Droughts in Angola 2012 - 2016

PDNA

Post Disaster Needs Assessment

ANGOLA DROUGHT

Recognitions

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Acronyms

BBB	Building Back Better
BNA	National Angolan Bank (Banco Nacional De Angola)
CERF	Central Emergency Response Fund
CLTS	Community Led Total Sanitation
CNPC	National Commission for Civil Protection (Comissão Nacional de Proteção Civil)
DRR	Disaster Risk Reduction
EM-DAT	OFDA/CRED International Disaster Database, Université Catholique de Louvain, Belgium.
EWCM	Early Warning Crop Monitor
FAO	Food and Agriculture Organization
FEWS NET	Famine Early Warning Systems Network
FLDAS	Fews Net Land Data Assimilation System
FMD	Foot And Mouth
GAM	Global Acute Malnutrition
GDP	Gross Domestic Product
GoA	Government of Angola
HDI	Human Development Index
HHWTSS	Household Water Treatment and Safe Storage
INE	National Institute Of Statistics (Instituto Nacional De Estatística)
ITCZ	Inter-Tropical Conversion Zone
LDC	Least Developed Country
MAM	Moderate Malnutrition
MDG	Millennium Development Goals
MINAGRI	Ministry of Agriculture
NASA	National Aeronautics And Space Administration
NDP	National Development Plan
NDVI	Rainfall Estimates And Vegetation
NTFP	Non Timber Forest Products
OCHA	Office For The Coordination Of Humanitarian Affairs
PDNA	Post-Disaster Needs Assessment
PME	School Lunch Program (Programa De Merenda Escolar)
PTPA	Therapeutic Program For Ambulatory Patients (Programa Terapêutico Para Pacientes Em Ambulatório)
SADC	Southern African Development Community
SAM	Severe Acute Malnutrition
UEN	Special Unit For Nutrition (Unidade Especial De Nutrição)
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations International Children's Emergency Fund
UNRCO	United Nations Resident Coordinator Office
WASH	Water, Sanitation And Hygiene Sector
WRSI	Water Requirement Satisfaction Index

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The PDNA exercise was undertaken by sector teams composed of representatives of the Government of Angola, the United Nations, European Union and the World Bank. The following national authorities and UN agencies participated in the PDNA: The National Commission for Civil Protection (CNPC) (composed by the Ministries of Agriculture (MINAGRI), Health (MINSA), Education (MINED), Assistance and Social Inclusion (MINARS), Energy and Water (MINEA)), the Service of Civil Protection and Fireghters (SPCB), the National Institute of Statistics (INE), UNDP, FAO, OMS, WFP, UNFPA, UNICEF, OCHA, the European Union and the World Bank.

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EXECUTIVE SUMMARY

Following the 2015-16 drought associated with El Nino, which follows four previous years of consecutive drought in southern Angola, the Government of Angola (GoA) requested the technical assistance of the United Nations in May 2016 to undertake a post-disaster needs assessment (PDNA) in the priority provinces of Cunene, Huila and Namibe in southern Angola.

The PDNA was conducted between 11 July and 19 August 2016 by a team of experts from Ministerial Departments of the CNPC, with the support of the United Nations agencies in Angola, the World Bank and the European Union.

Since the 2011/12 agricultural campaign, the southern region has been experiencing a drought situation, affecting mainly three provinces: Cunene, Namibe and Huíla. Sporadic rains during this period brought some relief but were not enough to start the recovery. The drought has returned to the agricultural calendar of 2015/16. In fact, some areas in southern Angola, as well as other parts of Southern Africa, recorded the driest season in 35 years, as shown in Fig. 1 below.

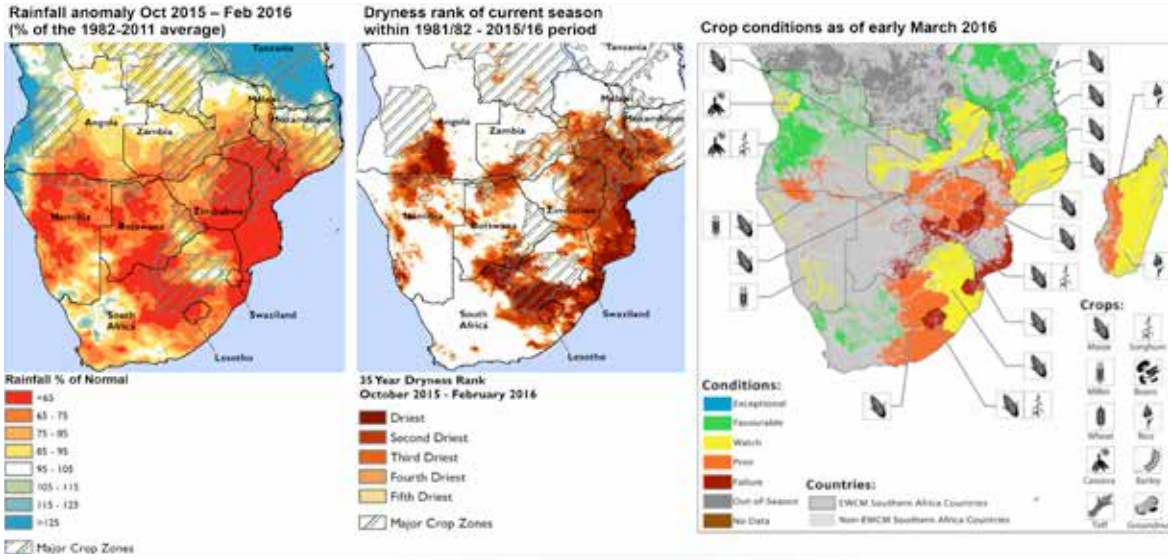


Fig. i: **Rainfall anomaly, dryness rank and crop conditions in Angola.**
Source: FewsNet Southern Africa Special Report, March 2016

The three provinces are within the arid and semi-arid agro-ecological zone that is characterized by desert, savannah grass and woodlands. This zone has a unimodal rainfall pattern, with average precipitation of about 200-400mm per annum. The rainy season lasts from mid-October to March.

The region is largely agro-pastoral and livestock is an important livelihood asset, primarily cattle but also goats, sheep, pigs and poultry. Livelihoods depend on a combination of livestock raising, milk production, cereal production, market food purchases, seasonal fishing (coastal and riverine areas), horticulture and gardening, as well as labor markets fueled by trade and industry. The main food crops grown are millet and sorghum, also maize

and beans especially in Huila where the northern region is one of the key areas supplying cereals in Angola, and, in recent years, the growth of tubers, such as cassava and sweet potatoes. Income along Namibe's coastline is based on large-scale, commercial and semi industrial marine fishing, as well as smallholder fishing activities.

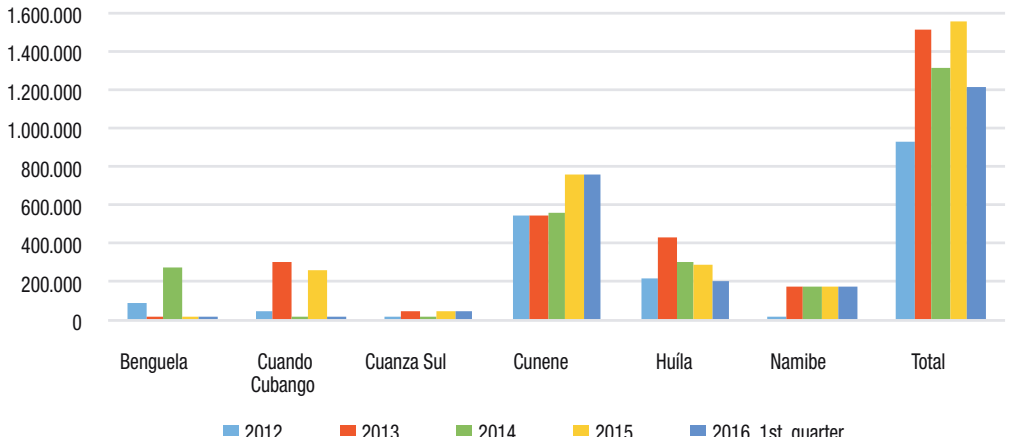
The drought in Angola occurs at a time when the country is experiencing an oil crisis, driven by the drop in the price of oil on the international market, which has considerably reduced state revenues, which in turn has led to significant cuts in public spending, and the substantial devaluation of the national currency (Kwanza).

KEY FINDINGS

- The southern provinces of Cunene, Huila and Namibe have experienced drought conditions since the 2011-12 agricultural calendar, along with other provinces. Since then, every year the Government has identified the number of people affected by drought in each province, as shown in Fig. ii below.

Fig. ii: **drought-affected population by province and year**

Province	2012	2013	2014	2015	2016 1st. quarter
Benguela	97.135	15.000	273.161	16.342	7.805
Cuando Cubango	45.000	306.606	2.976	267.832	22.444
Cuanza Sul	10.000	44.238	1.928	44.238	44.238
Cunene	550.000	550.000	555.000	755.930	755.930
Huíla	215.792	427.465	306.480	291.925	205.507
Namibe	15.000	177.627	177.627	177.627	177.627
Total	**932.927**	**1.520.936**	**1.317.172**	**1.553.894**	**1.213.551**
	780.792	1.155.092	1.039.107	1.225.482	1.139.064
% in the three affected provinces	83,7	75,9	78,9	78,9	93,9

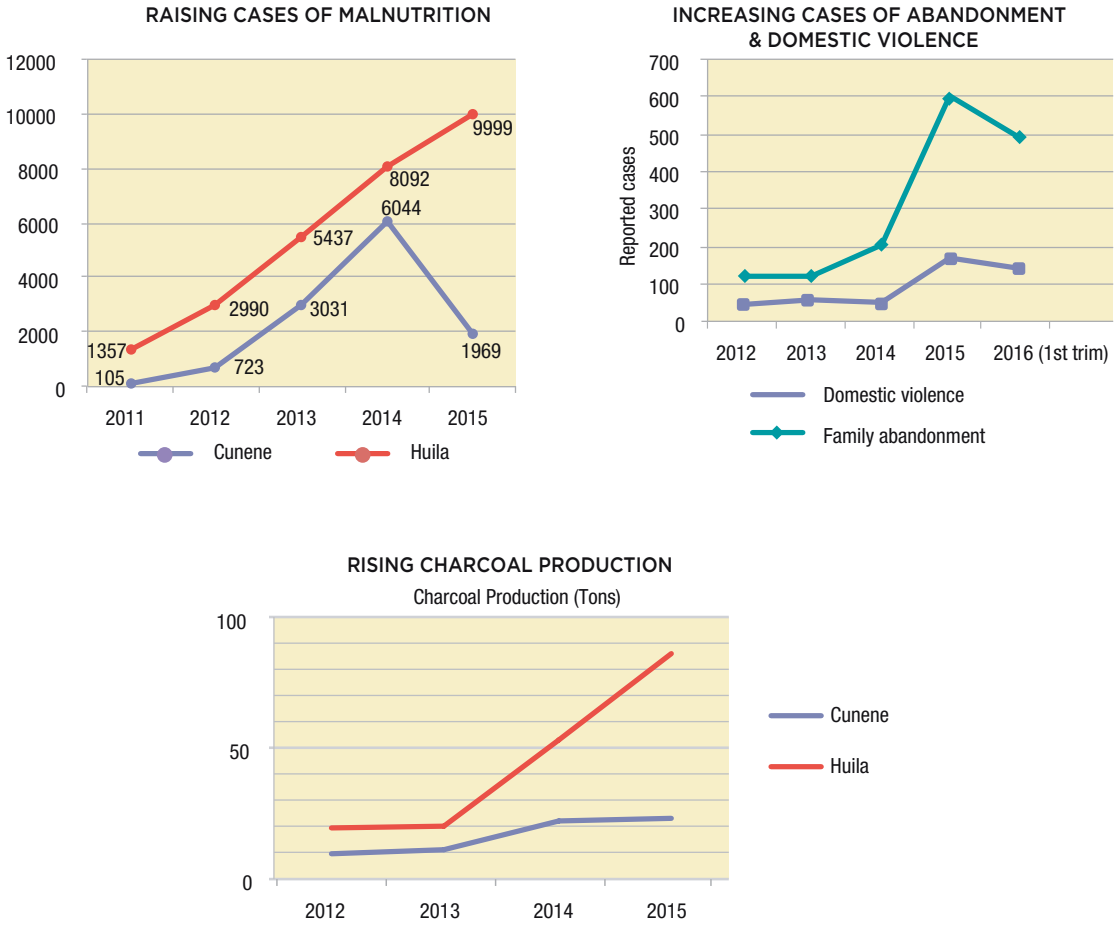


Source: National Commission of Civil Protection (CNPC)

- According to the latest figures provided by the GoA for the PDNA, there are currently 1,139,064 people affected by drought in the three provinces: 755,930 are in Cunene, 205,507 in Huila, and 177,627 in Namibe[1].

- The overall situation in drought-affected areas is deteriorating. This is evidenced by the rising trend in admission cases of malnutrition, of family abandonment, domestic violence, charcoal production as seen in Fig. 3 below, but also by increasing deforestation and the continued depletion of water resources in the region[2].

Fig. iii: **rising trends in malnutrition cases reported, family abandonment, domestic violence and charcoal production**



Source: PDNA team, based on data from Government of Angola

- The progressive decline of available water is a major problem, as rivers are drying up and the water flow to the aquifer of river basins in the region is dropping. Since 2013 there has been a progressive drying of two fertile oasis which are rich in biological resources and ecosystems. The water table is also declining and about 80 percent of the existing boreholes are non-functional due to water scarcity and disrepair (approximately 2400 boreholes damaged). It is estimated that less than 20 percent of communities have access to safe water.

[1] Data on the population affected in 2012 in this report, differs from the information reported by other sources including the international EM-DAT database on disasters. In 2012, 1.8 million people were reported as being affected by the drought in 10 provinces.

[2] The drop in numbers of malnutrition in 2015 is due to lack of reporting and not to actual decrease in the number of cases, as explained in detail under the chapter of nutrition and food security.

- The growing water deficit and worsening food security / nutrition conditions should be urgently addressed, to meet the minimum requirements of the affected population, and also to arrest the root causes of other secondary cascading effects such as school drop outs, domestic violence, migrations, deforestation, etc.
- Although drought affects the three provinces, the conditions seem particularly serious in the province of Cunene, taking into account the precarious socio-economic situation before the drought and its post-disaster situation. For these reasons, Cunene should receive priority assistance and conditions should be monitored closely over the next few months.
- Access to food and basic goods and public services is constrained by high inflation and reduced government spending, which worsens the impact of the drought. High inflation is driven by the cuts in fuel subsidies, reduced food supply in local markets, and devaluation of the currency (Kwanza), while low revenues due to the oil crisis has forced the government to drastically reduce public expenditures. As a result, local authorities lack the necessary resources to fully implement the drought response. Local water projects (repairs and construction of boreholes) initiated by local governments have come to a standstill due to the lack of resources to pay contractors and purchase the needed equipment. In addition, disruptions in the supply of nutritional supplements led to the closure of some inpatient and outpatient treatment centers (UEN and PTPA) in affected areas.
- Lower food production and constrained access is deteriorating the food security and nutrition situation of affected households. Food consumption has decreased in terms of quality and quantity of meals (1 or 2 meals a day mostly millet porridge). Households have turned to alternative sources of food and income, such as producing / selling charcoal and gathering wild food for consumption and sale. As noted, cases of malnutrition have been rising since 2012.
- Many reports confirmed greater school abandonment and lower school attendance due to the impact of the drought, including hunger and lack of water as a direct cause, increased need for child labor, out-migration, longer transhumance livestock migrations, greater difficulties in fetching water for family consumption, and closure of some schools.
- Environmental conditions are deteriorating, particularly the production of charcoal which has been increasing every year since 2012, leading to a higher rate of deforestation and land degradation.
- The social and human impact of the drought is significant. Transhumance livestock migrations begin earlier and last longer than is customary, school dropouts have been increasing, women and children have increased workloads, cases of family abandonment are rising as well as domestic violence. These trends can have negative consequences over the medium to long-term, including negative development outcomes such as lower educational attainment, deterioration of health, greater social exclusion, breakdown of family and social cohesion, increased social risk, and ultimately greater impoverishment.
- Overall, although the drought has had a significant impact as noted above, the drought did not affect trade and industry nor did it have an impact at the macro-economic level. However, the drought has impacted agricultural production at national level, and the country's economic crisis is serious and may worsen and further aggravate conditions for the populations affected.

