laboratories as well as of field instrumentation that can be used to measure and monitor important environmental variables. (Note, that it is important that in a "bottom-up" approach the stakeholders can see as well as measure improvements related to major infrastructure systems). In a long term perspective the African researchers and technicians may be expected to develop new field instrumentation which is better adapted to the climatic and environmental conditions in the respective countries.

– As a starting point we recommend Sida-SAREC to initiate support for regional workshops aiming at the following:

  Mobilising researchers from the African countries with competence in the major research fields within UDE for discussions and suggestions on the following topics:

  - Selection of suitable Model Research Areas in the African countries representing major challenges. The initiative could strengthen current activities and projects or have a fresh start. The Model Research Areas can later expand both in number and complexity.
  - Formation of criteria to be fulfilled by a well committed programme (leader) manager/co-ordinator for the Model Research Area. This is important because the selection of a programme manager (leader) is one of the cornerstones for achieving results and building confidence among the stakeholders in the Node within the Model Research Area.
  - Formation of criteria for the composition, and responsibilities/tasks, of the Node consisting of representatives for different stakeholders (municipal and national authorities, university researchers, inhabitants, NGOs)[8]. It is important to discuss what maximum number of persons that should form the Node in order to make it easy enough to manage and still representative. The manner of selection of Node members is another important task to address.
  - At a later stage the Nodes in the different countries might form a co-operation network, which could be co-ordinated by either bodies already having co-operation between the African Universities (for example the African Academy of Sciences or EAU) or by UN organisations (for example UNEP, UNDP, TWAS or UN

[8] Non Govenmental Organisation

HABITAT). The development of the Nodes and Model Research Areas could for example be treated in workshops in which scenarios for future development play an important part.

- Time plan and budget for the first three year phase of a programme aiming to analyse the most urgent R&D for the identified Model Research Areas.

Specialised workshops involving researchers, authorities and experts on the state-of-the-art. Topics in these workshops should address possibilities for improvements in the African society on infrastructure, urban design and other issues of relevance for sustainable development.

Exchange of information and discussions on development of MSc and PhD courses within the major topics on environment, urban infrastructure and urban design. One aim should be to establish *educational profiles* for the major universities in the involved countries. Co-operation between universities in MSc and PhD education should also be addressed.

Workshops that aim to develop models for exchange programmes for researchers and other experts between the African countries for rapid transfer of know-how and new knowledge. Special focus should be given to experts who can transfer information between the new Model Research Areas. The gender issue needs special attention in giving equal opportunities for men and women to transfer know-how and to understand the local situation.

2. Background

Urban Development and Environment is a vast research area and no common global definition of the concept exists. An urban area is a dynamic system where actors, activities, flows and functions are changing over time. The perspectives dealt with are highly complex and have many dimensions. Sustainable development combines economical, social and ecological dimensions, and research in this area therefore needs trans-disciplinary and holistic approaches. Other dimensions include rural-urban interactions as well as interactions between traditional fields of research within the biological/agricultural sector and those of technology, architecture and socio-economics. (See Appendix 6.2 "Letter with Questionnaire sent to Universities" and description of key features of urban environment and the urban agenda stated by UN HABITAT in "Shaping the Urban Environment in the 21st Century", OECD, October 2000).

The main focus of this study is on environmental sustainability in urban development although social and economic sustainability are preconditions needed to combat poverty and improve living conditions. Present and future research within UDE-area should support the Millennium Development Goal # 7; Ensure Environmental Sustainability:

- Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources;
- Halve by 2015 the proportion of people without sustainable access to safe drinking water, and;
- Have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers.

It is also important to stress that a city relies on access to a wide range of natural resources beyond its boarders, regionally and globally. The Ecological Footprint is considered a sustainability indicator describing the ecological condition of a region. It can measure the land and resources a society consumes to sustain itself. (Wackernagel and Rees, 1996)

3. Findings from the Study: Current Status and Gaps

3.1 General Considerations

The overall picture from the missions to Kenya, Mozambique, Rwanda and Uganda is that research and education in the field of Urban Development and Environment is quite limited although research related to important infrastructure systems exists. More importantly, few activities are going on merging the two research areas, Urban Development *and* Environment, or even connect and exchange ideas between existing research institutions. This would be cross-cutting research that is not yet established and the overview at universities, ministries and institutes is vague. It should be noted that this is the situation globally and not just in African countries.

The UDE research area lacks a common focal point for assimilation and production of knowledge. Current research is mainly based on a sectorial research concept, which mainly embraces environmental issues connected to natural resources, infrastructure, medicine, social sciences, health and economy. Relevant research on urban issues is thus conducted but not connected, and therefore has limited impact on policies and practices in Africa and elsewhere.

This might be the main reason why the inquiry that was sent out to universities, institutions and Swedish embassies generated few responses (Appendix 6.2). It was confirmed by correspondence and during the meetings held in the countries that it is difficult to get an overall picture of the current situation.

3.2 Activities in supporting organisations

There are many international and national organisations that have a potential for supporting activities within the UDE area, such as UNDP, UNEP, UN-HABITAT, TWAS, TWOWS, IFS, IAEA, UNESCO[9], and a number of donor countries, institutions and foundations, for example IDRC. The roles of these organisations are widespread and range from supporting scholarships and positions in the academic world to support of regional efforts to promote sustainable development in practice. In the following text we will briefly describe three of these organisations as representing the end-points in the range of activities that can be involved in the UDE area.

[9] International Atomic Energy Agency (IAEA), International Development Research Center (IDRC).

Third World Academy of Sciences, TWAS

The Third World Academy of Sciences (TWAS) is a non-governmental, non-political and non-profit-making organisation, founded in Trieste, Italy in 1983 by a distinguished group of scientists from the South under the leadership of the late Nobel Laureate Abdus Salam of Pakistan. It was officially launched by the Secretary General of the United Nations in 1985, and granted non-governmental organisation status by the UN Economic and Social Council the same year. The principal aim of TWAS is to promote scientific capacity and excellence for sustainable development in the South.

The membership of TWAS consists of Fellows and Associate Fellows, who are drawn from the most distinguished scientists. TWAS has approximately five hundred members and is thus in an excellent position in transfer of knowledge also in new areas of research.

A Council, elected every two years by members, is responsible for supervising all Academy affairs. A small secretariat headed by an executive director assists the Council in the administration and co-ordination of the programmes. The secretariat is located on the premises of the Abdus Salam International Centre for Theoretical Physcis (ICTP) in Trieste, which is sponsored by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the International Atomic Energy Agency (IAEA).

In 1991 UNESCO assumed responsibility for administering TWAS funds and staff, based on an agreement signed by TWAS and UNESCO. In addition to its strong links with UNESCO the Academy has maintained a close relationship with other international bodies with which it shares common objectives.

Since 1986 TWAS has been supporting research work of scientific merit in more than ninety countries in the South through a variety of programmes. A body of over two thousand scientists world-wide, including TWAS members, provides a free-of-charge peer review of proposals for research grants, fellowships and awards submitted to the Academy by scientists and institutions from developing countries. In addition, joint activities have been developed with among others UNESCO and ICSU[10].

