

NEPAD Networks of Centre of Excellence in Water Sciences  
PHASE II

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Agriculture and Water Thematic Area

Inception Report

Lead country: Malawi

BY

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## **Executive Summary**

This write-up presents an inception report on the Zambezi River Basin (ZRB) as part of the EU funded African Centres of Excellence Water Phase 2 (ACE Water II) on the thematic area of Agriculture and Water (A&W) which the NEPAD Southern Africa Network Water Centres of Excellence (SANWATCE) is implementing. The report presents the main objectives of the (A&W) component, its scope, covering activities in the work packages (WP) and the anticipated timeframe for the activities as well as the anticipated other countries collaboration on the A&W component. The report highlights the planned study activities aimed at characterization of prevailing agricultural activities in ZRB including their spatial distribution, analyzing the food security situation, and assessing the water demands for the various agricultural activities with the aim of revealing potential future water demands and other A&W-related developments in the region.

The major milestones are scheduled to be accomplished as follows: baseline assessment reports and databases of A&W activities by 30th November 2018, food security and vulnerability assessment by end of February 2019 and report and database on potential of A&W development by 30 June 2019. A choice of four study sites, one each from four of the nine ZRB riparian countries namely Malawi, Mozambique, Zambia and Zimbabwe shall be the main focus of field research and stakeholder consultations. Though Namibia and Botswana shall not have sites, they shall be included in the other general A&W analyses for region.

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## **Abbreviations and Acronyms**

A&W:	Agriculture and Water (A&W).
ACE II:	African Centres of Excellence Phase 2
AU:	African Union
EU:	European Union
NAREC:	Natural Resources and Environment Centre, UNIMA
NEPAD:	The New Partnership for Africa's Development
SANWATCE:	Southern Africa Network Water Centres of Excellence
UKZN:	University of Kwazulu-Natal
UNIMA:	University of Malawi
WP:	Work package
ZRB:	Zambezi River Basin
ZAMCOM :	Zambezi Watercourse Commission
SADC:	Southern African Development Community
JRC:	Joint Research Centre

# PART ONE: OVERVIEW

## 1.0 INTRODUCTION

The New Partnership for Africa's Development Southern Africa Network of Water Centres of Excellence (NEPAD-SANWATCE) is participating in the implementation of the European Union (EU) funded African Centres of Excellence (ACE) WATER 2 project for the period 2016-2019. The University of Malawi, through the Natural Resources and Environment Centre (NAREC), one of SANWATCE's satellite centres of water excellence, is taking lead in the coordination of the characterization of current agriculture activities, future potential irrigation developments and food security in the face of climate variability in the Zambezi River Basin (ZRB).

### 1.1.1 Goal of the Inception Report

This report presents, in detail, the work packages (WPs), the proposed activities and timeframe of the Agriculture and Water (A&W) component of the project.

### 1.1.2 Objective of the Report

With the A&W objectives being:

- To understand baseline conditions on agriculture (including livestock and fisheries) by gathering and processing data and by-products (land use and coverage, local practices, seasonal patterns) at ZRB scale;
- To perform agriculture assessment (crops water demand, productivity and potential impact of irrigation expansion) and scenario based management practices.

The following milestones are expected to be achieved:

- Reporting on characterization of current agriculture activities in ZRB and potential future developments in irrigation; (C.2.1)
- Reporting on food security situational analysis and vulnerability assessment in the face of climate variability challenges; (C.2.2) and
- Creating a database of spatial distribution of A&W-related types, rain-fed versus irrigated, irrigation expansion potentials and food security in the face of climate variability challenges. (C.2.3.)

Thus the main objective of this inception report is to give a clear guideline on the way the A&W thematic area shall be implemented within the wide ZRB project. Specifically, it is there

- To streamline the general methodology that the A&W will follow including choice of the study sites
- To list specific activities that shall be involved in implementing the A&W
- To specify the timelines that the milestones are expected to commence and complete.

