



## **Africa-EU Research Collaborations on Climate Change. A Critical Analysis of the Scope, Coordination and Uptake of Findings**

Draft report, May 2014

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*Publication date:*  
2014

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Haselip, J. A., & Spangsberg, T. (2014). *Africa-EU Research Collaborations on Climate Change. A Critical Analysis of the Scope, Coordination and Uptake of Findings: Draft report, May 2014*. CAAST-Net Plus consortium.

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# AFRICA-EU RESEARCH COLLABORATION ON CLIMATE CHANGE

A Critical Analysis of the Scope, Coordination and Uptake of Findings



**CAAST-Net**  **PLUS**

Building Bi-regional Partnerships for Global Challenges

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CAAST-Net Plus (2013-2016)

Advancing Sub-Saharan Africa-EU Research and Innovation Cooperation for Global Challenges

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Any citations to this report should read:

CAAST-Net Plus (2014), *Africa-EU Research Collaboration on Climate Change: A Critical Analysis of the Scope, Coordination and Uptake of Findings*.



CAAST-Net Plus is funded by the European Union's Seventh Framework Programme for Research and Technological Development (FP7/2007-2013) under grant agreement n° 311806. This document reflects only the author's views and the European Union cannot be held liable for any use that may be made of the information contained herein.



Publication compiled by: Research Africa (<http://info.researchprofessional.com/research-africa/>)  
Design and layout: Tracey Watson

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## ACKNOWLEDGEMENTS

This report is the output of a collaborative endeavour among the partners of the CAAST-Net Plus consortium. In particular, the members of the work package on climate change, which is led by Arne Tostensen and Jan Haakonsen (Research Council of Norway), and Mike Hughes and Remy Twiringiyimana (Ministry of Education, Rwanda) have played a lead role in its development. The report was researched and written by James Haselip and Tasia Spangsberg Christensen of the UNEP DTU Partnership (formerly the UNEP Risø Centre) based in Denmark, with support from Anne Olhoff. Substantive contributions to the report's content were provided by:

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- + Masahudu Fuseini and George Owusu Essegbey (Science and Technology Policy Research Institute of the Council for Scientific and Industrial Research, Ghana); and,
- + Mike Hughes (Ministry of Education, Rwanda).

The authors are grateful to Gerard Ralphs, Alison Bullen and Refilwe Mashigo at Research Africa based in South Africa for editorial and publishing support, and to Andy Cherry, coordinator of the CAAST-Net Plus consortium, for his sustained support and coordination.

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## LIST OF ACRONYMS

ACPC	African Climate Policy Centre	IPCC	Intergovernmental Panel on Climate Change
AU	African Union	JAES	Joint Africa EU Strategy
CDKN	Climate and Development Knowledge Network	JPI	Joint Programming Initiative
		KPI	Key Performance Indicator
CORDIS	Community Research and Development Information Service	MIRA	Mediterranean Innovation and Research Coordination Action
CPA	Africa's Science and Technology Consolidated Plan of Action	MPCs	Mediterranean Partner Countries
CRM	Climate Risk Management	NEPAD	New Partnership for Africa's Development
EAC	East African Community	NGO	Non-Governmental Organization
EC	European Commission	NRM	Natural Resource Management
ERA	European Research Area	OECD	Organisation for Economic Co-operation and Development
EU	European Union	OM	Outcome Mapping
FP6	Framework Programme 6	R&D	Research and Development
FP7	Framework Programme 7	REC	Regional Economic Communities
GCCA	Global Climate Change Alliance		
GGWSI	Great Green Wall of the Sahara and Sahel Initiative		





## PREFACE

In 2007, heads of state and government from Africa and Europe launched the Joint Africa-EU Strategy (JAES), formulated in response to geopolitical changes, globalisation and the processes of integration in Africa and Europe. At the heart of the strategy is an overtly political relationship and among the features distinguishing JAES from previous Africa-Europe policy initiatives is a rolling action plan addressing joint priorities for Africa-Europe cooperation. The contribution of scientific and technological research, development and innovation, and the centrality of research capacity for economic and social growth and poverty alleviation, for building knowledge-based societies and addressing global societal challenges of mutual interest is explicit. The value of cooperation between the continents is central and has already led to significant achievements for mutual benefit. In April 2014, African and European heads of state met in Brussels for the 4<sup>th</sup> EU-Africa Summit under the theme of “Investing in People, Prosperity and Peace”. They committed to enhancing Africa-EU cooperation for the period 2014-17. Importantly, climate change and the environment remains high on the agenda, under Priority Area 5: Global and Emerging Issues.

CAAST-Net Plus serves this Africa-Europe partnership in science, technology and innovation (STI), as framed by the JAES. We encourage more and better bi-regional STI cooperation for enhanced outcomes around topics of mutual interest, particularly in relation to the global societal challenges of climate change, food insecurity and health for all. In supporting the partnership CAAST-Net Plus draws heavily on debate and discussion among communities of STI stakeholders for gathering informed opinion and experience about Africa-Europe cooperation processes. The knowledge we gather and the analyses we conduct combine to inform and enrich policy and decision making around cooperation in formal and informal situations. **This report in particular forms part of a series of three CAAST-Net Plus reports that will focus on the impact of research cooperation between European and African actors in the three global societal challenges highlighted above.**

Through informing the bi-regional policy dialogue for mutual learning and awareness, through building support for coordinated and innovative approaches to funding of bi-regional cooperation around global challenges, brokering the public-private relationship to foster improved uptake and translation of bi-regional research partnership outputs into innovative technologies, good and services, and through dedicated mechanisms to encourage bi-regional research partnerships, CAAST-Net Plus is adding value to the quality and scope of the Africa-Europe STI relationship for mutual benefit.

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## EXECUTIVE SUMMARY

This report provides a critical evaluation of the scope, coordination, communication and uptake of Europe-Africa bi-regional research cooperation in addressing the joint European Union and African Union priorities for climate change mitigation and adaptation. The main focus is on bi-regional research funded through the European Union's Sixth and Seventh Framework Programmes (FP6 and FP7)<sup>i</sup>. The analysis considers the extent to which research knowledge is being used to inform policy-makers in developing effective responses to climate change, as well as whether and how bi-regional research and development outputs are being translated into technologies, goods and services.

We find that there is a significant body of scientific research on climate change funded under FP6 and FP7, resulting from collaborations between European and African institutes. The majority of this work reflects the priorities of the Joint Africa-EU Strategy (JAES). However, from the vantage point of project management and leadership, all recent framework-funded climate change research projects have been managed by European-based institutes. This fact appears to be of material consequence in terms of their limited contact with local policy-making and business leader networks, though this is already being addressed, to some extent, under the ERAfrica initiative.

In analysing the research-policy nexus we find a low level of 'outcome thinking', to the extent that many respondents confused project 'outcomes' with project 'outputs'. This is a fundamental issue that appears to explain the paucity of plausible arguments to attribute project outputs to demonstrable outcomes. Furthermore, we found that often statements of 'intended impact' are more akin to aspirations expressed by project designers and managers. In most cases these aspirations do little more than offer rhetorical support to wider climate and development targets, such as the Millennium Development Goals (MDGs). As such, there is generally no explicit explanation of how these impacts can — even theoretically — be achieved. Indeed, there is a predominant focus by framework project managers on outputs that are easy to document and report. Where an 'interaction with policy-makers' is mentioned, the precise mechanism through which research outputs actually influence policy or practice is rarely explained in any detail. As such, efforts to engage and influence policy-makers are mostly ad hoc at best, and amount to little more than a hope or expectation that the research findings will be accessed, understood and taken up by the relevant actors in government or the private sector. In turn, the general lack of clear mechanisms or theories of change undermines efforts to reflect upon the project implementation process or face the hard question of what difference they made.

We argue that many of these issues can be easily addressed, either at the design stage for future research collaborations under Horizon 2020 or during and after project implementation. Some recommendations are provided below. These are intended to help direct the remainder of the work of CAAST Net Plus in implementing solutions to enhance bi-regional research collaborations.

<sup>i</sup> For ease of reading, FP6 and FP7 projects are occasionally referred to in this report as "framework projects".





## KEY FINDINGS AND RECOMMENDATIONS

**Finding #1:** There is a lack of ‘outcome thinking’ at the level of research project management, and on the part of the European Commission. There is undue focus on project outputs (as opposed to project outcomes) that are easy to document and report on. There is minimal questioning of the actual difference projects make.

**Recommendation #1:** Stimulate debate on the role and importance of outcome thinking in Framework Project design, implementation and follow-up to influence projects being designed under Horizon 2020 and in other funding programming.

**Finding #2:** There is minimal evidence of framework research projects generating knowledge that feeds directly into technology development or patents. This is largely due to low levels of private sector involvement in EU-Africa research collaborations.

**Recommendation #2:** Promote systematic collaboration with civil society and private business lobbying sectors that have expertise in advocating policy change in support of climate technology development and uptake.

**Finding #3:** There is no need to set up another ‘knowledge management’ facility, online network, or portal.

**Recommendation #3:** Rationalise and/or better coordinate existing data platforms in order for Africa-EU partnerships on research and innovation and climate change to ‘speak with one voice’. These must be evidence-based processes — that is, informed by original EU-Africa research. EU-Africa research collaborations should seek to cooperate with a select few of the many networks and portals already in existence and that aim to inform the research-policy nexus.

**Finding #4:** There is a general lack of follow-up studies to monitor longer-term outcomes of framework research projects that reflects the predominant focus of monitoring, reporting and evaluation on the strength of short-term project outputs.

**Recommendation #4:** Stimulate debate in relevant forums about the proper role and importance of understanding longer-term outcomes of EU-Africa research collaborations and how this could be built into the project design stage.

**Finding #5:** The unequal proportion of African to European project leaders can create unbalanced partnerships and threaten the effectiveness of bi-regional cooperation.

**Recommendation #5:** Explore and further develop financing and cooperation models, such as ERAfrica, which allows for more balanced partnership and cooperation.

## 1



## INTRODUCTION

Climate change presents major risks to economies, ecologies and societies across the world. Yet the specific impacts of climate change are uneven, with some regions experiencing stronger disruptions to weather patterns. Differences in how regions and countries are able to adapt to climate change are often more important, with many countries in Africa lacking in key technological capacities. There are however some fundamental areas of mutual interest in mitigating and adapting to climate change between Africa and Europe, which are reflected in the high-level strategic agreements – principally the Joint Africa-EU Strategy (African Union-European Union, 2007a). Research knowledge, and the technological innovation it can lead to, has a central role to play in addressing the strategic objectives shared by African and European countries. In order to answer this report's overall question on the effectiveness of Africa-EU research collaborations on climate change, we first need to answer four key sub-questions:

- 1. To what extent does the climate change knowledge produced by Africa-EU research collaborations correspond to the bi-regional political priorities?**
- 2. What is the thematic and geographical distribution of this knowledge?**
- 3. To what extent is this knowledge being appropriately interpreted and applied to public policy-making processes? What are the barriers and constraints to this uptake?**
- 4. To what extent is this knowledge being applied to private or public-sector technology development and investment? What are the barriers and constraints to this uptake?**

In order to answer these questions we have used both desk-based data collection and analysis, and primary interview data collection methods. The broader issues of knowledge generation (questions 1 and 2 above) are addressed through the use of secondary data sources. The details of knowledge uptake (questions 3 and 4 above) are investigated primarily through interviews regarding selected research collaborations. This contributes to the analysis in section 5. At all times our analysis is driven by the goals, purpose and high-level objectives of bi-regional frameworks for addressing climate change. Our aim has been to identify examples of good practice and/or models of success, and weaknesses or gaps in the generation and uptake of climate change research.

The analysis is also set in the broader context of heightened scrutiny of the effectiveness and strategic value of international research spending and development aid more broadly. As such, we aim to contribute to wider debates about how to enhance EU-Africa research collaborations in terms of generating and communicating information of relevance to public policy-makers and private sector innovators. Indeed this is the overall goal of the CAAST-Net Plus consortium, which is tasked with designing and implementing specific activities until 2016, informed by this study and through discussions at targeted workshops in Africa and Europe.



## POLICY CONTEXT FOR EU-AFRICA CLIMATE CHANGE RESEARCH

### 2.1 The Joint Africa-EU Strategy framework

We frame this study within the bi-regional Africa-EU political priorities and common objectives on climate change research. These common objectives are expressed in the Joint Africa-EU Strategy (JAES) first agreed in 2007, which is a product of the Africa-EU Partnership. According to the Africa-EU Partnership paper, “2 Unions, 1 Vision”, the Partnership and the JAES “overarches all other existing channels of cooperation at national, regional and local level” (European Union, 2014, p. 10). Since the JAES is intended to play a leading role in defining the political priorities and guiding the actions and activities on climate change, it is therefore relevant to use this strategy as a point of departure when analysing priorities against actual research projects.

The JAES is implemented through successive action plans of which the second action plan covering the period 2011-2013 is the most recent<sup>ii</sup> (Appendix C). Whereas the first and second action plans focused on specific topics through different partnerships, as in the case of Partnership 8: Science, Information Society and Space, the third action plan is likely to be structured differently to reflect the five priority areas agreed at the 4th EU-Africa Summit in April 2014. Nevertheless, climate change and the environment remain priority areas under the ‘global and emerging issues’ pillar. It is however the first and second action plans and their priorities as expressed in their partnerships that will form the basis of our analysis of the bi-regional political priorities. This is because most of the projects analysed have been implemented under these action plans. Appendix C provides an overview of the relevant objectives, priority actions and expected outcomes of the two plans.

### 2.2 What are the joint Africa-EU climate change research priorities?

Even though the JAES is supposed to be the overarching strategy for EU-Africa cooperation, extracting specific priority topics from the JAES action plans has proven difficult. This is especially true for the second action plan: the objectives and expected outcomes are very broad and there seems to be a lack of coherence between the priorities stated in the overall objectives, the expected outcomes, and the priority actions. Furthermore, the objectives, expected outcomes and priority actions are, in some cases, closely tied to, or presented as concrete projects. The [Great Green Wall of the Sahara and Sahel Initiative](#), [ClimDev](#), [African Monitoring of the Environment for Sustainable Development](#) (AMESD) and the [Global Climate Change Alliance](#) are cases in point. This, in turn, adds to the unclear presentation of the priorities.

The lack of a clear statement of priorities on climate change presents a fundamental challenge to the task of assessing bi-regional climate change research projects against the stated political priorities. However, an attempt at highlighting some of the top priority topics in the JAES can be done by taking

<sup>ii</sup> At the time of the drafting of this report, the third action plan was under negotiation.

the priority actions listed in the action plans as being representative of the top priority topics for bi-regional cooperation.<sup>1</sup> Using this approach, the relevant bi-regional priority topics on climate change emerge as the following:

1. Desertification;
2. Climate Information and Earth Observation;
3. Adaptation;
4. Forests;
5. The Capacity of African Negotiators;
6. Disaster Risk Reduction;
7. Biodiversity Conservation;
8. Natural Resource Management;
9. Adaptation and Mitigation Strategies;
10. Carbon Markets; and,
11. Climate Friendly Technologies.

Extracting political priority topics from the action plans does, however, run the risk of excluding topics that are an integrated part of each priority action. This could be true for a topic like water. Water is not highlighted as a top priority in either of the plans. It is however mentioned as forming part of one of the activities in the AMESD project: “Enhancing the African capacities for the operational monitoring of climate change and variability, vegetation, water resources, land degradation, carbon dioxide emissions, etc.” (see p. 49 of the second action plan). While ‘water’ may be widely viewed as a ‘big issue’, it is mentioned in but a single bullet point, under one activity, under one priority action. This leads us to conclude that water is *not* a top priority in the JAES. Therefore, our analysis of what topics current bi-regional climate change research covers, and how these relate to the political priorities, will use the above-listed topics as the basis for addressing our first sub-question.

<sup>1</sup> Due to structural differences between the first and second action plans, the top priorities have been extracted from the topics listed as ‘activities’ in the first action plan (see Appendix C).



## MAPPING AFRICA-EU RESEARCH COLLABORATIONS

### 3.1 Project selection strategy

To get to an overview of current and recent Africa-EU bi-regional climate change research projects, our first step has been to map these activities. The mapping focused on FP6 and FP7 projects using the EU research information database, Cordis, as the primary source of information. The criteria for selecting projects were the following:

- + projects must be research-oriented;
- + projects must have an explicit focus on climate change; and,
- + projects must be bi-regional in nature, involving a minimum of one African and one EU partner.