TWAS also proved instrumental in the establishment in 1988 of the Third World Network of Scientific Organisations (TWNSO), a non-governmental alliance of scientific organisations in the South. TWNSO's goal is to help build political and scientific leadership in the south for science-based economic development through South-South and South-North partnerships in science and technology. TWAS provides the secretariat work for TWNSO and co-sponsors a number of its activities.

Third World Organisation of Women in Science, TWOWS

Third World Organisation of Women in Science (TWOWS) is a young organisation, which was officially launched in Cairo in 1993 and got its first support from Sida-SAREC in 1997. Through this support a fellowship programme for female students from Sub-Saharan Africa and least developed countries (LDC) has been established for postgraduate training leading to PhD at universities in the south. The specific aims are to improve access to educational and training opportunities for young and talented women from Sub-Saharan countries and to empower a new generation of women to take on a leadership role in their areas of re-

[10] International Council for Science (ICSU)

search. The fellowship provides support for travel, accommodation, living expenses and financial assistance for tuition, registration, bench and visa fees. The host institution in the South is expected to provide facilities such as training, supervision, laboratory supplies etc. The programme is open for competition, and there is a detailed application form including a proposed postgraduate study plan. The number of applications has increased rapidly since TWOWS started. The areas of research are wider than those of TWAS and cover basic sciences, as well as other disciplines in for example veterinary sciences, technology, medicine and environmental resources.

TWOWS has approximately two thousand members from more than eighty countries in the South. The secretariat of TWOWS is hosted and assisted by TWAS.

UN-HABITAT

UN-HABITAT appears to have the most comprehensive overview of urban development and environment research and activities in the region through work of its regional office and global programmes. "The Rapid Urban Sector Profiling for Sustainability Programme", the "Sustainable Cities Programme", the "Urban Indicators Programme", the "Secure Tenure Campaign", the "Urban Management Programme" and selected work in the Lake Victoria region, among others, have information and materials on their activities and projects, as well as contacts in the countries and at the local and national levels. Examples of the research results from UN-HABITAT work is included in Appendix 6.5, and UN-HABITAT could be a partner in the UDE research, since it has a long relationship with partners in the field, including established networks.

The UN-HABITAT programme "Rapid Urban Sector Profiling for Sustainability" (RUSP) is a programme that was founded to bridge various gaps in urban development concerning knowledge production, capacity building, dissemination and actions. Urban issues at the local and city level are identified through participatory rapid assessment. A city profile is developed, and then verified in a city consultation where priorities are identified and agreed upon. A national analysis and consultation is undertaken to agree on national themes, issues and response mechanisms.

This combination results in a national urban profile for each country that identifies gaps and priority areas of intervention. The main cross-cutting areas are urban governance, shelter and slum conditions, the urban environment and local economic development. The RUSP could be a framework and network for producing and disseminating knowledge in nations, regions and globally and would be a good basis to build on towards the research goals in this proposal.

There are more examples of UN-HABITAT programmes and activities that bear further investigation for linking to UDE research in Africa. The "Urban Management Programme", which was active in 120 cities globally, but is now closing, focused on the city consultation methodology with an emphasis on knowledge management. A CD of documents and outputs from these city activities is available. Of particular interest is the established knowledge management network in Africa called the "African Network of Urban Management Institutes" (ANUMI). Another example is the "Sustainable Cities Programme", active in approximately 20 cities in Africa, uses Environmental Planning and

Management to promote sustainability of cities. Publications on activities in Tanzania are provided for reference. UN HABITAT has a close co-operation with UNEP, UNDP, WHO in the UDE area.

The "Global Urban Observatory (GUO)" is a world-wide monitoring and learning network which has an international database providing comparative information on city conditions and policy. The flagship reports produced from this programme are: "The State of the World's Cities Report" and "The Global Report on Human Settlements". GUO has a programme entitled "1000 Cities GIS Programme" that offers GIS software and training to cities to better monitor urban information. A further specific initiative on the Lake Victoria region has produced a document entitled "Cities Development Strategies: For Improved Urban Environment and Poverty Reduction". The "Global Campaigns on Good Urban Governance and Secure Tenure" undertake a Situation Analysis before they launch national campaigns.

3.3 Impressions from the Kenya, Mozambique, Rwanda and Uganda.

The following description of the research situation in the visited countries is based on outcomes from publications and meetings in Kenya, Mozambique, Rwanda and Uganda. The countries have much in common, although their capacity varies. There is a joint call for efficient interaction within the universities, among stakeholders in the country, and co-ordination between the countries. There is a need for a common focal point for production of knowledge that is designed for multi- and trans-disciplinary work based in reality, and on its own conditions.

Of general concern is the apparent weakness on the part of authorities to include research results in the current policy on environment. Another hindrance for research is low payment and lack of technical support and laboratory resources. This is more important than it seems. Despite the crucial importance of research and knowledge management it is often seriously under-funded.

3.3.1 Kenya

In Kenya there are several projects and cities linked to the "Green Town Movement" (Appendix 6.6). Nakuru is one of those towns and is working on urban agriculture, cultivation and husbandry to also stimulate income generation activities. The research centre International Potato Centre is working closely with the municipality and neighbourhood focusing on project implementation and capacity building.

UN-HABITAT is present with several programmes with the mandate to address sustainable development and human settlements.

The Lake Victoria Region Water and Sanitation Initiative is supporting secondary urban centres around the Lake Victoria region with a focus on the MDG targets 10 and 11[11], including Safer Cities and slum upgrading projects. All projects have been designed with the overall goal of meeting the Millennium Development Goals.

The design school at the University of Nairobi is reformulating the curriculum for education towards sustainable development studies and international co-operation. It is at a similar level to Mozambique in terms of capacity and progress and a similar effort could be established in those two countries of the study.

[11] Target 10: Halve by 2015 the proportion of people without sustainable access to safe drinking water; Target 11: Have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers

Identified research bodies: International Potato Centre, Kenya Green Town Partnership Association, Mazingira Institute, University of Nairobi, the Design school, UN HABITAT, UNDP, UNEP, TWOWS, TWAS, IFS, IDRC.

3.3.2 Mozambique

In the area of Urban Development and Environment, current activities and projects are found in and around Maputo. The city is growing rapidly. People move to the city partly because they want to avoid conflicts in other regions and partly because there are more possibilities to earn a living. A large part of the population is living on "informal trade". Critical issues are those of creating a sustainable infrastructure at district level, of water management, (draught, flooding), energy supplies, recycling and waste management. The research director at the Eduard Mondlane University stressed the importance of long-term donor commitment and policy for research, and the networking with other African universities in south-south co-operation. Ongoing trans-disciplinary activities exist within for example water quality and sanitation, marine sciences and energy/climate/air pollution.

The Changalane Experimental Station (CSE´n) is one example of a project that is action-oriented and has potential for developing trans-disciplinary research. This is a co-operation between disciplines like agriculture, architecture, medicine, social and veterinary sciences. CSE is an experimental station for new technology, and it implements projects in urban settings. The local sites in the neighbourhood and urban areas are monitored and evaluated.

Current research is mainly on wetlands and water quality, and so far there appears to be only a vague connection to urban development.

Another current project in urban development deals with upgrading and redesign of marketplaces as income generating activities. Participatory planning is a key element in this project, in which innovative communication tools are developed for the concerned inhabitants, together with educational materials for schools and games.

