

# QUICK SCAN MOZAMBIQUE



May 2014



*The Quick Scan for Mozambique is commissioned by the Netherlands Space Office (NSO) within the framework of the Geodata for Agriculture and Water (G4AW) program. The following organizations have contributed to this document:*



## TABLE OF CONTENTS

Introduction.....	4
1 Assessment of Mozambique with a focus on agricultural issues .....	5
1.1 Main challenges in Mozambique agro-eco systems .....	5
1.2 Governmental Efforts.....	8
1.2.1 STRATEGIC PLANS FOR THE AGRICULTURAL SECTOR .....	8
1.2.2 PNISA .....	9
1.2.3 PEDSA.....	10
1.2.4 ESAN .....	11
1.2.5 PDDA.....	11
1.3 The organization of the Water sector .....	13
2 Assessment of status and problems of information supply in the Agricultural sector .....	16
2.1 Main challenges in information supply encountered in Agricultural activities.....	16
2.2 Institutional capacity to support viable information services.....	17
2.2.1 General information suppliers active in Agriculture domain .....	17
2.2.2 Specific agri-sector information supply and current mechanisms.....	18
2.3 Other sectors (and role of information) important for the Agricultural sector .....	19
2.4 Main challenges in information supply encountered in Agricultural activities.....	19
2.5 Institutional capacity to support viable information services.....	20
2.5.1 General information suppliers active in Agriculture domain.....	20
2.5.2 Other sectors (and role of information) important for the Agricultural sector .....	20
3 Needs assessment of improved ICT & information supply in the agri sector .....	22
3.1 Needs assessment with a focus on potential use of spatially based information services.....	22
3.2 Public and private problem stakeholders and international organizations in the domain of G4AW .....	27
3.3 Ongoing G4AW relevant activities and/or projects in target Mozambique.....	28
3.4 References to public domain publications .....	28
4. Base solution directions in target Mozambique tailored to local Agricultural practices .....	29
4.1 Actual Agri-spatial information services and projects .....	29
Farm insurance and risk prevention strategies .....	31
4.2 Differentiation of spatial solutions tailored to Agricultural practices/sector in target Mozambique .....	31
5. Partnerships between stakeholders in Mozambique and Dutch sector.....	33
Annex 1 ACCESS TO FINANCE OF THE AGRICULTURAL SECTOR .....	34

## INTRODUCTION

Within the framework of food security policy, the Ministry of Foreign Affairs of The Netherlands is implementing the programme '**Geodata for Agriculture and Water (G4AW) Facility**'. The G4AW Facility aims to increase the agricultural sector output in G4AW partner countries. This is achieved by providing food producers with relevant information, advice and/or (financial) products through operational information chains using satellite data.

In the summer of 2014, a new call for tenders will be opened. In this call, the Ministry of Foreign Affairs of The Netherlands calls for good quality project proposals from viable partnerships.

### **Goal of the Quick Scan**

The Quick Scan serves as input for preparing the country visit and the G4AW information and matchmaking workshop in Mozambique. In the workshop, the local context, constraints and challenges in agriculture will be discussed. Furthermore, the background and details of the G4AW Facility is provided and the development of partnerships is promoted.

This Quick Scan provides an up-to-date information assessment on agricultural and associated activities. It provides information from different perspectives and in a wider context (climate, water management). Additional, stakeholders from different types of organizations are identified and reported. The document is initially supporting the country visits and workshop, but the provided information can also contribute to the development of partnerships that are intending to bring forward a proposal in the second call of the G4AW Facility.

# 1 ASSESSMENT OF MOZAMBIQUE WITH A FOCUS ON AGRICULTURAL ISSUES

*Pressure on the agro-eco production systems caused by increased (overpopulation), climate changes and extreme weather conditions lead to a lack of natural local resilience. In this section, the most important challenges in the agro-eco systems in Mozambique are given as well as an overview of (governmental) efforts to address the food security situation.*

## 1.1 MAIN CHALLENGES IN MOZAMBIQUE AGRO-ECO SYSTEMS

Mozambique is a country in south-eastern Africa bordering Tanzania and Malawi to the north, the Mozambique Channel to the east and Zimbabwe, Zambia and South Africa to the west (see figure 1.1).

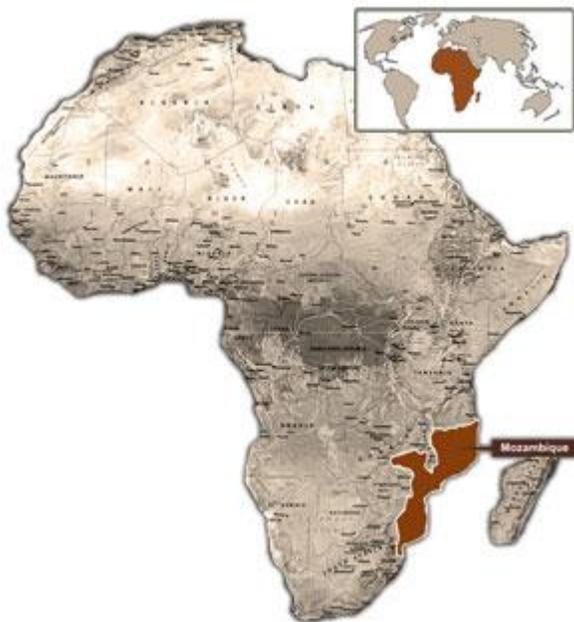


FIGURE 1.1: MAP OF AFRICA<sup>1</sup>

Mozambique has been recognized as a country with a lot of potential in either the tourism industry, the agricultural sector and lately also in the extractive industry. However it currently is a country that lingers in the lowest compartments of development lists. The potential and the current situation are illustrated by the data on geography, population and economy in table 1.1.

GEOGRAPHY	
Area	Land: 786,380 sq km Water: 13,000 sq km

<sup>1</sup> Source: <http://thrp.usask.ca/maps.htm>

Quick Scan Mozambique | G4AW Facility

<b>Landuse</b>	<p><i>Arable land: 6.51%</i>  <i>Permanent crops: 0.25%</i>  <i>Other: 93.24% (2011 est.)</i></p>
<b>Irrigated land</b>	1,181 sq km (2003 est.)
<b>Natural hazards</b>	Severe droughts; devastating cyclones and floods in central and southern provinces
<b>Fresh wateruse (dom/ind/agri)</b>	<p><i>Total: 0.88 cu km/yr</i>  <i>Domestic: 26%</i>  <i>Industrial: 4%</i>  <i>Agriculture: 70%</i></p>
<b>Drinking water source</b>	<p><u>Improved</u>  <i>urban: 78% of population</i>  <i>rural: 33.2% of population</i>  <i>total: 47.2% of population</i>  <u>Unimproved</u>  <i>urban: 22% of population</i>  <i>rural: 66.8% of population</i>  <i>total: 52.8% of population (2011 est.)</i></p>
<b>Sanitation facility access</b>	<p><u>Improved</u>  <i>urban: 40.9% of population</i>  <i>rural: 9.2% of population</i>  <i>total: 19.1% of population</i>  <u>Unimproved</u>  <i>urban: 59.1% of population</i>  <i>rural: 90.8% of population</i>  <i>total: 80.9% of population (2011 est.)</i></p>
<b>Main rivers</b>	<p>Zambezi - Central Mozambique  Limpopo - South Mozambique  Provide water resources estimated at 216 km<sup>3</sup> per year, of which 46 % are generated internally.</p>
<b>POPULATION</b>	
<b>Population</b>	23,7 million (2012 est.)
<b>Population below poverty line</b>	55%
<b>Population living in rural areas</b>	69%
<b>Population growth rate</b>	2.8% / year
<b>Average population density</b>	19 inhabitants/square km (est.)
<b>Life expectancy</b>	52.8 years
<b>Median age</b>	17 years
<b>Literacy rate</b>	<p><i>Total: 56.1%</i>  <i>Male: 70.8%</i>  <i>Female: 42.8% (2010 est.)</i></p>
<b>ECONOMY</b>	
<b>GDP (purchasing power parity)</b>	\$28.15 billion (2013 est.)

<b>GDP real growth rate</b>	7% (2013 est.) Note: largely based on capital intensive projects, particularly in extractive industry
<b>GDP per capita (PPP)</b>	\$1,200 (2013 est.)
<b>GDP composition</b>	<i>Agriculture: 28.7%</i> <i>Industry: 24.9%</i> <i>Services: 46.4% (2013 est.)</i>
<b>Labor force - by occupation</b>	<i>Agriculture: 81%</i> <i>Industry: 6%</i> <i>Services: 13% (2013 est.)</i>
<b>Official development aid</b>	<i>State Budget (OGE): 39.6%</i> <i>GDP: 14.9% (2012 est.)</i>
<b>Position Mozambique HDI</b>	185 (out of 187)

TABLE 1.1: GENERAL OVERVIEW MOZAMBIQUE ON GEOGRAPHY, POPULATION AND ECONOMY<sup>2</sup>

### Dependence on agriculture

The agricultural sector is of high importance to Mozambique. Illustrative is the percentage of the population depending on it in a subsistence way. The country has about 3.7 million farms and over 99% of these are small farms (see table 1.2). In addition over 80% of the active population is employed in the agriculture sector. There are over 36 million hectares of arable land of which 10% is in use and of this land 90% is cultivated by families. Cash crops occupy just over 5% of the cultivated area. In spite of the high potential for agriculture yields remain low and Mozambique is still a net importer of agricultural products.