- The drought recovery program that will be formulated based on the findings of the PDNA should be given priority, especially because of the consecutive drought and deteriorating conditions, but also in view of the reduced capacity of local authorities (due to reduced public spending), and the limited humanitarian funding received thus far.
- Given the limited capacity of local authorities, in terms of financial and human resources, it is important to ensure that the recovery programme supports governance, with additional personnel and technical expertise, strong implementation and coordination mechanisms.
- The recovery programme should implement the recommended short and medium-term measures, but also the longer-term strategies needed to build resilience and reduce the risks and vulnerability of the population to future droughts, floods and the growing impact of climate change.

TOTAL DAMAGE AND LOSSES

Table i below presents a summary of the damage and losses estimated for the provinces of Cunene, Huila and Namibe for each sector. Total damage for all sectors is estimated at just over US$297 million or AKZ 48.5 billions, while total losses at US$452 million or AKZ 74 billion. The losses overall are much higher than the damages since drought typically does not cause physical destruction as do other types of disasters.

Table i: **Total damage and losses in Cunene, Namibe and Huila**

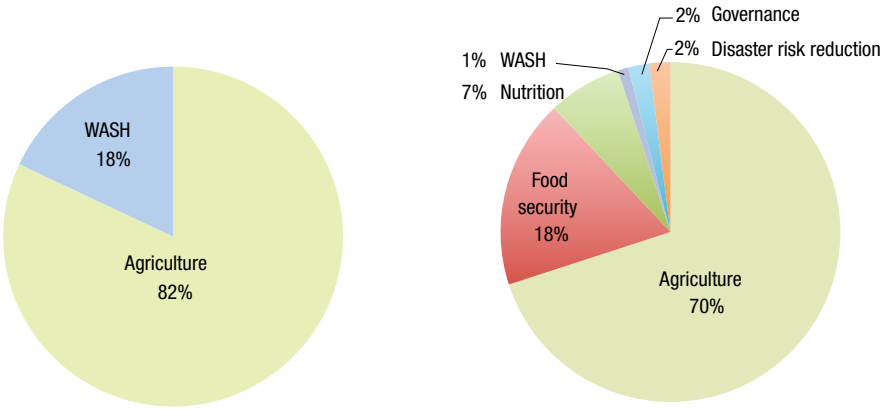
Sector	Damage USD millions	Losses USD Millions	Damage AKZ billions	Losses AKZ billions
Agriculture	244,7	316,9	40,0	52,0
Food security		82,0		13,3
Nutrition		32,8		5,4
WASH	52,5	5,3	8,5	0,9
Education				
The environment				
Disaster risk reduction		8,1		1,3
Governance		7,3		1,2
Total	**297,2**	**452,4**	**48,5**	**74,1**

As shown in Fig. 5 below, the agriculture-livestock-fisheries sector is by far the most affected. Total damage in the sector is estimated at US$244.7 million (AKZ $40 billion) which represents about 82 percent of all damage, while sector losses are estimated at US$317 million (AKZ 52 billion) which is equivalent to 70 percent of all losses. Damage figures were estimated based on the livestock deaths reported in Namibe (110.000), Huila (150.000) and Cunene (240.000) for a total number of cattle death of 500.00. Losses in the three provinces were calculated based on the reduced production of cereals and other crops, milk and meat, as detailed in the specific chapter.

For the water, sanitation and hygiene sector (WASH), total damage is estimated at US$52.5 million or AKZ 8.5 billion which considers the 80% of boreholes that are inoperable and need to be partially or fully repaired. Damage in the WASH sector represents the 18 percent of the total damage. Losses in the sector are estimated at US$5.3 million or AKZ 0.9 billion which reflects the additional costs incurred by the government and the international community to assist the affected population in the three provinces.

After agriculture-livestock-fisheries, the second greatest losses were in food security[3] with US$82 million or AKZ 13.3 billion, representing 18 percent of all losses. The nutrition[4] sector also had significant losses valued at US$32.8 million or AKZ 5.4 billion. These losses reflect the additional costs incurred by the government and the international community to reduce food insecurity and malnutrition among the drought-affected population in the three provinces.

Fig. iv: **distribution of damage and losses**



RECOVERY STRATEGY

Recovery Needs

Recovery needs were estimated on the basis of the PDNA results for disaster effects and disaster impacts and were determined for the following four components: 1) Reconstruction physical assets; 2) Resumption of production, service delivery and access to goods and services; 3) Restoration of governance and decision making processes; 4) Reduction of vulnerabilities and risks.

The short and medium-term recovery needs refer to measures required to address the current drought crisis while also rehabilitating crop and livestock production, water sources to improve water availability for people and livestock, support to nutrition centers for the treatment of malnutrition including supplies and trained personnel, support to reinstate school feeding programs to encourage the return to schools and arrest school drop-outs,

[3] Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.1996 World Food Summit

[4] According to WHO severe acute malnutrition is defined as a weight-for-height z-score of less than −3 SD or a mid-upper arm circumference of less than 115 mm, and a Z-score cut-off point of <-2 SD to classify low weight-for-age, low height-for-age and low weight-for-height as moderate.

alternative income-generation activities to as well as to reduce charcoal production, deforestation, and soil and land degradation, among other recovery measures.

The longer-term recovery needs include measures to reduce the risk associated to droughts and its possible impact in the southern region of Angola, for example through the better management of natural resources such as reforestation, the introduction of water harvesting techniques, community irrigation systems to support crop production, the introduction of farming technologies and practices that are more sustainable (e.g. drought-resistant crop varieties), alternative livelihood strategies and income-generating activities, among other measures to reduce risk and vulnerability and support adaptation, particularly in view of the likely increase in the frequency and severity of drought in the region due to climate change.

The proposed needs also take into consideration the issues of governance, particularly those measures required to strengthen the capacity of local authorities across all sectors to implement and manage the recovery programme, through additional expertise and human resources, equipment and information management systems to facilitate monitoring and inter-institutional coordination.

The identified needs include disaster risk reduction measures to build resilience and reduce the impact of future droughts in the southern region. The proposed DRR interventions are integrated within each of the sectors as part of the proposed sectoral long-term measures, and are reflected as such in the matrix below outlining the recovery needs and budget.

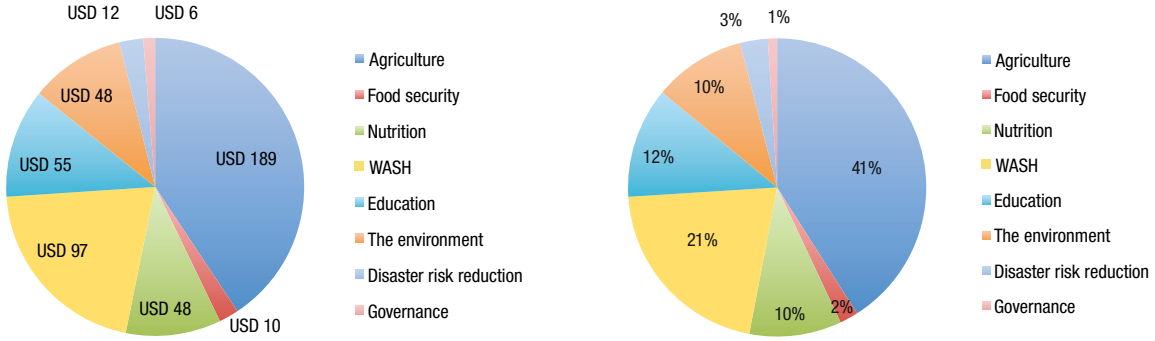
Table ii below presents the proposed budget for recovery, totaling US$464.5 million or AKZ 75.6 billion. The greatest needs are in the agriculture and water sectors, which require US$189 million and US$97 million respectively. The recovery needs include measures required in the short-term (6 months to 1 year), medium-term (1 to 2 years) and long-term (2 to 4 years).

Table ii: **Recovery needs in Cunene, Namibe and Huila, by sector (USD and AKZ)**

Sector	short term USD millions	medium term USD millions	long term USD millions	Total USD millions	Total AKZ billions
Agriculture	34	152	3	**189**	**30,75**
Food security	10			**10**	**1,63**
Nutrition	35	8	5	**48**	**7,81**
WASH	52,5	30	14	**97**	**15,7**
Education	35	20		**55**	**9**
The environment	15	23	10	**48**	**7,81**
Disaster risk reduction	12			**12**	**1,95**
Governance	2	2	2	**6**	**0,98**
Total	**195,5**	**235**	**34**	**464,5**	**75,63**

Note: short-term (6 months to 1 year), medium-term (1 to 2 years) and long-term (2 to 4 years).

Fig. v: **Recovery needs by sector, in USD million and as a percentage share of total**



Vision and intended sectoral results

The recovery strategy focuses in assisting 1,139,064 people affected by drought in the provinces of Cunene, Huila and Namibe by implementing the initiatives identified and budgeted in the recovery needs assessment, for a total amount of US$464.5 million or 75.6 billion AKZ as summarized in table 16 above.

Four are the key lines of intervention proposed for the recovery strategy:

- Address the most immediate needs of the most affected populations.
- Align the drought recovery strategy with the Angola's National and Provincial Development Plans 2013-2017.
- Link the agendas of disaster risk reduction and climate change and adaptation.
- Improve governance and information management

Implementation Arrangements

While it is recognized that recovery should be implemented under the strong leadership of the national government, other partners can bring technical skills and experiences that will improve the quality of recovery. The GoA should consider setting up appropriate coordination mechanisms to bring together the range of technical expertise required for recovery to provide sustained technical assistance to families for the long duration of the recovery process.

THE DISASTER RECOVERY FRAMEWORK

The PDNA and the proposed recovery strategy should be used as a reference to guide the formulation of a Disaster Recovery Framework (DRF) for the three most affected provinces, Cunene, Huila and Namibe.

Prepared under the leadership of the GoA, in consultation with key stakeholders, DRF would provide a systematic, structured and prioritized framework for implementing recovery and reconstruction. DRF is expected to be a common framework meant to serve all of government, as well as national and international partners and other recovery stakeholders, including the affected population. The DRF would support the GoA to approach in an integrated manner the policy decisions, institutional arrangements, financing and financial management strategies, as well as implementation and monitoring systems to plan and manage drought recovery.

A detailed recovery planning exercise should take place as an immediate follow-up to the PDNA, as an inclusive process, with the participation of the national and local government authorities, including sector line ministries, civil society and community-level organizations. The PDNA partners, EU, UN and WB remain committed to supporting the GoA to undertake this planning exercise that could include other relevant/interested partners.

THE PDNA METHODOLOGY

The PDNA follows a methodology jointly developed by the European Union, the World Bank and the UNDG that incorporates a collection of analytical methods, tools and techniques developed for post-disaster assessments and recovery planning, ensuring sector to sector comparability in the definition of the following elements:

- Pre disaster context and baseline identification
- The assessment of disaster effects
- Estimation of the economic value of the disaster effects
- The assessment of disaster impacts
- The Recovery Strategy, determining sector recovery needs.

The following sectors and cross-cutting issues were addressed by the PDNA: agriculture, food security, nutrition, water, sanitation and hygiene, education, the environment, social impact, industry and trade, disaster risk reduction, and the macro-economic impact.

Lack of sufficient baseline data and updated statistics further complicated the calculation of damage and losses across all sectors as per the standard PDNA methodology thus requiring an additional effort from the team.

The sector teams conducted the assessment through: 1) the collection of pre-disaster baseline data to compare with post-disaster conditions; 2) the evaluation of disaster effects and impacts in each sector to determine the overall recovery needs; and 3) the prioritization of these recovery needs.

Most of the sector teams conducted field visits to the provinces of Cunene, Huila and Namibe to assess conditions in the areas affected by the drought through participant observation techniques, focus group discussions, and key informant interviews with affected households and local authorities.

INTRODUCTION AND CONTEXT

Following the 2015-16 drought associated with El Nino, which follows four previous years of consecutive drought, the government requested the technical assistance of the United Nations (UN) in May 2016 to undertake a Post-Disaster Needs Assessment (PDNA) in the priority provinces of Cunene, Huila and Namibe, and to subsequently develop a resilience-building recovery programme. The approach is expected to contribute to the implementation of the government's Least Developed Country (LDC) graduation strategy and Sustainable Development Goals, as well as Sendai Framework for Disaster Risk Reduction (DRR) 2015-2030.

The PDNA was conducted between 11 July and 19 August 2016 by a team of experts from Ministerial Departments of the CNPC, with the support of the United Nations agencies in Angola, the World Bank and the European Union. The PDNA focused on the three southern provinces of Namibe, Cunene and Huila which were prioritized by the government as the most affected by the 2015-2016 rainfall deficits.

The methodology used to conduct the PDNA is described in the final chapter of the present report, along with the limitations faced in obtaining the necessary statistics to estimate the cost of the effects (damage, losses) and recovery needs.

THE SOCIO-ECONOMIC CONTEXT IN ANGOLA

The long 27 year civil conflict in Angola which ended in 2002 caused the widespread destruction of the country's infrastructure and social services, the dislocation of the rural population and the spread of landmines throughout the countryside. The effects have been profound and resulted in a massive decline of the country's productive capacity and socio-economic conditions. Angola was once a major African agricultural exporter but agriculture was crippled by the war: rural finance and marketing networks collapsed, agricultural institutional capacity at all levels was severely weakened including research, extension, storage and marketing, all of which are essential for agricultural production and trade.[5] The country' s education, water and sanitation infrastructure and services were also significantly destroyed by the conflict. The war left 1/3 of the national territory plagued by anti- personnel mines, and only half of the minefields identified have been cleared.

Angola made substantial progress in economic and political terms since the end of the war in 2002, aided by an economic boom that was fueled by increased oil production and prices. Angola's growth rates from 2003 to 2008 averaged 17 percent, placing it repeatedly among the 3 fastest-growing economies in the world. The abundance of revenues supported a massive recovery and infrastructure reconstruction plan. Agricultural production increased gradually since 2002. In 2009, agriculture value added was 7,702 million USD, an increase from the 2006 value of 4,018 million USD.[6] The sector contributed about 10 percent of GDP in 2011, up from 5.7 percent in 2000.[7] Agriculture is now the third largest contributor to the GDP, and agricultural exports were $4940 million AKZ in 2014.[8]

[5] FAO, 2011. Foreign agricultural investment country profile: Angola.