The Faculty of Architecture at Eduardo Mondlane University in Maputo is reformulating the curriculum towards integrating sustainable development in the education of architects. The Faculty is expressing keen interest in support and involvement around the concept of Model Research Areas to assist in the ultimate design of policy and academic research.

The proposed activities in Mozambique would then build on the Changalane Experimental Station project and work with the Eduardo Mondlane University to begin the development of the knowledge management Node.

Identified research bodies: Eduardo Mondlane University (Faculties of Architecture, Veterinary, Science and Technology), Ministries of Environment, Public works, Fund for Energy (FUNAE), TWAS, TWOWS, IFS, UNEP, UN-HABITAT and UNDP.

3.3.3 Rwanda

In Rwanda, urban development and environmental degradation is on the agenda and there are serious efforts from the authorities to combat the problems, which are acute. One of the major issues in Kigali is the rapid growth of informal settlements on the hills. Kigali is facing deforestation, soil erosion and heavy pollution from the industrial zone in the

valley, which degrades the air and water quality, agriculture, and wetlands. The effects on the fresh water system are also influencing Lake Victoria. Rwanda has been recently included in the Lake Victoria programme[12].

Presently, the city has no urban planning due to lack of capacity and planning tools at the municipality. However, there is new policy and legislation on environment (May 2005) and the Rwanda Environment and Management Authority (REMA) has a broad mandate to try to improve the situation.

The response to the questionnaire on relevant research activities sent by e-mail and post to the director of the National University in Rwanda (NUR) was poor. However, in meetings with representatives of UN-HABITAT, UNDP, Nuffic, Swedish Embassy, environmental authorities and individual researchers, it was found that there were current activities in relevant fields. As examples can be mentioned GIS, remote sensing and information systems, environmental economics, land administration, water resources, renewable energy and energy conservation and wetlands. Environmental management education on BSc and/or MSc levels exists supported by international donors, including EU and UNESCO. The two universities in Rwanda, NUR and Kigali Institute of Science, Technology and Management (KIST) organise many of these activities.

Rwanda is further behind the other visited countries in terms of urban development and environment, and therefore it is proposed that first actions in this country involve mobilising interest in NUR and KIST.

Identified research bodies: The National University of Rwanda (NUR), REMA, KIST, TWAS, TWOWS, IFS, UNESCO, UN-HABITAT, UNEP and UNDP.

3.3.4 Uganda

The Makerere University in Kampala has the resources for and conducts research on eco-systems. From Sida-SAREC documentation it is apparent that building capacity takes place at the university within areas related to house types and settlements, roads/pavements and management of road infrastructure. It also focuses on the impact of pollution on ground-waters, control of organic matter and human excreta/environmental systems analysis, ceramic raw materials, combustion and gasification of non-woody bio-mass, resources design of rural power systems, modelling wetlands, wind/solar generation, water resource management ICT and GIS.

Several PhD students and their professors/supervisor are involved in the work (started in 2002). Lists of publications from some research groups have been sent to the UDE study. A conclusion from these is that the competence within the university for addressing important parts of UDE is considerable. A wide range of relevant sciences and technologies exist, and there is an Institute for Environmental Studies and a School of Post-Graduate studies. These are important activities to build upon. It is, however, also important that the competence within the university is co-ordinated and made visible and action-oriented.

At the meeting with the dean of Science and Technology and key researchers within the UDE-framework there was interest in introducing energy and infrastructure issues into a broad perspective, taking into account production and consumption levels; i.e. look into energy efficient

[12] sponsored by Sida among others

cooking systems and health issues in kitchens and homes. Alternative building materials linked to eco-adapted housing designs as well as exchange of students and researcher in the region were priorities expressed. The problems to be solved were similar to the ones discussed in Maputo and Kigali, ranging from biological resources, management of water resources (wetlands, water quality), sanitation, energy sources and climate change, implementation of environmental policies and the need of pilot projects.

Identified research bodies: Makerere University, Faculty of Science and Technology, VicRES, TWAS, TWOWS, IFS, UNEP, UNESCO, UN HABITAT and UNDP.

3.4 General Gaps

Discussions with research stakeholders in the various countries and with Sida, UN-HABITAT and IDRC Nairobi, Kenya identified gaps and areas of weakness related to research and the production and dissemination of knowledge within the UDE area in the region where support would provide invaluable. These findings on common issues and identified gaps were confirmed by research documents and publications as well.

1. Research within the area of Environment is poorly connected to Urban Development and vice versa. In many cases, it is not connected at all. In addition, the research on environment is often sectorial research, concerning water and sanitation, waste, energy, air pollution etc.
2. Relatively little research on Urban Development by the involved research organisations was identified by the universities. In essence, research is either lacking or current activities are not successfully sharing their generated knowledge, which is in danger of being lost.
3. The investigators had great difficulties in finding any organisation or person who had an overview of the situation within the research areas of relevance for Urban Development and Environment in any of the countries. There is no agreed focal point for production of knowledge within UDE area.
4. There is generally a weak connection between research and educational curricula within the area of urban development in the visited countries, although Makerere University has an Institute of Environmental and Natural Resources.
5. There is a call for better communication and exchange between the universities within a country and between the universities in the region.
6. Communication between research, policy and society is weak. There is a need for a centre for knowledge management, which can assist in initiating and disseminating research to support the Millennium Development Goals, item 7; in order to integrate sustainable development into country policies.
7. Failing or weak Life Support Systems (LSS) identified in this study as access to water, energy, air and soil/nutrition, and their integration with physical environment and consumption, cause a lot of common problems. These are lack or overuse of clean water, erosion, deforestation, destroyed wetlands, rapidly expanding informal settlements, air pollution, poor and cramped living conditions, energy access, safety environments and many more. Tools to combat these problems, such as planning and urban design, policy and laws, are lacking.

8. Technical facilities and field instruments are not present to support research and development. Methodology and pedagogy for UDE research and education are needed, particularly tools, experimental set ups, laboratories and means of communication and dissemination within society.

4. The Research Approach

4.1 The Urban Development and Environment Programme

In documentation from Sida-SAREC and many other donors, two major issues emerge. One is the idea of south-south co-operation and the other is the "bottom-up" approach to research and sustainable development. The UDE study takes this as a standpoint for action, a concept supported by the different actors in the countries.

The problems identified as main obstacles for sustainable development are similar in Kenya, Mozambique, Rwanda and Uganda, with a range of competence, sometimes complementary, within research subfields in the four countries. However, it is expressed that there is too little exchange of know-how between the countries. Rather it seems that the major scientific partners for researchers in one country were to be found among scientists in a donor country or engaged by international bodies. In order to develop a research agenda for Urban Development and Environment that will address the gaps identified above and ultimately influence and produce a holistic approach, a new view on knowledge production is needed.

This study proposes a UDE programme that will take an integrated approach and support the new production of knowledge from a transsectorial research perspective. The aim of the UDE programme is to strengthen local initiatives and encourage introducing and linking these initiatives with research and educational programmes. It will focus on research that helps to develop sustainable urban development and reduces the environmental burdens, and will support appropriate technology toward finding solutions to local problems. Ultimately, it might change how research is done and will influence future education in the region.