The mapping exercise was undertaken using the online search functions as well as manually reviewing the database of FP6 and FP7 projects. The screening process resulted in a list of 41 relevant projects given in Appendix D. As part of this research, interviews were also conducted with project managers for the following projects, in both Europe and Africa (Appendix B):

- + [AFROMAISON](#)
- + [AMMA](#)
- + [AnimalChange](#)
- + [ClimAfrica](#)
- + [Rwanda Climate Observatory](#)<sup>2</sup>
- + [DEWFORA](#)
- + [Healthy Futures](#)
- + [QWeCI](#)

<sup>2</sup> Our collection of interview data included research from one project, the Climate Observatory, which was not included on the original list of projects. This is because it is not an Africa-EU bi-regional project. However, we have chosen to include it in our qualitative data set as it is a project of great significance to Rwanda and East Africa in general. Its goal is to provide a region-wide centre for climate data gathering, analysis and modelling that will feed into regional, national and local planning activities. The Climate Observatory project forms an integral part of Rwanda's objective to become a provider of technology services to the wider region of the East African Community (EAC), as well as its country growth and development strategy.

### 3.2 How the bi-regional climate change research portfolio links to the political priorities

The research projects on the long list were firstly categorised according to overall topic — that is, mitigation, adaptation, or both. The division of topics is represented in Figure 1.

It is evident from Figure 1 that there is more emphasis on adaptation projects in the Africa-EU bi-regional climate change science cooperation. This shows good coherence with the JAES third priority action on strengthening climate adaptation. Upon examination of the division between adaptation and mitigation in terms of the size of EU funding, the picture is, however, less clear. On average the mitigation projects have approximately 9.1 million EUR per project in funding from the EU, while adaptation projects have an average budget of about 6.3 million EUR per project. Projects covering both adaptation and mitigation have even smaller budgets, averaging 5.2 million EUR per project. Overall, there is still more Framework Programme finance directed towards adaptation than mitigation, as shown in Figure 2.

The research projects on the list were divided according to the topics listed above, namely: desertification; climate information and earth observation; adaptation; forests; African negotiators' capacity; disaster risk reduction; biodiversity conservation; climate friendly technologies; carbon markets; natural resource management; and adaptation and mitigation strategies. In the categorisation of projects, none of the topics are mutually exclusive, meaning that one project can cover several topics. This does not, however, count for the 'Other' category, which only includes projects that do not cover any of the other topics. The distribution of projects by category is shown in Figure 3.

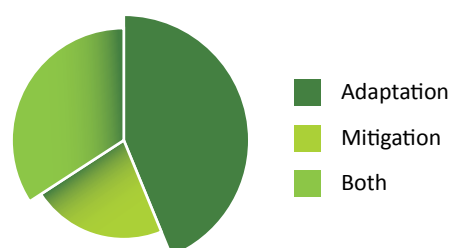


Figure 1: Division of FP6 and FP7 projects according to overall topic.

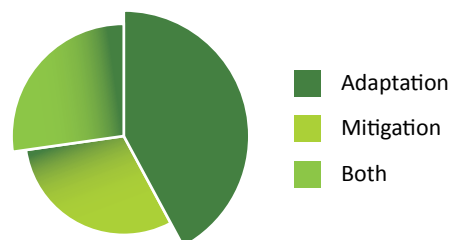


Figure 2: Share of FP6 and FP7 funding spend on adaptation/mitigation.

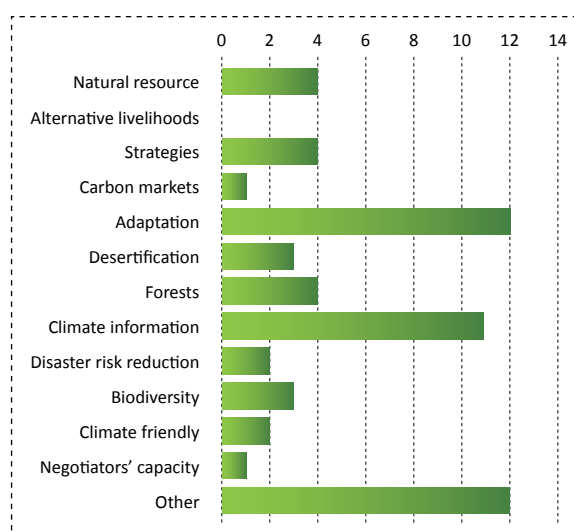


Figure 3: Number of projects in each JAES priority category.



According to Figure 3, less than one third of the projects on the list do not explicitly cover any of the priority topics extracted from the second JAES action plan, but instead focus on other issues. Several of these projects categorised as 'other' have an explicit focus on water or agriculture, which, as stated above, do not seem to be prioritised in the second action plan of the JAES. If 'water' and 'agriculture' are included as topics in the categorisation, the distribution appears as in Figure 4.

Figure 4 indicates that water and agriculture are very prominent topics in the bi-regional climate change research. This is especially true for 'water', which is included as a focus area in almost half of the projects investigated in this report. This thematic focus correlates poorly with the JAES action plans, which, at best, have a secondary focus on water and agriculture. It is also important to note that a topic such as 'adaptation' covers a wide range of different projects with different thematic emphases, not all of which are listed in the priority topics of the second action plan. Indeed, there seems to be an imbalance between the political priorities and the actual research conducted. Some of the political priorities are well covered by research. Yet others, like carbon markets, negotiators' capacity, disaster risk reduction and climate friendly technologies, are not very prominent in bi-regional research on climate change. When drawing these conclusions, it is however important to take into account the time lag between the adoption of a political strategy and its manifestation in implemented research projects. This is especially the case for this report: the JAES action plans referred to cover the period from 2008 to 2013, whereas some of the projects analysed date as far back as 2004.

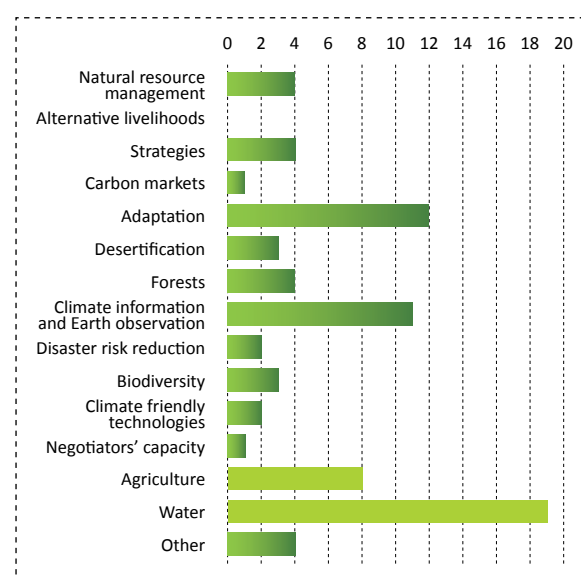


Figure 4: Number of projects in each JAES priority category, including water and agriculture.

When assessing priorities against actual research, it is relevant to consider the work of the International Panel on Climate Change (IPCC) whose scientific studies are the most significant and authoritative available. The research priorities expressed in the IPCC's 4<sup>th</sup> Assessment Report (AR4), notably Working Group II (IPCC, 2007a) and Working Group III (IPCC, 2007b), are presented differently to those of the JAES, which makes them difficult to compare. It is beyond the scope of this report to engage in an in-depth analysis of IPCC priorities versus actual research projects. It is however evident that the AR4 reports include topics that are not covered by the JAES, such as transport, buildings and industry, just as the reports puts a greater emphasis on agriculture and water as research priorities. In spite of this larger focus on agriculture and water, which is not present in the JAES strategy, several of the other topics highlighted by the IPCC are not covered

by the research projects analysed in this report. This is true for the above-mentioned transport, buildings and industry categories, none of which are covered by FP6 or FP7 research projects undertaken in collaboration with African institutions. Based on this, it is not possible to infer whether or not EU and African scientists look more to the IPCC for guidance on which research priorities to follow, though that could be an interesting topic to pursue in future studies.

The above observations correspond well with the needs expressed by the United Nations Economic Commission for Africa's Climate Policy Centre (ACPC), which itself exists to support the ClimDev initiative identified in the second action plan. Its 2011 report, "Climate Science, Information, and Services in Africa: Status, Gaps and Policy Implications", states that science-informed policy, planning, and practice will ensure that development is more resilient and less vulnerable to the negative impacts of climate change (UNECA-ACPC, 2011). However, it highlights the following key issues:

- + The use of climate information and science in Africa has been very weak. This is due, on the one hand, to the African climate community not being able to provide the appropriate decision-relevant information and, on the other hand, due to climate information that is available but not being used properly.
- + Among the major challenges for the African climate community have been a critical lack of trained personnel, inadequate meteorological infrastructure, and very weak communication and computational capacity.
- + A lack of communication between the users and providers of climate information has also been a serious problem.
- + From the 'user side', there is a reluctance to incorporate climate issues in management practices, and a poor understanding of how to deal with scientific uncertainties.<sup>3</sup>

### 3.3 Geographical spread of bi-regional projects

Investigating the geographical spread of Africa-EU bi-regional cooperation projects necessitates an examination of at least three aspects:

1. the regions/countries on which the projects focus;
2. the African countries involved in the bi-regional projects as partners; and,
3. the countries managing the projects as project leaders.

The figures below give an overview of these aspects, with Figure 5 focussing on the first aspect and Figures 6 and 7 (below) on second and third aspects. There is an uneven spread over the African

<sup>3</sup> Adapted from UNECA-ACPC (2011).

continent. The Mediterranean is by far the most represented region with 10 projects. East Africa is the least represented region with only one project. Europe is the second most represented region, matched only by the non-region specific categories. This means that only a small portion of the research on climate change carried out in an Africa-EU bi-regional context is focussed specifically on the sub-Saharan region.

Turning to the geographical spread of African project partners, Figure 6 shows that there seems to be a good spread of projects partners across the African regions, with 28 countries participating in at least one of the projects included in the mapping. However, of these 28 countries, 10 of them are only involved in one project.

The map also shows that some countries are more popular as project partners than others, with South Africa, Tunisia, Kenya, Egypt and Morocco at the top of the list, involved with between 9 and 18 projects each. Figure 7 below shows the number of projects in which a given country is involved as a coordinating country. From the map it is evident that the coordinating role in bi-regional Africa-EU climate change science cooperation lies solely with Western European countries. One of these countries is Norway, which is not an EU member state.

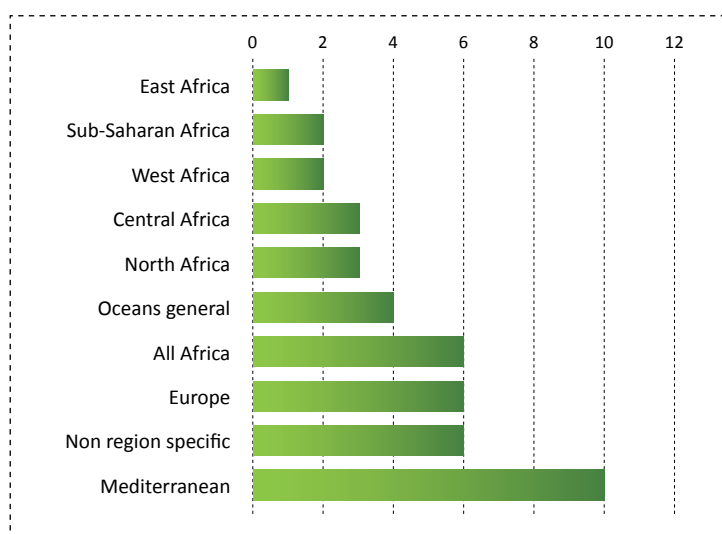


Figure 5: The geographical distribution of the selected projects.

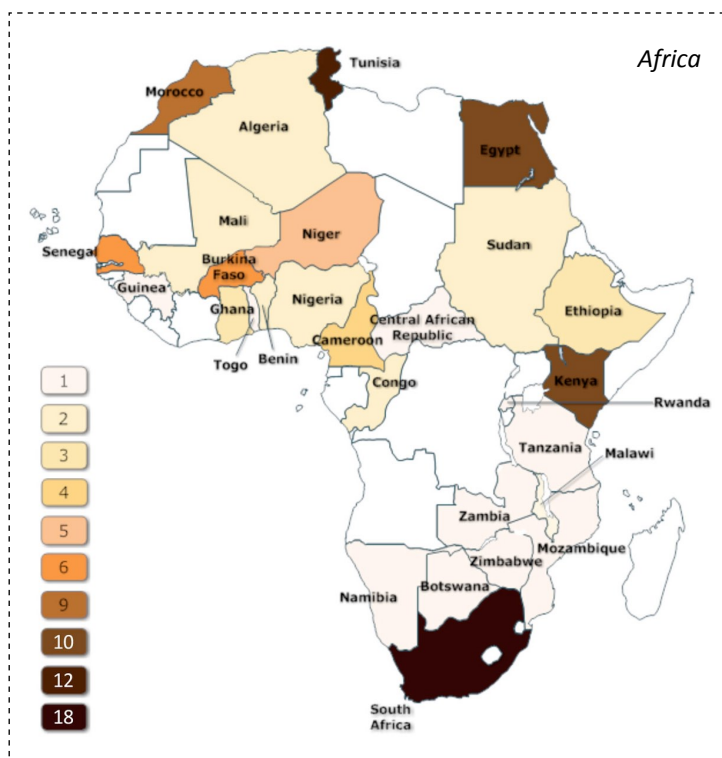


Figure 6: African project partners in FP6 and FP7 climate change projects. (Note: The colours/numbers refer to the number of bi-regional climate change projects a given country participates in as project partner.)

Norway does however contribute to the research budget of the frameworks as part of the European Economic Area. It is beyond the scope of this study to determine why there is a lack of Eastern European countries managing bi-regional climate change projects. It should be noted, however, that the mapping of projects performed in this report covers FP6 and FP7 projects and thus the period from 2002-2013, with FP7 starting in 2007. Since the bulk of Eastern European member countries did not join the EU until 2004 or 2007 this could explain their lack of involvement in the FP6 and FP7 as project leaders.

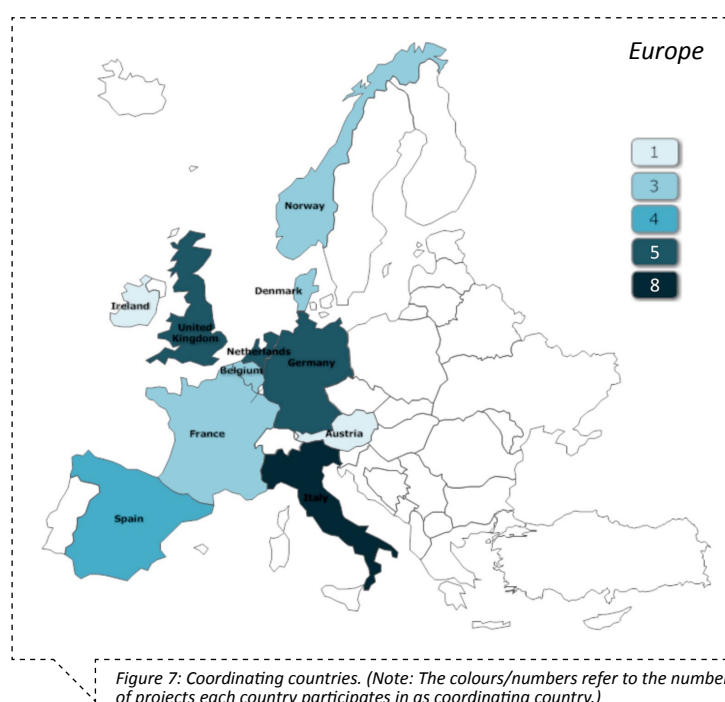


Figure 7: Coordinating countries. (Note: The colours/numbers refer to the number of projects each country participates in as coordinating country.)

According to the recent study “Mapping of Best Practice Regional and Multi-country Cooperative STI Initiatives between Africa and Europe: Identification of Financial Mechanism(s) 2008-2012” (HTSPE-Eurotrends, 2013), co-ownership is a core value of bi-regional cooperation. The research states that the single most important factor in fostering co-ownership is co-financing. Effective and equal partnerships play a large role in the success of international bi-regional cooperation. A conclusion of the study is that a “lack of equity in partnerships is corrosive and factors that perpetuate inequity imperil their efficiency” (p. 9). Following this line of thought, the lack of African project leaders can be seen as an expression of unequal partnerships, which in turn is a threat to the effectiveness of the bi-regional cooperation.

### 3.4 ERAfrica: rebalancing Africa-EU research collaboration?

ERAfrica is an FP7 project of the ERA-NET family.<sup>4</sup> The financial input from the EU covers only the administrative costs of running the network. The actual research funding to be granted by ERAfrica has to come from the participating countries on a *juste retour* basis. Each project funded by ERAfrica resources has to have at least two partners from two different countries in Europe and at least two

<sup>4</sup> For more information on the ERA-Net series of projects, see [http://ftp.cordis.europa.eu/pub/fp7/docs/eranet-series1\\_en.pdf](http://ftp.cordis.europa.eu/pub/fp7/docs/eranet-series1_en.pdf)

partners from two countries in Africa. These partners should be organised into a consortium with considerable coordination responsibility given to the project manager. The evaluation and selection process for project proposals has otherwise been similar to the FP7. Of the 19 approved projects in the “Interfacing Challenges”, “New Ideas” and “Renewable Energies” themes, eight have African coordinators — three in South Africa, three in Kenya, one in Egypt, and one in Burkina Faso. This reveals a more equal distribution of project leadership between European and African research centres.