Type of agricultural holding	Small	Medium	Large	Total
<b>Province</b>				
Niassa	224,577	568	6	225,151
Cabo Delgado	339,391	403	22	339,816
Nampula	828,788	819	35	829,642
Zambézia	828,123	632	47	828,802
Tete	367,977	8,064	96	376,137
Manica	262,692	2,744	53	265,489
Sofala	269,576	1,595	80	271,251
Inhambane	267,322	1,919	65	269,306
Gaza	211,067	5,516	153	216,736
Maputo	147,725	2,729	255	150,709
Cidade de Maputo	54,021	665	29	54,715
Total	3,801,259	25,654	841	3,827,754

<sup>2</sup> Source: PNISA (MINAG), World Factbook (CIA)

TABLE 1.2: TYPE OF AGRICULTURAL HOLDING PER PROVINCE

**Food Security and Nutrition**

Mozambique is experiencing high economic growth, however this growth is very concentrated in the extractive industry. Mozambique remains one of the poorest countries of the world. At the same time the agricultural sector has the potential to benefit from the momentum of the hydrocarbon sector through increased production of food and cash crops. It is tacitly acknowledged that the current poor performance of the agricultural sector is one of the reasons of the moderate progress in efforts to reduce poverty and strengthen food security and nutrition in Mozambique. Numbers of food insecurity and chronic malnutrition are relatively high as shown in table 1.3.

Food insecurity	35% of the population
Chronic malnutrition at national level	43% of the population
Chronic malnutrition at provincial level	
Cabo Delgado, Nampula	> 50% of the population
Zambezia, Niassa, Tete, Manica	> 45% of the population
Inhambane, Gaza, Maputo Province	> 40% of the population

TABLE 1.3: FOOD INSECURITY AND CHRONIC MALNUTRITION IN MOZAMBIQUE

**Challenges**

There are still a lot of challenges to tackle for the agricultural sector. Below are the ones listed that are mentioned in the main strategy reports of the Ministry of Agriculture, which are discussed below. (between brackets is the G4AW potential indicated, elaborated in section 4)

- Lack of extension services
- Lack of Research and Development devoted to agriculture
- Lack of use of irrigation **(G4AW)**
- Lack of provision and use of inputs (due to availability, quality, price)
- Lack of access to finance (insurance? **(G4AW)**)
- Lack of access to markets
- Serious deficiencies in the infrastructure of the country
- Roads / access routes to rural/production areas **(G4AW)**
- Energy
- Transport **(G4AW)**
- Communications
- High cost and low quality of raw materials for agro-processing facilities
- Absence of systems of agricultural information **(G4AW)**
- Low availability of information about markets and prices **(G4AW)**
- Deficient postharvest handling of the produce **(G4AW)**
- Lack of adequate storage infrastructures **(G4AW)**
- Inadequate implementation of quality norms and lack of qualified producers

**1.2 GOVERNMENTAL EFFORTS****1.2.1 STRATEGIC PLANS FOR THE AGRICULTURAL SECTOR**

Currently the agricultural sector is guided by the government based on several strategic plans:

- PNISA, National Plan for Investments in the Agrarian Sector, 2013-2017
- PEDSA, Strategic Plan for Agricultural Development, 2010-2019
- ESAN-II, Food and Nutrition Security, 2008-2015
- PDDA, Plano Director para o Desenvolvimento de Agronegocio
- PAEI, Agrarian Policy and Implementation Strategy
- PROAGRI, National Agricultural Development Programme

These strategic plans are influenced by the Plan for Poverty Reduction (PARP 2011-2014), the Agenda 2025 of Mozambique, the Green Revolution Strategy (signed in 2007) and the Comprehensive Africa Agriculture Development Programme (CAADP). The ones that are most relevant to the G4AW project are shortly described here.

### 1.2.2 PNISA

The National Plan for Investments in the Agrarian Sector runs from 2013 to 2017. It contains the vision to establish an agricultural sector in the medium / long term, to develop "a prosperous, equitable and sustainable competitive agricultural sector whose main purpose is to contribute to food security, income and profitability of agricultural producers and increased market-oriented agricultural production, quick, competitive and sustainable." For this purpose, five specific strategic objectives were chosen:

1. Increasing food production
2. Increase the market-oriented production
3. Enhancing the competitiveness of the agricultural and fisheries producers
4. Use of sustainable soil , water and forests
5. Developing the institutional capacity of the agricultural sector and fishing

PNISA further contains an Investment Plan for the sector consisting out of five components and each of them are supported by several programs and subprograms (see table 1.4).

Component	Programs
COMPONENT 1 Production and Productivity	Food Crops Cash crops Fisheries Program Livestock Program Program for Agricultural Research Agricultural Extension Program Program Hydroagricultural Support Program Mechanization
COMPONENT 2 Market Access	The Post Harvest and Marketing Management Program The Program for Financial Services The Support Program for Agri- Business The Program of Rural Roads The Program for Agricultural Statistics and Information Systems
COMPONENT 3 Food Security and Nutrition	Program Monitoring and Multisectoral Coordination SAN Program for Improving Access and Use of High Nutritive Value of Foods
COMPONENT 4 Natural Resources	Program for the Purpose of Earth Agrarian Program of Forestry and Wildlife Institutional Development Program Cartography and Remote Sensing Program
COMPONENT 5 Reform and Institutional Strengthening	Program for Institutional Reform Institutional Strengthening Program

Table 1.4: Components and programs of the Investment Plan from PNISA3

### 1.2.3 PEDSA

The Strategic Plan for Agricultural Development runs from 2010 to 2019 and its implementation approach is based upon value chains, so its operationalization takes into consideration all the activities linked to:

1. Development and transfer of technologies and provision of agricultural inputs
2. Agricultural production
3. Processing and marketing activities that add value to agricultural, livestock, forestry and wildlife products
4. Sustainable natural resource management.

To this end, 5 specific objectives are defined:

1. Increase agricultural production and productivity and its competitiveness
2. Improve infrastructure and services for markets and marketing
3. Use land, water, forest and fauna resources in a sustainable way
4. Establish a legal framework and policies that are conducive to Agricultural investment
5. Strengthen agricultural institutions

The strategy aims to increase agricultural growth by an average of at least 7% per year. The main contributors to this growth will be productivity (ton/ha) combined with an increase in the area which is cultivated. The ambition is

---

<sup>3</sup> Source: PNISA, MINAG

to double yields and to achieve a 25% increase in the area cultivated for basic food production by 2019, while ensuring the sustainability of natural resources.

PEDSA has a 10 year perspective, from 2010 to 2019, divided in two main periods:

1. The 5 Year Programme for 2010 to 2014 will focus on harmonization of activities in the agricultural sector. The ambition is to introduce significant improvements in land, water and forest use, with the objective of achieving the Millennium Development Goals.
2. The 5 Year Programme for 2015 to 2019 consolidates food security and widens access to the market for domestic production. The operational basis for this period will be established in the light of lessons learned during the first five years of implementation.

#### 1.2.4 ESAN

The Strategic plan for Food and Nutrition Security runs from 2008 to 2015. The Government Programme defines the central objective of economic development and social, meeting the food needs and job creation to combat hunger and extreme poverty in the country.

ESAN II contains the following strategic pillars:

1. Production and Availability
2. Enough food for consumption
3. Physical and economic access to food
4. Use the and proper utilization of food
5. Suitability for food to be social
6. Environmentally and culturally acceptable including the absorption of nutrients by the body
7. Stability of food intake at any time

And its main objectives are the following:

1. Ensuring food self-sufficiency of the country
2. Contribute to the improvement of the purchasing power of households
3. Reduce the incidence of malnutrition (acute and chronic) by improvement of health, water sanitation and nutrition education and nutrition
4. Ensuring the progressive realization of the human right to food suitable for all citizens
5. Increase the ability of households to respond to seasonal variations in the production,
6. Physical and economic access to adequate food

#### 1.2.5 PDDA

The Leading Plan for the Development of Agribusiness runs from 2013 to 2020. It states that in general a rapid development of agribusiness can be achieved as follows:

1. Increased use of agricultural inputs
2. Increase access of farmers to “affordable” credit
3. Ensuring access to markets
4. Investment in infrastructure, including irrigation, roads and forms of communication
5. Strengthening and maintenance of institutions and support services such as extension services, research and innovation programs, agro-processing units and input and output markets

## 6. Training of individual and collective producers

To give an indication of the targets set for 2020 table 1.5 provides an overview of the strategic goals of the increase of agricultural production.