Systems-based Research

A dynamic system's design view is needed, and includes an emphasis on how we can contribute to sustainable development. The systems analysis approach uses a holistic view and helps with the increasing complexity that planners, scientists and society must cope with in an urban setting. Various disciplines and their methods can be used in different situations as long as they accomplish the goal of learning about the system, its components and their relations.

The objectives of systems analysis are, according to Gustavsson and associates (1982), to start with real-life issues and to describe, analyse and understand them. The systems approach communicates between disciplines and levels, from micro level to macro studies; it is a common language for design. Participatory methods, communication tools and dialogues will be important parts of the method.

Production and consumption patterns link natural resources with urban life and settings. The link between rural and urban areas has also to be understood and addressed. The Life Support System operates in the urban settings in a dynamic way. For example, focussing on the "culinary chain" includes various aspects of food production in agriculture and fishery (rural and urban). Food products are transported to market places systems in the cities, with wholesale and feeding sub markets. From marketplaces, in mainly urban settings, food products are prepared in households (community and family kitchens) and are consumed. Along the culinary chain water, energy, land and transportation are utilised to "feed" the life of the culinary chain. The outcome is consumable products as well as residues and wastes like air pollution, smoky kitchens, and contamination. Food security and health issues addressing the wellbeing of people are included in all stages.

The Life Support System can alternatively be thought of as a "living" system that has dynamic components. When those components meet or collide with the physical environment, such as food products entering a market place, there is a ripple effect on the environment and on urban development. Similar chains as the one shown in Figure 1 can be identified for flows in other components for life, such as water, air and energy. In those cases, the influencing factors are largely due to human actions.

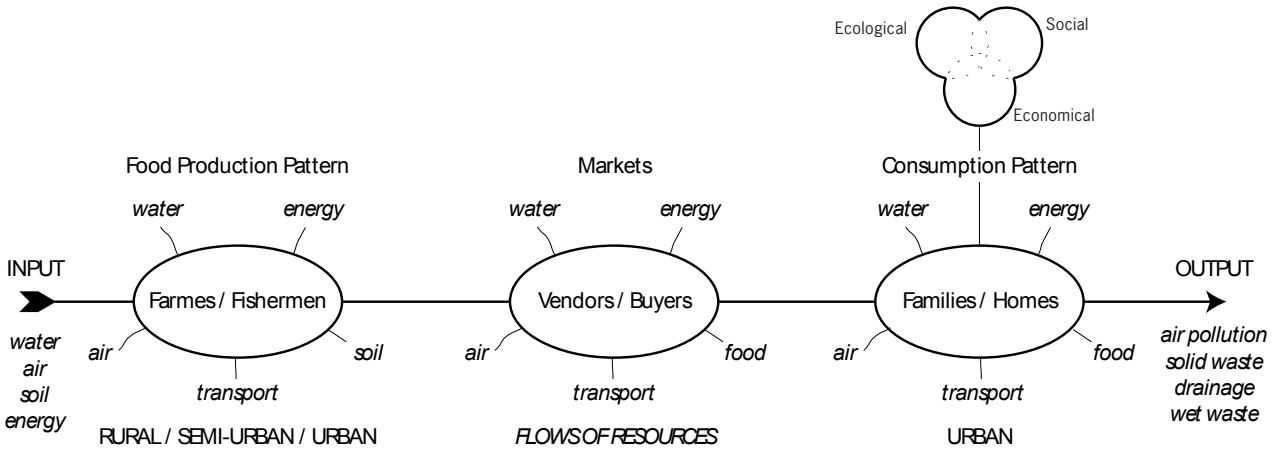

Figure 1. The food and culinary chain starts with production in rural but also urban areas and in the sea/lake. Food products are transported to markets, wholesales and further distributed to sub-markets within urban areas. Food is prepared in the home, kitchens. Along the chain resources are used and wastes are produced on various levels.

Model Research Areas (MRAs); Organisation and Responsibilities

The Life Support System described above offers an entry point for the proposed UDE programme. In each country, the study proposes that Model Research Areas should be selected, building on and reinforcing already-existing initiatives in a community or urban setting. These Model Research Areas would then address the research questions from a "bottom-up" perspective and co-operate with the inhabitants who own the problems. Methods, theory and technology would be implemented to

address key agreed problems. The reality and the daily life of the people create the laboratory for understanding the complexity of problems.

The MRAs would provide a source of important research, which would then be managed and co-ordinated by "Nodes" located in the university or partner research institution, preferably in the same city or community. They could be structured in the form of a steering group in a major university with the responsibility to conduct, finance, follow-up and report research and development results to the scientific community, to students, authorities and the general public. The status and position of a Node should be equivalent to that of a Faculty, but with different working methods.

Each country is proposed to establish part of an urban or semi-urban area as a Model Research Area. In this area, buildings and infrastructure should be remodelled and made sustainable and environmentally friendly. Together with the stakeholders and the involved authorities, sustainable and healthy systems should be introduced for life support systems (energy, drinking and waste water, sanitation and waste recycling or composting/other handling) together with design of buildings and public spaces (for example a school and school yard).

The location, size and ambitions for the Model Research Area should be selected by the involved stakeholders. The municipality could contribute by necessary changes in regulations or legislation if this is needed. The intention with a Model Research Area is to apply a "bottom-up" research approach to practical, every-day problems and at the same time set a good example for other people who will be able to apply similar solutions to their own housing areas. The Model Research Area starts at a moderate scale and grow if successful. It is essential that the initiative is sponsored by donor organisations, which channels funds through a responsible body of stakeholders, under the supervision of a major university.

An important issue to discuss between the universities and countries involved in a UDE initiative is the possible selection of Model Research Areas to which much effort will be directed. The first choice is whether it is better to establish one model area in an African country or to have a few. Whether one or more areas are chosen should be an item for discussions between involved partners (stakeholders, researchers and donors). However, at present, it could be wise to start with one area in the each of the four countries on a modest scale and let the evolution over time decide the future development. One should be aware of the fact that starting such an initiative is a long-term commitment lasting for a decade or more and that expectations from the public could become large and pose a challenge for researches and authorities.

The challenge would demand that the best available expertise within leadership, organisation and R&D in different sub-fields is raised. This necessitates south-south co-operation among the African experts. Considering future generations it is also important that not only the trained experts take part in activities but that also students at different levels have opportunities to study and take part in on-going activities. Accordingly students involved in projects should also have means and possibilities to travel to the Model Research Areas. A sketch of the connection between the governing body, the "Node", and the experimental Model Research Area is shown in Figure 2.

Model Research Areas; Selection and Locations

In selecting Model Research Areas for implementation of research within UDE, an obvious choice would be parts of mid-sized cities with a rapidly growing population who have more or less put up their houses spontaneously. Such areas, which are exposed to many of the urban problems, can be found in Kigali on the slopes down to the wetlands and in Kampala. In Kigali the housing locations are mixed with locations of sometimes rather heavy industries, which poses special problems such as pollutants. In Kampala similar locations can be found in which houses are located close to heavy traffic roads, markets or other major activities.