Two of the approved ERAfrica projects under “Interfacing Challenges” fall within the topic of climate change. They are:

1. INCAA: Innovative Conservation Agriculture Approaches: Food Security and Climate Action Through Soil and Water Conservation; and,
2. LOCLIM3: Local climate change in 3 cities (Cairo, Nairobi, and Istanbul) with different population, urban structure, land use classification and climate characteristics, and to compare different adaptation strategies.

Project management for INCAA will be hosted in Germany, while LOCLIM3 will be managed from Cairo University. The case of LOCLIM3 demonstrates that African institutions have the willingness and capabilities to successfully achieve funding for framework projects as project managers.

## 4



## PREVIOUS STUDIES AND METHODOLOGICAL NOTES

The authors of this report set out to investigate the outcomes of research-generated knowledge and to see whether these match the political objectives of bi-regional EU and Africa priorities on climate change. There are different paths that can be taken to observe the outcomes or impacts of research, and different methodologies that can be applied. Drawing on the experience and conclusions of previous studies has been an important exercise in determining the strategy for data gathering and analysis for this report.

There are, to the best of our knowledge, no other publications that focus on the effectiveness and outcomes of EU-Africa bi-regional climate change research cooperation. There are other studies, however, that cover relevant topics from a slightly different angle. Two examples include a report from the FP7 project, the Mediterranean Innovation and Research Coordination Action (MIRA, 2011), entitled “Assessment of International Scientific Cooperation in the Mediterranean Region: An International Challenge Ahead”; and a second study entitled “Mapping of Best Practice Regional and Multi-country Cooperative STI Initiatives between Africa and Europe: Identification of Financial Mechanism(s) 2008-2012”.<sup>5</sup> The latter study was developed as a response to the conclusions of the first Senior Officials Meeting of the High Level Policy Dialogue (HLPD) on science, technology and innovation.

The MIRA project developed a methodology for measuring and conducting impact assessments of research collaborations though the project did not, itself, conduct any such assessments. Their key insights and conclusions were that:

- + Relevant indicators are not easily available.
- + Scale is highly important and impact assessments are best performed at the programme level.
- + Indicators depend entirely upon the objective of the specific research project.
- + The consolidation of research teams is highly relevant: more resources and/or more collaborators do not necessarily result in better research outputs.

The MIRA analysis also concludes that a mapping of collaborations can be done using bibliometrics and outlines an inventory of criteria on which impact assessments at the programme level should be built. This inventory includes the number of doctoral students in the programme, the creation of networks, mapping of produced publications, size of funding, and the like.

Conversely, the second mapping study mentioned above takes a more qualitative approach to assess

<sup>5</sup> The MIRA project focuses exclusively on the Mediterranean area and the EU’s collaboration with the Mediterranean Partner Countries (MPCs). It does not have an explicit climate change focus. While not directly relevant for CAAST-Net Plus work on climate change, the MIRA project does however cover some of the same objectives as the overall CAAST-Net Plus project. The project can also be seen as complementary to the extent that CAAST-Net Plus focuses mainly on sub-Saharan Africa and MIRA on the North Africa and Mediterranean region.



existing bi-regional STI cooperation initiatives and to identify successful best practice models of Africa and Europe cooperation. Although the authors suggest key performance indicators or KPIs, can be used, their choice of method for actual data gathering were interviews and questionnaires, supplemented with information gathered through document reviews and internet research.

#### 4.1 Outcomes, not impacts

Bearing in mind the conclusions from the MIRA project, this report follows in the footsteps of their mapping study, placing a greater emphasis on qualitative accounts of research outcomes. We aim to identify the key outcomes of specific research collaborations, as well as the ‘mechanisms of change’ which enabled these outcomes. This information, by virtue of its complexity, is best understood through narratives as opposed to indicators or quantitative measures, which can only count outputs that in themselves are of little meaning in terms of the ultimate development impacts. To this end, we draw upon the Outcome Mapping (OM) school of thought.<sup>6</sup>

The debate and political discourse surrounding Africa-EU research collaborations more often refers to their ‘impact’. In this study, however, we are primarily concerned with ‘outcomes’ as opposed to ‘impacts’. This is an important distinction that enables us to better understand the chain of causation and attribution, and the consequences this has for proper accountability. The most basic point is that outputs, outcomes and impacts should be seen as results at different levels. Outputs are the immediate products of an individual’s or an organisation’s activities. They are the processes, goods and services are produced (OECD, 2002, p. 6). These can include, for example, workshops, training manuals, research and assessment reports, journal articles, books, guidelines and action plans, strategies, and technical assistance packages (Wilson-Grau, 2008). In other words, ‘outputs’ are within almost total control of the programme or project managers.

After the level of outputs comes ‘outcomes’, which, in the context of development assistance, the OECD defines as “the observable behavioural, institutional and societal changes...usually as the result of coordinated short-term investments in individual and organizational capacity building for key development stakeholders” (OECD, 2002). In other words, this is the intermediary level of observable positive or negative change in the actions of the specific social actors that “have been influenced, directly or indirectly, partially or totally, intentionally or not, by (a project’s) activities” (Wilson-Grau, 2008, p. 2). We move even further away from the sphere of influence when talking about ‘impacts’. Impacts concern the broader — often implicit — objectives of a given programme or project. In the context of scientific research into the causes and effects of climate change, objectives are usually to help achieve long-term, sustainable changes that aim to reduce greenhouse gas emissions and conserve natural resources. As such, it is unreasonable to assume that any single programme or project can do more than *contribute*, partially and indirectly, to the ‘bigger picture’ impacts. While these distinctions and processes may appear to be obvious or common sense, it is significant the

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<sup>6</sup> See [www.outcomemapping.ca](http://www.outcomemapping.ca) for more information.

extent to which project managers and stakeholders confuse these terms when questioned.

Through the use of semi-structured interviews this study identified the *mechanisms of change*, that is, a detailed description of how the specific research project fed into or influenced a given policy, practice or behaviour. It is this combination of ‘how-tos’ that should correctly be referred to as the *outcomes* of a given research project. It is important to note that with this type of investigation outcomes can only be linked to specific activities through plausible claims, that is, reasonable arguments provided by stakeholders as to the cause-and-effect relationship between the identified research project and a given policy, practice or behaviour.

Primary data was gathered for this report from interviews conducted by CAAST-Net Plus partners, who were primarily based in Africa. Some CAAST-Net Plus partners based in Europe conducted interviews with EU-based respondents. The shortlist of projects (see Section 3.1) was compiled solely on the basis of where CAAST-Net Plus partners have in-country representation and thus were able to better navigate local networks and provide some first-hand, contextual analysis to accompany their interview data. The semi-structured interviews were conducted based on a pre-developed interview guide to ensure some consistency in the interviews across the different interviewers (Appendix A). Summaries of the scope, aims and objectives of these projects are provided in the table on Africa-EU collaborations on framework research projects with a primary focus on climate change (Appendix D). The exception to this list of projects is the Climate Observatory initiative in Rwanda, where one of the CAAST-Net Plus partners, the Ministry of Education, is based. Despite not being a Framework Programme-funded project, or strictly speaking an Africa-EU collaboration, as noted above it has been included here due to its strategic importance and relevance in relation to the JAES priorities on both climate change and science and technology.



## CRITICAL ANALYSIS OF AFRICA-EU RESEARCH ON CLIMATE CHANGE

This section of the report analyses the primary and secondary data collected as part of the research. This includes interviews carried out in both Africa and Europe, primarily with managers of the selected framework projects (Appendix B). In line with the focus of this report, most of the questions posed concerned issues of outcomes and impacts, how these were anticipated and the extent to which this anticipation influenced the project design and implementation. As such, articulations regarding ‘theories of change’ are central to informing our analysis, which draws upon questions of how project activities and results were communicated and ‘sold’ to intended beneficiaries and a broader set of stakeholders.

Simply put, ‘theories of change’ are notions about causation in societal change. They depict an expected causal chain. A theory of change entails a sequence of events that is expected to lead to a particular desired outcome. Every programme or project is packed with beliefs, assumptions and hypotheses about how change happens. A theory of change is about articulating these underlying assumptions and taking into account intervening factors that may ‘contaminate’ the anticipated change process. Logical Framework Analysis (LFA), otherwise known as the logframe approach, is the simplest form of a ‘theory of change’. It is widely used by the donor community. The logframe approach promotes systematic thinking and logical sequencing from inputs and activities to immediate outputs, intermediate outcomes, and long-term impact. It is prescriptive and highly normative: in effect it offers a roadmap or pathway to results. Its simplicity is also its major shortcoming. It is superficial, largely internal to projects and programmes, and a static blueprint approach.

How do we advance beyond thinking of change processes as always logical and linear? Social reality is dynamic and messy with a multiplicity of actors who espouse and pursue their interests. Hence, there is need for dynamism and process thinking over time as well as in-depth analysis of the context in which research projects unfold. This report reveals that the ‘theories of change’ inherent in most framework projects, to the extent that are made explicit, are simplistic.

While the interview schedule placed a sharp emphasis on understanding how outcomes and impacts were understood and anticipated, many of these questions often proved difficult for respondents to answer. In many cases the respondents drifted toward a focus on more procedural and ‘mundane’ aspects of African-EU research collaborations, including the challenges of day-to-day management and the ultimate delivery of project outputs. Many respondents focused on the challenges of coordination and of targeting key project conclusions or recommendations to the most appropriate audiences. If they did manage to engage with ‘target audiences’, then there was often little or no follow-up that would enable project managers to understand the extent to which these key messages had influenced policy-makers or the business community. Information and knowledge in this regard remains anecdotal, at best. Finally, a key challenge was to receive concrete examples of ‘outcomes’ as understood in OM analysis, which many respondents confused with ‘outputs’. This is a fundamental issue, and one that appears to explain the paucity of plausible arguments to attribute project outputs to demonstrable outcomes.

## 5.1 Theme 1: Understandings of intended ‘impacts’ and the mechanisms of change

This section analyses the way in which the *intended impacts* and the *mechanisms of change* of Africa-EU research collaborations on climate change have been conceived and pursued by project managers. The analysis draws upon project documents and responses to interview questions from project managers. When research projects are granted funding under the EU Framework Programme, project descriptions usually contain statements of expected ‘impact’ — defined here in the broad, non-OM sense — that is used as a criterion of project assessment. Respondents were asked to describe the expected impacts of their projects, as defined at the start of the project. They were also asked if and how they tried to measure impacts and, what means or methods were used to measure impact. Furthermore, we asked project managers if they were able to plausibly attribute the observed ‘impact’ to their specific research project, as opposed to other intervening factors. In this regard we asked for explanations of *how* these outcomes occurred, that is, we asked: What was the ‘mechanism of change’ at work during and after project implementation?

The research-output-outcome chain can be seen as comprising a series of stages, starting with research design and the identification of specific user constituencies and the public at large. Dissemination could be directed at policy-makers, and further onwards to various categories of practitioners. The interface with policy-makers could lead to policy change or improvement. In turn, policy change or influence could lead to uptake by practitioners and users. Only the end result of these convoluted processes could qualify for the term ‘impact’. Our interviewees were asked about the ‘theories of change’ upon which those expected impacts were based. In other words, what notions they held in mind as the designated project manager about the causal chain from inputs through research activities to outputs, outcomes and eventual long-term, sustainable impact.

We found that often statements of ‘intended impact’ are more akin to aspirations expressed by project designers and managers. In most cases these aspirations do little more than offer rhetorical support to wider climate and development targets, such as the Millennium Development Goals. As such, there is generally no explicit explanation of *how* these impacts can — even theoretically — be achieved. Instead there is a significant level of assumed attribution, that is, broad statements about how the research project’s focus relates to the wider issues and how it contributes knowledge necessary to tackle these challenges vis-à-vis the stated aims and objectives.

An example is instructive in this regard. The following points are the closest to a statement of intended impacts for the African Monsoon Multidisciplinary Analysis, or AMMA, project:

- + to assist in the achievement of the UN MDGs in Africa and the implementation of the EU Strategy for Africa, which includes “action to counter the effects of climate change” and “the

development of local capabilities to generate reliable information on the location, condition and evolution of environmental resources, food availability and crisis situations”;

- + add to the African participation and ownership of AMMA research activities, and strengthen the linkages between European research institutions and the West African research community; and
- + ensure that the further development of national expertise is maintained beyond the AMMA project.

While such statements sound plausible and convincing, they serve mostly to highlight the topical relevance of the research. Indeed, according to Jan Polcher, European leader of the AMMA project, “the impact section of the proposal was very much political talk”. Furthermore, very few framework projects make clear distinctions between outputs, outcomes and impacts at the design stage. Consequently, the terms are often confused or used interchangeably where the most common mistake is to present and refer to project *outputs* (workshops, research articles, policy papers, conferences, etc.) as *outcomes*. Similarly, there is an over-referencing by project designers who, in outlining their activities, indicate ‘engagement with a variety of stakeholders’ as key. We suggest this is simply another rhetorical device that, while politically correct and plausible, is rarely explained in detail and hence fails to substantiate a convincing theory, or set of mechanisms, for actual change.

Similarly, the major anticipated outcomes of the FP7 project ClimAfrica focused on:

- + responding to environmental degradation as relevant for poverty alleviation and food security enhancement;
- + specific climate change mitigation and adaptation options for local communities;
- + capacity of team members and other stakeholders within the communities enhanced; and,
- + synergies with existing actors (NGOs, District Assembly, MOFA etc.) in the various localities strengthened.

These are typically vague statements of intended impact, difficult to measure or verify. Ernest Ohene Asare, described as a ‘beneficiary’ of the AMMA and QWeCI projects in Ghana, offered a more concrete account of observation outcomes. He stated that project funds were invested in the acquisition of instruments needed for data collection and therefore better data were collected for the AMMA and QWeCI projects. Specifically, he worked on a malarial model to be used in Ghana with partners from University of Cologne, Germany and the International Centre for Theoretical Physics (ICTP), Trieste, Italy, and is currently working to improve understanding of the breeding temperature of mosquitoes with the help of colleagues from the Kwame Nkrumah University of Science and Technology (KNUST, Kumasi, Ghana). The collection of data on weather, physical

and chemical variables and mapping of water bodies, the occurrence of *Anopheles* populations, characterisation of insect feeding success rate, and surveys of householder experiences were important for quantification of the effects of rainfall on malaria incidence.

Ohene-Asare stated that the project helped him to “get exposure” and that he was able to work with other scientists which also enhanced project work and gave new directions. He added that through the project his presentation skills had improved and that he had learnt how to make available to others in society the results of scholarly work through tailor-made presentations, personal discussions and formal interviews. More importantly, the two projects have brought together scientists from a range of disciplines and have fostered networking and knowledge sharing. While this account is more concrete, it nevertheless falls short of responding to the project’s statements of intended impacts, and rather provides an anecdotal basis for attributing project outcomes.

The AFROMAISON project (see Appendix D for summary scope) makes reference to ‘impact pathways’, developed at the beginning of the project. This approach is used to identify the potential impacts, elaborating the *how* (mechanism of change) in a participatory manner, and involving key stakeholders from the outset. As the project managers noted, this serves as a guide to implementation, a means for periodically checking whether the “impact theory” is correct, and making adjustments during implementation. If properly followed, this appears to be an effective mechanism for enabling the identification of realistic outcomes and how the project outputs can achieve these. Generally speaking, the articulation of impact pathways is considered to be part of the challenge of enhancing the ownership of tools and empowerment of the sub-national authorities and communities.

#### Box 1. Change happens over the longer-term

**Upon completion of the project [alternatively, into the duration of an on-going project], did your initial expectation of impact hold true?**

“Some modesty is probably needed with regard to the impacts. Real impact can only be measured after the project and preferably after a certain time. It does seem that in most of the case studies we will have created impacts in terms of better awareness of stakeholders in natural resource management (NRM) issues in their landscape, and in certain cases we have been able to observe that individuals have already started taking actions as a result of their participation in the project. On a policy level or mainly at local government level we will also see that approaches and management plans are being adjusted based as a consequence of AfroMaison. At these levels, changes do not occur as swiftly as at the individual level and implementation of NRM strategies or plans were unfortunately not within the scope of the project...”

Tom D’haeyer, Project Manager, AFROMAISON



In Uganda, the AFROMAISON project developed scenarios to understand the extent to which human activities had an impact on the natural resources and, ultimately, the climate in the Rwenzori mountains/Albertine region. This was achieved through ‘action research’ where the project team and communities met to share experiences and agree on practical solutions for pertinent NRM challenges like landslides, silting of rivers and floods. These served as both awareness raising and consensus building platforms for effective natural resource management. They also helped to ensure that research results were acceptable and directly beneficial to the target community. A key project output was the development of a participatory tool ‘Mpang’ame’ and simulation game that helps stakeholders identify and reflect on appropriate actions for better natural resource management practices.