Strategic objectives	Indicators	Unit	Baseline						
			Year	Value	2012	2013	2014	2015	2020
1. Increase the contribution of agribusiness in national agricultural production	% of medium and large enterprises (> 10 ha, > 10 cattle)	%	2010	0.7	1.16	1.5	1.94	2.5	5,0
	Production weight of cash crops	%	2010	5.7	7.14	7.99	8.94	10,0	15,0
	Commercial production								
	Corn	Ton	2009	83.419,0	231.308,0	282.914,0	339.988,0	403.010,0	827.012,0
	Rice	Ton	2009	7.206,0	11.658,0	17.660,0	24.352,0	31.800,0	82.926,0
	Soya	Ton	2010	8,0	14,9	16,0	17,2	18,5	26,9
	Sesam	Ton	2008	36,0	42,3	45,9	49,8	54,0	72,0
	Groundnut	Ton	2009	133,0	138,0	3.063,0	6.345,0	10.018,0	35.596,0
	Bananas	Ton	2010	35,0	45,0	50,0	55,0	60,0	70,0
	Horticulture	Ha	2010	376,0	442,0	480,0	520,0	564,0	846,0
	Tomato	Ton	2010	137,0	178,0	205,0	225,0	247,0	334,0
	Onion	Ton	2010	76,0	101,0	115,0	127,0	140,0	191,0
	Forests	(%)	2010	NA	0,4	0,6	0,8	1,0	2,0
	Cattle	10 ^3 Unid.	2010	1.400,0	1.600,0	1.700,0	1.837,0	2.000,0	2.915,0
	Goat	10 ^3 Unid.	2010		4.014,0	4.102,0	4.190,0	4.278,0	4.718,0
	Chicken	10 ^3 Unid.	2010	17.900,0	26.005,0	30.511,0	35.017,0	39.523,0	62.054,0
	Egg	10 ^3 Dúzias	2010		4.142,0	4.646,0	5.149,0	5.653,0	8.171,0
	Milk	Ton	2009	1.504,0	2.703,0	2.877,0	3.050,0	3.223,0	4.090,0
	Beans	Ton	2009	939,0	3.082,0	8.045,0	13.605,0	19.816,0	62.888,0
	Cassava	Ton	2009	8.819,0	26.028,0	197.754,0	390.402,0	605.902,0	2.105.666,0
	Potato (reno)	Ton	2010	119,7	152,1	169,9	189,2	215,7	323,4
	Tobacco	Ton	2010	70,0	76,0	79,0	82,0	85,0	100,0
	Sugercane	Ton	2010	281,0	446,4	521,5	576,6	594,2	690,5
Cotton	Ton	2010	70,0	83,4	91,7	120,0	137,7	274,4	
Cashew	Ton	2010	94,0	98,0	103,0	112,0	120,0	180,0	

Operators of commercial agriculture	Unid.	2010	50,0	61,0	67,0	73,0	75,0	100,0
Commercialization of Agriculture (Accumulated Growth Rate)	(%)		-	0,2	0,3	0,4	0,5	1,0
Agricultural financing (% Total Loans)	(%)	2010	0,1	0,1	0,1	0,1	0,2	0,3
Producers engaged in outgrowing schemes	Unid.	NA	-	0,3	0,5	0,8	1,0	2,0
Postharvest losses	(%)	2008	0,3	0,2	0,2	0,1	0,1	0,1

TABLE 1.5: STRATEGIC GOALS FOR THE INCREASE OF CONTRIBUTION OF AGRIBUSINESS TO NATIONAL PRODUCTION

### 1.3 THE ORGANIZATION OF THE WATER SECTOR

The organization of the water sector is yet a major challenge to facilitate the agricultural interests in a sustainable way. Currently the governmental water boards are organized in the so-called ARA's (or Administração Regional de Água), residing under the Direção Nacional de Águas (Ministry of Water and Public works) divided into the following regions ARA Sur, ARA Centro, ARA Zambesi and ARA Norde.

There is need to enhance capacity on water management and waters basin management on local level and capacity building programmes. Initiatives are undertaken by World bank programmes, e.g. example of capacity building on irrigation management and watershed management through projects and bilateral projects (Dutch and Mozambique)<sup>4</sup>. From the statistics from the FAO<sup>5</sup> it can be seen that the area equipped for irrigation is stagnating over the last 20 years, while the production capacity is increasing.

#### Area Equipped for irrigation

(1000 ha)				
	1994	1999	2004	2009
Area	107	112	118	118

#### Production quantities for selected commodities

		1995	2000	2005	2010
(1000 t)	Wheat	3	1	2	3
	Cereals	1,128	1,587	1,139	2,506
	Oilcrops	129	124	138	132
	Coarse grain	1,012	1,405	1,072	2,323
	Paddy rice	113	181	65	180
	Coffee	1	1	1	1

Source: [Production Statistics - Crops and Crops Processed, 2012](#)

<sup>4</sup> <http://www.wageningenur.nl/nl/show/Wageningen-UR-wins-two-multimillion-euro-irrigation-projects-in-Mozambique.htm>

<sup>5</sup> <http://mozambique.opendataforafrica.org/qcpvszc/mozambique-fao-stat-water-resources-agriculture-production-and-trade>, see page 67, Increasing productivity through input intensification, section 5.8,

Irrigation: Rain-fed production systems in Mozambique produce only one crop per year. Areas where farmers can produce two crops a year are limited to pockets of land in northern and central Mozambique as well as in the irrigated areas in the southern region. Therefore, land use intensity across much of rural Mozambique can only be improved with the provision of irrigation facilities. A simple form of small-scale irrigation is commonly practiced by manually pouring water on fields. This is practiced by peri-urban farmers who grow vegetables, while rice farmers do flood irrigation in marshlands. Modern irrigation practices that use pumps and pipes to distribute water are restricted to sugar estates, a few private companies engaged in agriculture and a few emerging medium commercial farmers. Figure below shows that the percentage of farmers reporting the use of irrigation fluctuated between 6 and 10% during much of the period under review. TIA data are not specific on the type of irrigation technology being employed by farmers and the extent of the area to which irrigation is applied. Despite government’s pronouncements on support for irrigation it is too early to conclude that Mozambique would double the pre-2000 area irrigated by 2015. The slow rate of adoption and limited investments in rehabilitating old irrigation schemes suggest that this target may not be achieved.

MOZAMBIQUE ANNUAL TRENDS AND OUTLOOK REPORT: 2010

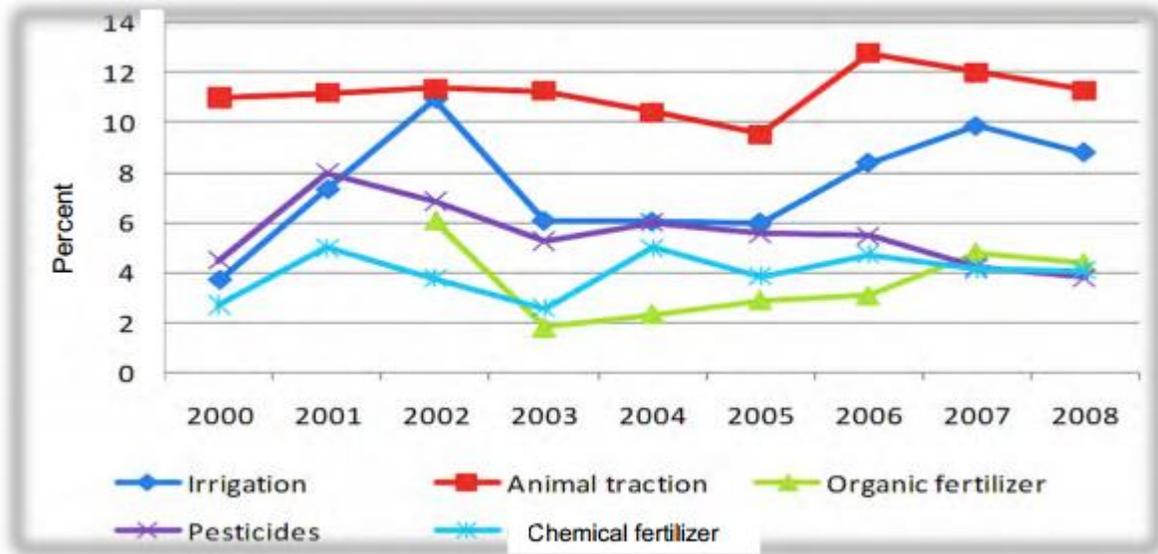


Figure 1.24. Trends in percentage of smallholder farmers utilising various technologies, 2000–08.

These capacity building initiatives on IWRM are supported by the Dutch Embassy (Mr Herko Jansen), and WUR/Alterra is involved.

Through the Water governance center (of the Netherlands) additional support in capacity building is developed in cooperation projects with NWP (Peter v.d. Horn) and by the Dutch Water boards ‘De Dommel’ with the ARA Zambesi and by Water board ‘Wetterskyp Fryslan’ with the ARA Sur in Mozambique.

In the urban areas there little capacity on Water management which is problematic in times of extreme rains and water excess and droughts. The focus is mainly on wash and sanitation/drinking water.