As noted above an inter-disciplinary research activity has already started in Mozambique through the Changalane Experimental Station (CSE´n). The location of the station is not inside Maputo; instead it is close to a number of smaller villages. Longitudinal studies of urban development in such villages could be of interest because of the process in which urbanisation is spread to include an increasing number of smaller villages into the larger cities.

In Kenya the existence of "green towns" is important and parts of the town Nakuru could well serve as a Model Research Area. The activities have so far been mainly devoted to urban agriculture, livestock keeping and waste management. This town has the advantage that the municipal council together with NGOs and local inhabitants are already involved in environmental activities. The town is located in the proximity of an important natural reserve, and has thus special responsibilities for keeping pollution from the town as low as possible.

The Model Research Areas will operate in countries based on current activities and projects as well as also covering two major geographical areas: Lake Victoria and the Coastal Zone in the East African countries. The zones represent different environments, historical cultural settings, climates and natural resources. The zones are of global interest concerning environmental degradation caused by growing urban settings. Mid-sized cities are growing fast without any planning strategies. Research has already been done but so far there is a lack of research into local action.

Lake Victoria is surrounded by a number of countries, and has significant environmental problems. Major research in this area concerns environment and natural resources and urban population growth in cities, called "secondary towns" around the lake. Recently UN-HABITAT started the Sida-supported Lake Victoria Water and Sanitation Initiative supporting secondary urban centres in the Lake Victoria Region to achieve the Millennium Development Goals. In addition, Sida is present in Tanzania, Uganda, Kenya and now lately Rwanda, supporting the Lake Victoria Research Initiative (VicRes).

Coastal Zones around the world are facing rapid growth. This is true for coastal towns like Bagamoyo, Kilwa, Pangani, Zanzibar, Mombasa, Lamu Island, Inhaca Island. They also represent cultural heritages=and face special problems related to marine eco-systems, tourism, conservation, renovation and preservation of this significant cultural heritage. Of special interest are the islands at the coast representing closed ecosystems and lives in the facing challenge and threat of tourism. Many towns lack planning strategies for the future.

The educational curricula, Science and Technology, in Mozambique as well as the Design school, University of Nairobi are undertaking revision to fulfil sustainable development. They are already working in reality by connecting studies with municipalities, etc. Such initiatives could be a part of the Model Research Area activities.

Nodes; Organisation and Responsibilities

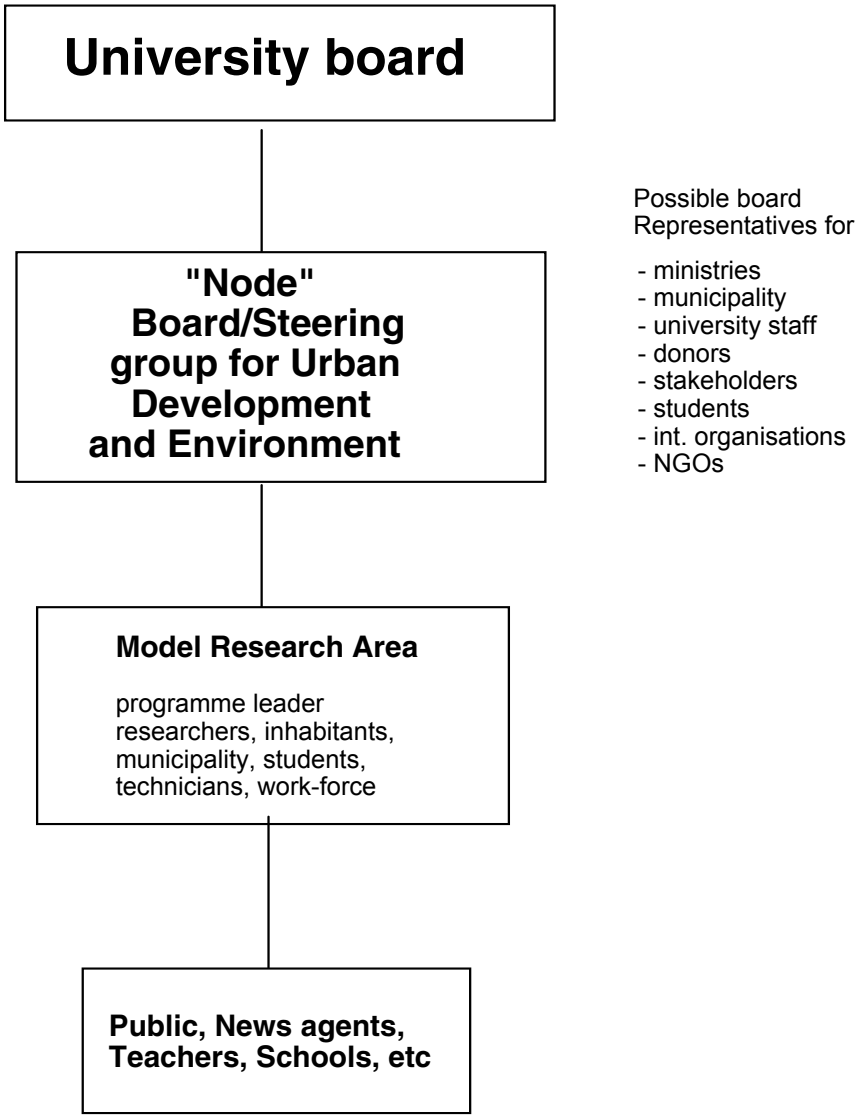

Figure 2. Organisational sketch of the connection between Nodes and Model Research Areas. The Nodes have the status of faculties within the university systems with obligations to conduct research and undertake bachelors, masters and PhD education within the UDE area. The teachers/researchers within a UDE-faculty can also belong to a traditional faculty for example technology, architecture, sciences, humanities, social sciences, medicine etc.

In Figure 2 the position of the Node within the university system is proposed. In this context it is important to realise that if the research within the UDE area is to be visible and trustworthy it should be a well-recognised part of the academic structure as well as of the surrounding society. The research will ultimately have to be evaluated in terms of scientific quality and relevance for society. Thus it is important that it is positioned as one of the major activities in a university with mandate to develop and evaluate curricula for BSc, MSc and PhD education as well as conducting high-ranking research from senior scientists. However, since the activities are expected to evolve over time the beginning can be modest and later on expand. Some of the universities have already ongoing undergraduate studies in the environmental field that might be readily included into the Node.

In view of the tasks that need to be addressed the study suggests that the Node responsible for UDE-research is placed at the faculty level and given the same responsibilities as other faculties. However, as discussed above, the UDE area needs to raise competence from many of the already existing faculties. This problem can be solved if allowing double belonging for the scientists already involved in existing faculties.

As also seen in Figure 2, the composition of the board of the Node will have to be different from that of some of the other faculties and also include different stakeholders, ranging from authorities to inhabitants and also including teachers, students etc.

One task that is more demanding than in other faculties within the normal university is that of knowledge management: which involves to take care of research results produced in the Model Research Areas and communicate the results to the surrounding society (regional, national and international). The Node will also be responsible for feeding regional, national and international databases with research results in order to make the information widespread. The Node should ensure that there is a flow back to the MRAs of relevant information as illustrated in Figure 2. (Compare Millennium Development Goals).

It will be critical to have civil society and the local authorities closely involved in the UDE activities, and extra care would be taken to ensure research focused on specific gender needs and collected gender data.