As of late 2013, many of the project activities were still being implemented or at the partial completion stage, though steps had been taken to disseminate the Mpang’ame to stakeholders at different levels. At the local level, the game has been disseminated to schools, vocational institutions, local government leaders and policy-makers within various fora. At regional and international levels the game was disseminated at meetings for AFROMAISON partners and NRM stakeholders in Burkina Faso, Ethiopia, Mali, South Africa, Tunisia, as well as to graduate students in France, on special request from university administrators. Other dissemination channels included journal articles published in the *International Journal of Innovation Sciences*, book chapters (forthcoming), brochures, leaflets, and the project website.

According to Prof. Arseni Semana, the Principle Investigator of AFROMAISON in Uganda, the main challenges that the project encountered were related to the attitudes of the communities. There was slow adoption of integrated NRM practices mainly because of the commercial culture that has emerged within the beneficiary communities. NGOs facilitate communities’ participation in NRM planning and implementation. As a result, it is almost impossible to engage communities without attaching a monetary incentive. Private sector involvement is still minimal and participating private sector players are mainly informal and micro. Nonetheless, the project plans to hold a consultative meeting between the ministries of Agriculture, Animal Industry and Fisheries, and that of Water and Environment to enhance policy level integration of NRM using tools from the research. This constitutes a more valuable, critically reflective account of the relationship between the project’s outputs and outcomes, and one which integrates key contextual factors to explain the barriers and constraints to achieving the intended impacts.

## 5.2 Theme 2: Engaging and influencing public and private decision makers

In this section we discuss how, and the extent to which, R&D outputs from Africa-EU collaborations under the framework have informed public policy-making and business planning under the

assumption that these are the key means of tackling climate change. The well-known challenge is to *apply* technical knowledge into policy and business planning. But what do we know about the *barriers and constraints* to such uptake? How can these be removed? We answer these questions by analysing responses from civil servants, civil society (for lobbying and campaigning) and commercial actors. Our questions centred on the issues faced in specific projects. They included questions such as: What were the main challenges in communicating research to a policy and business audiences? Did project partners interact with policy-makers? If so, did these actors adopt the research findings as evidence in support of their policy formulation or revision, and how did they ascertain whether they did so or not? If they did not embrace the research findings, what was the reason?

#### Box 2: The private sector is efficient and excited by our results

**Did you interact directly with the private sector, i.e. relevant companies? If so, what were your experiences? Please elaborate.**

“Yes, we had many partners that we explored. For instance, we interacted with many and varied companies working in the tourism sector. We experienced that private sector approach is always objective oriented and efficient. It looks at sustaining efforts both strategically and financially. One of the key learning is also that success is possible through private public partnership and private sector has a big role in this....The Private sector in Rwanda is very much aware about the impact of environment into their business, therefore the need to conserve gorillas and natural flora and fauna. They are also very receptive to the idea of the Climate Observatory Project and they feel not only that this will be useful in terms of anchoring tourism projects but also to use it as something that can lead to Rwanda’s image being a leader in the concept of managing Climate Change. The tourism project can also be combined with educational projects. This also has a good private sector buy-in as they believe in the need for learning about climate change. It is not only being receptive to the idea but also being ready to invest in these ideas.”

Sujeev Shakya, Team Leader, Cable Car Project, Rwanda

The Principal Investigator on the AMMA and QWeCI projects in Ghana, Prof. Sylvester K. Danuor of the Physics Department of KNUST, stated that in order to achieve the project’s intended impacts, research findings were disseminated mainly at conferences and workshops, and through journal articles. He stated that workshops were the most effective means of reaching out to the intended beneficiaries. These included the research community, policy-makers and civil society organisations. He and other interviewees were of the opinion that the AMMA and QWeCI projects “had some interaction” with policy-makers who “embraced the research findings” but that this is yet to be reflected in official policy formulations. For example, there were meetings with the Ghana Meteorological Agency and the District Health Directorates through the Metropolitan Health Directorate of the Ministry of Health. There was a similar positive interaction with civil society organisations with a view to influencing and encouraging them to making use of the project’s findings in policy formulation and activities.

This account of the project-policy interactions is typical of the responses received for this research. These responses reveal a high degree of uncertainty and inability to verify the claims, however plausible they appear. As mentioned in the previous section, this would appear to reflect a lack of ‘outcome thinking’ at the level of research project design and management. In short, there is a predominant focus by framework project managers on outputs that are easy to document and report. Where an ‘interaction with policy-makers’ is mentioned, in fact the precise mechanism through which research outputs actually influence policy or practice is rarely explained in any detail. As such, efforts to engage with and influence policy-makers are mostly *ad hoc* at best, and amount to little more than a hope or expectation that the research findings will be accessed, understood and taken up by the relevant actors in government or the private sector. In turn, the lack of clear *mechanisms or theories of change* undermines efforts to reflect upon the project implementation process or face the hard question of what difference efforts made. Finally, there is also a general lack of follow-up studies to monitor longer-term outcomes of framework research projects, which once again reflects the predominant focus on monitoring, reporting and evaluating the strength of project outputs.

### Box 3: We have identified our stakeholders

**By what means do you intend to disseminate the research findings in order to achieve impact? What will be the main means of dissemination and which were given priority and why?**

“There is a technical team formed of representatives of all the potential stakeholders in Rwanda likely to benefit or be impacted by the Climate Observatory project. This technical team comprises representatives from the Ministries of Education, Infrastructure, Natural Resources, the Rwanda Development Board (both the ICT Departments and the Tourism and Conservation departments), Higher Learning Institutions, Rwanda Environmental Management Agency, Rwanda Meteorological Agency. There is also a High Level Steering Committee comprising the Ministers of Education, Infrastructure, Natural Resources and ICT, and the CEO of the Rwanda Development Board. Through the direct involvement of the concerned stakeholders in the project both at technical and policy level the ongoing development of the project and the results obtained will be directly disseminated to both the technical stakeholders who need the information and the policy-makers who will be able to use the results in any necessary policy related decisions.”

Mike Hughes, Ministry of Education, Rwanda

Focusing on the private sector, there is minimal evidence of framework research projects generating climate change knowledge that feeds directly into technology development or patents. It should be acknowledged that this finding is based on an in-depth questioning of a small sample of projects, so caution should be taken in drawing programme-wide conclusions. One would, however, expect to gather at least some anecdotal evidence of positive relationships between research projects and technology developers and/or private sector investors operating in the market for clean and low-carbon technology. To a large extent this lack of obvious examples reflects the thematic focus of many framework projects on climate change: a majority focus on the generation of basic research

knowledge, such as emissions monitoring and data analysis, or capacity building, which does not have a strong or obvious commercial application. As such, there are generally low levels of private sector involvement in EU-Africa research collaborations.

While it may not be easy to identify a clear attribution between Africa-EU research collaborations on private sector innovation and technology development, it does not mean that it does not occur. Indeed, it is far more likely that private sector actors will be drawing upon the findings of such research collaborations in the preparation of their business plans, given they have a clear and strong incentive to develop their business and investment intention upon scientifically-sound findings. The fact that most framework-funded research findings are publically available would make this even more likely, though the project managers and partners would be unaware of this information 'uptake'. This points to the need to conduct a targeted survey with private sector actors about the connections between research and private sector decision-making.

Another issue that may constrain the active promotion of framework-funded research findings into public and private (non-research) forums is the lack of ability or willingness by project managers to actively engage with such decision makers. In the case of climate change research all the recent framework projects are managed by European-based institutes. This fact may be of material consequence in terms of their limited contact (apart from via project partners) with local policy-making and business leader networks. There may also be reluctance on the part of Europeans to 'get involved' with local policy-making and politics. Project managers are likely to be unfamiliar with the complex institutional and policy terrain of African countries. As Jan Polcher, the European-based manager of the AMMA project, stated:

"[O]ur main targets were the local scientific community and the operational agencies [...] [However] it is my belief that Western scientists have no role in disseminating to policy-makers; civil society organisations; politicians; private sector in West Africa. Because of the colonial heritage our message would not have the desired impact. So this dissemination is to be left to the regional research community."

This is an unusually frank, but significant, admission by a project manager who would be responsible for pushing the research-to-policy connections. It raises more questions about whether this agenda is being pushed in the first place, despite the broad statements of intended impact mentioned in the project documents.

It is worth noting that none of the respondents mentioned the Joint Programming Initiative (JPI), 'Climate', introduced by the European Commission in July 2008 as one of five initiatives for implementing the European Research Area (ERA). The JPI was designed to respond to the need for a strategic approach to coordinating European research activities to address societal challenges of

common interest, and to increase the value of relevant national and EU R&D funding by concerted joint planning, implementation and evaluation of national research programmes.

### 5.3 Theme 3: Managing information and knowledge effectively

In an age of voluminous and rapid flows of information, effective knowledge management is crucial to enabling research collaborations achieve their intended outcomes.<sup>7</sup> Nowhere is this more the case than for climate change, which has witnessed an explosion of North-South networks. These networks have given rise to new online sources of information dissemination. This includes workshops and the presentation of research and evidenced-based policy papers, as well as country factsheets and 'best practice' databases targeted at a range of public, private and civil society stakeholders. For Africa alone there are numerous networks and online portals that cover this ground. A small number of these are listed in the box below.

#### Box 4. Climate change portal proliferation

##### World Bank Climate Change Knowledge Portal

<http://sdwebx.worldbank.org/climateportal/index.cfm>

##### Adaptation Learning Mechanism

<http://www.adaptationlearning.net/>

##### Africa Adaptation Knowledge Network

<http://www.aaknet.org/>

##### Eldis

<http://www.eldis.org/>

##### Climate Impacts Global and Regional Adaptation Support Platform

[http://www.pik-potsdam.de/~wrobel/ci\\_2/](http://www.pik-potsdam.de/~wrobel/ci_2/)

##### Africa Adapt

<http://www.africa-adapt.net/>

One of the larger and arguably most visible of these portals is the Climate and Development Knowledge Network (CDKN), available at <http://cdkn.org>, which has received funding from the UK Department for International Development. It aims to “help decision makers in developing countries design and deliver climate compatible development”. In June 2011, CDKN convened a workshop with twenty climate change and development networks to discuss how to improve collaboration and collective effectiveness. This resulted in a series of recommendations, under the title “Seeking a Cure for Portal Proliferation Syndrome”.<sup>8</sup> These recommendations suggest the basic need for networks to

<sup>7</sup> The European Union's *Community Research and Development Information Service* (CORDIS) defines knowledge management as “...getting the right knowledge to the right person at the right time. This in itself may not seem so complex, but it implies a strong tie to corporate strategy, understanding of where and in what forms knowledge exists, creating processes that span organizational functions, and ensuring that initiatives are accepted and supported by organizational members.”

<sup>8</sup> <http://cdkn.org/2011/06/portal-proliferation-syndrome/>

be more aware of each other so as to minimise the risk of duplicating their activities. One proposal is the use of advanced search filters and RSS feeds that can help minimise knowledge repetition and enable differing networks and portals to offer thematic or geographical niches.

A major challenge in this regard is that many networks and portals set out with the ambitious aim of becoming ‘the Facebook of climate change’. The power and success of Facebook is due to the very fact that it became the clear and dominant market leader in social media. Extending this example, other networks and portals may play a supporting role, but there can, by definition, be only one Facebook-type portal for climate change knowledge management. A general failure to recognise this reality has led to the ‘portal proliferation’ that serves to undermine each portal’s good intentions by flooding the market with information. This flood of information can be confusing and overwhelming for the target ‘stakeholders’ and ultimately risks being counter-productive. More importantly, the analysis conducted by CDKN concluded that there has been a widespread failure of climate change networks/portals to conduct market research, that is, to identify their target audience at the outset, and then to establish the needs of this target audience, rather than basing the portal’s focus and content on what it is *assumed* are the needs.

In the context of this portal proliferation, the European Commission put out to a tender in 2010 for an African-EU consortium to create a ‘climate change knowledge platform’ for Africa, with 1 million EUR of funding under FP7. This resulted in the launch of the AfriCAN Climate portal in mid-2012.<sup>9</sup> It is described as “a web-based knowledge platform to share climate change research and good practice using multilingual, interdisciplinary climate change knowledge to encourage learning from Africa’s challenges and success stories.” The AfriCAN Climate Portal targets a wide variety of climate change researchers, field practitioners, project developers, development partners, NGOs, local/national governments and farmers’ organisations.

Knowledge on climate change is collected and shared on the portal from a wide range of scientific research and sources of indigenous knowledge, including other FP7 research projects. The portal thus constitutes the principle effort by the EC to communicate climate change research and technology to inform better policy-making and to inspire non-government actors to action.

According to Martha Bissmann, the project manager for AfriCAN Climate at WIP Renewables in Germany, the portal’s main success has been to establish a “rich knowledgebase including different types of content well presented in a user-friendly portal, with high standards of graphic design quality.” Says Bissman: “This has been positively evaluated by the climate change experts on our Editorial Board.” In addition, Bissmann refers to various promotional events, including workshops, technical tours to ‘good practice’ sites and an awards ceremony as successful in bringing together African and European organisations and networks. The portal’s activities have grown in response to

<sup>9</sup> <http://africanclimate.net/>



these offline activities, according to Bissmann. At the same time, Bissmann acknowledged that it has proved challenging to attract external contributions to the knowledge platform, despite sustained efforts, and that the number of content uploads from non-project staff users has been limited. Bissmann suggests that “this reveals the inherent challenge of securing contributions to portal content based on goodwill alone and for the sake of the public good.”

#### Box 5: The case of the AfriCAN Climate portal

**To what extent does the AfriCAN Climate portal aim to influence policy-makers and the private sector in Africa? If this is an aim, then how does the portal make connections between the knowledge it manages and the world of policy formulation it aims to influence? Have these ‘mechanisms of change’ been effective? How do we know?**

“Influencing policy-makers and the private sector definitely is the aim of AfriCAN Climate. The portal disseminates climate change related policy recommendations/policy briefs under the ‘policy’ section of the portal. Any interested user searching for such information in the web will be able to find these through search machines. AfriCAN Climate has a very good Google search rating. Policy recommendations are also being disseminated at various dissemination events where project partners present the project.”

Martha Bissmann, Project Manager, AfriCAN Climate (WIP Renewables, Germany)

While the AfriCAN Climate portal is well-structured and hosts a lot of relevant knowledge, it is unclear to what extent it has achieved its intended outcomes in terms of influencing public policy-making processes and private entrepreneurship. As with most other portals and networks on climate can development, it is clear that its ‘impact’ is assumed to occur through its very existence. Yet experience to date suggests that this is little more than wishful thinking.

We suggest that there is a lack of targeted engagement by research-based knowledge management portals with government Ministries, and a lack of collaboration with key national stakeholders and lobby groups, in particular with influential NGOs. Instead such platforms tend to rely too heavily on research and academic networks, thus limiting the scope for influencing key public and private sector decision makers.

## 6



## CONCLUSIONS

This study started by mapping the landscape of Africa-EU research collaborations on climate change with a focus on FP6 and FP7. We find that there is a weak relationship between the JAES priorities and the focus of climate change research Framework Programme-funded projects. Water and agriculture are very prominent topics in the bi-regional climate change research. Yet these have at best a secondary focus under the JAES action plans for climate change. However, it is evident that there is more emphasis on adaptation projects, which corresponds well with the JAES third priority action on strengthening climate adaptation. In terms of how projects are led and managed, all recent framework-funded climate change research projects have been managed by European-based institutes. This fact appears to be of material consequence in terms of their limited contact with local policy-making and business leader networks.

The second major focus of this study was to conduct a thematic analysis of Africa-EU research collaboration on climate change, in particular, to analyse how projects tend to conceptualise their intended impacts, and how they imagine this change will occur. We argue that the ‘theories of change’ inherent in most framework projects (to the extent they are made explicit) are too simplistic and depend upon linear concepts, as manifested in the predominant logframe approach to project design and management. Many of the respondents in this research focused on the difficulty in targeting key project conclusions or recommendations to the most appropriate audiences. If and when they did manage to engage with ‘target audiences’, then there was often little or no follow-up that would enable project managers to understand the extent to which these key messages had influenced policy-makers or the business community. Knowledge in this regard remains anecdotal, at best. There appears to be a low level of ‘outcome thinking’, which many respondents confused with project ‘outputs’. This is a fundamental issue, and one that appears to explain the paucity of plausible arguments to attribute project outputs to demonstrable outcomes.

Furthermore, we found that statements of ‘intended impact’ are often tantamount to mere aspirations expressed by project designs and managers, which in most cases do little more than offer rhetorical support to wider climate and development targets, such as the MDGs. As such there is generally no explicit explanation of *how* these impacts can, even theoretically, be achieved. Instead there is a significant level of ‘assumed attribution’, that is, broad statements of how the research project’s focus relates to the wider issues and how it contributes knowledge necessary to tackle these challenges vis-à-vis the projects’ aims and objectives. Similarly, there is too much reference to projects aiming to achieve their stated aims and impacts by ‘engaging with a variety of stakeholder’, which is another rhetorical device that is at once politically correct and plausible, though this activity is rarely explained in detail and hence fails to provide a convincing theory, or mechanism, of change.