More specific special challenges from the perspective of water are mentioned below<sup>6</sup>:

- Coal Mining activities: pollution/threads of groundwater
- Continuity of Water transport on the Zambesi river: important for economic activities
- City council Bayra: agricultural growth corridor project(Deltares, NWP Ben Lamoree)
- Water supply from groundwater, there is little surface water, mostly rural exploitation by water wells
- Problems of water management with the Maputo Dam (hydro-electric dam) in the South of Mozambique, and also with the dam in the Zambesi River and their impact on the environment (water distribution, droughts in the lower deltas, and salinization effects in coastal area).
- Flooding problems in general with existing river infrastructure
- Etc. (see also footnote 5)

Last year Mozambique was represented on the International Water Week (IWW) by Mrs. Suzanna Saranga of the Direção Nacional de Águas, presenting the national water program of Mozambique on how to improve the Water management in all 13 basins in Mozambique (as a part of the larger regional basin with the surrounding countries) and with that the related sectors (including agriculture)<sup>7</sup>.

---

<sup>6</sup> For more information on water related issues see Report DHV, Watermondiaal, 2011, Marketscan Mozambique

<sup>7</sup> For more information see [www.dnaguas.gov.mz](http://www.dnaguas.gov.mz).

## 2 ASSESSMENT OF STATUS AND PROBLEMS OF INFORMATION SUPPLY IN THE AGRICULTURAL SECTOR

### 2.1 MAIN CHALLENGES IN INFORMATION SUPPLY ENCOUNTERED IN AGRICULTURAL ACTIVITIES

The Statistics Act (Law No. 7/96) bestows on INE the responsibility for the collection, production and dissemination of official statistics in the country. INE has the power to delegate some responsibility to those government ministries and institutions it deems to have capacity to collect and publish official statistics including the Ministries of Agriculture, Health, Education, etc. It is therefore under delegated authority that the Ministry of Agriculture produces and publishes official agricultural statistics.

#### **Agricultural systems**

The main sources of agricultural information are concentrated within the Ministry of Agriculture (MINAG) – in the Directorate of Economics (DE) which undertakes the annual agricultural survey (TIA) and the Agricultural Market Information System (SIMA). Also under DNSA are the Technical Secretariat of Food Security and Nutrition (SETSAN) and the Famine Early Warning Systems (FEWS) NET. Also under the National Directorate of Agricultural Services is the Technical Secretariat of Food Security and Nutrition (SETSAN) and the USAID-funded Famine Early Warning Systems (FEWS) NET which is linked to SETSAN. The Department of Early Warning is responsible for providing a forecast of crop production, whereas SETSAN and FEWS.NET assess food security on a regular basis. FEWS relies heavily on satellite imagery and modelling using Normalized Difference Vegetation Index (NDVI – photosynthetic activity), Meteosat Rainfall Estimation (RFE – time series rainfall comparison) and Waters Requirements satisfaction Index (WRSI). SETSAN leads the Vulnerability Assessment Group and provides livelihood assessments within the context of food security. SETSAN is supported by the Government, international donors and NGOs. SETSAN also has a provincial base. It is inter-ministerial since food security and nutrition issues are multi-sectorial.

#### **Market information**

There are two main sources of market information. There is the Ministry of Commerce (MIC) and MINAG Agricultural Markets Information System (SIMA). MIC provides market information that meets the needs of traders (upstream), whereas SIMA meets the needs of farmers (downstream). MIC covers the later part of trade which involves wholesale prices

from among larger traders and millers as well as current stocks SIMA is the national MIS based in the Ministry of Agriculture and aims to provide agricultural market information to farmers to enable them negotiate for better prices with traders, to traders and processors to identify opportunities, and to policymakers for food security planning and policy formulation. SIMA has representatives in each province SIMA collects and provides information on transportation costs incurred by traders to move commodities between markets; producer, wholesale, and consumer weekly price levels using both standard and nonstandard units; estimated quantities of commodities available for sale in major wholesale markets; regional and international FOB prices, future prices of major commodities; and foreign exchange rates of neighboring and major countries' currencies. SIMA also provides market analysis covering opportunities and outlook for selected commodities in selected provinces based on field research and rapid appraisals.

The main modes of diffusion used by SIMA at national level include email, national Radio Mozambique, national television, website, and newspapers. The main modes of diffusion used by SIMAP at provincial levels include local radio in local languages, email, notice boards, blackboards, hand-delivery, and through mail bins (pigeon holes) at the province headquarters once a month. Copies of the bulletin are given to local NGOs so that they can distribute the information through their extension agents. Also, the provincial officials take the market information bulletin with them when they go to visit the rural areas in districts.<sup>8</sup>

Organisation	Name	Description
FAO	Aquastat	AQUASTAT is FAO's global water information system, developed by the Land and Water Division. The main mandate of the programme is to collect, analyze and disseminate information on water resources, water uses, and agricultural water management, with an emphasis on countries in Africa, Asia, Latin America and the Caribbean. This allows interested users to find comprehensive and regularly updated information at global, regional, and national levels.
FAO	CountrySTAT	CountrySTAT is a web-based information system for food and agriculture statistics at regional, national and subnational levels. It is based on the FENIX platform, which uses the same open-source technology of the FAOSTAT family. CountrySTAT's objective is to improve access to food and agricultural statistics, which can: Support data analysis and evidence-based decision making Facilitate informed policy making and monitoring with the goal of eradicating extreme poverty and hunger.
FAO	FAOSTAT	The FAOSTAT system is one of FAO's most important corporate systems. It is a major component of FAO's information systems, contributing to the organization's strategic objective of collecting, analyzing, interpreting, and disseminating information relating to nutrition, food and agriculture for development and the fight against global hunger and malnutrition. It is at the core of the World Agricultural Information Centre (WAICENT). WAICENT gives access to FAO's vast store of information on agricultural and food topics – statistical data, documents, books, images, and maps.
IFDC, EAC, COMESA	AMITSA	Among the major constraints to increased use of agro-inputs in East Africa is the lack of information about these agro-inputs. It is against this background that IFDC in collaboration with East Africa Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) have developed AMITSA, the Regional Agricultural Input Market Information and Transparency System. A compilation of data and key statistics on fertilizer, seeds and crop protection products in selected East African countries. Most of these data are sourced from reputable bodies such as FAO, IFDC, Ministries, Industry, Projects and so on. Data on prices, trade, production and consumption of fertilizers
UN	UNOSAT	UNOSAT is the UNITAR Operational Satellite Applications Programme, implemented with the support of the European Organization for Nuclear Research (CERN) and in partnership with UN and non-UN organizations. UNOSAT is a technology-intensive programme delivering imagery analysis and satellite solutions to relief and development organizations within and outside the UN system to help make a difference in critical areas such as humanitarian relief, human security, strategic territorial and development planning. UNOSAT develops applied research solutions keeping in sight the needs of the beneficiaries at the end of the process.

TABLE 1.7 INFORMATION SYSTEMS OUTSIDE THE GOVERNMENT

## 2.2 INSTITUTIONAL CAPACITY TO SUPPORT VIABLE INFORMATION SERVICES

### 2.2.1 GENERAL INFORMATION SUPPLIERS ACTIVE IN AGRICULTURE DOMAIN

<sup>8</sup> Impact of Agricultural Market Information Systems Activities on Market Performance in Mozambique, Michigan State University, by Andrew M. Kizito, Cynthia Donovan, and John M. Staatz (2012).

However, as discussed in the study earlier mentioned<sup>9</sup>, limited development of basic infrastructure, particularly rural infrastructure, coupled with insufficient support services, including information services and key institutions, poses great challenges to achieving the potential of agriculture.

Access to information in the agricultural sector<sup>10</sup> is decreasing see figure below

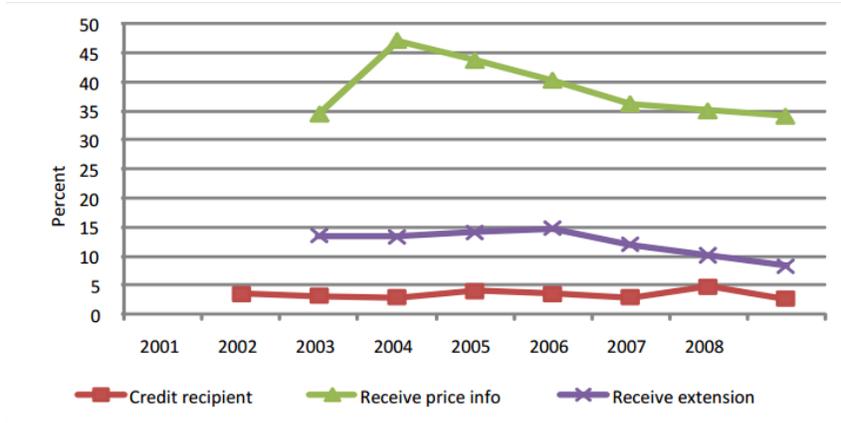


Figure 1.25. Percentage of farmers accessing agricultural services, 2001–08.