The Nodes could be established in each country preferably starting in Uganda, Rwanda, and Mozambique, and later developed in Kenya and Tanzania. Donor agencies should be partners to monitor and evaluate

As expressed in the preceding text international organisations, like TWAS, TWOWS, IDRC, IFS, UNEP, UNESCO, UNDP, UN-HABITAT have different mandates and competence. They can contribute in different ways in accordance with their mandates on for example information management and implementation or funding of relevant activities and programmes in the MRAs.

The traditional tasks of a faculty are 1) to secure that research results can be published within the academy in peer-reviewed journals; 2) to exert quality control over the research and education, and 3) to undertake the financial responsibilities for activities supported by donors and national authorities. In the proposed model the Nodes within the UDE area will have the following additional tasks:

- Support the collection of research results in the MRAs through the provision of students and researchers;
- Provide support in terms of new research methods;
- Determine key goals and objectives of the MRA including targets and indicators to measure success (for example, to influence policy or legislation within ten years; to achieve a certain number of articles in popular media; to influence university course curricula, to establish a regional database etc);
- Ensure that research results are disseminated to the society and the local community in a variety of formats, tailored to meet the needs of the target audience;
- Organise a variety of workshops and symposia, such as 1) Specialised workshops involving researchers, authorities and experts on status and possibilities for improvements in the society on infrastructure, urban design and other issues of relevance for sustainable development; 2) General workshops that aim to develop models for exchange

programmes for researchers and other experts between the countries for rapid transfer of know-how and new knowledge between the African countries;

- Conduct a dialogue which should start with the formulation of relevant research issues and gathering in-data to the research problems;
- Stimulate communication in the different stages of the process with various stakeholders;
- Stimulate new ways of producing knowledge, based on action oriented research and project implementation;

5. Next Steps:
Starting Activities in the Urban Development and Environment Programme

In order to start activities and suggest Model Research Areas, it is recommended that representatives of Sida-SAREC discuss the ideas put forward in this study with the involved ministries, universities and other donor organisations. The activities can then be started in a modest form as targeted workshops/seminars that aim at the following:

1) Identifying the major research fields needed for implementation, together with an inventory over major already existing competence in the African countries and ways of filling in gaps from other countries and regions;
2) Discussion of the characters, sizes and locations of one or a few Model Research Areas with a representative group of stakeholders from the four countries of Rwanda, Uganda, Mozambique, Kenya and neighbouring countries that may be active in south-south co-operation like South Africa, Botswana, and Tanzania. In such workshops, the organisation and responsible body of the programme should be discussed and identified.

The first design effort of a Node and Model Research Area could take place in Uganda. UN HABITAT has offered technical and substantive assistance to Makerere University in the organisation of the first workshop.

Key issues include:

- Principles for formation of a steering group for each Model Research Area in which different stakeholders are represented (municipal and national authorities, university researchers, inhabitants, NGOs, donor representatives).
- Formation of criteria to be fulfilled by a well committed programme manager, (leader)/co-ordinator for the Model Research Area. This is important because the selection of a programme manager, leader, is crucial for achieving results and building confidence among the different stakeholders both in the Nodes and the MRAs.
- Specification of the responsibility and tasks of the MRAs and the Nodes.
- Mandate, authority and status of the Node in each university with target objectives.

– Time plan and budget for the first three year phase of a programme aiming to analyse the most urgent R&D for each selected location and start up the activities.

When a model for the mode of working has been identified and established, preferably in a co-ordinated agreement between donors and country representatives, funding needs to be allocated for the purposes of raising interest in the expert communities and stimulating south-south co-operation.

For the purpose of enhancing south-south co-operation, Sida-SAREC should further fund meetings organised by one of the responsible universities in the form of:

3) Specialised workshops involving researchers, authorities and experts on state of the art and possibilities for improvements in African society. The workshops should address major topics on infrastructure, urban design and other issues of relevance for sustainable development that need to be considered when initiating new methods and solutions to every-day problems in the model research areas.
4) Meetings for exchange of information and discussions on development of masters and PhD courses within the major topics on urban infrastructure and urban design with the aim of establishing educational profiles for the major universities in the involved countries. This would satisfy the need to establish strong strategic educational and research areas in the different universities (all universities cannot be excellent in all scientific/educational fields), and stimulate south-south co-operation in the young generation.
5) Workshops that aim to develop models for exchange programmes for researchers and other experts between the countries for rapid transfer of know-how and new knowledge between the African countries. Special focus should be given to experts who can transfer information between the new MRAs. The gender issue needs special attention in giving equal opportunities for men and women to transfer know-how.

Other key issues for Sida-SAREC to address are the following:

– The importance of developing undergraduate as well as masters and PhD education within the scientific fields related to urban development and environment within African Universities and education institutes.
– The need to fund adequate equipment for analytical work in university laboratories as well as field instrumentation that can be used to measure and monitor important environmental variables (it is important that in a "bottom-up" approach the stakeholders can see as well as measure improvements related to major infrastructure systems). In the long term, African researchers and technicians may be expected to develop new field instrumentation which is better adapted to the climatic and environmental conditions in the respective countries.
– The study proposes that a database for achievements and ongoing research in the UDE area is created. Although internal databases of results from UN-HABITAT of relevance for the UDE area exist (See Appendix 6.5), the study has not found any database on research on sustainable development and environment.

- Donors are encouraged to co-operate more intensely within the UDE-area, not only by extensive exchange of information but also by joint funding for common workshops, symposia and seminars within the different scientific sub-fields in the UDE-area representing thematic urban issues to cover the inter-disciplinary approach and stimulate south-south co-operation.
- Donors are encouraged to promote exchange of researchers, teachers, masters- and PhD-students between the African countries; development of common curricula for candidates, masters and PhD levels in the African countries (compare the European Bologna-process). They are also encouraged to allocate means for travelling funds within the African universities by which researchers/technicians jointly can assist each other in conducting R&D at the "Model Research Areas" as described in this report.
- Donors are furthermore encouraged to establish a common policy on issues of reporting R&D results, not only in the UDE area but also in other fields of R&D. In some documents donors complain about duplication of funding for some purposes on one hand and lack of funding for other important issues on the other. These difficulties can be avoided if donors set up reporting systems harmonising and adapting to the actual situation. Research results can be reported and disseminated in various ways but should fulfil requirements on transparency, transferability, and relevance. Another efficient and close way is to include students both for knowledge production and dissemination in profession and society through the knowledge management Nodes.
- South-south co-operation and information exchange between African countries is necessary to ensure a knowledge transfer, both academic and practical, and build capacity. Creating incentives and providing support and resources for communication of research results for the individual researchers as well as for the responsible persons at academic levels is recommended.

6. Appendices

6.1 Terms of Reference for a Desk Study to Identify Research Needs and Research Groups Dealing with Urban Development and Environment in Africa

20050617/Gity Behravan

1. Background

Although most Africans currently live in rural areas, rates of urbanization in the region are very high. The urban population of Sub-Saharan Africa is growing at about 6% each year and will double within the next 12 years.