## 1.4 Summary of Data Collection and Analysis Strategy

Component deliverables C.2.1, C.2.2 and C.2.3 will respectively report on current agriculture activities in the ZRB, assessing food security situation analysis and community vulnerability assessment in the face of climate variability challenges and creation of the database and food security assessment.

Apart from getting information from some regional offices, a strategy will be employed to collect more information from national offices and source primary data from local knowledge on the existing agricultural livelihood practices such as crops, livestock and fisheries for the selected sites regarding their spatial distribution and productivity and water supply types and quantities as well as the food situation in the ZRB region. The relevant A&W information shall input into a centralized database which shall be built and managed by JRC in Italy. In addition, modelling techniques shall be employed to forecast on future A&W-related demands and the potential of expansion in the ZRB region.

This inception report is organized in the following manner:

- Part One: Overview

- Part Two: Methodology

- Part Three: Activities and Timeframe.

## **PART 2 METHODOLOGY**

### **2.0 General Research Approach**

To achieve the objectives/deliverables, several approaches are proposed ranging from desktop reviews, acquiring satellite A&W-related data and scientific field work of the chosen case study areas as well as qualitative and quantitative data from stakeholder consultations. University of Kwa Zulu (UKZ) Natal, which is also contributing to this component, mainly on the irrigation aspect, shall be central in the sharing and synchronizing A&W activities proposed by the Malawi and the UKZ teams.

### **2.1 Desktop Review**

Firstly, one aspect of the assessment shall be going through official documentation on A&W in the ZRB participating countries. Of special focus shall be country reports from ministries dealing with Agriculture, Irrigation and Water as well as any existing relevant data such departments may have. Second target shall be sections dealing with A&W-related issues in the country and regional offices of Southern African Development Community (SADC), NEPAD and Zambezi Watercourse Commission (ZAMCOM). Thirdly, would be reviewing A&W literature existing in a various publications existing internationally, regionally or nationally.

### **2.2 Stakeholder Consultations**

For each study site, local interviews shall be conducted with purposely selected key informants representing various stakeholders in the water sector at national and regional levels. The aim of the consultation process shall be to learn from their experiences, knowledge and obtain primary source on the A&W-related activities including the challenges that they face along with the three objectives and further establish the status of A&W in the ZRB region. Some inputs for the future direction of A&W issues will be investigated.

### **2.3 Nature of the Data**

Relevant water, agriculture, climatic and food security and vulnerability data shall be gathered focussing on the following elements:

- General land use and coverage data, local practices, seasonal patterns.
- Agricultural land available in the basin.
- Water commitments (quantities) in the basin in relation to agricultural crops water demands.
- Cropping systems and crop combinations.
- Agricultural practices/agricultural water management – typologies e.g.
  - Rain fed agriculture
  - Irrigated agriculture
  - Flood plain agric
  - Dambo cropping
- Livestock

- Large stock e.g. cattle sites and water demands
- Medium size stock e.g. sheep
- Small livestock e.g. poultry
- Fisheries
  - Commercial sites
  - Artisanal sites
- Desktop review
  - Existing documentation of ZRB data on A&W and food security
  - Reviewing literature on ZRB information of A&W and food security
- Key informant interviews
  - Interviews with key informant personnel in the 4 countries on A&W issues and food security
  - Focus group discussions on or around the 4 chosen sites on A&W issues and food security
  - To cover A&W issues and household food security and vulnerability issues

## **2.4 Future A&W Demands and Projections**

Upon collection of relevant water, agriculture, climatic and food security data, expertise drawn from the ZRB shall collaborate to analyse the data and further proceed with mathematical, statistical and econometric modelling as well as qualitative approaches to come up with the future projections of the A&W demands and come up with scenario-based management practices suggestions. The CROPWAT modelling using satellite images and time series data shall be used as well as those suggested by the Mozambican team who are leading in the economic modelling. The scale, resolutions and data requirements shall depend on the existing data and applicability of the models to a level where they will give reliable results.