Access to price information: Over 30% of smallholder farmers have access to the price information collected and distributed by the Agricultural Market Information System (SIMA), a unit in the Department of Statistics in MINAG. This unit collects prices of agricultural produce from several retail markets in all provinces of Mozambique, and produces weekly and monthly price bulletins. These bulletins are widely broadcast by public and community radio stations.

Access to agricultural extension: Access to agricultural extension is also very minimal. Figure shows that the proportion of smallholder growers accessing extension services has averaged around 12% during the period under review. The extension referred to covers extension provided by the public system, private companies and local and international NGOs. Between 2005 and 2008, access to extension services declined consistently from 14% to less than 8%. Reasons for this decline have not yet been documented.

### 2.2.2 SPECIFIC AGRI-SECTOR INFORMATION SUPPLY AND CURRENT MECHANISMS

Mozambique’s agriculture sector is widely pluralistic and comprises six different groups of stakeholders: (1) the public sector, (government ministries and other public organizations), (2) the private sector, (3) nongovernmental

<sup>9</sup> <http://mozambique.opendataforafrica.org/qcpvszc/mozambique-fao-stat-water-resources-agriculture-production-and-trade>, see page 67, page 5.

<sup>10</sup> [http://www.resakss.org/sites/default/files/pdfs/MozSAKSS\\_ATOM\\_2010.pdf](http://www.resakss.org/sites/default/files/pdfs/MozSAKSS_ATOM_2010.pdf), Dec 2011, Mozambique Ministry of Agriculture (MINAG)

organisations (NGOs), (4) farmers, (5) fishers, and (6) development partners (DPs). Figure 2.1 shows the current composition of different groups of agriculture-sector stakeholders.

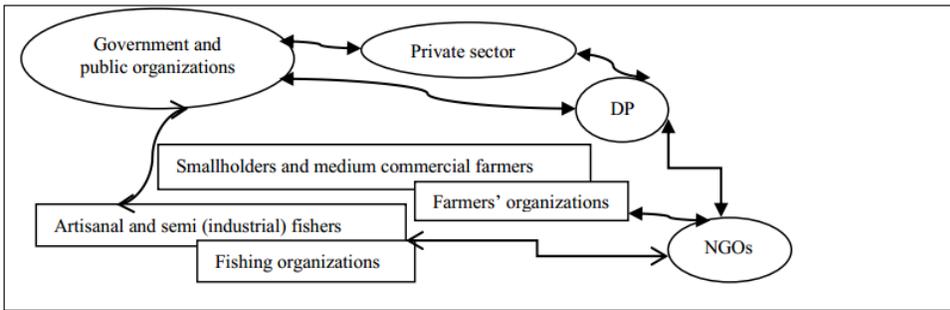


Figure 0.1. The main groups of agriculture stakeholders.

Source: The authors, based on MINAG, MP, MIC information 2010.

See activities of MINAS and SIMA in chapter one for the specific agri-sector mechanisms (and earlier footnotes of resakss.org)

## 2.3 OTHER SECTORS (AND ROLE OF INFORMATION) IMPORTANT FOR THE AGRICULTURAL SECTOR

Assessment of status and problems of information supply in the Agricultural sector see earlier publications.

*For food (and water) security programs, actual and accurate (spatial) information is crucial for land and crop production systems to provide quick indicators on the context (e.g. water availability), status (e.g. biomass, crop type, acreage, etc.) and trends (within and in between seasons, years) of local farming practices/performance. In this section, the main challenges in information supply in Mozambique are summarized as well as the institutional capacity to support viable information services.*

## 2.4 MAIN CHALLENGES IN INFORMATION SUPPLY ENCOUNTERED IN AGRICULTURAL ACTIVITIES

When looking at the earlier mentioned challenges for the agricultural sector, the following issues are partly related to information problems in the sector

- Lack of extension services
- Lack of Research and Development devoted to agriculture
- Lack of use of irrigation **(G4AW)**
- Lack of provision and use of inputs (due to availability, quality, price)
- Lack of access to finance and need for insurance mechanisms **(G4AW)**
- Lack of access to markets
- Serious deficiencies in the infrastructure of the country
- Roads / access routes to rural/production areas **(G4AW)**
- Energy
- Transport **(G4AW)**
- Communications

- High cost and low quality of raw materials for agro-processing facilities
- Absence of systems of agricultural information (**G4AW**)
- Low availability of information about markets and prices (**G4AW**)
- Deficient postharvest handling of the produce (**G4AW**)
- Lack of adequate storage infrastructures (**G4AW**)
- Inadequate implementation of quality norms and lack of qualified producers

**Specific challenges identified:**

The beer/brewer industry (2M, SAB Miller, Manica) are consuming a lot of water for their industrial processing. Important is that quality and quantity is guaranteed. Important is that there is a balance in water use in relation to other sector needs in the area. Objective Information on the availability of water is a main challenge for water governance.

In the agriculture sector there are little real commercial farms owned by the Mozambique farmers, merely the commercial farming is dominated by South African and Zimbabweanese (Contract) farmers.

e.g. important commercial farms in Mozambique are Agrigane (sugar cane and bananas) and the Banco Terra biological sugar cane farm.

## 2.5 INSTITUTIONAL CAPACITY TO SUPPORT VIABLE INFORMATION SERVICES

- Analysis of the institutional capacity to support viable information services

### 2.5.1 GENERAL INFORMATION SUPPLIERS ACTIVE IN AGRICULTURE DOMAIN

- Inventory of general information suppliers active in Agriculture domain (Topographic institutes, Agriculture organizations, meteo organizations, etc,)

Building Mozambique's Cadaster is a very delicate process, which requires a balance between property rights and landuse and with that the official registration<sup>11</sup>. Besides that a public open data infrastructure would improve transparency and ground for private investments and agricultural development in general, see in 2.5.2 the mining sector.

### 2.5.2 OTHER SECTORS (AND ROLE OF INFORMATION) IMPORTANT FOR THE AGRICULTURAL SECTOR

The Ministry of Mineral Resources (MIREM) in Mozambique has launched (in 2013) an Extractive Industry Transparency Initiative (EITI) compliant Mining Cadstre Portal for the country. The online portal is aimed at improving the transparency and promoting investment in the country's mining sector<sup>12</sup>.

#### **Water**

There are many capacity building efforts needed on implementing monitoring techniques on Water balance and

---

<sup>11</sup> [http://www.landandpoverty.com/agenda/pdfs/ppt/rose\\_powerpoint.pdf](http://www.landandpoverty.com/agenda/pdfs/ppt/rose_powerpoint.pdf)

<sup>12</sup> See more at: [http://geospatialworld.net/News/View.aspx?ID=27421\\_Article#sthash.nftea91r.dpuf](http://geospatialworld.net/News/View.aspx?ID=27421_Article#sthash.nftea91r.dpuf)

water accounting techniques which are important for the rural area (especial water distribution and use in agriculture and food industry)

Need for knowledge and services on monitoring Water productivity and optimization of water use in agriculture is evident. (Where the ARA's play a major role in water distribution, see section 1.3)

### 3 NEEDS ASSESSMENT OF IMPROVED ICT & INFORMATION SUPPLY IN THE AGRI SECTOR

In this section, an inventory of specific needs and problems in the information supply (and demand) in the Mozambique Agri sector is provided. The most important local stakeholders represented in the identified problem domains are selected (short list). Furthermore, additional stakeholders in related domains need to be selected (e.g. water domain, nature, industry, etc.).

#### 3.1 NEEDS ASSESSMENT WITH A FOCUS ON POTENTIAL USE OF SPATIALLY BASED INFORMATION SERVICES

##### **Main constraints of contract farming schemes:**

- Market Risk for Farmers
  - Farmers are vulnerable to the risk of the contracting companies not buying the harvest as agreed, sometimes a result of a poorly managed contract scheme. This can leave farmers with a crop and no market.
- Side Selling Risk for Contracting Companies
  - Contracting companies must accept the risk that the farmers fail to honor the contract and instead sell the crops produced with the inputs from the contracting company to other buyers that offer more attractive prices.
- Lack of Competition
  - The dominance of Out grower companies in some areas can reduce the bargaining power of producers and result in unfavorable terms for the producers. Sometimes during the growing season the market prices for crops drop below the prices negotiated at the beginning of the crop season due to market changes. In these cases, the low bargaining power of farmers forces them to accept the prices that companies are willing to pay. If the opposite happens, i.e., the price of the crop increases, Out grower companies do not normally adjust the prices as the companies constitute the only market most of the farmers have. This fact sometimes creates tension between the two parties and negatively affects what should be a win-win partnership.
- Environmental Degradation
  - If proper steps are not taken to ensure appropriate crop rotation, participation in Out grower schemes can lead to soil fertility problems for farmers in the future.
- Risk and Expense of Making Payments in Cash
  - Out grower companies must make payments to thousands of rural farmers each year, many of whom have no access to financial services. This means that payments must be made in cash, at times necessitating that payments be made with helicopter or armed guards to prevent robbery during transport. Safety aside, there are significant operational costs to making so many cash payments. As noted earlier, companies that operate 'mobile money' services can play an important role in addressing this constraint.