[6] Fewsnet, 2012, Angola Desk Review.

[7] Plano de desenvolvimento do Sector Agrario 2013-2017

[8] Instituto Nacional de Estatistica, 2015, Angola 40 anhos de estatistica 1975-2015.

However, the country continues to face massive developmental challenges which include rebuilding more needed infrastructure, developing the full potential of its agricultural sector, improving institutional capacity, governance, public financial management systems, human development indicators and the living conditions of the population.

Less than 30 percent of Angola's arable land is currently under cultivation, and agricultural productivity and crop yields remain very low compared to other countries in Sub-Saharan Africa. According to FAO, the average yield of beans in Angola is 0.34 ton per ha compared to 0.60 in the southern African region, while the average millet yield is 0.24 ton per ha compared to the regional average. At present, 80 percent of Angolan farmers are smallholders who produce over 90 percent of all agricultural products in the country. Angola is a net food-importing country. The total value of all agricultural imports between 2008-2010 has ranged from 2.1 billion to 2.6 billion USD, while agricultural export value ranged between 9 -12 million USD between 2008-2010.[9]

Large pockets of the population still remain in poverty and without adequate access to basic services. Only 32 percent of households has access to electricity. According to the 2014 census, only 44 percent of households[10] have access to appropriate sources of drinking water[11]. In the rural area, this percentage is significantly lower at 22.4 percent. Angola ranks last in access to safe drinking water among the SADC member countries[12]. Over 3,000 boreholes countrywide are said to form the chief means of rural water supply[13], but many of these are not working due to maintenance and other problems. With regards to sanitation, 60 percent of households at the national level use appropriate locations to defecate. However, it is only 26 percent in rural areas against 82 percent in the urban areas.

Angola continues to face a big challenge in the provision of education and health services although it has been investing in primary education and rebuilding its health infrastructure. At present, only some 30 percent of the households has access to government health facilities. Malaria, accounts for an estimated 35 percent of mortality in children under the age of five, 25 percent of maternal mortality, and represents the major cause of mortality, illness, and absence from work and school. The death rate due to diarrheal diseases is 152 over 10,000 people, making Angola rank third in the world. The child-mortality rate is 44 deaths per 1,000 births, stop malnutrition is acute with 38 percent of children less than five years of age suffering from stunting and 15 percent are underweight.[14]

Although the country has made reasonable progress toward attaining the Sustainable Development Goals, it did not meet its Millennium Development Goals targets in 2015. Angola ranks low on human development. It's HDI value for 2014 was 0.532— which put the country in the low human development category— positioning it at 149 out of 188 countries and territories. The overall poverty rate however has declined from 62 percent in 2001 to about 37 percent in 2009, a major achievement yet major regional disparities in the poverty rate exist across different provinces as well as between rural and urban areas. The rural poverty rate is almost 58 percent, in contrast with an urban poverty rate of less than 30 percent.[15]

[9] Fewsnet, 2012, Angola Desk Review.

[10] A typical household in Angola comprises 4.6 members.

[11] Appropriate sources of drinking water are tap sources connected to the public network, public fountain, pump hole, *cacimba* or protected springs.

[12] SADC Regional Humanitarian Appeal, June 2016 citing UNICEF, WHO, SADC on the JMP

[13] World Bank Water Sector Institutional Development Project Information document, Redvers Louise on Relief Web, March 2011

[14] African Development Bank, 2011, Angola 2011-2015 Country Strategy Paper.

[15] UNDP, 2015, Human Development Report 2015

The drought in Angola has evolved against the backdrop of the country's worst oil crisis. Its economy has been severely affected by the sharp decline in oil prices since mid-2014. Oil prices fell by over 72 percent between March 2014 and March 2016. This has had a ripple effect across the economy: a current account deficit, a scarcity of foreign currency, the depreciation of its local currency (Kwanza), and inflationary pressures, with annual inflation currently around 26 percent. On the fiscal front, the drop in oil prices drastically reduced government revenues, leading the government to implement large cuts in government expenditures, including the virtual elimination of fuel subsidies, the cancelation of capital expenditures, and a reduction in acquisitions of goods and services.

Angola's GDP grew by 2.8 percent in 2015, down from 4.8 percent in 2014, mostly as a result of the drop in oil prices. Nonetheless, the oil sector remains the driving force of the Angolan economy. Over the past five years, oil accounted for 40 percent of GDP, 95 percent of export earnings and nearly 75 percent of fiscal revenues.[16]

The continued dependence on oil and high economic risks have prompted the government to accelerate its plans to diversify the economy as designed under its National Development Plan 2013-2017 (NDP). To this end the NDP contains a National Policy on "Promotion and Diversification of National Economic Structure", focusing on the priority clusters: Food and Agro-Industry, Energy and Water, Housing and Transport and Logistics. The chief objective is to create a strong and diverse economic base to reduce dependence on imports of consumer goods and high dependence on exports from the oil sector. In this context, the government recognizes that the agricultural sector has significant potential and is among its priority sectors for economic growth and diversification under its NDP. Yet, drought conditions since 2012 may be arresting progress in the agriculture-livestock-fisheries sector, food security and overall development goals.

THE CONTEXT IN CUNENE, HUILA AND NAMIBE

Socio-economic conditions

The provinces of Cunene, Huila and Namibe fall within the arid and semi-arid agro-ecological zone in Southern Angola that is characterized by desert, savannah grass and woodlands. Generally, the region is subject to recurrent drought and flooding. It is sparsely populated and many rural communities are marginal and have low levels of socio-economic development. As shown in table 1 below, the three provinces have a combined population of nearly 4 million, most of which is concentrated in Huila. Over 2.6 million live in rural areas or roughly 66 percent of the total population.

In relation to education, nearly 29 percent of children and youth aged 6 to 17 in Cunene have never attended school, while in Huila and Namibe it is about 20 to 21 percent. In Cunene about 25 percent of the population between 15 and 24 years of age cannot read or write, while in Huila and Namibe it increases to 35 and 36 percent respectively.

[16] AfDB, OECD, UNDP, 2016, African Economic Outlook: Angola

Table 1: **demographics in Cunene, Huila and Namibe**

Province	Population Total	Population Urban	Population Rural	Population Median age	Number of people per household -median	Proportion of population aged 6-17 years who have never attended school	Proportion of population aged 15-24 who can read and write
Cunene	990,087	207,156	782,931	21	5,3	28,7	75,2
Huila	2,497,422	817,039	1,680,383	20	4,8	20,3	64,8
Namibe	495,326	315,656	179,670	20	5,1	21,2	63,6

Source: INE 2016 prepared for the PDNA

As with most of rural Angola, boreholes are the chief means of water supply, but rivers are also an important source of water particularly for livestock. In many areas, there are no proper sanitation facilities and open defecation is common practice. In Huila, 35.5 percent of households has access to drinking water, while in Namibe it is 48 percent. In Cunene only 23 percent of households has access to water and less than 12 percent of households have access to sanitation facilities, as shown in table 2.

Rural areas in Angola depend entirely on the consumption of firewood and charcoal. Roughly 11,7 of family households has access to electricity, and it is estimated that charcoal consumption represents 57 percent of the total energy consumed in the country. In Cunene only 32% of households of inhabitants have electricity while in Huila it is 16 percent, which is well below the national average.

Farming is the principal activity of the majority of the households, roughly 68 percent in the case of Cunene and Huila. The section below describes in more detail the livelihoods of the local households.

Table 2: **socio-economic characteristics in Cunene, Huila and Namibe**

Province	Unemployment rate in pop 15 years or more	Proportion of households who practice farming on their own	Proportion of households with access to drinking water	Proportion of households with proper treatment of drinking water	Proportion of households with access to adequate sanitation facilities	Proportion of households with access to electricity
Cunene	20,7	67,7	23,3	18,0	11,8	11,7
Huila	17,9	67,9	35,5	17,0	26,4	16,0
Namibe	18,0	30,1	48,1	30,5	41,0	48,6

Source: INE 2016 prepared for the PDNA

Description of livelihood zone

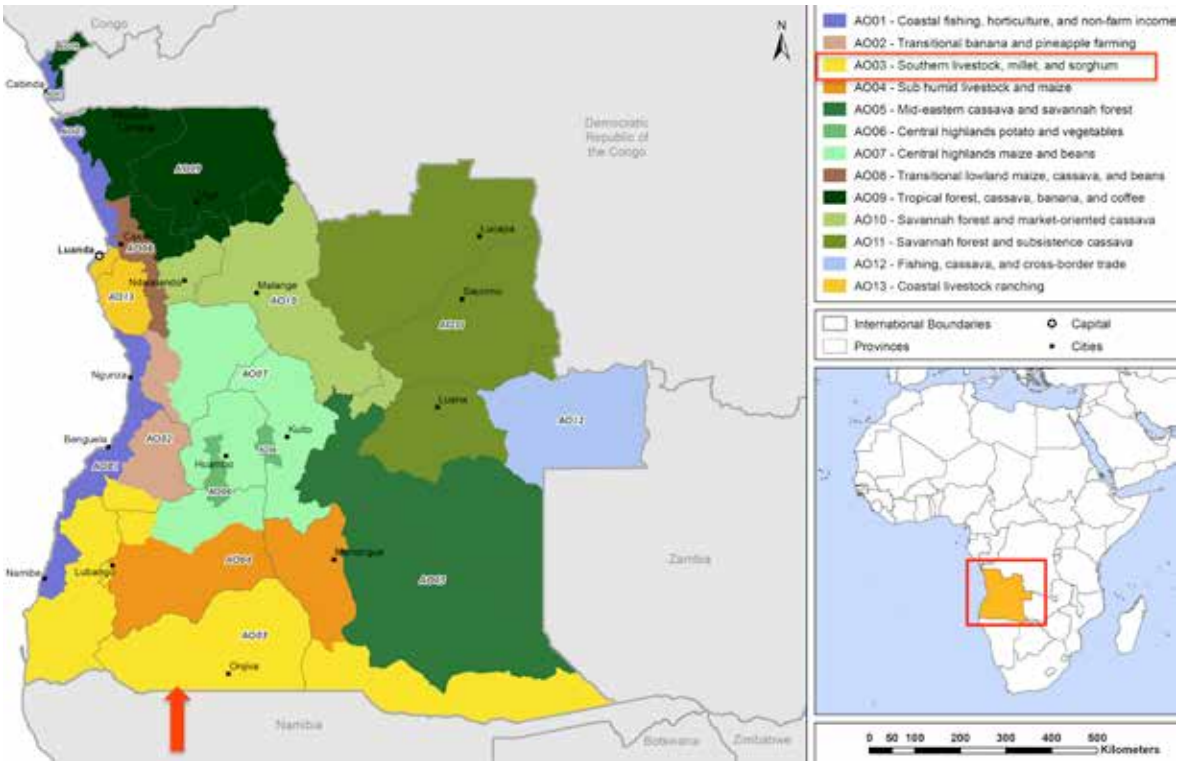
The southern region forms part of Angola's *Southern Livestock, Millet, and Sorghum livelihood zone* (AO03 in Map 1 below), which is largely agro-pastoral. This zone has a unimodal rainfall pattern, with average precipitation of about 200-400mm per annum. There are two

seasons, the rainy season which lasts from mid-October to March and the dry season from April to early October.

Livestock is an important livelihood asset, primarily cattle but also goats, sheep, pigs and poultry. Given high rainfall variability in the region, transhumance pastoralism or the seasonal migration of livestock is common practice between the lowlands and adjacent mountains.

Commercial and traditional milk production is key to the local communities. Milk is consumed throughout the year, and in greater amounts during the rainy season, and sold in local markets by the better-off populations. Most of the livestock products consumed by poorer population are obtained through in-kind labor payment from the better- off group for herding livestock. Livestock sales, when needed, are the most important source of cash income, although income also comes from the sale of goats and pigs, charcoal and firewood. The better-off groups obtain income from the sale of milk and milk products. Cattle are rarely sold unless a household is under duress or the cattle are in extremely poor condition.[17]

Map. 1: **Livelihood Zones in Angola**



Source: FewsNet, 2013, Angola Livelihood Zones and Descriptions

The main food crops grown are small grains (millet and sorghum) especially in Cunene, Namibe and southern Huila, though yields are low. There is some maize and vegetable produced for consumption especially along the main rivers and valleys. Normally local production of millet and sorghum provides staple food for up to half of the year, while in the second half of the year consumption needs are met through market food purchases.

[17] Ministry of Agriculture with the assistance of Fews-Net

Since many areas in Namibe and Cunene are maize and bean deficit, their markets are supplied by nearby Huila Province (maize and beans) and Namibia (maize) across the border. The northern part of the province of Huila receives good rainfall (1000-1200 mm annually) which allows for large-scale rain-fed agriculture.[18] This part of the province is among the key areas supplying cereals in Angola, producing 50 percent of the national supply together with the provinces of Bie and Huambo.

According to the 2014 census there are 2351.678 farming households in Huila, 144.085 in Cunene and 36.304 in Namibe. Livelihoods depend on a combination of livestock raising, milk production, cereal production, market food purchases, seasonal fishing (coastal and riverine areas), horticulture and gardening, as well as labor markets fueled by trade and industry. All households depend on market purchases of staple foods during the months of December to May, supplemented by milk and meat especially during the rainy season.[19]

The southern region has two major river basins, the Cunene and Cuvelai and the basin of the rivers Curoca, Giraul and Lucira, in addition to many rivers and streams, as well as intermittent rivers in Namibe which supports some horticulture. Fishing in these is seasonal and provides an additional source of food, nutrition and income.

Namibe's coastline is very arid and semi-arid and therefore has very low agricultural potential. Parts of this coastline fall into another livelihood zone, the coastal fishing, horticulture and non-farm income zone (AO01 in Map 1). Most income in this zone is mainly based on large-scale, commercial and semi industrial marine fishing, as well as smallholder fishing activities. The province supplies about 60 percent of the country's fish production. The primary source of household food in the zone is from the market, although horticultural crops (tomatoes, onions, cabbages and spinach) are also grown. Tomato production is also important as it supplies most of the country's domestic market, and provides employment and income to local farm laborers. Households depend on the sale of fish for income although poorer households also rely on the sale of vegetables, wood, charcoal and coal, petty trade, fish processing plants and other services sector.[20]

[18] FewsNet, 2013, Angola Livelihood Zones and Descriptions; FewsNet, 2012, Angola Desk Review

[19] FewsNet, 2013, Angola Livelihood Zones and Descriptions.

[20] Manuel Nzinga, Moraima Suris, 2016, Caracterización de fincas productoras de tomate (*Solanum lycopersicum L.*) en la provincia Namibe como base para el manejo de plagas.

DROUGHT CONDITIONS IN ANGOLA

The rainfall estimates and vegetation indices (NDVI) provided by satellite images as well as the water requirement satisfaction index (WRSI), indicate that Angola has been affected by rainfall deficits since the 2011-12 agricultural calendar, as explained in the following sections.