In short, there is a predominant focus by framework project managers on project outputs that are easier to document and report. Where an ‘interaction with policy-makers’ is mentioned, the precise mechanism by which research outputs can influence policy or practice is rarely explained in detail. As

such, efforts to engage and influence public policy-makers are more often than not an *ad hoc* activity at best, and often little more than a hope or expectation that the research findings will be accessed, understood and taken up by the relevant actors in government or the private sector. In turn, the lack of any clear *mechanisms of change* undermines efforts to reflect upon the project implementation process and question ‘what difference did it make?’ There is also a general lack of follow-up studies to monitor longer-term outcomes of Framework Programme research projects, again reflecting the predominant focus on monitoring, reporting and evaluating the strength of project outputs.

## 7



## RECOMMENDATIONS

This study will help inform the work of CAAST-Net Plus over the next two years (2014-2016), in particular, in designing and implementing specific interventions to tackle some of the issues raised in this report. We recommend this should include the following actions:

- + Stimulate debate on the role and importance of outcome thinking in framework project design, implementation and follow-up to influence projects being designed under Horizon 2020 and in other funding programming.
- + Promote systematic collaboration with civil society and private business lobbying sectors that have expertise in advocating policy change in support of climate technology development and uptake.
- + Rationalise and/or better coordinate existing data platforms in order for Africa-EU partnerships on research and innovation and climate change to 'speak with one voice'. These must be evidence-based processes, that is, informed by original EU-Africa research. EU-Africa research collaborations should seek to cooperate with a select few of the many networks and portals already in existence and that aim to inform the research-policy nexus.
- + Stimulate debate in relevant forums about the proper role and importance of understanding longer-term outcomes of EU-Africa research collaborations and how this could be built into the project design stage.
- + Explore and further develop financing and cooperation models, such as ERAfrica, which allows for more balanced partnership and cooperation.



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## APPENDICES

### Appendix A. Interview guide for project partners

An interview guide is a set of open-ended questions compiled to ensure a modicum of uniformity when interviewing key respondents. It serves as a reminder for the interviewers that the same key issues be raised with all respondents in the interest of comparability. Still, every qualitative, in-depth interview has its own dynamic. Some interviewees are forthcoming and articulate which makes communication easy. In such cases, it may be necessary for interviewers to rein in the interviewees and keep them on track. Others are withdrawn and taciturn, in which case the interviewer may need to be more pro-active and prod to extract the required information. It is the task of the interviewer not only to obtain relevant information, but also to stick to the set of questions listed in the interview guide, although allowing for some flexibility.

An interview guide should be distinguished from a questionnaire, which is used in large sample surveys with a large number of respondents and often contains pre-coded response alternatives. An interview guide is used in qualitative research when the respondents are comparatively few and the questions are digging deeper. The interviewers should take copious notes to be used in the write-up after the interview.

Before embarking on the interview, introduce yourself and state the reason why you are collecting this information. In order to encourage frank discussion, please reassure the interviewee that the information provided will not be traceable back to the respondent but used as the basis of a 'story' about impact. Try to put the respondent at ease and turn the interview into a 'conversation' rather than a formal interview.

The questions below are intended for managers of research projects regarding the perceived impact of research findings. Each main question may need follow-up questions and probing.

1. At the time when your project was granted funding under the EU Framework Programme, the project description contained a statement of expected impact that was used as a criterion of assessment. What were the expected impacts at the start of the project (please specify in as much detail as possible with reference to the text of the project document)?
2. On what 'theories of change' were those expected impacts based? In other words, what notions did you have as the designated project manager about the causal chain from inputs through research activities to outputs, outcomes and eventual long-term, sustainable impact?
3. Who were the principal beneficiaries of your research project? Please specify the categories of beneficiaries.
4. Upon completion of the project [alternatively, into the duration of an on-going project], did your initial expectation of impact hold true? Please specify in detail by type of impact.
5. Did you try to measure impact? If so, by what means/methods did you measure impact? How accurate were those methods?

6. Were you able to attribute the observed impact to your specific research project rather than other intervening factors? If so, how can you be sure about attribution?
7. By what means (journal articles; reports; books; conferences; workshops; policy briefs, etc.) have you disseminated the research findings in order to achieve impact? What were the main means of dissemination and which were given priority and why?
8. What means of dissemination did you find most effective? Please specify.
9. To which constituencies (the research community; policy-makers; civil society organisations; politicians; private sector) did you disseminate the findings? Please specify in detail and state the means of dissemination used.
10. Did you interact with policy-makers? If so, did they or did they not adopt the research findings as evidence in support of their policy formulation or revision and how did you ascertain whether they did so or not? If they did not embrace the research findings, what do you think was the reason?
11. Were the impacts found predominantly in Europe or in Africa? Were the benefits distributed more or less equally between the two continents? Or was there a bias in favour of one over the other? State the reasons for the bias or the balance, as the case might be.
12. Did you interact with civil society organisations with a view to inducing them to make use of your findings in policy formulation and activities? If so, were they receptive to your findings? If not, why did they assume a sceptical attitude?
13. Did you interact directly with the ultimate beneficiaries at the grassroots or only through intermediaries such as policy-makers and civil society organisations? If you interacted directly, what were your experiences? Please elaborate.
14. Did you interact directly with the private sector, i.e. relevant companies? If so, what were your experiences? Please elaborate.
15. Have any of your research findings led to innovations of any kind in the form of tangible commodities or services? Please describe your role, if any, in the commercialisation process.

Based on the responses to the above questions, please write up the 'story' or 'narrative' as conveyed by the research project manager and preferably add your own commentary, if expedient. In doing so, it is critical that you distinguish between the respondent's 'story' and your own comments. Please bear in mind that if the interviewees are unable to say much about the impacts, that is also a significant finding. There is no stipulated length of the 'story' when written up. It could be anything from a couple of pages to perhaps as much as ten, depending on the richness of the material obtained.



## Appendix B. List of project managers and stakeholders contacted

	INTERVIEWEES	MONTH/YEAR INTERVIEWED
1	Dr. Regina Sagoe, Team Leader, ClimAfrica, Ghana	November 2013
2	Prof. Sylvester K. Danuor, Principal Investigator of AMMA and QWeCI, Ghana	November 2013
3	Anthony Basing, Cecilia Dorin Mensah, Ernest Ohene-Asare, and Dr. Ewusie Yeboah, AMMA and QWeCI project beneficiaries, Ghana	November 2013
4	Prof. Arseni Semana, Principal Investigator, AFROMAISON, Uganda	November 2013
5	Dr. Moses Muhumuza, Project Team Member, AFROMAISON, Uganda	November 2013
6	Hon. Alex Ruhunda, Member of Parliament for Fort Portal Municipality, Secretary to the Sectoral Committee on Natural Resources in the Parliament of Uganda	November 2013
7	Prof. Bonfils SAFARI, Project Leader of the MSc in Atmospheric and Climate Science, National University of Rwanda, Rwanda	December 2013
8	Vianney Rugamba, Acting Coordinator, Climate Observatory Secretariat, Rwanda	December 2013
9	Dr Kat Potter, Principal Investigator, Climate Observatory project, Rwanda	December 2013
10	Sujeev Shakya, Team Leader, Cable Car Project, Rwanda	December 2013
11	Tom D'Hayer, Europe-based project manager for AFROMAISON	November 2013
12	Laragh Larsen, Europe-based project manager for Healthy Futures	November 2013
13	Jan Polcher, Europe-based project manager for AMMA	November 2013
14	Martha Bissmann, Europe-based project manager for AfriCAN Climate	January 2014

## Appendix C. The Joint Africa EU Strategy

The Africa-EU bi-regional political priorities and common objectives are expressed in the Joint Africa-EU Strategy from 2007 (JAES), which is a product of the Africa-EU Partnership. The JAES is implemented through successive action plans of which the second action plan 2011-2013 is the most recent, with the first action plan covering the period from 2008-2010 (see Figure 8, an illustrative diagram, overleaf). The analysis of this report is based on information from the first and second action plans which sets out targets within eight areas of cooperation/partnerships, namely;

1. Peace and Security
2. Democratic Governance and Human Rights
3. Trade, Regional Integration and Infrastructure
4. Millennium Development Goals (MDGs)
5. Energy
6. Climate Change and Environment
7. Migration, Mobility and Employment
8. Science, Information Society and Space

The report is written within the context of Partnership 8 on Science, Information Society and Space, but with the thematic focus on Partnership 6: Climate Change and Environment. The report thus focuses on the role and importance of scientific research in helping meet the objectives of Partnership 6.

Partnership 6 is focused on a specific topic, namely climate change and environment, whereas Partnership 8 is more cross-cutting, dealing with the broader subjects of science, the information society and space. The objectives outlined in Partnership 8 are to a large degree built upon the already existing African development goals described in Africa's Science and Technology Consolidated Plan of Action (CPA) from 2005.<sup>10</sup> The CPA consolidates science and technology programmes of the African Union (AU) Commission and the New Partnership for Africa's Development (NEPAD). The priorities in Partnership 8 are therefore closely linked to the common African development goals.

Figure 8 overleaf gives an overview of the Africa-EU partnership and related action plans. It also lists the objectives and expected outcomes in Partnership 6 that are relevant for the focus of this study.

<sup>10</sup> The CPA is replaced by the Science, Technology Innovation Strategy for Africa (STISA-2024).

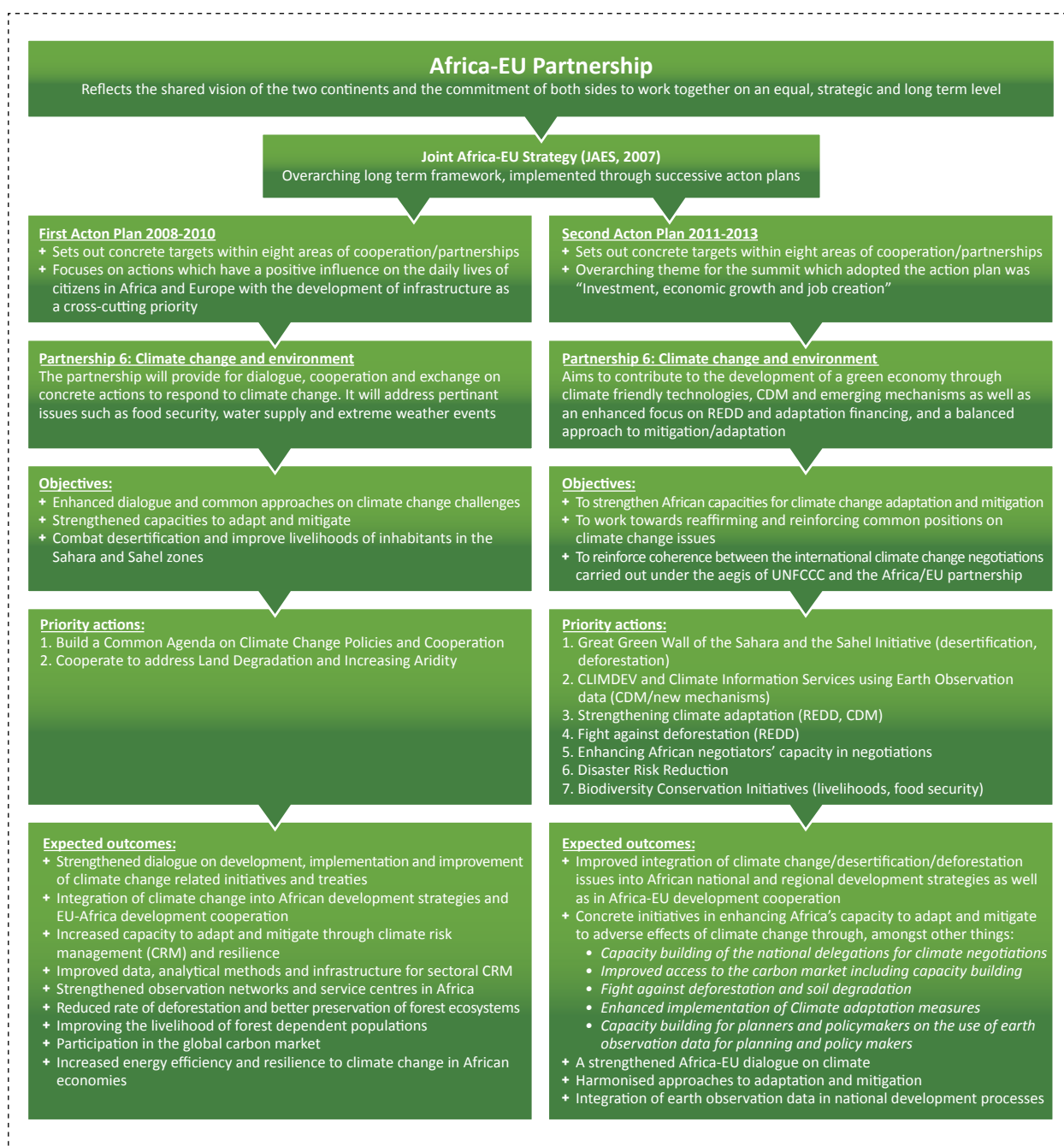


Figure 8: The JAES action plans and partnership 6 priorities.

Sources: African Union-European Union (2007b) and African Union-European Union (2010).