Another option that is available for the agricultural sector are wholesale financial service providers that work with institutions working in rural areas, three examples are FARE, GAPI and Banco Terra.

FARE was created in 1996 to offer retail credit to rural shops, mills and some other agricultural projects. Today it plays more of a supporting role to the industry, but also operates a wholesale lending program designed to encourage institutions to initiate activities in rural areas without access to such services.

GAPI has become an active wholesale lender in addition to its primary activity of offering financial services directly to small and medium businesses in rural areas. GAPI's wholesale lending has been directed at micro banks, especially those operating in rural areas, such as the Caixa de Poupança Postal de Mozambique, Caixa Financeira de Caia, Yingwé Microbanco, Microbanco para Desenvolvimento da Mulher (MDM-Microbanco) e Rovuma Microbanco. Additionally, it offers credit to associations of informal traders active in the agricultural sector.

Like GAPI, Banco Terra also offers wholesale credit in addition to its retail operations. Specifically, it offers lines of credit to microfinance institutions. Up until June of 2001 it had supplied 15 million Mt. in credit to 11 microfinance institutions. The minimum value of each credit line was reportedly 100,000 Mt. for a period of 3 years at an annual interest rate of 24%.

Finally, special attention needs to be given to "mobile money". Carteira Móvel SA launched Mozambique's first cell-phone banking service, mKesh, in 2011. The venture is 70% owned by the telecommunication operator mCel and 30% by IGEPE. mKesh allows clients to open accounts from which they can send and receive money transfers as well as pay for services. The transactions are either carried out using their mobile phone or by visiting one of the mKesh agents or mCel stores throughout the country. Clients can also carry out transactions with non-clients by sending them a password that allows them to receive the money from an mKesh agent. Transactions can range from 50 to 25,000 MZM, for which mKesh charges a transaction fee of between 10 and 50 MZM. At the end of September 2011, mKesh had 2,728 agents serving 45,000 clients throughout the country, with the majority being in Maputo (1635), Sofala (526) and Nampula (324). The seven other provinces had between 4 and 70 agents each. Challenges for developing the business have included working within a developing regulatory environment for mobile banking, recruiting personnel with experience in the field as well as significant start-up and advertising expenses. Future plans call for continued expansion to new districts in addition to the development of new services, including the possibility of offering savings accounts. Integration with ATM's and accounts from other banks may also be on the horizon. The other wireless communications operator, Vodacom, is also developing cell-phone based financial services to compete with mKesh throughout the country.

### **Climate**

The country exist of ten agro-ecological zones which are diverse in terms of soil and climate (see map 2.1). Annual rainfall varies between 327 mm in the west of Pafuri area to 2,611 mm per year in the highlands of Gurue district in Zambezi province. The production in Mozambique largely depends on rain, as only 115,000 farms have access to irrigation systems. The production of food crops, which is the smallholder sector's main focus, is subject to enormous variations due to climatic uncertainty and recurring droughts, especially in semi-arid zones; every year pockets of food and nutritional insecurity emerge and reappear. The risk of losing harvests because of unfavorable weather conditions is over 50% throughout the areas of rain fed agriculture south of the Save River, and can reach 75% in the interior of Gaza province.

### **Water**

Better Integrated Water Resource management (IWRM) in the water basins is needed for improved water conservation/harvesting and distribution throughout the year. Climate resilience of farmers through structural water, soil, crop management is needed see following sections.

### **Soil**

With regard to soil management and conservation, Mozambique is facing the challenge of reductions in arable land due to the increased levels of erosion and salinization that are visible on all sides. Expected consequences of

climate change include a rapid decline in natural soil fertility and increased salinization in coastal areas due to salt water encroachment.

### Irrigation

The production in Mozambique largely depends on rain, as only 115,000 farms have access to irrigation systems. Subsistence agriculture is highly dependent on rainfall in at least 95% of cultivated areas. The consequence is that the impact of recurrent droughts or insufficient rainfall has resulted in significant loss of harvests. Since energy in general only reaches towns and urban centers, the lack of electricity means that irrigation has to depend on using fossil fuels. The price of these has been rising, which makes the cost of production unsustainable. At the same time in areas where there is access to electricity, the producers complain about the high prices charged by the concession companies. Mozambique has 15 major water basins of which 9 are shared with neighboring countries. These basins have the potential to support agricultural production and productivity growth and minimize the negative impact of climate change and other variables.

### Inputs and technologies

Fertilizers and pesticides are only used by a small proportion of smallholder farmers. Regional and provincial data shows that their use is primarily associated with tobacco and cotton production, particularly in the center and north. Contributing to the low use of improved inputs are its availability and high cost of acquisition and transaction. Table 2.2 shows the limited use of technology and other inputs in the smallholder sector.

	1996	2002	2003	2005	2006	2007	2008
Users of irrigation	4%	11%	6%	6%	8%	8%	3%
Users of animal traction	7%	11%	11%	9%	12%	11%	11%
Users of chemical fertilizers	1%	4%	3%	4%	5%	4%	3%
Users of pesticides		7%	5%	5%	5%	7%	3%
Member of an association		4%	4%	6%	7%	8%	7%
Help of extension services		14%	13%	15%	12%	10%	8%
Has employees permanently		2%	2%	2%	2%	3%	3%
Has employees temporarily		16%	16%	18%	24%	21%	19%

TABLE 1.8: USE OF TECHNOLOGY AND OTHER INPUTS IN THE SMALLHOLDER SECTOR<sup>13</sup>

### Infrastructure

In the northern region, which has the highest agricultural production, road access limits the activities of the marketing agents, particularly during the rainy season. There is no specialized transport subsector for agricultural trade. There is no railway system linking the north and south of the country.

### Storage

The Mozambique Cereals Institute (ICM) owns warehouses scattered throughout the country inherited from the colonial period, most of which are rented to private traders. The majority of storage capacity is located in the cities and towns, and there is little close to the productive centers. Postharvest losses are high, due to both pests and the physical deterioration of the products in store.

<sup>13</sup> Source: PDDA (MINAG)

FIGURE 1.2: MAP OF MOZAMBIQUE WITH AGRO-ECOLOGICAL ZONES<sup>14</sup>

---

<sup>14</sup> Source: PNISA, MINAG

### **Crops**

Over 80% of the total cultivated area is used for rain fed production of food crops, with maize, cassava and beans occupying around 60% of the total. Production of food crops is important in every region, with differences in the type of crop. Maize and cassava production is dominant throughout the country. In addition, in the north around half of rural households cultivate sorghum. In the center sweet potato and rice are widely grown (particularly in Zambezia and Sofala provinces); and in the south, with the exception of Inhambane, groundnuts play a major role in household food security.

Cash crops make up between 5-6% of the total production. Production of cash crops is mainly concentrated in the center and north, namely cotton (north), sesame (north and Manica province), sunflower (Manica province), tobacco (Tete province).

### **Productivity**

When compared to regional standards, the agricultural production is low in Mozambique. The yield per hectare of agricultural commodities has practically been constant over fifty years. The increase in production has been mainly due to the increasing area that has grown almost in proportion with the increase in population.

### **Knowledge, extension services and research**

Amongst smallholders there is little knowledge of advanced production techniques and commercial practices. Public extension services cover all the 128 districts and 13 cities, with a total of 872 extension agents and technicians, this still serves only 11 % of the total peasant families. The system of public research in Mozambique has a total of 1087 employees of which only 16.7 % are researchers, and of these only 10.4 % have a doctorate.

### **Organization of producers**

Not even 10% of the farmers is organized in small associations or forums. Many of these associations are operating in the formal sector and lack legal status of minimal organizational capacity. Due to this the associations are not contributing a lot to obtain economies of scale and access to land, credit and markets.

### **Processing industry**

The Mozambican agro-industry is poorly developed. There is a lack of processing facilities and a number of facilities are operating with obsolete technologies which make it difficult for them to be competitive. The lack of a processing industry for agricultural products means that value is not added to the primary products. Where processing is done locally the industry has served to catalyze production, as can be seen in examples such as tobacco, cotton, sugarcane, cashew and tea. In these schemes farmers produce under contractor in a concession system for tobacco and cotton coupled with credit in kind.

### **Market access**

Due to the high transaction costs the access to markets is hard to gain for subsistence farmers. The height of the costs is related to expensive transport, limited access to remote areas and the high costs of basic services (electricity, water and telephone). In addition, farmers lack market information.

## 3.2 PUBLIC AND PRIVATE PROBLEM STAKEHOLDERS AND INTERNATIONAL ORGANIZATIONS IN THE DOMAIN OF G4AW

### **Institutional coordination**

The institutions responsible for the framework of the agrarian sector are fundamentally public sector organizations. The main functions of coordination fall to the Ministry of Agriculture (MINAG) and include: analysis, formulation and monitoring of public policies (on land and agriculture); internal and external audit and regulatory mechanisms; the provision of services (extension and research). In addition there are three semi-autonomous in the agricultural sector and rural development which are the Mozambique Cotton Institute (IAM), the Sugar Institute of Mozambique (INA) and the Cashew Promotion Institute (INCAJU). These institutions deal with issues of legislation, implementation and monitoring of policies specific to these crops. Furthermore, to coordinate the involvement of the private sector the Center for Promotion of Commercial Agriculture (CEPAGRI ) was established. To improve the dialogue with the private sector CEPAGRI works closely with the Confederation of Economic Associations of Mozambique (CTA).