DROUGHT TIMELINE: 2011/12 – 2015/16

Like much of the southern Africa region, Angola has experienced drought conditions since the 2011-2012 agricultural season, marked by a combination of rainfall deficits, uneven rainfall distribution and dry spells. The spatial distribution of dryness has varied from one season to the next, affecting provinces and livelihood zones differently.

The agricultural calendar season 2011-12 was marked by rainfall deficit of more than 60 per cent compared to normal years, according to an in-depth assessment conducted by the Ministry of Agriculture (MINAGRI) in April/May 2012. The seasonal drought struck much of the country, but especially the provinces of Bengo, Kwanza-Sul, Benguela, Huila, Namibe, Cunene, Moxico, Bie, Huambo and Zaire.[21]

In 2012/2013, the country continued to experience drought conditions in some of the central and northern provinces, which can be seen below in Fig. 2 showing the NDVI.

In 2013/2014, the country experienced once again rainfall deficits, with hotspots reaching 80 to 100 percent less in large areas of the southwest along the border with Namibia. The most affected areas were the southern provinces of Cunene, Huila and Namibe, but not as severe as in the previous year. There are also clear negative anomalies (below normal rainfall) along the coast and especially in Bengo, Cuanza Norte and Benguela provinces (Fig 3 – NDVI). Cunene province during this season reported some floods along Cuvelai basin.

In 2014/2015, severe and widespread rainfall deficits were particularly pronounced in the first phase of the season and continued until end of April 2015. Several reports considered this season as the driest in 25 years for the provinces of Cunene and Namibe and the second driest for Huila. This resulted in delays in the start of the agricultural season and extremely unfavorable conditions for crop development (Fig 9 & 10).

In 2015/2016, the Southern provinces faced yet another drought although with a slight improvement compared to the previous season (Fig 11 – Normalized difference vegetation index - NDVI). Nonetheless, dry conditions in southern provinces lowered production of millet and sorghum, which are the predominant crops in the region. Further north, weather conditions have been generally beneficial in the large maize-growing central provinces of Cuanza Sul, Huambo and Bie, which combined account for about two-thirds of the national maize harvest.

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Fig. 1: **Vegetation Performance in end of February 2012 – (Mid-season of 2011/2012)**

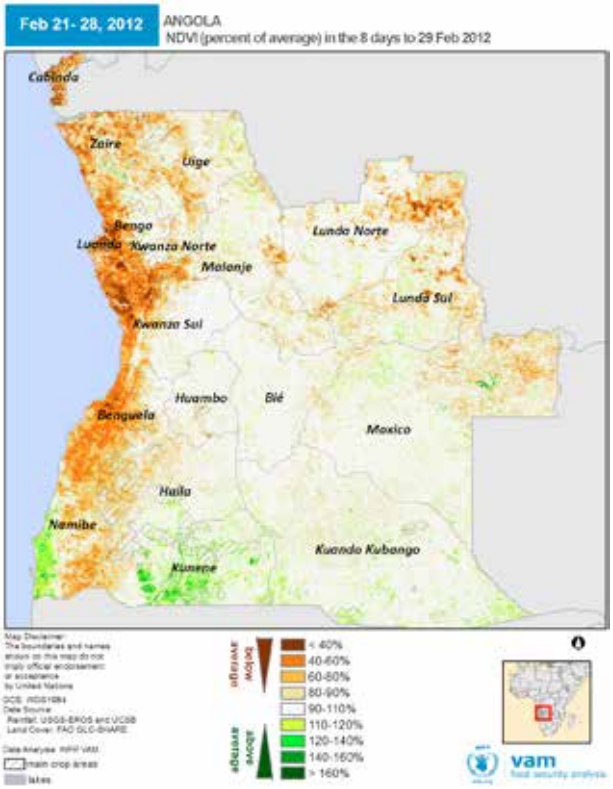


Fig. 2: **Vegetation Performance in end of February 2013 – (Mid-season of 2012/2013)**

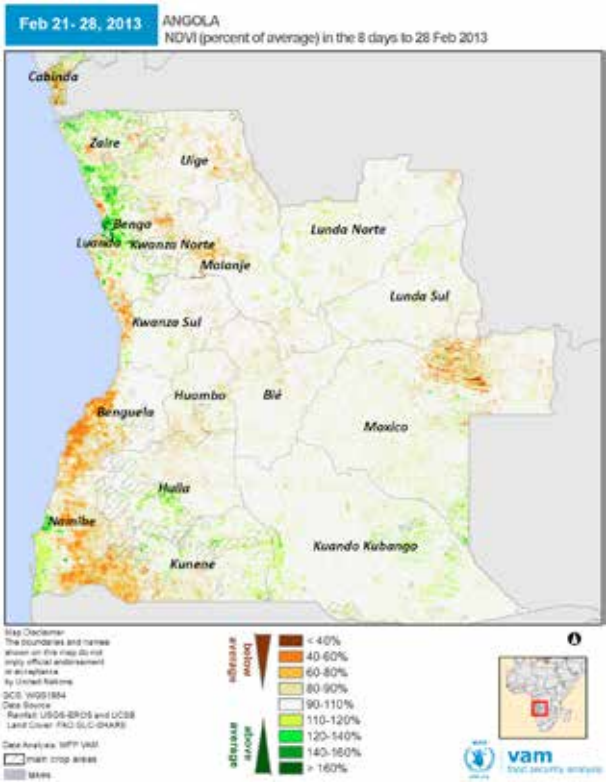


Fig. 3: **Vegetation Performance in end of February 2014 – (Mid-season of 2013/2014)**

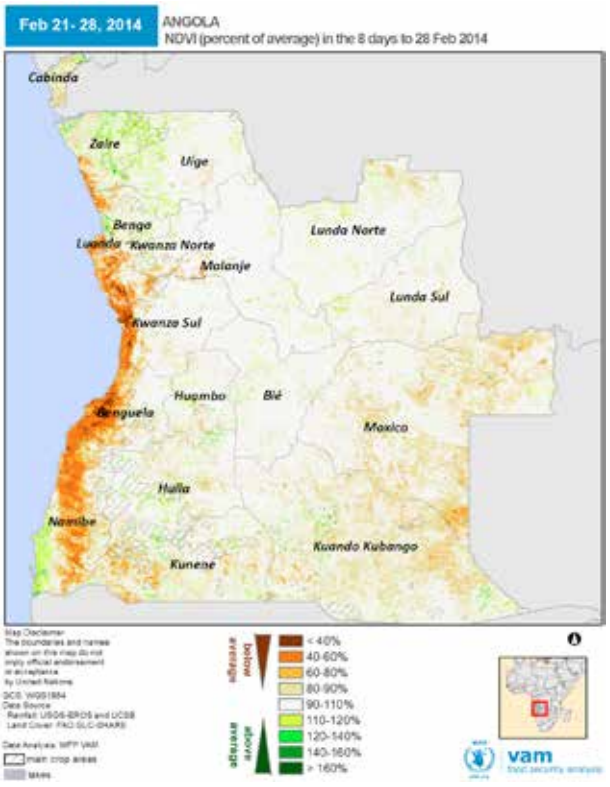


Fig. 4: **Vegetation Performance in end of February 2015 – (Mid-season of 2014/2015)**

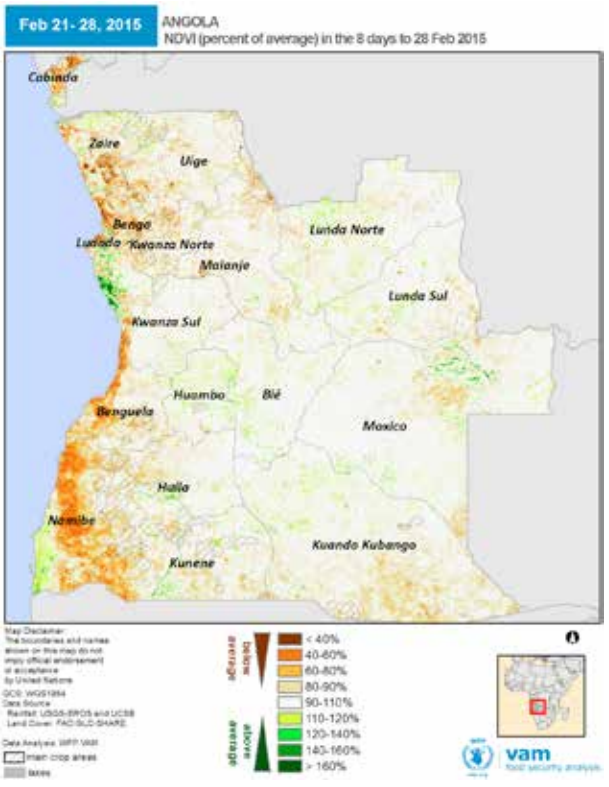


Fig. 5- **Cumulative rainfall – November 2014 to January 2015**

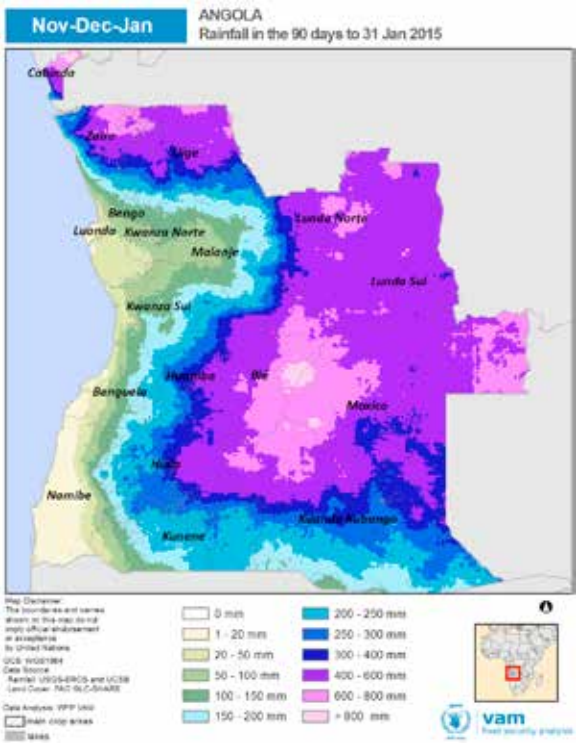


Fig. 6- **Cumulative rainfall – February to April 2015**

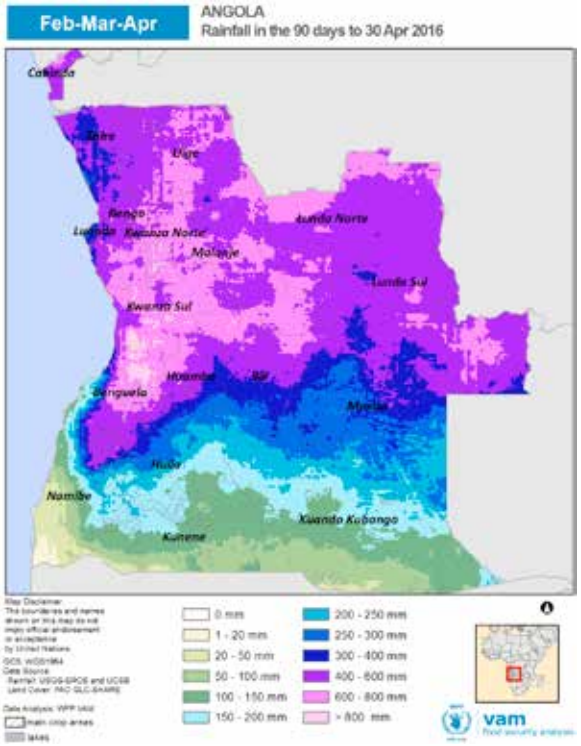


Fig. 7- **Rainfall anomaly – November 2014 to January 2015**

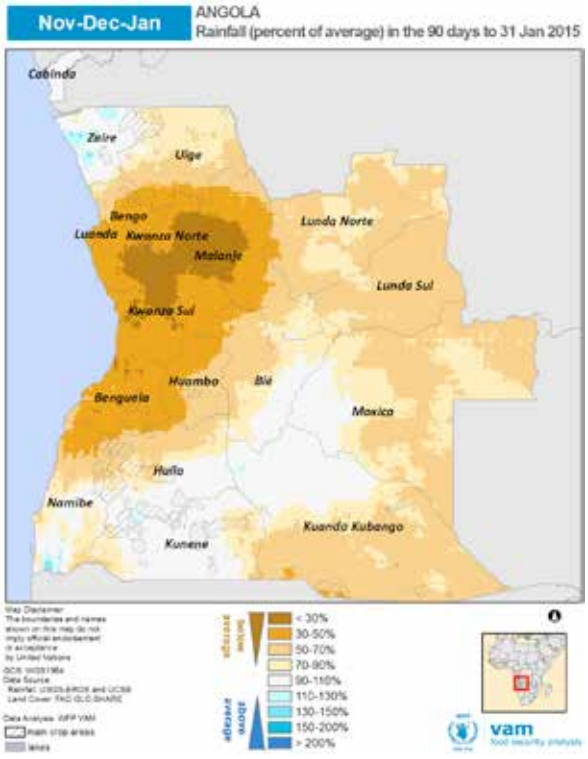


Fig. 8- **Rainfall anomaly – February to April 2015**

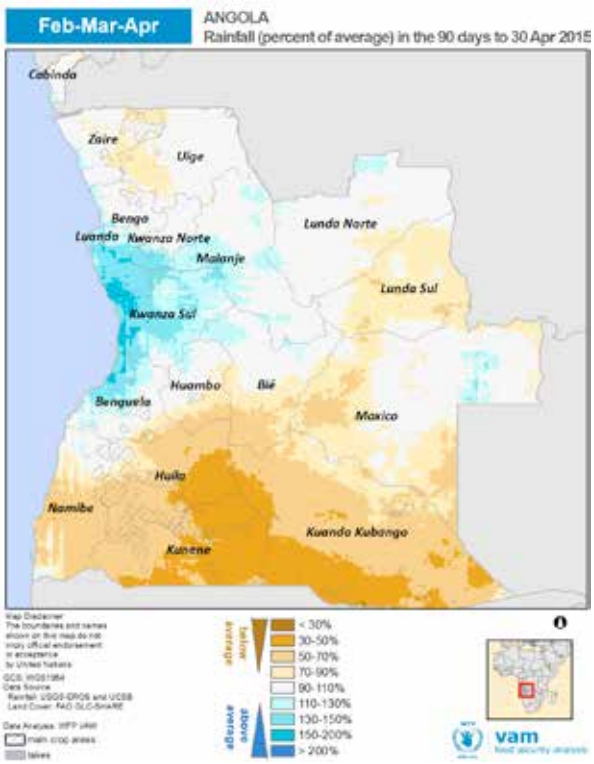


Fig. 9- **Maximum Vegetation Index – November 2014 to January 2015**

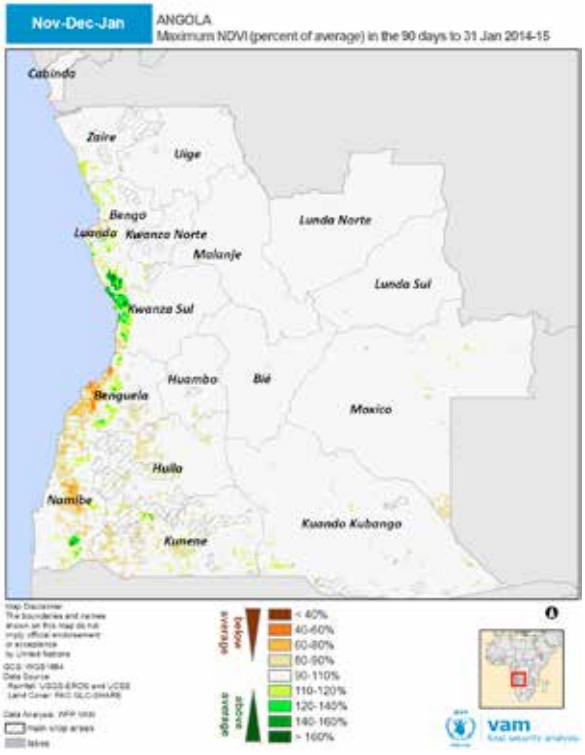
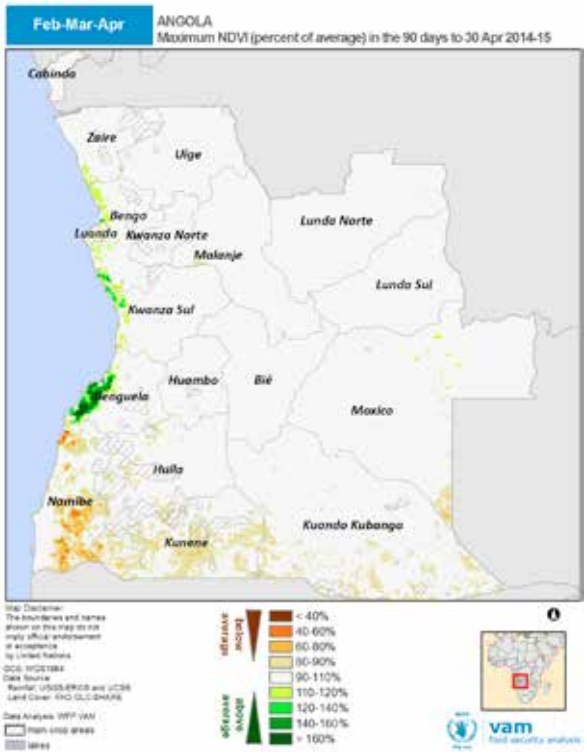