## Appendix D. Africa-EU collaborations on framework projects with a primary focus on climate change

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
AFROMAISON	Africa at a Meso-scale: Adaptive and Integrated Tools and Strategies for Natural Resources Management	Threats to the environment and natural resources, coupled with poor management, have serious implications for both poverty reduction and sustainable economic development. Degrading natural resources in Africa therefore result in an increased vulnerability of the poor as a result of ecosystem stress, competition for space, soaring food and energy prices, climate change and demographic growth. AFROMAISON will make use of what is available regarding INRM and will contribute to a better integration of the components of INRM. The main outputs of AFROMAISON are a toolbox, short-term to long-term strategies, quick wins (many gains with little effort) and operational strategies for adaptation to global change. In order to enhance the potential impact, we will put strong efforts in integrated capacity building and a solid dissemination strategy. In order to do so, we will integrate tools, frameworks, strategies and processes for landscape functioning, livelihood and socio-economic development (incl. vulnerability to global change), local knowledge, institutional strengthening and improved interaction between sectors, scales and communities.	<ul style="list-style-type: none"> <li>+ In order to enhance the potential impact, we will put strong efforts in integrated capacity building and a solid dissemination strategy.</li> <li>+ Integrate tools, frameworks, strategies and processes for landscape functioning, livelihood and socio-economic development (incl. vulnerability to global change), local knowledge, institutional strengthening and improved interaction between sectors, scales and communities.</li> <li>+ Development of concrete operational strategies for adaptation to global change.</li> </ul>
ALERT	Sustainable Management of Water Resources by Automated Real-Time Monitoring	ALERT aims to develop a radically different strategy for monitoring and managing the impact of climatic change and land-use practice on scarce water resources. Innovative ALERT technology will be designed that will allow the near real-time measurement of geoelectric, hydrology and hydro chemical properties, virtually "on demand", thereby giving early warning of potential threats to ecosystems, and vulnerable water systems. The project will focus primarily on coastal zones where aquifers are under threat from over-exploitation, rising sea levels, anthropogenic pollutants and seawater intrusion.	<ul style="list-style-type: none"> <li>+ Providing timely warning of potential threats to vulnerable water systems.</li> <li>+ Developed an innovative strategy for monitoring and managing the impact of climatic change and land-use practices on scarce water resources.</li> <li>+ Develop predictive numerical modelling that could link all components of the hydrological continuum.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
AMMA	African Monsoon Multidisciplinary Analysis	<p>Marked inter-annual variations in recent decades in the region of the West African Monsoon (WAM) have resulted in extremely dry years with devastating environmental and socio-economic impacts. Vulnerability of West African societies to climate variability is likely to increase in the next decades as demands on resources increase due to the rapidly growing population. Motivated by the need to develop strategies to reduce the socioeconomic impacts of climate variability and change in WAM we aim:</p> <ul style="list-style-type: none"> <li>+ To improve our ability to predict the WAM and its impacts on intra-seasonal to decadal timescales, and;</li> <li>+ To improve our ability to predict the consequences of climate change on WAM variability and its impacts.</li> </ul> <p>These objectives will be achieved in the African Monsoon Multidisciplinary/Analysis (AMMA) project by re-enforcing the regional environmental monitoring systems and conducting intensive field campaigns. This will lead to a better understanding of the mechanisms involved and in-fine improve our models and their predictive skills.</p>	<ul style="list-style-type: none"> <li>+ The need to develop strategies to reduce the socioeconomic impacts of climate variability and change in WAM.</li> <li>+ A better understanding of the mechanisms involved.</li> <li>+ Improve our models and their predictive skills.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
ANIMALCHANGE	An Integration of Mitigation and Adaptation Options for Sustainable Livestock Production Under Climate Change	ANIMALCHANGE will provide scientific guidance on the integration of adaptation and mitigation objectives and design sustainable development pathways for livestock production in Europe, in Northern and Sub-Saharan Africa and Latin America. ANIMALCHANGE will inform public policy development in EU27 and propose cooperation programs addressing smallholder livestock farming in selected developing countries. The core analytical spine of the project is a series of coupled biophysical and socio-economic models combined with experimentation.	<ul style="list-style-type: none"> <li>+ Provide scientific guidance on the integration of adaptation and mitigation objectives.</li> <li>+ Design sustainable development pathways for livestock production in Europe, in Northern and Sub-Saharan Africa and Latin America.</li> <li>+ Inform public policy development in EU27 and propose cooperation programs addressing smallholder livestock farming in selected developing countries.</li> <li>+ Provide direct support through the design of an integrated and consistent mitigation and adaptation policy framework for the livestock sector.</li> </ul>
CARBOAFRICA	Quantification, Understanding and Prediction of Carbon Cycle, and other GHG Gases, in Sub-Saharan Africa	The overarching goal of this project is to set up a first attempt of a GHG fluxes monitoring network of Africa, in order to quantify, understand and predict, by a multi-disciplinary integrated approach, GHG emissions in Sub-Saharan Africa and its associated spatial and temporal variability. The existing GHG observations capabilities for fluxes and stocks of carbon, their geographical distribution, the end users requirements for UNFCCC and IPCC guidelines implementation, will be used to design an optimal monitoring system network and the identification of its components.	<ul style="list-style-type: none"> <li>+ Strengthen the capacity of Europe to understand global change process.</li> <li>+ Enhance earth observations systems.</li> <li>+ Promote the integration of the environmental dimension in the social and economic context.</li> <li>+ Support Sub-Saharan African countries on the path of a sustainable development.</li> <li>+ Capacity building activities.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
CARBOCHANGE	Changes in Carbon Uptake and Emissions by Oceans in a Changing Climate	CARBOCHANGE will provide the best possible process-based quantification of net ocean carbon uptake under changing climate conditions using past and present ocean carbon cycle changes for a better prediction of future ocean carbon uptake.	<ul style="list-style-type: none"> <li>+ CARBOCHANGE results are important for the interdisciplinary climate change research community, for the global change impact community, and for decision makers designing and implementing appropriate climate mitigation as well as adaptation measures.</li> <li>+ Results of the project will be summarised and forwarded to policy-makers working on climate change mitigation through specifically targeted outreach papers.</li> <li>+ Update the worldwide general public and not only decision makers about the emerging status of our planet.</li> <li>+ Provide a direct input into designing and enforcing greenhouse gas emission limitations and a respective change in energy production as well as energy use.</li> </ul>
CARBOOCEAN	Marine Carbon Sources and Sinks Assessment	<p>CARBOOCEAN IP aims at an accurate assessment of the marine carbon sources and sinks. The target is to reduce the present uncertainties in the quantification of net annual air-sea CO<sub>2</sub> fluxes by a factor of 2 for the world's oceans and by a factor of 4 for the Atlantic Ocean:</p> <ul style="list-style-type: none"> <li>+ How large are the Atlantic and Southern Ocean CO<sub>2</sub> sinks precisely, i.e. how efficient is the downward transport of carbon in the deep-water production areas of the world ocean?</li> <li>+ What do European rivers and shelf seas contribute to the large scale CO<sub>2</sub> sources and sinks pattern of the North Atlantic Ocean in relation to uptake within Western Europe?</li> <li>+ What are the key biogeochemical feedbacks that can affect ocean carbon uptake and how do they operate?</li> <li>+ What is the quantitative global and regional impact of such feedbacks when forced by climatic change in the next 200 years?</li> </ul>	<ul style="list-style-type: none"> <li>+ Reduce the present uncertainties in the quantification of net annual air-sea CO<sub>2</sub> fluxes.</li> <li>+ Deliver description, process oriented understanding and prediction of the marine carbon sources and sinks.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
CLICO	Climate Change, Hydro-conflicts and Human Security	<p>There are surprisingly few peer-reviewed studies rigorously addressing links between climate change, hydrological systems, conflict and security. CLICO will fill this gap in knowledge over the social dimensions of climate change, by looking whether hydro-climatic hazards intensify social tensions and conflicts in the Mediterranean, Middle East and Sahel, or if they provide a catalyst for cooperation and peace. It will examine why some countries and communities are more vulnerable to droughts, floods and related conflict, and what types of policies and institutions are necessary to ensure adaptation, security and peace in the face of global and regional hydro-climatic change.</p>	<ul style="list-style-type: none"> <li>+ Advance knowledge concerning climate change, peace, and security.</li> <li>+ Link this knowledge to the formulation and implementation of EU policies.</li> <li>+ Improving and integrating hydro-security policy at the international (UN) and EU level, as well as in the cases of three case study countries.</li> <li>+ Recommendations for policy that can improve security and avoid (or productively mediate) social tensions and conflicts.</li> <li>+ Strengthen Inter-disciplinarity.</li> <li>+ Confident that project Potential impact both inside and outside the scientific community is high.</li> </ul>
CLIMAFRICA	Climate Change Predictions in Sub-Saharan Africa: Impacts and Adaptations	<p>There is an urgent need for the most appropriate and up-to-date tools to better understand and predict climate change, assess its impact on African ecosystems and population, and develop the correct adaptation strategies. In particular the current proposal will focus on the following specific objectives:</p> <ul style="list-style-type: none"> <li>+ Develop improved climate predictions on seasonal to decadal climatic scales, especially relevant to SSA;</li> <li>+ Assess climate impacts in key sectors of SSA livelihood and economy, especially water resources and agriculture;</li> <li>+ Evaluate the vulnerability of ecosystems and civil population to inter-annual variations and longer trends (10 years) in climate;</li> <li>+ Suggest and analyse new suited adaptation strategies, focused on local needs;</li> <li>+ Develop a new concept of 10 years monitoring and forecasting warning system, useful for food security, risk management and civil protection in SSA;</li> <li>+ Analyse the economic impacts of climate change on agriculture and water resources in SSA and the cost-effectiveness of potential adaptation measures.</li> </ul>	<ul style="list-style-type: none"> <li>+ Better understand and predict climate change</li> <li>+ Assess its impact on African ecosystems and population.</li> <li>+ Develop the correct adaptation strategies</li> <li>+ Outreach activities will be conducted to raise awareness about climate change and its impact in Africa, increase the visibility of the project, and maximize its effectiveness. They will also ensure accessibility and use of the outputs to interested stakeholders beyond the project lifetime.</li> </ul>



ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
CLIMB	Climate Induced Changes on the Hydrology of Mediterranean Basins: Reducing Uncertainty and Quantifying Risk through an Integrated Monitoring and Modelling system	Modelling capabilities must be improved and appropriate tools developed to advance the capability to assess climate effects on water resources and uses. The project consortium will employ a combination of novel field monitoring concepts, remote sensing techniques, integrated hydrologic (and biophysical) modelling and socioeconomic factor analyses to reduce existing uncertainties in climate change impact analysis and to create an integrated quantitative risk and vulnerability assessment tool. Together, these will provide the necessary information to design appropriate adaptive water resources management instruments and select suitable agricultural practices under climate change conditions. The integrated risk and vulnerability analysis tool will also enable assessment of risks for conflict-inducing actions, e.g. migration. Improvements will be communicated to stakeholders and decision makers in a transparent, easy-to-understand form, enabling them to utilize the new findings in regional water resource and agricultural management initiatives as well as in the design of mechanisms to reduce potential for conflict.	<ul style="list-style-type: none"> <li>+ Reduce existing uncertainties in climate change impact analysis and to create an integrated quantitative risk and vulnerability assessment tool.</li> <li>+ Appropriate adaptive water resources management instruments and suitable agricultural practices under climate change conditions.</li> <li>+ Enable assessment of risks for conflict-inducing actions, e.g. migration.</li> <li>+ Improvements will be communicated to stakeholders and decision makers in a transparent, easy-to-understand form, enabling them to utilize the new findings in regional water resource and agricultural management initiatives as well as in the design of mechanisms to reduce potential for conflict.</li> </ul>
CLIM-RUN	Climate Local Information in the Mediterranean Region: Responding to User Needs	CLIM-RUN aims at developing a protocol for applying new methodologies and improved modelling and downscaling tools for the provision of adequate climate information at regional to local scale that is relevant to and usable by different sectors of society (policymakers, industry, cities, etc.). Differently from current approaches, CLIM-RUN will develop a bottom-up protocol directly involving stakeholders early in the process with the aim of identifying well defined needs at the regional to local scale.	<ul style="list-style-type: none"> <li>+ Develop a protocol for applying new methodologies and improved modelling and downscaling tools for the provision of adequate climate information at regional to local scale that is relevant to and usable by different sectors of society (policymakers, industry, cities, etc.).</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
CLUVA	Climate Change and Urban Vulnerability in Africa	<p>The overall objective of CLUVA is to develop methods and knowledge to be applied to African cities to manage climate risks, to reduce vulnerabilities and to improve coping capacity and resilience towards climate changes. CLUVA will assess the environmental, social and economic impacts and the risks of climate change induced hazards expected to affect urban areas (floods, sea-level rise, storm surges, droughts, heat waves, desertification, storms and fires) at various time frames. The project will develop innovative climate change risk adaptation strategies based on strong interdisciplinary components.</p>	<ul style="list-style-type: none"> <li>+ Provide researchers and governments of African cities with information on “outcome vulnerability”, as considered in the climate change community, and “contextual vulnerability”, as considered in the hazard and disaster community.</li> <li>+ Scientific and technological innovation of African institutions.</li> <li>+ Help African cities to manage climate risk, to reduce vulnerability and to improve coping capacity and resilience towards climate change.</li> <li>+ Provide policy-makers with tools for the development of urban structures resilient towards climate change.</li> <li>+ Advance in significant terms research capacity in Africa with long lasting effects.</li> <li>+ Build up of research groups of excellence in five African countries.</li> <li>+ Improvement in significant ways of the capacity of European partners to work in the African context.</li> <li>+ Capacity building will be fostered at local level for sustainable African cities development, linking adaptation and mitigation measures and improving livelihoods and quality of life for the urban population.</li> </ul>

## ACRONYM

## FULL NAME

## OBJECTIVE STATEMENT

## INTENDED IMPACTS

DEWFORA

Improved Drought  
Early Warning  
and Forecasting  
to Strengthen  
Preparedness and  
Adaptation to  
Droughts in Africa

The principal aim of the DEWFORA proposal is to develop a framework for the provision of early warning and response to mitigate the impact of droughts in Africa. The proposal has been built to archive three key targets:

- + Improved monitoring: by improving knowledge on drought forecasting, warning and mitigation, and advancing the understanding of climate related vulnerability to drought - both in the current and in the projected future climate.
- + Prototype operational forecasting: by bringing advances made in the project to the pre-operational stage through development of prototype systems and piloting methods in operational drought monitoring and forecasting agencies.
- + Knowledge dissemination: through a stakeholders platform that includes national and regional drought monitoring and forecasting agencies, as well as NGO's and IGO's, and through capacity building programmes to help embed the knowledge gained in the community of African practitioners and researchers.

- + Foster understanding of how response to early warning can adverse the impact of droughts.
- + More effective early warnings.
- + Help affected societies become more resilient to drought hazard.
- + Through close interaction with stakeholders that include scientists, water management agencies and policy-makers, the uptake of advances made is encouraged.

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
ENTTRANS	The Potential of Transferring and Implementing Sustainable Energy Technologies through the Clean Development Mechanism of the Kyoto Protocol	<p>The objective of ENTTRANS was to analyse how transfer of sustainable energy technologies to developing countries could be supported through the clean development mechanism (CDM) of the Kyoto Protocol. The proposed study will carry out the following activities:</p> <ul style="list-style-type: none"> <li>+ Conduct an extensive overview and evaluation of the state of play with the CDM, such as CDM funding programmes established by investor country governments and private sector entities, policy initiatives undertaken by developing countries for hosting CDM projects, GHG accounting methodologies approved by the CDM Executive Board, potential barriers to CDM project implementation, and the appropriate financial mechanisms.</li> <li>+ Prepare an assessment of the state-of-play regarding the three technology options: decentralised electricity production systems, efficiency improvement of fuel switch, and CO<sub>2</sub> capture and storage.</li> <li>+ Combining the analysis under 1) and 2) by exploring requirements for energy technology diffusion to developing countries and the extent to which the CDM could support this process.</li> <li>+ Dissemination of the results from 1-3 to policy-makers in the EU and in developing countries.</li> </ul>	<ul style="list-style-type: none"> <li>+ Support the work of, e.g. the Expert Group on Technology Transfer of the UNFCCC and individual countries when assessing their technology transfer and CDM policies both at the side of investor countries and developing countries.</li> <li>+ Overall support to building awareness in the case-study countries of technology transfer aspects and the CDM contribution to sustainable development.</li> <li>+ Delivered two specific tools to support international policy and decision-making.</li> </ul>
FOCX	Fog Induced Carbon Dioxide Fluxes in Biological Soil Crust Dominated Desert Ecosystems	<p>The terrestrial carbon cycle and land-atmosphere carbon dioxide fluxes are central issues of recent political and scientific efforts to understand and compete with the potential hazards of uncontrolled anthropogenic impacts on the Earth's climate. The proposed research aims to implement carbon dioxide flux measurements in Biological Soil Crust (BSC) dominated ecosystems. The results would be useful to:</p> <ul style="list-style-type: none"> <li>+ Assess the contribution of BSC to carbon dioxide fluxes in different arid land ecosystems,</li> <li>+ Evaluate the profit gained with BSC growth relative to the conservation of soil carbon stocks as compared with disturbed arid lands, and</li> <li>+ Finally, to provide improved information for policy and land use management with respect to a growing population in arid lands.</li> </ul>	<ul style="list-style-type: none"> <li>+ Understand and compete with the potential hazards of uncontrolled anthropogenic impacts on the Earth's climate.</li> <li>+ Provide improved information for policy and land use management with respect to a growing population in arid lands.</li> </ul>

## ACRONYM

## FULL NAME

## OBJECTIVE STATEMENT

## INTENDED IMPACTS

FUME

Forest Fires under Climate, Social and Economic Changes in Europe, the Mediterranean and other Fire-affected Areas of the World

Forest fires are a result of complex interactions between climatic, biological and socioeconomic factors operating at various scales. FUME aims to improve our understanding of forest fires in a context of global change that encompasses these interacting elements. The ultimate goal of FUME is to increase our understanding of how these three components interact to affect forest fires in order to better quantify the impacts of such human driven changes on future fire risk, fire regime and vegetation, among other.

- + Adaptation of current fire prevention and suppression plans and protocols to climate and socioeconomic changes will be proposed in collaboration with stakeholders.
- + Minimum requirements, common to the different collected plans in EU countries, will be defined for adaptation to future climate and fire scenarios.
- + Provide the scientific basis for the development of a decision support service for post-fire restoration.
- + Assessing the consequences of future fire-risk scenarios on policy costs and carbon prices for the EU mitigation policy.
- + Better quantification of the impacts of future climate, social and economic changes on fire regime, on the landscape, and on vegetation.
- + Identify future vulnerabilities of plants and ecosystems to cope with fire under ongoing global change.

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
GATEWAYS	Multi-level Assessment of Ocean-climate Dynamics: a Gateway to Interdisciplinary Training and Analysis	<p>GATEWAYS will conduct interdisciplinary climate change research on an ocean regime of regional and global significance:</p> <ul style="list-style-type: none"> <li>+ The Agulhas Current off southern Africa. GATEWAYS will test the sensitivity of the Agulhas Current to changing climates of the past;</li> <li>+ The current's influence on southern Africa climates;</li> <li>+ Buoyancy transfer to the Atlantic by Agulhas leakage around southern Africa; and</li> <li>+ Modulation of the Atlantic circulation by the leakage. Courses on project management, data processing and communication techniques will foster generic complementary skills.</li> </ul> <p>Secondments, longer stays at partner institutes and internships at SME partners add to the training. ESR and ER will acquire a solid knowledge in their own specialty field;</p> <ul style="list-style-type: none"> <li>+ A firm multi-level grounding in the marine and climate sciences;</li> <li>+ Proficiency in analytical procedures and high-end numerical data processing and modelling, and;</li> <li>+ Managerial skills to design and carry out research in an efficient and pragmatic way.</li> </ul>	<ul style="list-style-type: none"> <li>+ Provide training in proficient transfer of information between the academic and private sectors.</li> <li>+ Schools/workshops will deepen the insight gained and stimulate Network-wide discussion.</li> </ul>
GEO-BENE	Global Earth Observation - Benefit Estimation: Now, Next and Emerging	<p>The "Global Earth Observation - Benefit Estimation: Now, Next and Emerging" (GEO-BENE) project's objective is to develop methodologies and analytical tools to assess societal benefits of GEO. Global Earth Observations are instrumental to attain sustainable development goals and are major drivers of how the society - technology - environment system is managed. An integrated economic, social and environmental assessment of the nine benefit areas of GEO has not yet been carried out.</p>	<ul style="list-style-type: none"> <li>+ To support the international negotiation processes connected to these areas (Disaster, Health, Energy, Climate, Water, Weather, Ecosystems, Agriculture and Biodiversity).</li> <li>+ Development of good policies.</li> </ul>

## ACRONYM

## FULL NAME

## OBJECTIVE STATEMENT

## INTENDED IMPACTS

GEOCARBON

Operational Global  
Carbon Observing  
System

Today, countries use a wide variety of methods to monitor the carbon cycle and it is difficult to compare data from country to country and to get a clear global picture. Decision makers need now more than ever systematic, consistent and transparent data, information and tools for an independent and reliable verification process of greenhouse gas emissions and sinks.