While urban areas offer considerable opportunities for employment, education and social services, and contribute substantially to national GDPs, they also have their own environmental problems. In Africa, poor economic growth and low investment in infrastructure have left provision of housing and basic services in urban areas lagging far behind the rate of population growth, resulting in a proliferation of urban slums. Slums often lack access to many essential services such as water, sanitation, and waste disposal, concentrate the pressures of pollution on the environment and are detrimental or even hazardous to human health. Emissions from industry and vehicles are additional threats to human health in the larger urban areas.

The African urban planners and developers face an enormous task-creating the cities of the future. It is mainly the midsized cities that are growing. An urban area is a dynamic system where actors, activities, flows and functions are changing over time. A city is a complex of systems operating and interacting between each other and on different levels. Hence, there is a need for a new field of "sustainability science" that seeks to understand the fundamental character of interactions between nature and society. Such an understanding must encompass the interaction of global processes with the ecological and social characteristics of particular places, sectors and socio-economic contexts. This involves two different dimensions. First, relevant research will have to integrate the effects of key processes across the full range of scales from local to global. There is increasing understanding that seemingly local environmental issues must be approached also from a global perspective and that both perspectives are necessary for a complete causal analysis.

Second, sustainable development combines economic, social and ecological dimensions, and research in this area therefore tends towards interdisciplinarity and holistic approaches. The importance is to define the life support systems from household levels up to, town, national, regional and also the global impact.

The overriding goal of Swedish international development cooperation is, according to the decision of the Swedish Parliament and Government, to improve the standard of living of poor people. This is well in line with the international undertaking to halve the proportion of extremely poor people in the world by the year 2015. Sida's work shall promote: economic growth, economic and political independence, economic and social equality, democratic development, sustainable use of natural resources and equality between women and men. All work financed by Sida has to take the sustainable use of environment into account. Support for urban development and the environment is a priority area for Sida.

The overall objective for Sida research co-operation is to strengthen the research capacity of developing countries and their access to knowledge in areas of central importance for poverty reduction and sustainable development. This is done through support for research institutions in some partner countries, through support for regional and international research networks and institutions. When relevant, this may involve the engagement of Swedish research co-operation.

Urban development and environment is one of the areas to which Sida gives a high priority now and during the next coming years. As a first step in a process to identify important research activities for possible future support, Sida needs to gain a deeper understanding of this field of research. It needs to know where the research gaps are and also what promising research institutions and research groups exist in order to formulate a strategy for what kind of support would be most appropriate and cost effective.

2. Purpose and scope of the desk study

The purpose of the desk study is to assess important research relating to urban development and environment in selected in Sida supported countries in Africa; identify research gaps and furthermore identify research groups and relevant institutions within this field. The findings and recommendations will guide decisions on future Sida/SAREC support.

In consultation with Sida the consultants shall identify;

1. Research areas and education systems necessary for promoting and implementing a holistic sustainable urban development and environment.
2. Key research institutions or equivalent actors should be identified. There is a requirement that the bodies should have documented capacity and expertise in the actual research fields that could and can serve as a resource base for a possible Sida support in future.
3. On the basis of problem identification (1) and (2) the consultants shall propose means and actions for Sida support.

The consultants shall describe various aspects as indicated in the Assignment (3).

3. The assignment

The consultants shall describe relevant research findings in the area of urban development and environment and identify research gaps within this field.

The consultants shall present an inventory of relevant institutions and research groups in Africa within the field urban development and environment. The inventory shall contain a brief description of the area of research including latest publications.

The consultants shall present an inventory of current donor funded support and initiative in the region within the field of urban development and environment.

4. Methodology and time schedule

The consultants shall write a report that includes 1) a brief background review of relevant research in selected countries and in the area of urban development and environment, including a short discussion of possible research gaps in this field, 2) an inventory of relevant institutions and research groups in selected countries within the field of urban development and environment, 3) identify international researchers and research groups if any, within this field and with a focus on the selected countries 4) an inventory of current donor funded support and initiative in the selected countries within the field and 5) suggestions for what kind of support Sida/SAREC could give in the future that would be appropriate and cost effective.

The consultants may need to travel to meet with research groups in selected countries and it is the duty of the consultant to make their own travel and meeting arrangements to fulfill the assignment.

The desk study will commence June 20, 2005. A draft report shall be submitted to Sida no later than October 24, 2005 and presented November 3, 2005. The maximum work time spent on the desk study will be 200 hours per consultant.

5. Reporting

The report shall be written in English and shall not exceed 40 double spaced typed pages, excluding annexes. The draft report shall be submitted to Sida electronically. After presentation November 3, 2005 of the draft report at Sida a final version shall be submitted to Sida not later than November 15, 2005.

6.2 Letter with Questionnaire sent to Universities

2005-07-18

Dear colleagues,

The two of us, who are responsible for this document, have been chosen by Sida/SAREC to perform a desk study to identify research needs and research institutions dealing with urban development and environment in selected Sida-supported sub-Saharan African countries. The Terms of Reference (ToR) raises many issues and also demands us to visit some of you later and finally report our findings to Sida/SAREC (See enclosure 1.ToR).

The overall objective for Sida research co-operation is to strengthen the research capacity of developing countries and their access to knowledge in areas of central importance for poverty reduction and sustainable development. Urban development and sustainable use of natural resources and environment are priority areas for Sida.

As stated in the ToR the consultants shall identify

1. Research areas and education systems necessary for promoting and implementing a holistic sustainable urban development and environment.
2. Key research institutions or equivalent actors. These bodies should have documented capacity and expertise in the actual research fields that could and can serve as a resource base for a possible Sida-support in future.

Besides knowledge on key institutions Sida also wants to have a better knowledge on research gaps and new promising research institutions and research groups for defining future directions. The desk-study might guide Sida-SAREC for supporting future research activities.

Urban Development and Environment

is a vast area and no common global definition exists. An urban area is a dynamic system where actors, activities, flows and functions are changing over time. The perspectives with which we will deal are highly complex and have many dimensions. Relevant research which integrates the effects of key processes across the full range of scales from local to global will have to be identified. Sustainable development combines economic, social and ecological dimensions, and research in this area therefore needs cross-disciplinary and holistic approaches. Other dimensions include rural-urban interactions as well as interactions between traditional fields of research within the biological/agricultural sector and those of technology, architecture and socio-economics. Our main focus in this study will be on environmental sustainability although we recognize that social and economic sustainability are also needed to combat poverty and improve living conditions.

The following is a description of key features of urban environments and the urban agenda stated by UN HABITAT Shaping the Urban Environment in the 21st Century, OECD, OCDE October 2000)

"The urban environment is a complex mix. Natural elements include air, water, land, climate, flora and fauna. The built environment, the physical surroundings constructed or modified for human habitations and activity, encompasses buildings, infrastructure and urban open spaces. A city's built environment also gives visible form

to import historic or contemporary cultural values. Cities are generally recognised as densely settled, non-agricultural areas but commonly agreed, 'objective definitions of what constitutes an urban place are hard to come by.

High densities of population and economic activities in urban centres imply large volumes of industrial and household waste and high levels of pollution. Although they may seem physically isolated from the natural environment, urban centres actually depend heavily on natural resources as "sinks" for the disposal of their waste.