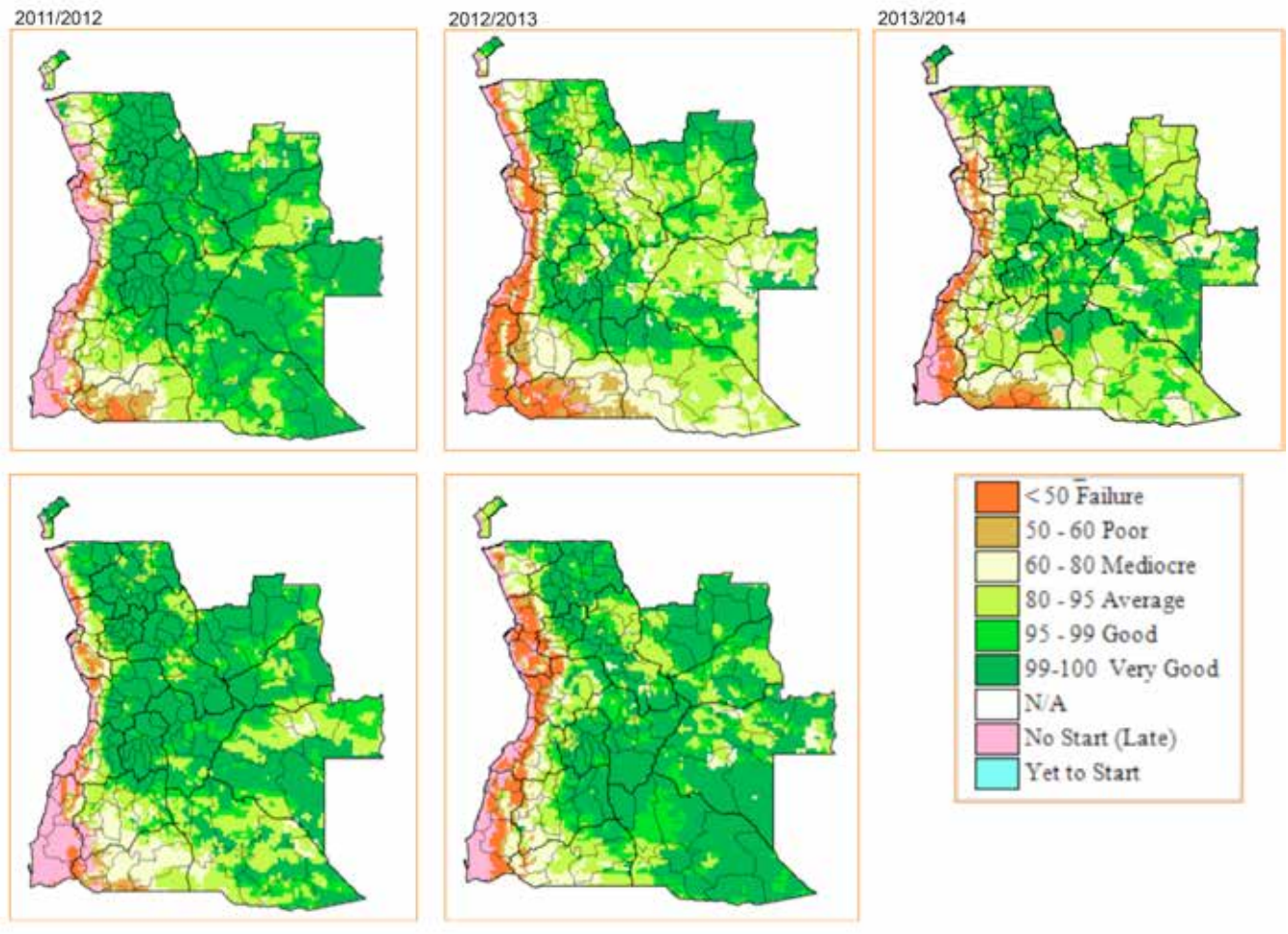
Fig. 10 **- Maximum Vegetation Index – February to April 2015**



Additionally, the above tendencies are reflected also in the water requirement satisfaction index (WRSI) which is an indicator of crop performance based on the availability of water to the crop during a growing season (fig 11).

Water stress is clearly visible at the end of season in Cunene, Huila and Namibe and both seasons were characterized by prolonged delays in the start of the season. In both provinces, there is a significant area under poor to crop failure condition, WRSI less than 50. The 2014/2015 season was the most affected by rainfall deficit, which led to prolonged dry spell conditions and crop failure in the southwestern part of the country.

Fig. 11: **water requirement satisfaction index (WRSI) for maize**

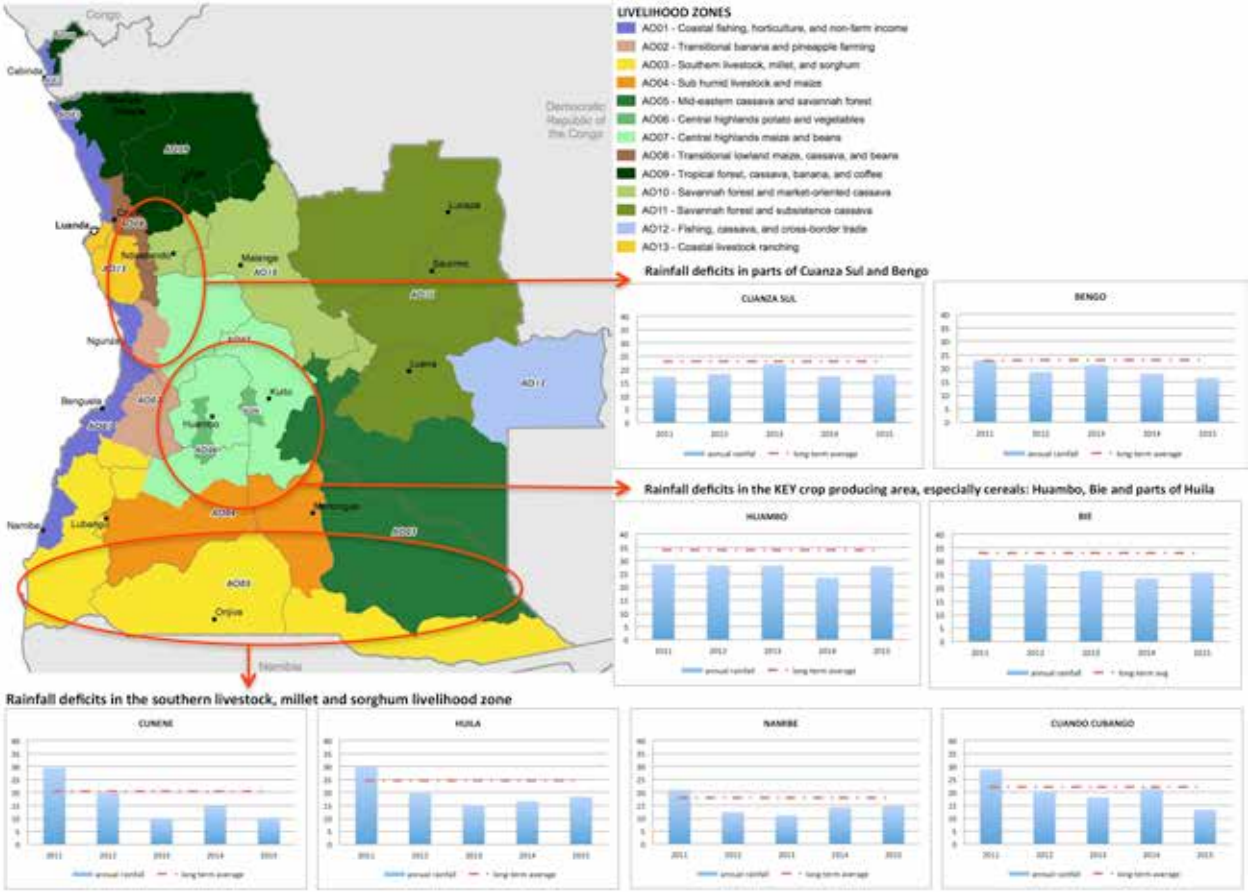


Source: GEOWRSI

RAINFALL DEFICITS 2011 TO 2015

In the three provinces assessed (Cunene, Huila and Namibe) precipitation was significantly below average between 2012 and 2015, except in Cunene in 2012 which saw normal rains. By 2016, most areas had experienced four consecutive years of dryness, with occasional short rains that have provided some measure of relief yet not enough for recovery. As a result, there has been a cumulative impact over time on populations affected, with a progressive erosion of their livelihoods and food security, as well as of the environmental conditions in this region.

Fig. 12: **Rainfall deficits between 2011/12 to 2015/16, compared to the long-term average**



Source: FAO GIEWS Earth Observation, based on precipitation estimates from NOAA / FEWSNet

Rainfall deficits are also observed in the central plateau which is a key cereal-producing region in the country. The provinces of Huambo and Bie experienced below average rains since 2011 and through to 2015. The northern provinces of Cuanza Sul and Bengo also had below normal rainfall throughout the same years although to a lesser degree.

THE DROUGHT IN 2015-16

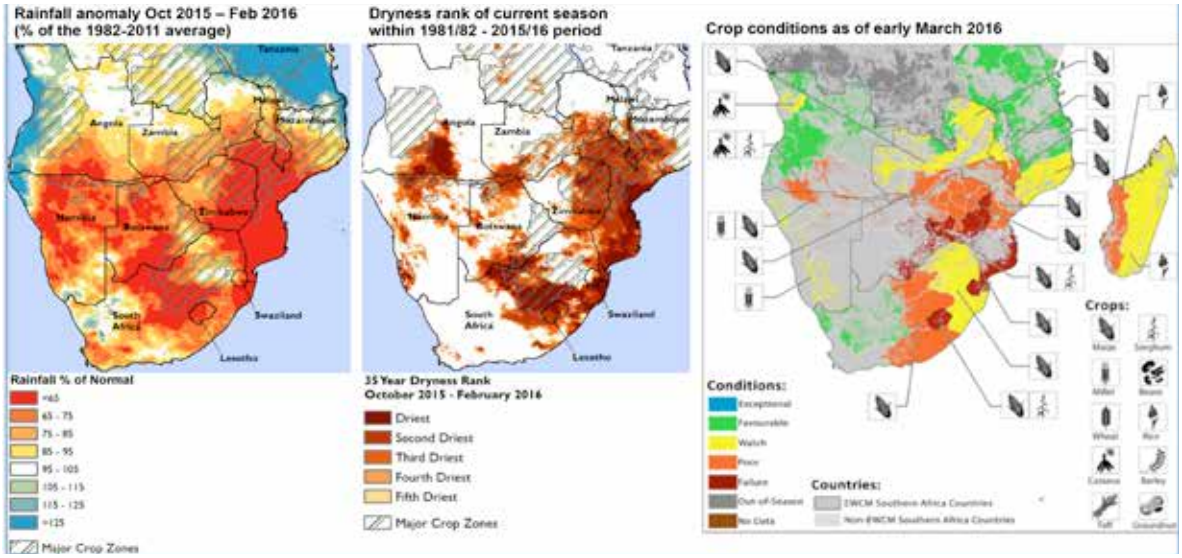
The agricultural calendar 2015-16 once again brought dry spells and rainfall deficits associated with El Nino, especially in the south and parts of the central region. The map below (1) in Fig. 13 illustrates how rainfall between October 2015 and February 2016 deviated from the 1982-2011 average in Angola and across the Southern Africa region. During this period, rainfall was less than 75 percent of average in significant portions of southern Angola especially Cunene and Cuando Cubango. Parts of the central region were also affected including important cropping areas in the country.

The second map (2) highlights areas where the past season has been one of the five driest in the past 35 years. A large area of southern Angola experienced the driest or second driest year on record, especially Cunene and Cuando Cubango.

Map (3) presents crop conditions in Angola and wider Southern Africa region, as classified by the GEOGLAM Early Warning Crop Monitor (EWCM). As of 28 February 2016, the EWCM classified maize crop conditions as "poor" in parts of southern Angola and especially in Cunene.

Fig. 13: **Rainfall anomaly, dryness ranking and crop conditions as of March 2016**

Map 1 **Map 2** **Map 3**



Source: FewsNet Southern Africa Special Report, March 2016

Note: the major agricultural season for Angola (and Southern Africa) runs from October/November through April.

Note map 2: Major crop zones are defined as the main production areas for the country's primary crop. The identified areas are not necessarily surplus producing areas and are spatially generalized for presentation and calculation purposes.

Note map 3: The EWCM is a consensus based, multi-agency effort in which experts from FEWS NET, JRC, WFP, Agricultural Research Council of South Africa, and the University of Maryland assess a range of inputs, including remotely sensed imagery and field reports, to classify current crop conditions.

For the coming agricultural season, there is currently much uncertainty about the projected impacts of La Niña conditions on rainfall in Southern Africa. Should it result in more

favourable growing conditions, it could potentially provide early green harvests in some countries. However, La Niña conditions could also result in flooding in Angola and neighbouring countries and should therefore be monitored closely.