Specific objectives of the GEOCARBON project are:

- + Provide an aggregated set of harmonized global carbon data information (integrating the land, ocean, atmosphere and human dimension).
- + Develop improved Carbon Cycle Data Assimilation Systems (CCDAS).
- + Define the specifications for an operational Global Carbon Observing System.
- + Provide improved regional carbon budgets of Amazon and Central Africa.
- + Provide comprehensive and synthetic information on the annual sources and sinks of CO<sub>2</sub> for the globe and for large ocean and land regions.
- + Improve the assessment of global CH<sub>4</sub> sources and sinks and develop the CH<sub>4</sub> observing system component.
- + Provide an economic assessment of the value of an enhanced Global Carbon Observing System
- + Strengthen the effectiveness of the European (and global) Carbon Community participation in the GEO system.

- + An independent and reliable verification process of greenhouse gas emissions and sinks.
- + Compare data from country to country and to get a clear global picture.

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
GLOWASIS	A Collaborative Project aimed at Pre-validation of a GMES Global Water Scarcity Information Service	The main objective of the proposed project GLOWASIS is to pre-validate a GMES Global Service for Water Scarcity Information. In European and global pilots on the scale of river catchments, it will combine in-situ and satellite derived water cycle information and more government ruled statistical water demand data in order to create an information portal on water scarcity. By combining complex water cycle variables, governmental issues and economic relations with respect to water demand, GLOWASIS will aim for the needed streamlining of the wide variety of important water scarcity information.	<ul style="list-style-type: none"> <li>+ GLOWASIS' information will contribute both in near-real time reporting for emerging drought events as well as in provision of climate change time series.</li> <li>+ Aim for the needed streamlining of the wide variety of important water scarcity information.</li> <li>+ A portal which can be used by different end users and contains viewable and downloadable data to be used in either policy-making or scientific research or for the public interest.</li> <li>+ Create awareness for the complexity of water scarcity research.</li> <li>+ Create impact on the scale of EC policy-makers, water managers (river catchment agencies), international meteorological and research institutes.</li> </ul>



ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
GREENSEAS	Development of Global Plankton Data Base and Model system for Eco-climate Early Warning	<p>GreenSeas shall advance the quantitative knowledge of how planktonic marine ecosystems, including phytoplankton, bacterioplankton and zooplankton, will respond to environmental and climate changes. The focus will be on capturing the latitudinal gradients, biogeographical distributions and provinces in the planktonic ecosystem from the Arctic, through the Atlantic and into the Southern Ocean. The heart of the GreenSeas concept is establishing a 'core' service following the open and free data access policy implemented in the Global Monitoring for Environment and Security (GMES) programme. Connecting with 'downstream' services GreenSeas will moreover offer ecosystem assessment and indicator reports tailored for decision makers, stakeholders and other user groups contributing in the policy-making-process. Finally, knowledge transfer will be guaranteed throughout the project lifetime, while the legacy of the GreenSeas database web-server will be maintained for at least 5 years beyond the project lifetime.</p>	<ul style="list-style-type: none"> <li>+ Provide the European Commission (EC) with an increased understanding of the impacts of climate change on planktonic ecosystems.</li> <li>+ Advance the quantitative knowledge of how planktonic marine ecosystems.</li> <li>+ Enhance international cooperative links with other plankton monitoring and analysis surveys around the globe.</li> <li>+ Ecosystem assessment and indicator reports tailored for decision makers, stakeholders and other user groups contributing in the policy-making process.</li> <li>+ Understanding of uncertainties, so that impacts and risk to ecosystem status and sustainable welfare can be adequately assessed.</li> <li>+ Delivering new insights in key environmental domains such as climate change and fisheries.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
HEALTHY FUTURES	Health, Environmental Change and Adaptive Capacity: Mapping, Examining and Anticipating Future Risks of Water-related Vector-borne Diseases in Eastern Africa	The HEALTHY FUTURES project is motivated by concern for the health impacts of environmental changes. HEALTHY FUTURES aims to respond to this concern through construction of a disease risk mapping system for three water-related high-impact VBDs (malaria, Rift Valley Fever and schistosomiasis) in Africa, accounting for environmental/climatic trends and changes in socio-economic conditions to predict future risk.	<ul style="list-style-type: none"> <li>+ Improved understanding of links between environment (including climate) and disease.</li> <li>+ Strengthened early-warning systems.</li> <li>+ More effective implementation of policies on climate change and health in the study area. The project supports implementation of several key policies and strategies relating to environment and health.</li> <li>+ Enhanced capacity in the study area through the provision of opportunities for funded postgraduate research, training and networking.</li> </ul>
IMPACT2C	Quantifying Projected Impacts Under 2°C Warming	Political discussions on the European goal to limit global warming to 2°C demands that discussions are informed by the best available science on projected impacts and possible benefits. IMPACT2C enhances knowledge, quantifies climate change impacts, and adopts a clear and logical structure, with climate and impacts modelling, vulnerabilities, risks and economic costs, as well as potential responses, within a pan-European sector based analysis. IMPACT2C utilises a range of models within a multi-disciplinary international expert team and assesses effects on water, energy, infrastructure, coasts, tourism, forestry, agriculture, ecosystems services, and health and air quality-climate interactions.	<ul style="list-style-type: none"> <li>+ Political discussions on the European goal to limit global warming to 2°C are informed by the best available science on projected impacts and possible benefits.</li> <li>+ Enhanced knowledge.</li> <li>+ IMPACT2C integrates and synthesises project findings suitable for awareness raising and are readily communicable to a wide audience, and relevant for policy negotiations.</li> </ul>

## ACRONYM

## FULL NAME

## OBJECTIVE STATEMENT

## INTENDED IMPACTS

I-REDD+

Impacts of Reducing Emissions from Deforestation and Forest Degradation and Enhancing Carbon Stocks

The overall objective will be to obtain an improved understanding of how the implementation of REDD+ mechanisms may:

- + Reduce emissions of GHG and maintain or enhance existing stocks of carbon in vegetation and soil of various land cover types;
- + Impact livelihoods and welfare of local farming communities and differences between communities;
- + Impact biodiversity conservation, and;
- + Provide a realistic framework for monitoring, reporting and verification of REDD+, including the importance of governance and accountability at multiple levels.

- + Understanding and monitoring the impact of REDD+ activities on climate effectiveness, cost efficiency, equity and co-benefits.
- + Strong emphasis on local dissemination and capacity development in order to ensure that project results influence REDD+ policy development at local, national and global level.

LUPIS

Land use Policies and Sustainable Development in Developing Countries

The proposed project will develop integrated assessment tools for sustainable development for application by scientists in a selected number of developing countries. Attention will be given to both natural and agricultural ecosystems.

The project provides assessment procedures that enable documentation and understanding on impacts of land use policies on sustainable development, taking into account multi-functionalities and European policy options on biodiversity, climate and trade. More, specifically, the project will include the following actions:

- + Design of an analytical framework to assess the impact of land use policies on the sustainable development of developing countries;
- + Identify the key driving forces for the utilization of land and their impacts on sustainable development and externalities;
- + Tools developed in SENSOR and SEAMLESS will be used both as building blocks in and guidelines for this project;
- + Select, adapt and apply tools for understanding, planning and forecasting the impacts of land use policies. Multifunctional land use and European and developing country policy options are taken into consideration.
- + Define indicators and explore their thresholds in the context of sustainable development.
- + Enhance existing knowledge in the field of data management.

- + Identify the key driving forces for the utilization of land and their impacts on sustainable development and externalities.
- + Select, adapt and apply tools for understanding, planning and forecasting the impacts of land use policies.
- + Enhance existing knowledge in the field of data management.

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
MACIS	Minimisation of and Adaptation to Climate Change: Impacts on Biodiversity	<p>MACIS will review and meta-analyse the existing projections of climate change impacts on biodiversity. It will assess the available options to prevent and minimise negative impacts for the EU25 up to 2050 and review the state-of-the-art on methods to assess the probable future impacts of climate change on biodiversity. This includes the review of possible climate change adaptation and mitigation measures and their potential effect on future biodiversity. MACIS wants to further develop a series of biodiversity and habitat models that address biodiversity impacts, and are capable of calculating the consequences of the changes in the trends in drivers as specified by the narrative scenarios provided by the IPCC. MACIS will identify policy options at EU, MS, regional and local levels to prevent and minimise negative impacts from climate change and from climate change adaptation and mitigation measures.</p>	<ul style="list-style-type: none"> <li>+ Calculating the consequences of the changes in the trends in drivers as specified by the narrative scenarios provided by the IPCC.</li> <li>+ Identify policy options at EU, MS, regional and local levels to prevent and minimise negative impacts from climate change and from climate change adaptation and mitigation measures.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
MEDPRO	Prospective Analysis for the Mediterranean Region	<p>The MEDPRO project will undertake a deep foresight analysis of the development issues in eleven countries in the Southern and Eastern Mediterranean participating in the Barcelona process and in the Union for the Mediterranean. The project will undertake an analysis of the current state and prospective development in main areas of socio-economic development:</p> <ul style="list-style-type: none"> <li>+ Geopolitics and governance;</li> <li>+ Demography, ageing, migration, health and gender issues;</li> <li>+ Sustainable development, management of resources, adaptation to global warming;</li> <li>+ Energy and climate change mitigation;</li> <li>+ Economic development, trade and investment, and;</li> <li>+ Financial services and capital markets and human capital, education and development of skills.</li> </ul> <p>It will then bring the partial foresight analyses in these areas into a broader framework of quantitative general equilibrium modelling, and be completed with qualitative scenarios for regional and broader integration within the region and with the EU and policy conclusions for the EU approach. Whereas the main objective is to provide targeted scientific support to the future development of the relations between the EU and the Mediterranean region, the impact of this project will be underpinned by an exceptional effort of dissemination in both the EU and the Southern and Eastern Mediterranean countries.</p>	<ul style="list-style-type: none"> <li>+ Provide targeted scientific support to the future development of the relations between the EU and the Mediterranean region.</li> <li>+ Help the reform process undertaken both in the MED11 as well as regarding the EU's policies towards the region.</li> <li>+ Reinforce the Euro-Mediterranean research links.</li> <li>+ Assesses and clarify the issues facing the EU and the MED11 countries in the formulation and implementation of policies.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
MedSeA	MEDiterranean Sea Acidification in a Changing Climate	The MedSeA project addresses ecologic and economic impacts from the combined influences of anthropogenic acidification and warming, while accounting for the unique characteristics of this key region. MedSeA will forecast chemical, climatic, ecological-biological, and socio-economical changes of the Mediterranean driven by increases in CO <sub>2</sub> and other greenhouse gases, while focusing on the combined impacts of acidification and warming on marine shell and skeletal building, productivity, and food webs.	<ul style="list-style-type: none"> <li>+ Inform ongoing debate on the role of the basin's thermohaline circulation and export production on the uptake of anthropogenic carbon.</li> <li>+ Identify the regions of the Mediterranean Sea that are expected to be more vulnerable to acidification under future climate scenarios.</li> <li>+ Enhanced understanding of the current and future dynamics and vulnerability of the Mediterranean marine carbonate system.</li> <li>+ Projection of potential changes to services related to the ecosystems and species.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
MEECE	Marine Ecosystem Evolution in a Changing Environment	MEECE is a scientific research project which aims to use a combination of data synthesis, numerical simulation and targeted experimentation to further our knowledge of how marine ecosystems will respond to combinations of multiple climate change and anthropogenic drivers. With an emphasis on the European Marine Strategy (EMS), MEECE will improve the decision support tools to provide a structured link between management questions and the knowledge base that can help to address those questions. A strong knowledge transfer element will provide an effective means of communication between end-users and scientists.	<ul style="list-style-type: none"> <li>+ Improve the decision support tools to provide a structured link between management questions and the knowledge base that can help to address those questions.</li> <li>+ Develop decision support tools, which assess key vulnerabilities and risks of global change for the marine ecosystem.</li> <li>+ A strong knowledge transfer element will provide an effective means of communication between end-users and scientists.</li> <li>+ MEECE places a strong emphasis on knowledge transfer to society, through the dissemination of research-based knowledge, expertise and skills to stakeholders.</li> <li>+ The great challenge is to ensure the outputs of MEECE contribute to the process of both defining and evaluating indicators of good ecological status.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
NITROEUROPE IP	The Nitrogen Cycle and its Influence on the European Greenhouse Gas Balance	<p>The NitroEurope IP (or NEU for short) addresses the major question: What is the effect of reactive nitrogen (Nr) supply on net greenhouse gas budgets for Europe? The objectives are to:</p> <ul style="list-style-type: none"> <li>+ Establish robust datasets of N fluxes and net greenhouse-gas exchange (NGE) in relation to C-N cycling of representative European ecosystems, as a basis to investigate interactions and assess long-term change;</li> <li>+ Quantify the effects of past and present global changes (climate, atmospheric composition, land-use/land-management) on C-N cycling and NGE;</li> <li>+ Simulate the observed fluxes of N and NGE, their interactions and responses to global change/land-management decisions, through refinement of plot-scale models;</li> <li>+ Quantify multiple N and C fluxes for contrasting European landscapes;</li> <li>+ Scale up Nr and NGE fluxes for terrestrial ecosystems to regional and European levels, and;</li> <li>+ Assess uncertainties in the European model results and use these together with independent measurement/inverse-modelling approaches for verification of European N<sub>2</sub>O and CH<sub>4</sub> inventories and refinement of IPCC approaches.</li> </ul>	<ul style="list-style-type: none"> <li>+ Verification of European N<sub>2</sub>O and CH<sub>4</sub> inventories and refinement of IPCC approaches.</li> <li>+ Advance the fundamental understanding of C-N interactions at different scales.</li> </ul>



ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
QWECI	Quantifying Weather and Climate Impacts on Health in Developing Countries	<p>The QWeCI project thus aims to understand at a more fundamental level the climate drivers of the vector-borne diseases of malaria, Rift Valley Fever, and certain tick-borne diseases, which all have major human and livestock health and economic implications in Africa, in order to assist with their short-term management and make projections of their future likely impacts. QWeCI will develop and test the methods and technology required for an integrated decision support framework for health impacts of climate and weather. Uniquely, QWeCI will bring together the best in world integrated weather/climate forecasting systems with health impacts modelling and climate change research groups in order to build an end-to-end seamless integration of climate and weather information for the quantification and prediction of climate and weather on health impacts in Africa.</p>	<ul style="list-style-type: none"> <li>+ Develop an effective knowledge exchange programme which is coupled with the development of decision support systems to maximise the impacts of the research outcomes on societies in Africa.</li> <li>+ Continued use of the integrated systems produced within the project in the countries where they are developed and the uptake of the systems that will be flexible for modification, for use elsewhere in other regions and countries in Africa and beyond.</li> <li>+ Foster synergy and encourage capacity building through exchange of knowledge within the consortium.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
REDDAF	Reducing Emissions from Deforestation and Degradation in Africa	<p>A group of developing countries initiated a process at the UNFCCC Conference of Parties (COP-11) in 2005 to address the issue of reducing emissions from deforestation and degradation (REDD), that would be implemented as a post-Kyoto Protocol mechanism. Countries have been encouraged to develop REDD Pilot Projects to assess the feasibility of such a mechanism. REDDAF aims to develop pre-operational forest monitoring services in two Congo Basin countries that are actively involved in the REDD process. The main activities proposed are:</p> <ul style="list-style-type: none"> <li>+ Stakeholder Analysis: country specific user requirements to identify the needs of stakeholders in terms of instituting REDD projects;</li> <li>+ Carbon stock accounting: research and development of methods for improved EO/ in-situ data applications to estimate the real extent of deforestation and forest degradation as well as biomass per unit area, and;</li> <li>+ Technology Transfer/Capacity Building to the country: activities to ensure that project results, methodologies and lessons learned are provided in a manner to best support the work of national and regional counterparts.</li> </ul>	<ul style="list-style-type: none"> <li>+ Provide improved methodologies.</li> <li>+ Support the development of operational service chains, which can be scaled up to national level and therefore, contribute to the current national REDD+ MRV activities.</li> <li>+ Offer cost-effective methods with known certainty levels for products and services development.</li> <li>+ Develop customised products and services that are compliant to international standards and norms and can be easily integrated into the working cycles of the users.</li> <li>+ Dissemination and training to ensure that the methods and techniques developed are transferred to the user and to a wider external audience through seminars, workshops, and publications.</li> <li>+ Involvement of the user community and the subsequent transfer of the developed methods and techniques.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
REDD-ALERT	Reducing Emissions from Deforestation and Degradation through Alternative Land-uses in Rainforests of the Tropics	Addressing deforestation in tropical areas: greenhouse gas emissions, socio-economic drivers and impacts, and policy options for emissions reduction. The overall goal of the project is to contribute to the development and evaluation of mechanisms and the institutions needed at multiple levels for changing stakeholder behaviour to slow tropical deforestation rates and hence reduce GHG emissions. This will be achieved through enhancing our understanding of the social, cultural, economic and ecological drivers of forest transition in selected case study areas in Southeast Asia, Africa and South America. This understanding will facilitate the identification and assessment of viable policy options addressing the drivers of deforestation and their consistency with policy approaches on avoided deforestation, such as Reduced Emissions from Deforestation and degradation (REDD), currently being discussed in UNFCCC and other relevant international fora. At the same time, ways of improving the spatial quantification of land use change and the associated changes in GHG fluxes will be developed, thereby improving the accounting of GHG emissions resulting from land use change in tropical forest margins and peatlands. This will allow the analysis of scenarios of the local impacts of potential international climate change policies on GHG emission reductions, land use, and livelihoods in selected case study areas, the results of which will be used to develop new negotiation support tools for use with stakeholders at international, national and local scales to explore a basket of options for incorporating REDD into post-2012 climate agreements. The project will provide a unique link between international policy-makers and stakeholders on the ground, who will be required to change their behaviour regarding deforestation, thereby contributing to well-informed policy-making at the international level.	<ul style="list-style-type: none"> <li>+ Change stakeholder behaviour to slow tropical deforestation rates and hence reduce GHG emissions.</li> <li>+ Develop new negotiation support tools for use with stakeholders at international, national and local scales.</li> <li>+ Provide a unique link between international policy-makers and stakeholders on the ground</li> <li>+ Contribute to well-informed policy-making at the international level.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
SWEETFUEL	Sweet Sorghum: an Alternative Energy Crop	Increasing world market prices for fossil fuels, driven by limited reserves, growing demand and instability in producing regions, now render renewable fuels economical. Such fuels are also a pathway to reducing GHG emissions and mitigating climate change. This project will breed for improved cultivars and hybrids of sorghum for temperate, tropical semi-arid and tropical acid-soil environments by pyramiding in various combinations, depending on region and ideotype, tolerance to cold, drought and acid (Al-toxic) soils, and high production of stalk sugars, easily digestible biomass and grain (WP 1-3).	<ul style="list-style-type: none"> <li>+ Provide a multicriteria evaluation of the sustainability of the sweet sorghum production and use routes.</li> <li>+ Provide a full appreciation of the various impacts of the sweet sorghum production and use chains and alternative production.</li> <li>+ Assess ethical risks generated by the development of ethanol production from sweet sorghum in the target environments.</li> <li>+ Sensitise beneficiaries to the impacts of their research at different levels (scientists, policy-makers, stake holders, end users).</li> <li>+ Development of the production of bioethanol from sweet sorghum.</li> <li>+ Maintain a close dialogue with all stakeholders through the organisation of dedicated local workshops in all WPs engaged.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
SWUP-MED	Sustainable Water use Securing Food Production in Dry Areas of the Mediterranean Region	<p>The strategic objective of the project is to improve food crop production in the Mediterranean region, influenced by multiple abiotic stresses. These stresses are becoming even more pronounced under changing climate, predicted to result in drier conditions, increasing temperatures, and greater variability, causing desertification. The project will work mainly in farmers communities to improve farming systems, by strengthening a diversified crop rotation and using marginal-quality water for supplemental irrigation, aiming at:</p> <ul style="list-style-type: none"> <li>+ Introducing and test new climate-proof crops and cultivars with improved stress tolerance;</li> <li>+ Selecting promising varieties of cereals, grain legumes and new crops;</li> <li>+ Climate-proof traits will be identified for breeding programmes using advanced physiological and biochemical screening tools;</li> <li>+ Supplemental irrigation will be performed as deficit irrigation by different sources of water;</li> <li>+ Investigate the sustainable field applicability of the farming systems, such as environmental effects related to irrigation water quality assessed by monitoring groundwater and soil quality, and;</li> <li>+ Financial implications for the farmer and economic costs and benefits in the food sector will be analysed.</li> </ul>	<ul style="list-style-type: none"> <li>+ Improve food crop production in the Mediterranean region.</li> <li>+ Improve farming systems.</li> <li>+ Introduce and test new climate-proof crops and cultivars with improved stress tolerance, selecting promising varieties of cereals, grain legumes and new crops.</li> <li>+ Financial implications for the farmer and economic costs and benefits in the food sector will be analysed.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
UNDESERT	Understanding and Combating Desertification to Mitigate its Impact on Ecosystem Services	<p>UNDESERT aims at combating desertification and land degradation in order to mitigate their impacts on ecosystem services, and following on human livelihoods. The West African region is central for understanding desertification and degradation processes, which are already severe and widespread as a consequence of climate change and human impact. Decision support models and tools will be developed and introduced to natural resource managers. UNDESERT also includes two very practical aspects:</p> <ul style="list-style-type: none"> <li>+ Restoration through tree plantations, which will be certified for CO2 marketing as the first restoration site in West Africa, and;</li> <li>+ Ecosystem management based on scientific data and best practices developed in close collaboration between scientists and local communities.</li> </ul>	<ul style="list-style-type: none"> <li>+ Combating desertification and land degradation in order to mitigate their impacts on ecosystem services, and following on human livelihoods.</li> <li>+ Contribute to the implementation of relevant international strategies, initiatives and commitments of the EU and African countries.</li> </ul>
VEG-I-TRADE	Impact of Climate Change and Globalisation on Safety of Fresh Produce Governing a Supply Chain of Uncompromised Food Sovereignty	<p>VEG-I-TRADE provides platforms to identify impacts of anticipated climate change and globalisation on food safety, microbiological and chemical hazards, of fresh produce and derived food products. Control measures of managerial and technological nature will be developed in the supply chain of crop production, post-harvest processing and logistics to minimize food safety risks.</p>	<ul style="list-style-type: none"> <li>+ Minimize food safety risks.</li> <li>+ Recommendations on European and global level on quality assurance and the setting of science-based performance objectives.</li> <li>+ Stakeholders in the global food chain reflecting on issues of acceptable risk, sustainability of fresh produce production and long term strategy of international food trade, while making no compromise in food safety for European consumers and in respectation of food sovereignty.</li> <li>+ Risk communication to increase awareness of trade partners production systems and the uneven consumer behaviour will provide key conditions for prioritisation of risk management strategies.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
WADI	Sustainable Management of Mediterranean Coastal Fresh and Transitional Water Bodies: a Socio-economic and Environmental Analysis of Changes and Trends to Enhance and Sustain Stakeholders benefits	Management decisions of fresh water resource are generally driven by the urgency of recent changes in the human (globalisation) and natural (climatic changes) contexts. However, the local context, which is most sensitive to human impact, is often neglected, resulting in conflict. The project aims at encouraging the rational and sustainable use of fresh and transitional water resources within the Mediterranean coastal area, which experiences freshwater scarcity, through participatory approaches. Fresh water bodies in coastal areas, essentially where large demographic concentrations occur, are particularly at risk of negative impacts, risks and threats, both natural and anthropogenic. Water management measures may affect ecosystem viability and sustainable resource production, which in turn may have a negative influence on Mediterranean human populations, sustained economic growth and development.	<ul style="list-style-type: none"> <li>+ Encouraging the rational and sustainable use of fresh and transitional water resources within the Mediterranean coastal area.</li> <li>+ The specific role of women as end-users of water will be a main focus and special attention will be given to their involvement in the local dissemination of the project findings and results.</li> <li>+ Increase awareness and collaboration among the actors for the conservation of freshwater resources and their sustainable use for the benefit of the community at large, particularly of those who have little voice in the local communities.</li> </ul>
WAHARA	Water Harvesting for Rainfed Africa: Investing in Dryland Agriculture for Growth and Resilience	WAHARA will take a transdisciplinary approach to develop innovative, locally adapted water harvesting solutions with wider relevance for rain-fed Africa. Water harvesting technologies enhance water buffering capacity, contributing to the resilience of African dry lands to climate variability and climate change, as well as to socio-economic changes such as population growth and urbanisation. To ensure the continental relevance of project results, research will concentrate on four geographically dispersed study sites in Tunisia, Burkina Faso, Ethiopia and Zambia, covering diverse socio-economic conditions and a range from arid to sub-humid climates.	<ul style="list-style-type: none"> <li>+ Improving the livelihoods of rural communities.</li> <li>+ Strengthening the potential and sustainability of rainfed agriculture by increasing food production and security.</li> <li>+ Water harvesting holds considerable promises to increase water use efficiency and agricultural productivity while sustaining ecosystem services, and to contribute to developing vigorous and resilient agricultural economies.</li> </ul>

ACRONYM	FULL NAME	OBJECTIVE STATEMENT	INTENDED IMPACTS
WASSERMED	Water Availability and Security in Southern Europe and the Mediterranean	<p>The WASSERMED project will analyse, in a multi-disciplinary way, ongoing and future climate induced changes in hydrological budgets and extremes in southern Europe, North Africa and the Middle East under the frame of threats to national and human security. A climatic and hydrological component directly addresses the reduction of uncertainty and quantification of risk. The case studies are illustrative and represent situations which deserve special attention, due to their relevance to national and human security. Furthermore, impacts on key strategic sectors, such as agriculture and tourism, will be considered, as well as macroeconomic implications of water availability in terms of regional income, consumption, investment, trade flows, industrial structure and competitiveness. WASSERMED forms part of a cluster of independent EU projects, together with CLIMB and CLICO, which also address environmental and social aspects of climate-induced changes as threats to security.</p>	<ul style="list-style-type: none"> <li>+ Reduction of the uncertainty of climate change impacts on hydrology in identified regions.</li> <li>+ Improved assessment of climate effects to water resources, water uses and expected security risks.</li> <li>+ A better basis for achieving water security, by identifying, analysing and evaluating policy options.</li> </ul>



## Appendix E. Example of written responses to interview questions

The responses detailed below were provided by Dr Kat Potter, Principal Investigator for the Climate Observatory project, Rwanda.

QUESTION	RESPONSE
<p><i>At the time when your project was granted funding under the Government of Rwanda/MIT Partnership the project description contained a statement of expected impact that was used as a criterion of assessment. What were the expected impacts at the start of the project (please specify in as much detail as possible with reference to the text of the project document)?</i></p>	<p>Assess the impact of Climate Change and Green House Gas emissions in the Region around Mount Karisimbi that includes all of East Africa, most of Central Africa and the Indian Ocean, Parts of Southern, Eastern and Northern Africa.</p> <p>Data from Karisimbi will feed into national, regional and global climate models for measuring the impacts of the changes and forecasting climate and weather.</p> <p>Will improve global predictions e.g. rainfall patterns of increased or changed seasonal rainfall, temperature etc.</p> <p>Data would be fed into AGAGE for global utilization and will improve the current models and understanding since there is currently a scarcity of meteorological measurements and a lack of high frequency GHG measurements anywhere in Africa and above all in equatorial Africa. The project would enhance capacity building for Rwanda and the region.</p> <p>Politicians would use the data to make knowledgeable policy decisions from scientifically sound data.</p>
<p><i>On what 'theories of change' were those expected impacts based? In other words, what notions did you have as the designated project manager about the causal chain from inputs through research activities to outputs, outcomes and eventual long-term, sustainable impact?</i></p>	<p>Climate data gathered would be mathematically modelled to avail information for decision makers and in the process enhance human capacity in climate science modelling.</p>
<p><i>Who were the principal beneficiaries of your research project? Please specify the categories of beneficiaries.</i></p>	<p>East African in particular and African Population as a whole in assessing impacts of climate change on sectors of Agriculture, health, and tourism that are not only critical for development but also for food security and livelihood, employment and income generation, foreign exchange and government revenue. Also adding to global knowledge related to climate change.</p>

QUESTION	RESPONSE
<p><i>Upon completion of the project [alternatively, into the duration of an on-going project], did your initial expectation of impact hold true? Please specify in detail by type of impact.</i></p>	<p>Project is not complete. There has not been enough progress and outcomes to judge if our expectations will hold.</p>
<p><i>By what means (journal articles; reports; books; conferences; workshops; policy briefs, etc.) do you intend to disseminate the research findings in order to achieve impact? What will be the main means of dissemination and which were given priority and why?</i></p>	<p>Research findings will be spread in the global scientific community through articles in world-class peer-reviewed journals. As part of the AGAGE global network, data generated at the Climate Observatory will be publicly available on the AGAGE website which is open to the entire scientific community to use for the purposes of climate research and developing new important findings, often then distributed in peer-reviewed journal articles.</p> <p>The data and research generated at the Rwanda Climate Observatory will be an important and prominent piece of the body of knowledge and data about global climate change because of its unique product of climate data in Africa.</p> <p>Because of the tie of the Climate Observatory to education at the University of Rwanda and degree programs there, research findings will be largely disseminated through the University professors, students, and their research presentations. These will include written reports, scientific articles, oral presentations, educational coursework, educational workshops, and hands-on trainings at the Climate Observatory.</p> <p>The eventual Climate Observatory will be located on Mt. Karisimbi and is integrated into the eco-tourism plan. Visitors and tourists to the top of Karisimbi will learn about climate change and the research happening there, including simply distilled information about important findings and work that is being done at the Rwanda Observatory.</p> <p>Better planning is needed for the issue of information sharing outside of the scientific and University community. Particularly to the government so that government decisions can be made based upon climate research findings. Policy briefs should be created when research findings are pertinent to policymaker, with the Climate Observatory Principal Investigator responsible for doing this, but I do not know in Rwanda the avenue of reaching the policymakers with the brief.</p>

QUESTION	RESPONSE
	<p><i>Continued from previous page</i></p> <p>Also a better plan is needed to share the important climate research outcomes with the beneficiaries of farmers throughout Rwanda and East Africa. The Climate Observatory has ties to MeteoRwanda as a stakeholder. Climate data and other findings can be shared through the same routes as MeteoRwanda shares its weather information—maybe within the same structure by which weather information is shared currently if a good system is existent, or we may need to develop a better system together.</p>
<p><i>What means of dissemination did you believe will be most effective? And why?</i></p>	<p>University education and workshops. Hands-on trainings. Partnering with MeteoRwanda to work on sharing important weather and climate prediction information to the agricultural community so that they may be better prepared and adapt to a changing climate.</p>
<p><i>Did you intend to interact with policy-makers? If so, how will your research findings provide evidence in support of their policy formulation or revision? Were the impacts found predominantly in Europe or in Africa? Were the benefits distributed more or less equally between the two continents? Or was there a bias in favour of one over the other? State the reasons for the bias or the balance, as the case might be.</i></p>	<p>Policy formulation will be impacted in Africa by the Climate Observatory with results from regional climate studies and regional climate change forecasts. Policy will be less impacted in Europe specifically, but rather global climate change policy and agreements will be informed by the vital information that this African Climate Observatory data will bring to the ability to improve global climate models and climate change forecasts.</p>
<p><i>Do you interact with civil society organisations with a view to inducing them to make use of your findings in policy formulation and activities? If so, were they receptive to your findings? If not, why did they assume a sceptical attitude?</i></p>	<p>I am not familiar enough with the civil society organisations in Rwanda with which we could interact. There is no current plan with any civil society organisations. (Unless University of Rwanda counts?)</p>

QUESTION	RESPONSE
<i>Do you interact directly with the ultimate beneficiaries at the grassroots or only through intermediaries such as policy-makers and civil society organisations? If you interacted directly, what were your experiences? Please elaborate.</i>	Beneficiaries being the general populace and agricultural community will not be interacted with directly. Climate information will be shared with them via policy actions and alongside weather forecasting information.
<i>Did you interact directly with the private sector, i.e. relevant companies? If so, what were your experiences? Please elaborate.</i>	No interactions with the private sector are planned or expected to occur.
<i>Have any of your research findings led to innovations of any kind in the form of tangible commodities or services? Please describe your role, if any, in the commercialisation process.</i>	The research findings at the Climate Observatory will not form any tangible commodities or services. Non-tangible services will be provided through the eco-tourism to occur at Mt. Karisimbi by informational displays and brochures.



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