Without adequate infrastructure, regulation and management capacity – to provide safe water, manage waste, regulate industrial pollution and maintain sanitary living conditions-urban environments can concentrate a municipality of biological and chemical disease causing agents in the air, water, or soil. They may also concentrate physical hazards, such as landslides or flooding. The stress of overcrowding, noise and pollution may exacerbate psycho-social health problems, drug and alcohol abuse and interpersonal violence. These hazards are most prevalent in poor neighbourhoods. Thus, cities can become unsafe hazardous places to live, presenting a range of significant health risks for the urban population as a whole and poor in particular.

The sustainability of urban centres hinges on access to a wide variety of natural resources and products that originate outside their boundaries. These include fresh water agricultural products, energy and raw materials. Conversely, urban centres provide important markets for rural producers. Cities also offer opportunities for the rural poor to diversify their sources of livelihood, through seasonal migration, and provide havens from adverse climatic events such as drought."

It is also important to stress that a city relies on access to a wide range of natural resources beyond its boarders, regionally and globally.

List of Questions/issues

As a starting point in our study we have made a list of questions/issues which we would like you to address. We hope that we can have fruitful discussions with you and your colleagues from which the activities within the areas of urban development and environment will eventually benefit. The discussions will take place over the e-mail and also in personal contact with some of you. (We intend to visit some of your countries in September 10 and onwards)

Due to our rather tight time schedule we ask for your answers to this e-mail and questions before the end of August. Please send us a full address list of key persons to facilitate the communication (name, mail addresses, physical address, telephone numbers)

In order to complete the task as formulated in the ToR we will need your answers on the following points:

1. Research activities within the area of urban development and environment.

– Identify the relative strength and research gaps within research areas of relevance for urban development and environment by describing each research group involved with respect to
    a) its main research focus,
    b) the number and gender of research staff and their respective qualifications, ranking and specialization,

c) he number and gender of PhD and postgraduate students active in each research group,

d) the scientific productivity during the last five years 2000–2004 in terms of refereed publications and publications addressed to authorities, stakeholders and the general public.

e) the number of publications and dissemination tools (books, articles, video, exhibitions, demonstration objects, TV, radio and other media)

- Add information on the relevant research activities/groups concerning financial matters by showing the budgeted and actual expenditures for the respective activity/group and the sources of financial support (whether from your own country, single donors or from a group of donors in networks, or from the private sector etc)
- Give a break-down of available facilities in the research groups in a tabular form; eg. access to laboratory facilities, library, staff offices, computing facilities, advanced instruments etc.
- Comment on the existence of cross-disciplinary, inter-discilpinary and multi-disciplinary research activities in urban development and environment within your university.
- If it exists, how does the university co-ordinate such research?
  - Are such activities a research priority within the university?
  - How is priority setting on research activities made?
  - Undergraduate and graduate education within the area of urban development and environment.

Bachelor, masters and PhD education within the area of urban development and environment can be achieved either as whole undergraduate or graduate programs or by additional courses for undergraduate and graduate students mainly working in other academic fields. Both these aspects are of interest, and we would like to obtain information on the following points:

- Does entire undergraduate (bachelor), masters or PhD programs in the area of urban development and environment exist at your university?
- If so, describe them in terms of focus of interest, number of undergraduate respectively graduate students active during the last three years (2002–2004), with specification of program curricula, and outcome of the studies
- If courses of relevance for urban development and environment at either PhD, masters or other levels exist at your university please describe them in terms of contents, credit points and the number of students enrolled in the respective courses during the last three years (2002–2004).
- Describe the existing plans and strategies for the further development of education capacity in areas and disciplines of relevance for urban development and environment.
- For which of the existing programs and/or courses of relevance for urban development and environment do you have financial support from Sida and/or other donors? Please specify.
- Comment on the influence from external actors (local or regional authorities, public at large, enterprises etc) with respect to the contents

in programs and courses in the areas of urban development and environment. To which extent can stakeholders be involved in the problem formulation of research and education topics? What are the mechanisms for ensuring relevance of the R&D at your university?

We hope that this study will give us all good discussions and new insight in the area of URBAN DEVELOPMENT AND ENVIRONMENT. If you want clarification from us during your work with the questions, please feel free to e-mail or contact anyone of us when you like. We also hope that you will spread this message to other parties, whom you think will be interested.

With best wishes

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6.3 Meetings

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Visit with UN-HABITAT Website at www.unhabitat.org

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6.6 Green Towns in Kenya

The Chairman Kitengela Green Town Environmental Initiative P.O. Box 237 Kitengela KENYA	The Chairman Kitale Green Towns Environmental Initiative P.O Box 260 Kitale KENYA	The Chairman Runyenjes Green Towns Environmental Initiative Runyenjes Town Council P.O. Box 81 Runyenjes KENYA
The Chairman Elburgon Green Town Environmental Initiative Private Box 90 Elburgon Nakuru KENYA	The Chairman Nyahururu Green Towns Environmental initiative P.O. Box Nyahururu KENYA	Requests for training by 10 small Towns in Kisii and one in Rongo Nyanza Province, Kenya 2 towns in Meru, Eastern Province, Kenya That have not undergone training in Participatory Environmental Planning
The Chairman Kendu Bay Green Town Environmental Initiative Big Five Hotel P.O. Box 218 Kendu Bay KENYA	The Chairman Mbita Point Green Town Environmental Initiative Mbita-Point Town Council P.O. Box 307 Mbita Point KENYA	The Chairman Naivasha Green Town Environmental Initiative Naivasha Town Council P.O. Box 126 Naivasha KENYA
The Chairman Thika Green Town Environmental Initiative Thika Municipal Council P.O. Box 240 Thika KENYA	The Chairman Kilifi Green Town Environmental Initiative Kilifi Town Council P.O. Box 519 Kilifi KENYA	The Chairman Lamu Green Towns Environmental Initiative Lamu Municipal Council P.O. Box 107 Lamu KENYA

The Chairman Mariakani Green Town Environmental Initiative Mariakani Town Council P.O. Box 165 Mariakani KENYA	The Chairman Mombasa Green Town Environmental Initiative Coast Development Authority P.O. Box 1322 Mombasa KENYA	The Chairman Migori Green Town Environmental Initiative Migori Town Council P.O. Box 617 Migori KENYA
The Chairman Nanyuki Green Town Environmental Initiative Nanyuki Municipal Council P.O. Box 450 Nanyuki KENYA	The Chairman Attn. Erastus Mukuna Ronda Kaptembwa Green Town Environmental Initiative Box 10165, Nakuru KENYA	The Chairman Busia Green Town Environmental Initiative Busia Municipal Council P.O. Box 513 Busia KENYA
Mr. Gesimba Kisii Green Town Environmental Initiative Kisii Municipal Council P.O. Box 406 Kisii KENYA	The Chairnam Attn.Andrew Omari Siaya Green Town Environmental Initiative Siaya Town Council P.O. Box 803 Siaya KENYA	The Chairman Eldoret Green Town Environmental Initiative Eldoret Municipal Council P.O. Box 6369 Eldoret KENYA

6.7 Literature

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Halving poverty by 2015 is one of the greatest challenges of our time, requiring cooperation and sustainability. The partner countries are responsible for their own development. Sida provides resources and develops knowledge and expertise, making the world a richer place.

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