POPULATION AFFECTED

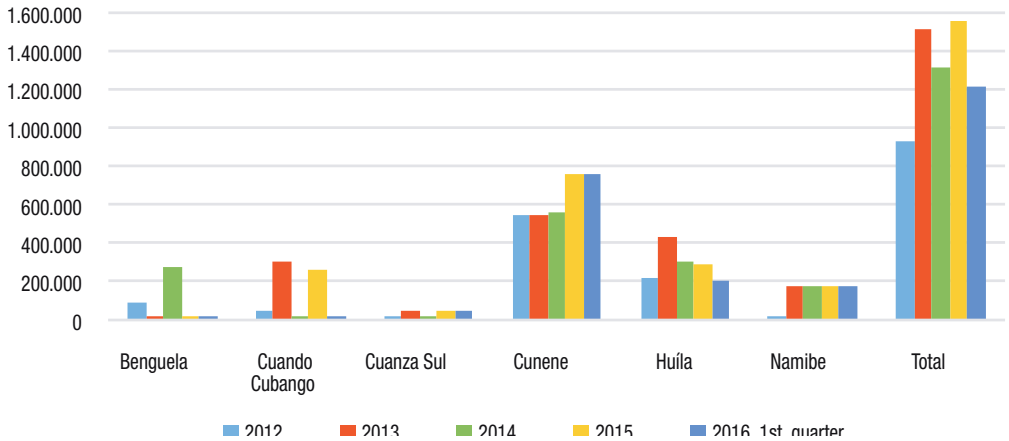
According to the latest figures provided by the GoA for the PDNA, there are 1,213,551 people currently affected by drought in six provinces in the country, of which the vast majority are in the three provinces: 755,930 are in Cunene, 205,507 in Huila, and 177,627 in Namibe.

Figure 14 below presents the populations affected by drought in each province between 2012 and 2016, as reported officially by the government for the purpose of the PDNA. It indicates a growing number of people affected. It is worth noting, however, that the data on the population affected in 2012 differs from the information reported by the United Nations and other sources in several situation reports and databases, including the CERF, OCHA, UNRCO and the international EM-DAT database on disasters. For year 2012 for example, these organizations reported 1.8 million people as being affected by the drought in 10 provinces[22].

Fig. 14: **Drought-affected population, by year and by province**

Province	2012	2013	2014	2015	2016 1st. quarter
Benguela	97.135	15.000	273.161	16.342	7.805
Cuando Cubango	45.000	306.606	2.976	267.832	22.444
Cuanza Sul	10.000	44.238	1.928	44.238	44.238
Cunene	550.000	550.000	555.000	755.930	755.930
Huíla	215.792	427.465	306.480	291.925	205.507
Namibe	15.000	177.627	177.627	177.627	177.627
Total	**932.927**	**1.520.936**	**1.317.172**	**1.553.894**	**1.213.551**
	780.792	1.155.092	1.039.107	1.225.482	1.139.064
% in the three affected provinces	83,7	75,9	78,9	78,9	93,9

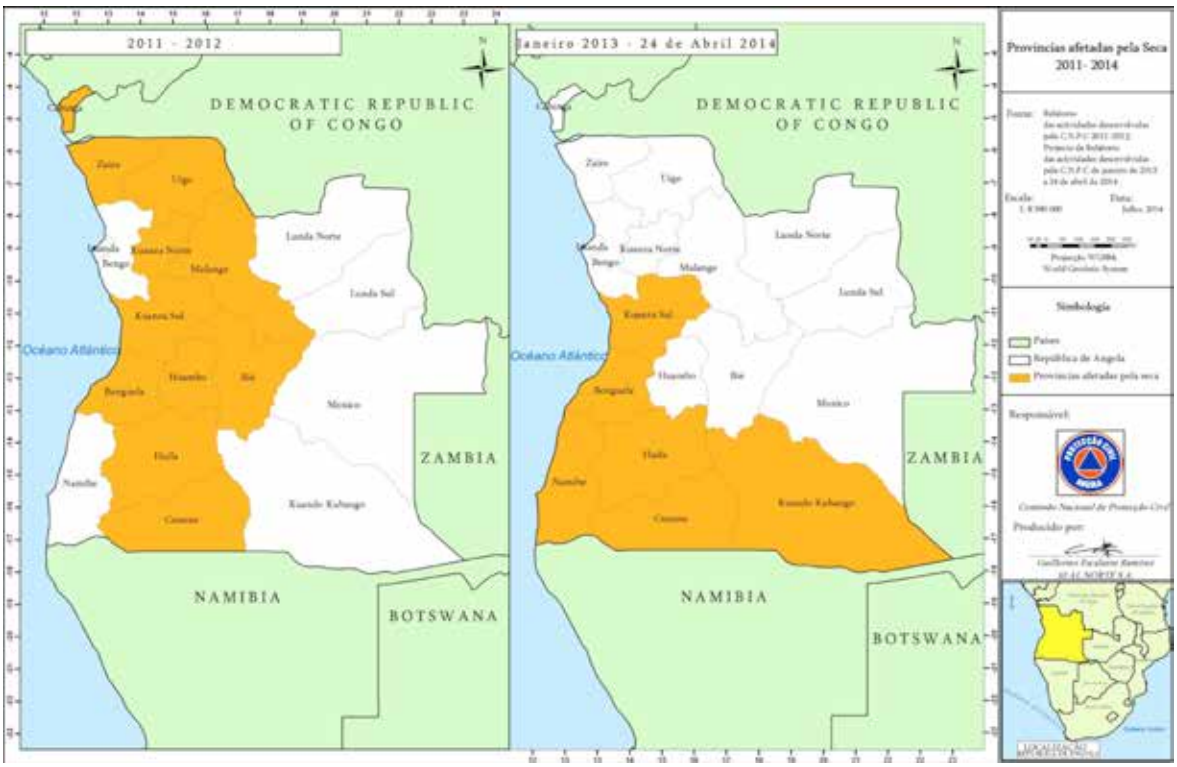
[22] For example: Central Emergency Response Fund (CERF), 2013, Resident/Humanitarian Coordinator Report 2012 on the Use of CERF Funds Angola; UNRCO, Angola Drought Response, 19 October 2012; FAO GIEWS, Country Brief Angola, 9 July 2012; OCHA, Angola Situation Report No. 1, 24 May 2012.



Source: National Commission of Civil Protection (CNPC)

Map 2 bellow shows how the drought in Angola moved progressively from the Western provinces in 2011-2012 to the most Southern provinces in the subsequent period 2013-2014.

Map 2: **Provinces affected by drought in 2011-12 and 2013-14**



Source: Angola Civil Protection

SECTOR ANALYSIS

AGRICULTURE, LIVESTOCK AND FISHERIES

Context

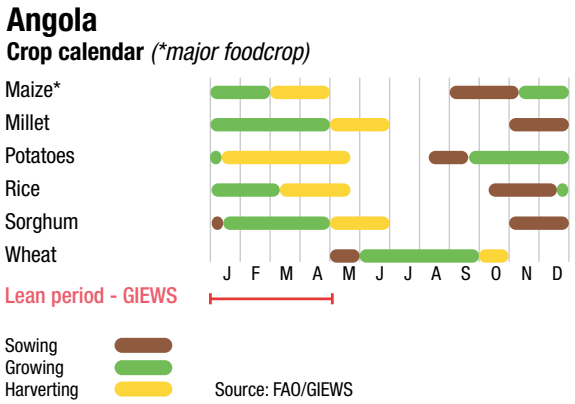
As described earlier in the section on socio-economic context and livelihoods, in Angola 80 percent of farmers are smallholders (planting an average of 1.4 ha per family) who produce over 90 percent of all agricultural products in the country. For the most part agriculture is not mechanized, does not use animal traction, and utilizes relatively low levels of improved inputs. Production is based on a single rainy season that runs from November to June. The sector lags behind in productivity and production compared to other SADC countries. Yet agricultural production has increased gradually since 2002 and contributed about 9.3% to the GDP in 2011 (the year before the start of recurrent drought in the country). It is one of the priority sectors under the National Development Plan (NDP) (2013-2017), particularly to diversify the economy. The sector is expected to play a key role in substituting oil as a major source of foreign currency earnings and revenue.

The country's main crops, in terms of both production quantity and value, are cassava, bananas, potatoes, sweet potatoes, sugar cane, maize, vegetables, pineapples, citrus fruits, while milk and meat are the main livestock products. Its five principal export crops are palm oil followed by coffee, millet, tea and cotton, although overall agricultural exports are very low.[23] There are regional differences on important food commodities. The southern

[23] FAO Angola Country Profile.

region of the country bases its diet on maize and its derivatives, and produces also millet, sorghum, beans and potatoes. The northern region's staple food is cassava and its derivatives, and produces, in addition to cassava, beans, coffee, rice, yam, sweet potato and legumes. In the central plateau maize production predominates intercropped with beans, sorghum or millet and sweet potatoes.[24]

Fig. 15: **Angola crop calendar**



The livestock sub-sector can be divided into two: a) a young mid- to large-scale commercial sector and b) subsistence livestock production among agropastoral families which predominate in the South (Cunene, Huila, Cuando Cubango and Namibe), part of Benguela, and in central Cuanza Sul. Commercial milk production is concentrated in the region of Huila, Cunene, Cuanza Sul and Namibe, while traditional producers of milk are mostly found in south of Huila, Namibe and Cunene, and the Southwest of Angola. There are no current records on existing animal population, but estimates based on the number of herds vaccinated suggest that there are approximately 4 million cattle, 2.5 million pigs, 300,000 sheep and 4 million goats.[25]

The drought effect on national production

National production data on the country's main crops show some annual variability, likely reflecting the varying patterns of rainfall deficits and uneven spatial distribution of rains in the country since 2011/12. Crop production losses were particularly high in 2012, as shown in Fig. 16, as a result of widespread drought conditions during the 2011-2012 agricultural season affecting 10 of Angola's 18 provinces, especially in the coastal regions and central highlands which are key crop producing areas in the country. Drought affected the provinces of Huambo, Huila and Bie which collectively contribute over 50 percent of the national cereal output. An assessment conducted by the Angolan Ministry of Agriculture, Rural Development and Fisheries in May 2012 estimated that 1.8 million people in the affected provinces were exposed to food insecurity due to the drought.[26]

Cereal production declined by over 900,000 tonnes between 2011 and 2012, from 1,412,826 tonnes produced in 2011 to 509,705 in 2012, resulting in a reduction of nearly 64 percent as

[24] FAO Angola Country Profile; FewsNet, 2012, Angola Desk Review.

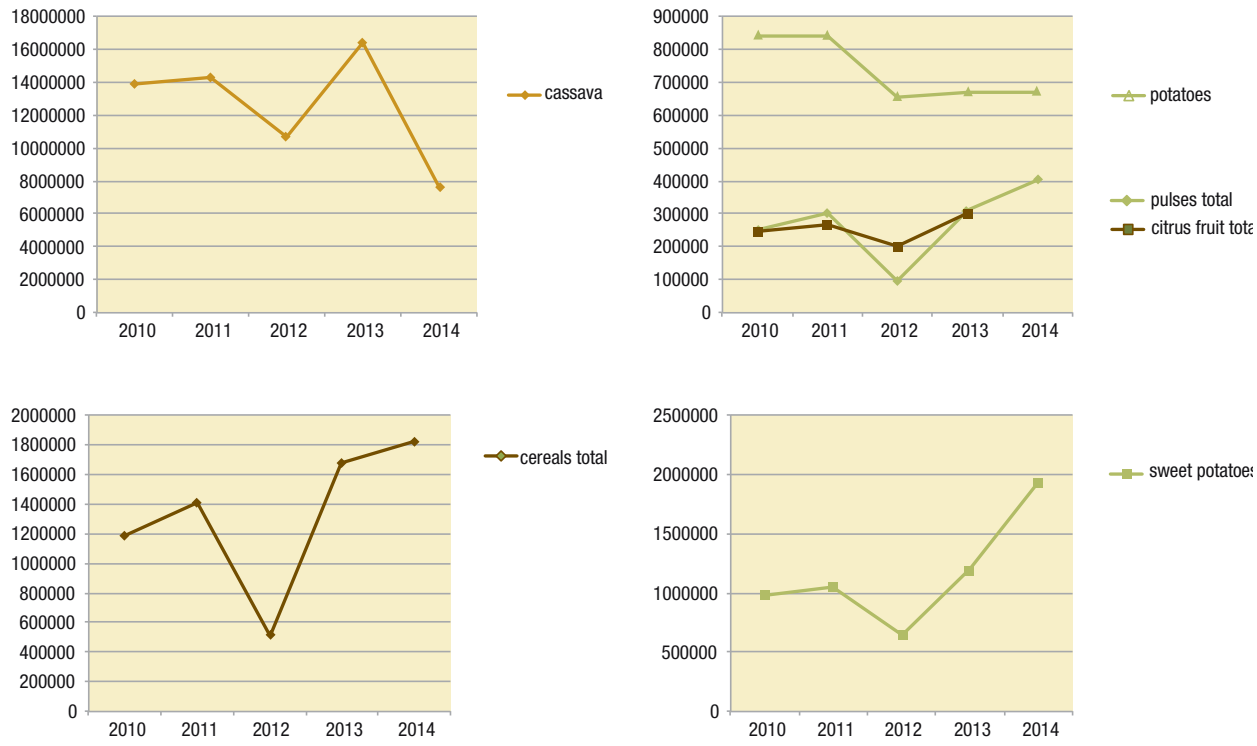
[25] FewsNet, 2012, Angola Desk Review; FewsNet, 2012, Angola Livelihood Zones and Descriptions

[26] Central Emergency Response Fund (CERF), 2013, Resident/Humanitarian Coordinator Report 2012 on the Use of CERF Funds Angola; UNRCO, Angola Drought Response, 19 October 2012; FAO GIEWS, Country Brief Angola, 9 July 2012; OCHA, Angola Situation Report No. 1, 24 May 2012.

shown in Fig. 16. Production recovered in 2013-14, remained even through 2015-16 without growth, and it is projected to decline slightly more in 2016-17.

Production figures for the country's other main crops was only available for up to 2014. As with cereals, there are significant crop losses in 2012, as seen in Fig. 16. Production of pulses fell from over 304,000 to 96,000 tonnes between 2011 and 2012, resulting in a 68.4 percent reduction. For cassava, which is the country's main crop in terms of production quantity and value, production dropped by 3.7 million tonnes, from 14.3 million to 10.6 million tonnes between 2011 and 2012, consisting in a 25.8 percent decrease. However, production recovered in 2013 for all crops except potatoes which remained low through 2014. Cassava production fell again in 2014 after its recovery in 2013.