### **Financial**

Financing of the agricultural sector in Mozambique is heavily dependent on foreign aid to the state budget. At the same time the total expenditure allocated to agriculture and rural development has been low. Commercial banks grant credits or through normal schemes as well as special lines of credit and guarantee funds. The volume of bank lending to agribusiness is limited, especially for small and medium producers. The banks claim as the main reason the high risk associated with the climate and the lack of safeguards. On the other side the small and medium producers state that when they are “bankable”, the financial products offered are inappropriate to their needs, the interest rates are too high and access is mostly limited to short-term credit. Banks that are mostly related to the sector in Mozambique are Banco Terra and Banco de Oportunidade de Mozambique.

Furthermore there are several microfinance institutions and programs, which are of particular importance to the sector since the far majority does not have access to credits from banks. Examples of MFIs and programs in Mozambique are GAPI and FINAGRO. The financial situation of the agricultural sector will be elaborated later on.

### **Legal**

There are several legal issues that constrain the agricultural sector. First, there is very small percentage of land that has legally recognized forms of ownership. It is estimated that for 96.9% of the area occupied by smallholder farmers a land title is not held. Secondly, there is little guarantee that the legally recognized rights of communities and beneficiaries to land and natural resources are actually maintained. Third, a different new legal issue recently occurred in the form of the new draft agricultural law. Since it is still being discussed, there is no point to elaborate extensively on it. However it deserves attention to that matter that the main point of critique is that the draft law intends to focus on the development of rural and family agriculture as a solution for the eradication of absolute poverty in Mozambique, while almost ignoring the agricultural industry in the process.<sup>15</sup>

---

<sup>15</sup> Source: Legal analysis of the draft law on agriculture, food security and nutrition (draft), SPEED (2014)

### 3.3 ONGOING G4AW RELEVANT ACTIVITIES AND/OR PROJECTS IN TARGET MOZAMBIQUE

The Dutch developed the Messica Irrigation Pilot Project (MIPP) that is supported by Partners for Water since 2012. As a follow up 2 spinoff projects were developed relevant for the agricultural sector in Mozambique:

1. Wageningen UR has won two multi-million euro projects within the Sustainable Irrigation Development Project (PROIRRI), a 5-year programme from the Government of Mozambique, financed by the World Bank. PROIRRI is a highly innovative project, both in its broad approach to revive the country's irrigation sector and in its approach of supporting farmer-initiated irrigation development. Wim van Driel, Team Leader for the project: "The Mozambican Government shows a genuine interest in re-engaging with irrigation and puts substantial attention to creating an enabling environment through the development of policy and investment frameworks, re-training its extension staff and re-establishing higher education in irrigation. The project will also contribute to the national food security."
2. Besides the capacity development project Wageningen University is also part of a consortium that won a 5.8 million US\$ bid for the Irrigation Service Provider within the same PROIRRI programme. This 5-year project will organize the design and implementation process of 3,000 ha rice irrigation. The consortium is led by Royal HaskoningDHV. Gert Jan Veldwisch of Wageningen University will provide academic support by facilitating reflection on the participatory methodology and connecting research activities to the implementation process.

In both projects, a structural component on spatial information for monitoring performance and production could be an interesting add on and could be supported by future G4AW consortia.

### 3.4 REFERENCES TO PUBLIC DOMAIN PUBLICATIONS

- References to public domain publications (e.g. FAO, World Bank, IFC, IFAD)

Market Scan Mozambique Challenges and Opportunities for the Dutch Private Water Sector:

<http://wptest.partnersvoorwater.nl/wp-content/uploads/2011/07/MarketScanMozambique.pdf>

Teaser Opportunities Mozambique:

<http://www.scheepsbouw.nl/dsresource?type=pdf&objectid=default:15358&versionid=&subjectname=>

River Basin Management of Zambezi 2011:

<http://www.slideshare.net/justicaambiental/6-river-basin-management-of-zambezi-2011>

Geodata For Development: a practical approach 2012:

<http://www.eisourcebook.org/cms/files/Geodata%20for%20Development,%20A%20Practical%20Approach.pdf>

## 4. BASE SOLUTION DIRECTIONS IN TARGET MOZAMBIQUE TAILORED TO LOCAL AGRICULTURAL PRACTICES

### 4.1 ACTUAL AGRI-SPATIAL INFORMATION SERVICES AND PROJECTS

Institution name	Institution type	Program name	Activity objective
FAO	Donor	UNJP/MOZ/112/UNJ - Increasing Resilience , Food Security and Livelihoods in Limpopo River Basin	Community management of natural resources is strengthened to increase eco-system resilience to climate change
CARE Mozambique Ireland	Development Agency / NGO Donor	PROSAN (Nutrition and Food Safety Program)	PROSAN aims at tackling household food and nutrition insecurity while strengthening poor resilience to natural disasters and climate change. Food and nutrition security with a conservation agriculture and climate change adaptation component
ADB (African Development Bank)	Donor	Sustainable Land and Water Project	To strengthen capacity of communities to address inter-linked challenges of adverse impacts of climate change, rural poverty, food insecurity and land degradation
European Union	Donor	Support to accelerate progress towards MDG1c in Mozambique	To enhance agricultural and fisheries production through improved access to inputs and advisory services, to increase access to food through improved infrastructure and linkages with buyers; to improve nutrition through fortification, access to essential nutrient and nutritional education.
USAID	Donor	Integrated community-level food security	Build capacity of farmer associations & cooperatives; transfer improved agriculture technologies; facilitate market linkages; support community-level nutrition education
USAID	Donor	Platform for Agricultural Research and Technology Innovation (PARTI)	Develop and transfer improved agricultural technologies; strengthen capacity of agricultural research and technology transfer system

TABLE 1.9: ONGOING AGRIBUSINESS PROJECTS WITH POSSIBLE LINK TO G4AW<sup>16</sup>

<sup>16</sup> Taken from the Deloitte Monitor list of 2013

Organisation	Name	Description
FAO	Aquastat	AQUASTAT is FAO's global water information system, developed by the Land and Water Division. The main mandate of the programme is to collect, analyze and disseminate information on water resources, water uses, and agricultural water management, with an emphasis on countries in Africa, Asia, Latin America and the Caribbean. This allows interested users to find comprehensive and regularly updated information at global, regional, and national levels.
FAO	CountrySTAT	CountrySTAT is a web-based information system for food and agriculture statistics at regional, national and subnational levels. It is based on the FENIX platform, which uses the same open-source technology of the FAOSTAT family. CountrySTAT's objective is to improve access to food and agricultural statistics, which can: Support data analysis and evidence-based decision making Facilitate informed policy making and monitoring with the goal of eradicating extreme poverty and hunger.
FAO	FAOSTAT	The FAOSTAT system is one of FAO's most important corporate systems. It is a major component of FAO's information systems, contributing to the organization's strategic objective of collecting, analyzing, interpreting, and disseminating information relating to nutrition, food and agriculture for development and the fight against global hunger and malnutrition. It is at the core of the World Agricultural Information Centre (WAICENT). WAICENT gives access to FAO's vast store of information on agricultural and food topics – statistical data, documents, books, images, and maps.
IFDC, EAC, COMESA	AMITSA	Among the major constraints to increased use of agro-inputs in East Africa is the lack of information about these agro-inputs. It is against this background that IFDC in collaboration with East Africa Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) have developed AMITSA, the Regional Agricultural Input Market Information and Transparency System. A compilation of data and key statistics on fertilizer, seeds and crop protection products in selected East African countries. Most of these data are sourced from reputable bodies such as FAO, IFDC, Ministries, Industry, Projects and so on. Data on prices, trade, production and consumption of fertilizers
UN	UNOSAT	UNOSAT is the UNITAR Operational Satellite Applications Programme, implemented with the support of the European Organization for Nuclear Research (CERN) and in partnership with UN and non-UN organisations. UNOSAT is a technology-intensive programme delivering imagery analysis and satellite solutions to relief and development organisations within and outside the UN system to help make a difference in critical areas such as humanitarian relief, human security, strategic territorial and development planning. UNOSAT develops applied research solutions keeping in sight the needs of the beneficiaries at the end of the process.

TABLE 1.10: INFORMATION SYSTEMS OUTSIDE THE GOVERNMENT

#### FARM INSURANCE AND RISK PREVENTION STRATEGIES

As mentioned before, this sector (insurance) is in a very primordial stage due to the lack of extension services and actual information of individual smallholders in the field. As the main part of the sector is rainfed and therefore mainly climate dependent, risk prevention strategies are very important for the agricultural sector in the near future of Mozambique.