## **2.5 Study Sites**

It is proposed that four manageable sites be chosen, within the basin, one site from each of the following four countries: Malawi, Mozambique, Zambia and Zimbabwe since these countries are the major countries lying in the Zambezi River Basin region. This is considered a practical and manageable approach since the basin is huge, although most of the other deliverables will consider the whole basin. The scale of analysis shall depend on the resources and availability of the detailed datasets.

## **2.6 Anticipated limitations on the proposed**

Part of the success of the A&W component depends on the availability of information and support from other relevant WPs teams. It is expected that information from across different countries may not be at par due to missing or incomplete data. Furthermore, it may be possible that some national offices may not readily have the information for the collaborating teams. This might affect the quality of the data and in turn, the correct projection of future water demands in agriculture.





## **PART 3 ACTIVITIES AND TIMEFRAME**

### **3.0 General introduction**

In this section of the inception report, the main proposed activities will be highlighted. The time schedules in line with the main ZRB proposal will then be presented:

### **3.1 List of Activities**

The methodological and/or conceptual developmental framework shall be devised upon collaborating with other experts in the SANWATCE applicable to the Zambezi River Basin. The activities for the A&W thematic area is structured as follows:

- (a) Data Gathering
- (b) Data Capturing
- (c) Data Analysis
- (d) Database Creation
- (e) Report Writing
- (f) Dissemination

The next sections expands on each of the above six activities in line with the A&W objectives.

### **3.2 Data Gathering on the A&W**

Data collection will be one major activity involving gathering data on current agriculture crops, livestock and fisheries, spatial distribution, productivity. This data will be analysed and synthesised to inform decision making on the potential future developments on water, agriculture and irrigation developments.

### **3.3 Data Capturing on the A&W**

Quantitative data shall be captured on database templates or statistical software. Some qualitative data shall be transcribed on spot by researchers and other data shall be transcribed from audio recordings. Random checks on some captured quantitative data shall be done to affirm the data capturing exercise or clean the data if significant data error shall be observed.

### **3.4 Data Analysis on the A&W**

The qualitative data shall be analysed thematically via relevant approaches depending on the way the data shall be gathered. For the quantitative data, apart from presenting general statistical summaries and performing significant testing of various comparisons, factor analysis and model fitting shall be conducted to elucidate on the variability seen in the data and for future forecasts, respectively.

### 3.5 Database on the A&W

Besides creating a database of the raw datasets for the quantitative data, attempt shall be made to have the results from the quantitative data presented in some database to facilitate access and usage of the results. As alluded to in this inception report, the final database shall be input into the database developed and managed by JRC in Italy.

### 3.6 Reports on the A&W

The results will be compiled through three activities associated with report writing as follows:

- (a) Draft A&W report writing on assessment of agriculture activities and potential developments in irrigation and needed baseline data for the database
- (b) Draft report writing on food security and vulnerability in the face of climate variability.
- (c) Consolidated final report on the A&W theme.

### 3.7 Dissemination the A&W results

Prior to some of the results being disseminated on Aquaknow website on the Joint Research Centre (JRC), Italy, the results shall be disseminated through national, regional and international workshops/conferences.

## 4.0 Timeframe

The table below lists the activities and the expected start and completion times.

**Table 1: Timeframe for Activities**

Year	2016				2017				2018				2019			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Activities</b>																
4.1. Inception report																
4.2. Stakeholder consultations																
4.3. Data Capturing																
4.4. Data Analysis																
4.5. A&W report																
4.6. Database creation																
4.7. Food security report																
4.8. National dissemination																
4.9. Regional meetings																
4.10. Consolidation report																
4.11. International meeting																

#### 4.1.1 Summary on inception report

Though Malawi is taking lead in the A&W area, its major role apart from making sure that the deliverables are met as planned is that of facilitating the coordination of the component. In order to achieve this there shall need for some individuals in Malawi

and at UKZ or other countries to continuously meet or link up regionally to align expectations and implementation activities.