Fig. 16: **National production of maize, millet, sorghum, pulses and other key crops**



Source: assessment team, based on FAO GIEWS and FAOSTAT; GoA, 2012, Plano de Desnvolvimento de Medio Prazo do Sector Agrario 2013-2017. Note: figures for 2016-17 are government estimates

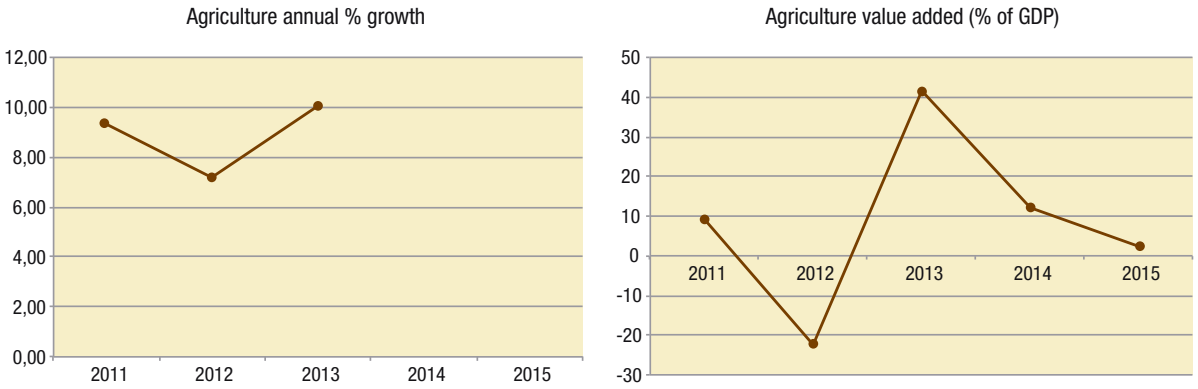
Cereal imports surged dramatically by 40.6 percent, from 850,195 tonnes in 2011 to 1,195,983 in 2013, likely to compensate for the cereal deficit. Angola as a whole remains heavily dependent on imported food.

The high crop losses in 2012 caused a sharp decline in overall sector growth, which dropped from 9.3 percent in 2011 to -21 percent in 2012 (Fig. 17). Growth recovered in 2013 and fell sharply once again in 2014. It dropped further in 2015 when it nearly reached zero growth, well below the 11.9 percent planned in the NDP 2013-17. In addition to the lower output due to drought conditions, growth of the agriculture sector is also constrained by a combination of public expenditure cuts due to lower oil revenues and declining commodity prices.[27]

[27] AfDB, OECD, UNDP, 2016, African Economic Outlook: Angola

The sector's contribution to national GDP also fell from 9.3 percent in 2011 to 7.2 percent in 2012 (Fig. 17). The overall impact of drought on the sector is significant for a country already facing a severe economic crisis and resting on agricultural growth to offset the increasing risks.

Fig. 17: **Agriculture sector annual % growth; and Agriculture value added (% of GDP)**



Sources: Banco de Angola, Relatorio de inflacao III trimestre de 2015; WB World Development Indicators.

Note: data for 2015 on sector growth is a government estimate.

It is worth noting that the partial recovery of production may have been influenced by increasing government efforts to boost agricultural production in the country, potentially offsetting higher losses. Under the national development plan 2008-2012 one of the objectives for the sector was to increase cropland by about 4 million hectares to produce over 15 million tonnes of cereals.[28] There are indications that there were some positive results. For instance, the agricultural season prior to the drought (2010-11), shows an increase of 19 percent in cereal production and 27 percent in production of pulses / oilseeds, compared to the previous year. The positive results were partly due to an increase in cultivated area of 6 percent.[29]

The 2013-17 national development plan for agriculture is equally ambitious as the government strives to diversify its economy, boost sector growth and exports, and improve food security and rural development. As of 2012, for example, the government had secured credit financing valued at over US$197 million to finance large agricultural investments using international credit lines (chiefly from China, Brazil, Israel, South Korea, Spain and Germany).[30]

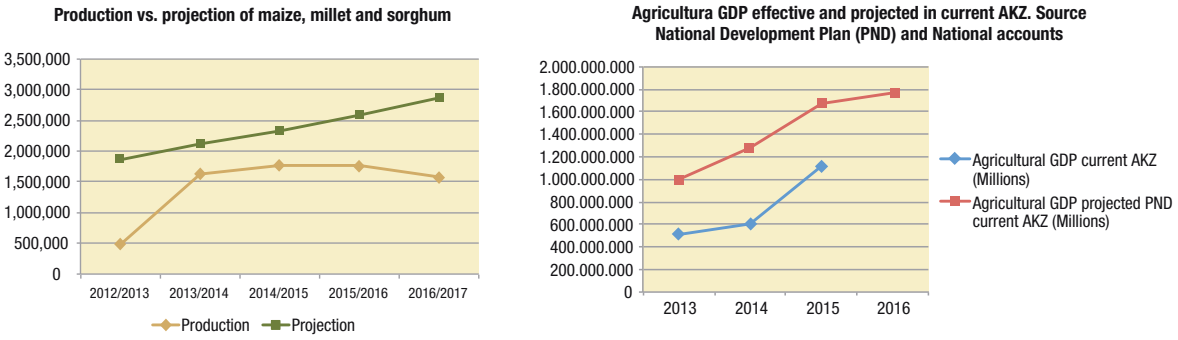
The gap between the government's plans for the sector compared with actual performance is clearly seen in Fig. 18 below. The projected production targets for maize, millet and sorghum is significantly higher compared to actual production, especially in 2012-13 and 2016-17. The estimates for the 2016-17 season show an expected gap equal to that in 2012-13. Similarly, there is a large gap between the projections for agriculture GDP and actual performance between 2013 and 2015 (Fig. 18).

[28] GoA, 2012, Plano de Desnvolvimento de Medio Prazo do Sector Agrario 2013-2017; FAO, 2012, Angola Country Programming Framework 2013-2017;

[29] GoA, 2012, Plano de Desnvolvimento de Medio Prazo do Sector Agrario 2013-2017

[30] FewsNet, 2012, Angola Desk Review

Fig. 18: **Production: actual vs. projection of maize, millet and sorghum; and Agriculture GDP: projected vs. actual (AKZ millions)**



Source: GoA, 2012, Plano de Desnvolvimento de Medio Prazo do Sector Agrario 2013-2017.

Damage and losses in Cunene, Namibe and Huila

Context analysis

As mentioned, the provinces of Cunene, Huila and Namibe are within the arid and semi-arid agro-ecological zone in Southern Angola that is characterized by desert, savannah grass and woodlands. The region is largely agro-pastoral, livestock is an important livelihood asset especially cattle but also goats, and commercial and traditional milk production is key to local communities. Transhumant pastoralism is a common practice, in the form of seasonal migration of livestock.

The main food crops grown are small grains (millet and sorghum), though yields are low. Normally local production of millet and sorghum provides staple food for up to half of the year, while in the second half of the year consumption needs are met through market food purchases. Since many areas in Namibe and Cunene are maize and bean deficit, their markets are supplied by nearby Huila Province (maize and beans) and Namibia (maize) across the border. The northern part of the province of Huila receives good rainfall which allows for large-scale rain-fed agriculture.[31] This part of the province is among the key areas supplying cereals in Angola, producing 50 percent of the national supply together with the provinces of Bie and Huambo.

Livelihoods depend on a combination of livestock raising, milk production, cereal production, market food purchases, seasonal fishing (coastal and riverine areas), horticulture and gardening, as well as labor markets fueled by trade and industry. All households depend on market purchases of staple foods during the months of December to May.

The southern region has three major river basins, the Cunene and Cuvelai and the basin of the rivers Curoca, Giraul and Lucira, in addition to many rivers and streams. Fishing in these is seasonal and provides an additional source of food, nutrition and income. Along Namibe's coastline most income is based on large-scale, commercial and semi industrial marine fishing, as well as smallholder fishing activities.

[31] FewsNet, 2013, Angola Livelihood Zones and Descriptions; FewsNet, 2012, Angola Desk Review

The livestock sub-sector

The livestock sub-sector was the most affected by the drought. The lack of adequate pasture and reduced availability of water as a consequence of prolonged drought has affected the health conditions of livestock and made them more vulnerable to disease. Transhumance livestock migrations have continually started earlier and lasted longer periods of time to provide adequate feed and water for livestock. These migration patterns did not allow herders to ensure that their animal could be part of the national vaccination campaigns both in 2012 and 2013, which increased the risk of exposure to disease. Livestock health conditions worsened with the outbreak of the Foot and Mouth (FMD) disease in 2015. This situation has led to the closure of some local markets for one year before re-opening in June 2016 in most areas (though remaining closed in some municipalities).

Records on livestock disease and mortality rates were partial and incomplete in the three drought-affected provinces. However, reports from government officials and the affected population confirm the incidence of livestock deaths and disease, with differences in the incidence among the provinces. Between 2015 and 2016, there were 110,000 livestock deaths (mainly cattle) reported in Namibe, 150,000 in Huila and 246,384 in Cunene, as seen in Table 3 below. Data on livestock (bovine) disease in Cunene shows that there were 8071 cases in the province in 2013, dropping to 1275 in 2014 and rising again to 7435 in 2015.

Table 3: **livestock mortality by province**

LIVESTOCK DEATHS	**Namibe**	**Huila**	**Cunene**	**Total**
Head of cattle 2016 (number) (Source UNICEF/OCHA	110.000	150.000	240.000	500.000
Head of Bovine 2015 (Source Annual reports PDA)			353	
Head of Bovine 2014 (Source Annual reports PDA)			172	
Head of Bovine 2013 (Source Annual reports PDA)			5.722	
Head of Goats 2014 (Source Annual reports PDA)			129	
Head of Goats 2013 (Source Annual reports PDA)			8	
Head of cattle value USD (millions)	53	73	116,7	242,7
Head of cattle value AKZ (millions)	8.803.000	12.004.000	19.646.100	40.453.000

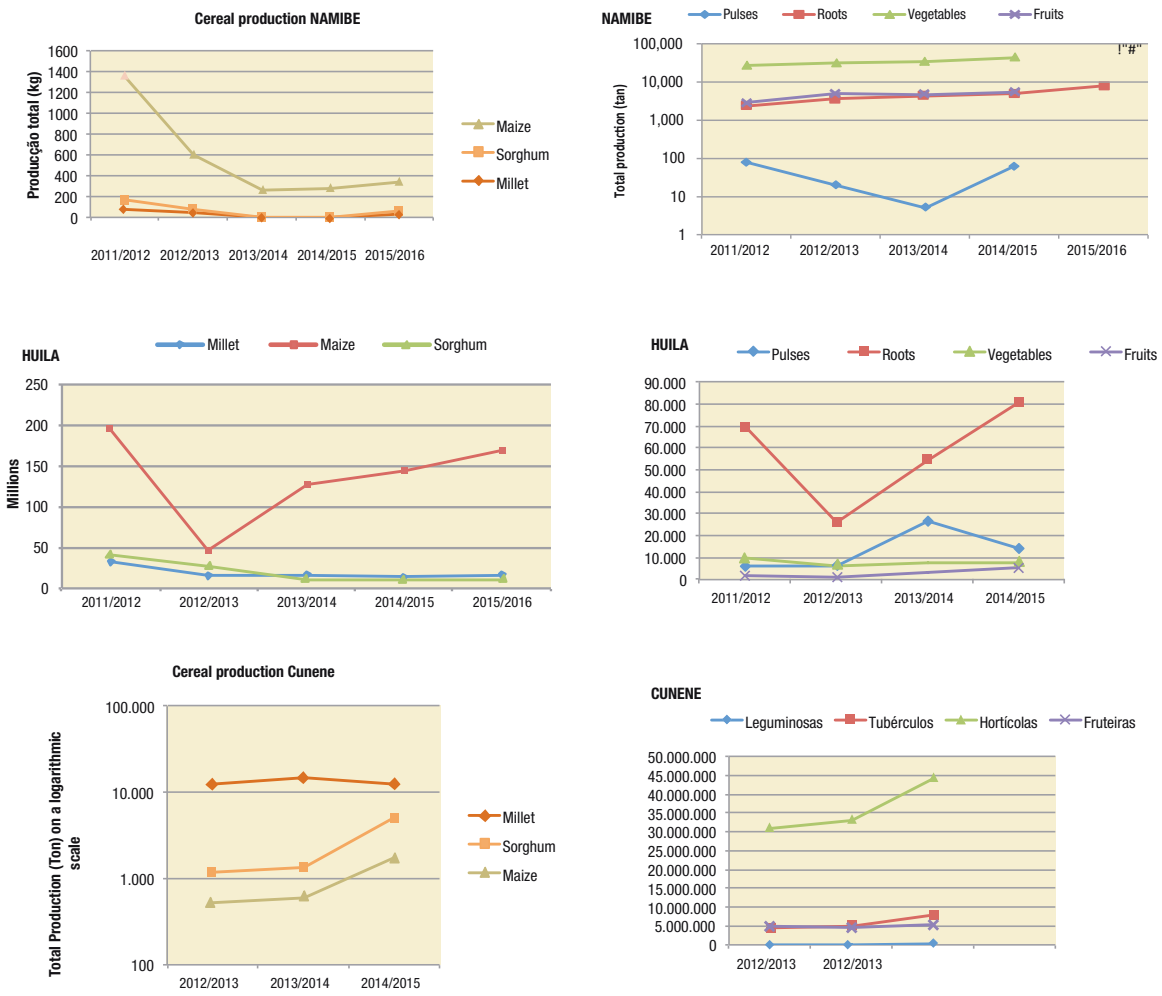
In addition, the combination of inadequate pastures, reduced water availability, livestock disease, and longer transhumance migrations had an impact on milk and meat production. The main losses were in milk production, estimated to be $18.000.000 AKZ or USD$109 million. The province of Cunene suffered from the greatest losses in milk production with $8.640.000 AKZ, followed by Huila with $5.400.000 AKZ.

The crop sub-sector

Production figures for the main cereals, pulses and other crops is presented below in Fig. 19. As illustrated, crop production varied among the provinces but also for each type of crop, in some cases indicating production increases. However, there were significant challenges during the assessment in obtaining consistent data on crop production in the three provinces, with differences in the data provided by various provincial and national departments. Local authorities reported a lack of resources and capacity to monitor production. It is likely that the data presented does not reflect actual production, especially in the case of cereals which is rainfed and likely to have been negatively affected by the prolonged drought.

Production figures for pulses, roots and tubers, and vegetables, which show no change or increases in production, may be more accurate given the government's drought response through horticulture projects under small irrigation schemes known as *polos de desenvolvimento agrícolas*.

Fig. 19: **production of cereals, pulses and other crops in Cunene, Huila and Namibe**



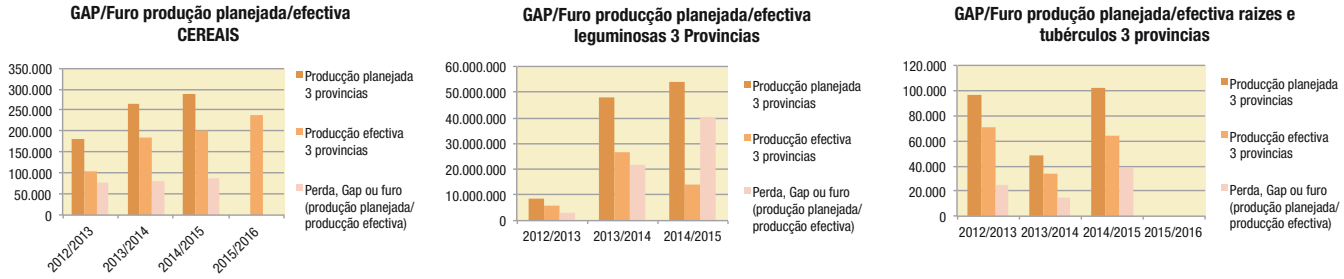
Source: Annual Reports of Provincial Department of Agriculture in Namibe, Cunene and Huila

Yet, based on discussions with the affected population, informal reports from authorities and field observation it is clear that production has been significantly affected by the prolonged drought in all three provinces. This is consistent with the findings in other sectors including on levels of food insecurity and increases in malnutrition cases, as presented in the next section.