#### 4.2 DIFFERENTIATION OF SPATIAL SOLUTIONS TAILORED TO AGRICULTURAL PRACTICES/SECTOR IN TARGET MOZAMBIQUE

**Climate:** The large variation in rainfall is one of the major issues for having sustainable growth and production in the agricultural regions of Mozambique as most of the crops are rain fed cultures. It is therefore important to have early warning (remote sensing and weather based) systems on drought, which can help farmers anticipate in the agricultural plans and investments for the next season also to take timely measures during the season. Another farm management tool could be monitoring on water productivity and water accounting using optical/thermal remote sensing techniques.

**Soil:** Using integrated field and remote sensing monitoring approach one can evaluate the land use and with that the suitability for growing the right crops in the specific areas. Each crop has its own requirements of the land and its resources and with that the additional measures needed to have effective agri-business. With remote sensing one can also evaluate production and growth performance through monitoring and mapping the areas over the seasons and the years. It can help supporting decisions in changing land use to other more effective agriculture. E.g. the management of the land (like contour ploughing) can improve the production and local soil conditions, due to less erosion and loss of minerals. Or the irrigation with use of (salinized) groundwater can be directly monitored in the crop performance or the harvest.

**Irrigation:** The irrigated agriculture (minority) is depending on local water resources/surface water in the near surroundings (lakes, rivers) and on water availability in aquifers. The lack of proper water management (IWRM) require the farmers to use their water as efficient as possible. Apart from applying various irrigation techniques one also could use information from remote sensing to identify the hotspots, where losses are high, in order to take local effective measures and to focus the attention of improving the management on the right place and time. (Water productivity monitoring using remote sensing). Risk reduction techniques help in

**Infrastructure:** For planning and optimization of routing, but also for estimating at end of seasons harvest volumes of various crops, one can use remote sensing and GIS applications to anticipate and plan the most efficient way for logistics. Of course this information over the years will also give input to long term planning of the best economic location of infrastructure (railway, road transport, etc.)

**Storage:** See similar spatial applications for routing mentioned earlier, when agricultural (location based) information over the years is known, better and efficient planning and routing is possible. With that also the most important nodes in infrastructure will be known and with that also storage facilities for harvest and goods. Storage facilities are also important for back up for anticipating near future crisis (like droughts or local floods) which help in storing and near future benefits from local harvests (food) and prevents further losses and decay. Also these storage facilities/nodes help in managing inputs (storage of seeds, etc.) for local farmer communities.

**Crops:** Crop Production monitoring and (Acreage) mapping using remote sensing in combination with fieldwork can result into timely information during the season. Which is important for crops management and optimization of production and reduction of losses due to growth limiting factors (such as drought, disease, lack of nutrients, etc.). It is also interesting to build capacity to the extension services, by having support of fieldwork and indicators of hotspots with potential problems. Interesting is that without knowing the crop type (which can be mapped/classified with remote sensing as well, with certain need of ground truth for validation) also water productivity in general can be derived from satellite imagery, which is an indicator for water availability and crop growth conditions in general .

**Productivity:** Besides earlier mentioned indicators and monitoring of (water) productivity and mapping (acreage) of crops it is possible to use remote sensing as a part of advice to farmers to increase productivity. This could be an additional (new) service or a combination with the extension services of the government, which is in need for more capacity.

**Knowledge extension services and research:** By cooperation between universities; research institutes and companies one can work together with local Mozambique actors in agriculture. Some examples are already in place (see project Alterra/WUR on irrigation capacity)

## 5. PARTNERSHIPS BETWEEN STAKEHOLDERS IN MOZAMBIQUE AND DUTCH SECTOR

Partnerships are to be developed after the mission of the G4AW team and according matchmaking efforts during and after the mission. Some directions can be identified with NGO's (like SNV and local partners in the cotton sector), or in the agribusiness chain and insurance business related to cotton (which is an important agricultural activity in Mozambique and also investigated by the Mozambique government: MINAG).

## ANNEX 1 ACCESS TO FINANCE OF THE AGRICULTURAL SECTOR<sup>17</sup>

Although financial institutions are not lacking in Mozambique, for various reasons smallholders have limited access to them, 85% of the agricultural groups were excluded from access to rural finance. Of rural enterprises, 2% of the small ones has access to credit, 7% of the medium ones and 15% of the big companies. This means that 2% of the agricultural enterprises in Mozambique has access to credit. Below is a short description of different types of financial institutions in Mozambique and their relation to the agricultural sector.

In Mozambique there are 18 commercial banks registered with the Bank of Mozambique that offer a wide range of financial products. Of these, there are four commercial banks dedicated to microfinance: Banco Procredit SA, Banco Socremo de Microfinanças SA, Banco Oportunidade de Moçambique SA (BOM) and BancoTchuma, SA. All of the commercial banks in Mozambique finance agricultural production through their standard loans. However, as commercial banks have expanded, they have designed specific products aimed at the sector, such as lines of credit. That is the case with Banco Terra, which has begun offering credit all along the value chain, and Standard Bank, which has created a department specializing in agricultural finance.

In 2004 the Bank of Mozambique signed a decree that opened up opportunities for so called Micro Banks. Eight banks were authorized to operate, however in 2012 still none of them offered agricultural loans. In addition there are seven Credit Cooperatives operating in Mozambique, distributed in five provinces (Maputo city (2), Gaza (1), Tete (1) and Nampula (2)). Although they have some clients which are involved in agriculture, they have a very limited outreach.

Furthermore, according to BoM data, in August 2011, there were 155 microfinance operators in Mozambique. These include NGOs and associations, as well as individuals who have obtained licenses from the central bank to be engaged in microcredit activities. The latter make up around 20% of microfinance operators. The vast majority operate in Maputo City and Province (70%). Manica, Tete and Niassa are the least served provinces, with only 1, 2 and 2 operators, respectively. Due to the nature of their licenses, these institutions can strictly offer only credit products. Again, information about the portfolios of this type of financial service provider is limited. Only a limited proportion includes agricultural loans in their product mix and their outreach is limited. Outcomes of a survey in 2012 show that the 23 institutions that responded, have in average each operator has 821 clients and an average portfolio of 720, 000 Mts. In terms of insurance, only one institution (Hluvuku) offers credit insurance to its clients.

Main constraints of Micro Finance Institutions in Mozambique

- Dependence on Donors
  - The microcredit operators have an enormous dependency on donors. This situation is made worse when payments from donors lag behind. The biggest microcredit operators are considering or have already drafted business plans to enable them to capture deposits so that they have additional sources of funding to finance their portfolio. However, given the internal capacity issues, strict reporting requirements and limited access to finance to pay for the transformation process (including the investment in staff, equipment, security, more appropriate systems and infrastructure), it is unlikely that it will happen in the short term.
- Lack of a Credit Bureau for Microcredit Operators

---

<sup>17</sup> Source: Status of Agricultural and Rural Finance in Mozambique, Finmark Trust, Henriqueta Hunguana, Paulo Ribeiro, Tatiana Mata, Menzi Dlamini, Vuyo Mahlati and Kevin Fitzpatrick (2012).

- Microcredit operators have no efficient means of determining if a client is also a client of another financial institution. Only institutions subject to prudential supervision are part of the credit bureaus that are supervised by the central bank. As a result, there are signs of over indebtedness as some clients request loans from one institution to pay debt owed to another.
- Lack of Information Systems

Many microcredit operators lack sophisticated management information systems that could increase their operating efficiency, principally due to the costs associated with their implementation and maintenance. Additionally, several are using different systems from various providers, making it difficult to share the acquisition and maintenance costs.

An important source of credit for many smallholder farmers in Mozambique is the empresas de fomento. These agro-processing firms have been implementing out grower schemes for cash crops for decades. The firms typically provide smallholder farmers with inputs like fertilizer and seeds at the beginning of the planting season, agreeing on the price that the company will pay for the harvest at the end of the season. Once harvest time comes, the company pays the established price for the harvest minus the cost of the distributed inputs. Currently, the empresas de fomento are concentrated in two crops: tobacco and cotton.

The largest tobacco empresa de fomento is Mozambique Leaf Tobacco (MLT). The firm buys and processes burley tobacco from over 120,000 smallholder farmers in Tete, Niassa and Zambézia. In this outgrower scheme, MLT provides fertilizers, chemicals and seed on credit that is repaid by the farmers with their harvest. The company has a processing facility in Tete.

The Mozambique Cotton Institute estimates that 170,061 smallholder families produced cotton in 2011 and most sold it to empresas de fomento. 128,000 ha. of cotton were planted in 2011, producing just over 70,000 tons. Nearly 95% of this production came from Smallholder farms. Three firms, Lexus, OLAM e SANAM account for 79% of the production. Even a firm like JFS/SAN, with just 6% of the production, worked with over 20,000 small producers and distributed over 3 million USD in inputs in 2011. OLAM specifically works with over 40,000 small producers, providing them with inputs, financing and extension services. The company has 19 warehouses nationwide. In addition to cotton, OLAM also works with the following products: cashew, peanuts, rice, sesame and wood.