The national cereal deficit was estimated at 38% for the 2015/2016 marketing. The national production, calculated at 2,374,208 MT was able to cover 62% of internal needs: MINAGRI Food Security Office and Study and Planning Office.

Data obtained on the production gap for cereals, pulses and tubers which compares government projections with actual production, also suggests production losses over the past four years in the three provinces. As noted earlier, the government has increased efforts in recent years to boost agricultural production in the country, and has been expecting higher production at national level. In all three provinces there has been a production gap between 2012 and 2015, as shown in Fig. 20 below, another indication that the drought has caused crop losses.

Fig. 20: **Production gap in cereals, pulses and roots/tubers: projected versus actual production in three provinces**



However, due to the inconsistencies in the data on crop production it was not possible to calculate losses resulting from lower production or yields. Instead, the losses reported below were estimated by taking into account lower crop production figures where this is found in the data, combined with the cost of food aid received by the drought-affected population.

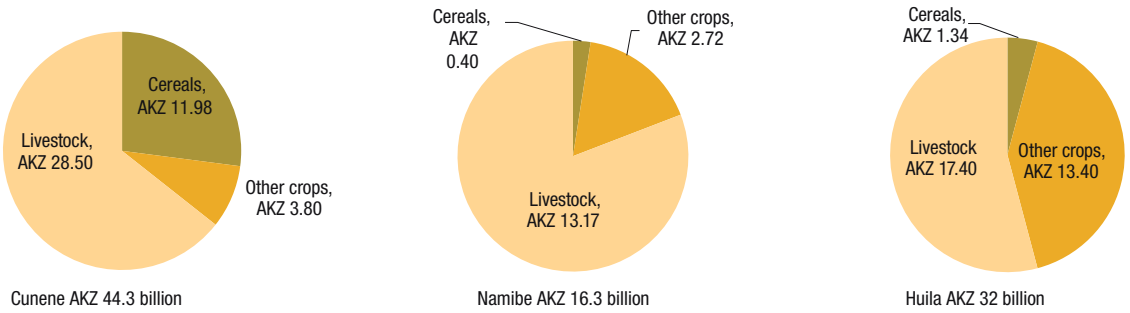
Damage and losses by province

In the province of Namibe, total damage and losses amounted to AKZ 16.3 billion or US$98.5 million, as shown in Fig 21 below. About 80 percent of this damage and loss was from the livestock sub-sector, due to 110,000 livestock deaths reported in 2015-16 and to losses in meat production (bovine). Losses in cereals and other crops are estimated at AKZ 3.12 billion or roughly US$18.9 million.

Namibe benefited from government horticultural projects or "*polos de desenvolvimento agrícolas*" implemented in five municipalities (three per municipality). The projects used small irrigation schemes and provided some agricultural inputs to cultivate vegetables and fruits. The projects seem to have provided some relief for the affected population and some measure of food security.

Data on fish production was not available for analysis and the impact of drought on fisheries could not be assessed. However, as reported in the chapters on water and food security, rivers have run dry and the availability of both surface and underground water aquifers has been declining. This would have likely reduced fish production with further negative consequences for the food security of populations who rely on in-land fishing as one of their livelihood strategies, particularly riverine communities.

Fig. 21: **crop and livestock damage and losses in Cunene, Namibe and Huila**



In Huila, total damage and losses amounted to AKZ 32 billion or US$195 million. About 54 percent of this damage and loss was from the livestock sub-sector, mostly due to 150,000 livestock deaths reported in 2015 and 2016 and losses in milk production. Overall, cereal and other crop losses in Huila were estimated to be nearly AKZ 15 billion, the highest cereal losses among the three provinces. As noted above, the northern part of the province is among the key areas supplying cereals in Angola.

In the province of Cunene, the crop production figures obtained indicate that production did not decrease although it is clear that the province has been significantly affected by the prolonged drought. This is consistent with the number of livestock deaths reported in Cunene, a total of 240.000, and with the analysis on food insecurity and malnutrition cases presented in the next section.

As noted, losses were largely calculated based on food aid received by the affected population. In total there were AKZ 44.3 billion or US$ 268 million in overall damage and losses in Cunene, the highest among the three provinces and making Cunene the most affected. Approximately 64 percent was in the livestock sub-sector, due to 246,384 livestock deaths (mainly heads of cattle), but also losses in milk and meat production.

Total crop and livestock damage and losses

In the three provinces of Namibe, Cunene and Huila, total damage and losses in the crop and livestock sub-sectors amounted to nearly AKZ 93 billion or USD $562 million, as shown in Fig. 22 below.

About 63 percent of this total (59 billion AKZ) corresponds to damage and losses in the livestock sub-sector, due to livestock deaths and lower milk and meat production. Losses in cereal production are estimated to be AKZ 13.7 billion and losses in other crops such as beans is estimated at nearly AKZ 20 billion.

Fig. 22: **total crop and livestock damage and losses in all three provinces**

Table 4: **total damage and losses, by province and subsector**

TOTAL DAMAGES AND LOSES									
	AKZ millions								
	NAMIBE		HUILA		CUNENE		TOTAL		
	DAMAGE	LOSSES	DAMAGE	LOSSES	DAMAGE	LOSSES	DAMAGE	LOSSES	TOTAL
CEREALS		423.227,7		1.336.399		11.980.064		13.739.690,7	13.739.690,7
OTHER CROPS		2.719.465,4		13.405.190		3.827.414		19.952.069,4	19.952.069,4
LIVESTOCK	8.803.000	4.374.105	12.004.000	5.400.000	19.650.000	8.825.735	40.457.000	18.599.840	59.056.840
FISHERIES	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
TOTAL AKZ	8.803.000	7.516.798	12.004.000	20.141.589	19.650.000	24.633.213	40.457.000	52.291.600	92.748.600
TOTAL IN USD millions	**53**	**45,5**	**73**	**122,07**	**118,7**	**149,2**	**244,7**	**316,9**	**561,6**

Recovery needs

The recovery needs for the agriculture-livestock-fisheries sector have been estimated at US$189 million or AKZ 30.75 billion, as shown in detail in the final section on recovery. The following is a summary of the short, medium and long-term recovery needs that have been identified:

Short-term recovery (6 months to 1 year):

For the livestock sub-sector, the most immediate recovery efforts should focus on re-stocking poultry and small livestock, and if possible also restocking larger livestock such as cattle; establishing animal watering points; the regeneration of pastures; and livestock vaccination and veterinary care for affected animals. In the crop sub-sector, first efforts should focus on the rehabilitation of crop production by providing the necessary seeds and other agricultural inputs, especially for key staples such as cereals and pulses, but also to support horticulture along the lines of government projects or polos that have been effective during the recent drought response.

Medium-term recovery (1 to 2 years):

In the crop-subsector, effort should be made to promote crop diversification, through the selection of varieties which are more drought-resistant as well as through the promotion of other crops that can be cultivated in a sustainable manner under local conditions; develop small irrigation schemes where water availability permits or where water sources can be restored. In the livestock sub-sector, efforts should transition to restocking large livestock such as cattle and to promoting livestock diversification. Overall, efforts should be made to coordinate with the WASH sector to ensure water availability for livestock and agriculture.

Long-term recovery (2 to 4 years):

Over the long-term, recovery should focus on promoting sustainable practices that build resilience, such as: climate-smart agriculture through the introduction of farming practices and agricultural technologies that are more sustainable under local conditions; the rehabilitation of water infrastructure to support irrigation and expansion of irrigation infrastructure; improving information systems for food security and animal health surveillance systems; introducing proper range land management systems; strategic grain reserves, infrastructures and management; promoting income diversification activities and agro-industry; studies on sustainable farming practices, among other measures outlined in the section on needs analysis and recovery.

FOOD SECURITY AND NUTRITION

Context analysis: livelihood zone

As described earlier, the provinces of Cunene, Huila and Namibe form part of Angola's ***Southern Livestock, Millet, and Sorghum livelihood zone***, which is an arid and semi-arid agro-ecological zone. The region is largely agro-pastoral, and livestock is an important livelihood asset, primarily cattle but also goats, sheep, pigs and poultry. Given high rainfall variability in the region, transhumant pastoralism or the seasonal migration of livestock is common practice between the lowlands and adjacent mountains. There is both commercial and traditional milk production, and milk is consumed throughout the year and sold in local markets by the better-off populations. Livestock sales, when needed, are the most important source of cash income, although income also comes from the sale of goats and pigs, charcoal and firewood. The better-off groups obtain income from the sale of milk and milk products. Cattle are rarely sold unless a household is under duress or the cattle are in extremely poor condition.[32]

As mentioned, the main food crops grown are small grains (millet and sorghum) though yields are low. There is some maize and vegetable produced for consumption especially along the main rivers and valleys. Normally local production of millet and sorghum provides food for consumption for up to half of the year, while in the second half of the year consumption needs are met through market food purchases. Since areas in Namibe, Cunene and Cuando Cubango are maize and bean deficit, markets are supplied by nearby Huila Province (maize and beans) and Namibia (maize).

[32] FewsNet, 2013, Angola Livelihood Zones and Descriptions.

Map. 3: **Farming systems in Angola**

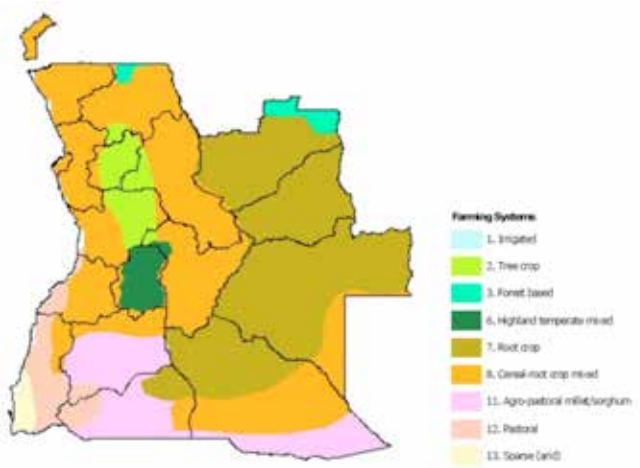


Fig. nº 55 - Sistemas agrícolas (Fonte: FAO - website, 2006)

Livelihoods depend on a combination of livestock production, some cereal production, market food purchases, seasonal fishing (coastal and riverine areas), horticulture and gardening, and labor markets fueled by trade and industry. All households depend on market purchases of staple foods during the months of December to May, supplemented by milk and meat especially during the rainy season.[33]

Along Namibe's coastline, large-scale, commercial and semi industrial marine fishing is the main economic activity, as well as smallholder fishing activities. Households depend on the sale of fish for income although poorer households also rely on the sale of vegetables, wood, charcoal and coal, petty trade, fish processing plants and other services sector. Tomato production supplies the national market, and provides employment and income to local farm laborers.[34]

Impact of drought on food security and nutrition

Four consecutive years of drought has deteriorated the livelihoods of agropastoral communities in Cunene, Huila and Namibe. Since the reduced rainfall of the 2011-12 agricultural season, access to water for human and livestock consumption has depleted, both in terms of surface and underground water sources. As a result of scarce water and poor pasture conditions throughout drought affected areas, transhumance or the long migration northwards of livestock has been starting months earlier than is customary, between 1 to 6 months depending on the area and severity of drought, and has involved longer distances. One assessment found that as early as 2013 cattle were walking nearly 80 km between pasture and water every two days, compared to 30 km in a typical year for the same season.[35]

The lack of adequate pasture and reduced water availability has worsened the body conditions of livestock and eroded the ability of local pastoralists to produce milk which is a basic staple among agropastoralists. There have also been reports that the lack of pasture and water is affecting livestock reproduction, with reports of calves' abortion and lack of milk production.

[33] FewsNet, 2013, Angola Livelihood Zones and Descriptions.

[34] Manuel Nzinga, Moraima Suris, 2016, Caracterización de fincas productoras de tomate (*Solanum lycopersicum L.*) en la provincia Namibe como base para el manejo de plagas.

[35] FEWSNet, 31 October 2013, Angola Drought Assessment Special Report.

As reported in the section on agriculture above, by moving early and far, most cattle missed the vaccination campaigns in 2012 and 2013, and conditions worsened for livestock with the outbreak in 2015 of Foot and Mouth (FMD) disease. Between 2015 and 2016, over 500,000 livestock deaths were reported, mainly head of cattle.

In 2015, yield losses were estimated at 75 percent and production losses at 52 million tons in the 3 provinces.[36] These recent crop losses add to 3 - 4 years of production losses in the region, eroding the ability of pastoralists to produce cereals and sustain their livelihoods.

Since many households sow crops for consumption, they have had to rely more on markets for cereal purchases, bartering, and livestock sales several months earlier than usual. However, the province of Huila typically supplies food deficit areas in Namibe and Cunene, yet drought and low crop production in Huila has had a negative impact on the volume of staple food supplies that flow to Namibe and Cunene.

Food access in 2015 and 2016 has been constrained as a result of inflation, exacerbating food insecurity among the affected populations. The increase in fuel costs in late 2014, resulting from the cut in fuel subsidies in Dec 2014 with petrol and diesel prices increasing by 20 percent (which followed a previous 25 percent increase in Sept 2014), exerted an upward pressure on food prices, thus negatively impacting on food access in deficit producing areas.[37]

In Cunene and Namibe, foreign exchange reserves in local markets were reported to be at a low in 2015, which combined with the gradual devaluation of the Kwanza have further complicated the process of importing goods during the lean season.[38] These conditions and the country's macroeconomic environment have been pushing up prices in most of the country, constraining access to food for poor households[39].

Food prices increased 800% over the past year: 1 kg of maize flour increased from 50 AOA in January 2015 to 400 AOA in January 2016.[40] Prices for staple foods and cattle have risen in local markets (above 100 percent compared to before crisis), as seen below in table 5.

Table 5: **Price increases for staple food and basic commodities**

Commodities	Price 2015 (Kwanzas)	Price 2016 (Kwanzas)
Maize meal	150Kwanzas/Kg	200 Kwanzas/Kg
Fish	25 Kwanzas/Tabua	100 Kwanzas/Tabua
Salt	50 Kwanzas/Kg	150 Kwanzas/Kg
Soap	250 Kwanzas/bar	900 Kwanzas/bar

To cope, poor households have turned to alternative sources of food and income, such as producing and selling charcoal, gathering wild food for consumption and sale, fishing, and selling other forest products for income to purchase food. While these strategies are typical during the lean season, they have intensified and are being practiced out of season. Overall, households have been minimally able to meet their food needs, and their livelihoods and food security have been declining. Food consumption has declined in terms of

[36] UNRCO, 13 April 2016, Angola Drought: Office of the Resident Coordinator Situation Report No. 1.

[37] FAO, 18 May 2015, GIEWS Country Brief Angola

[38] FEWSNet, Feb 2015, Angola Remote Monitoring Update.

[39] FAO/GIEWS Country Brief Feb 2015 and Country Brief May 2015

[40] UNRCO, 13 April 2016, Angola Drought: Office of the Resident Coordinator Situation Report No. 1.

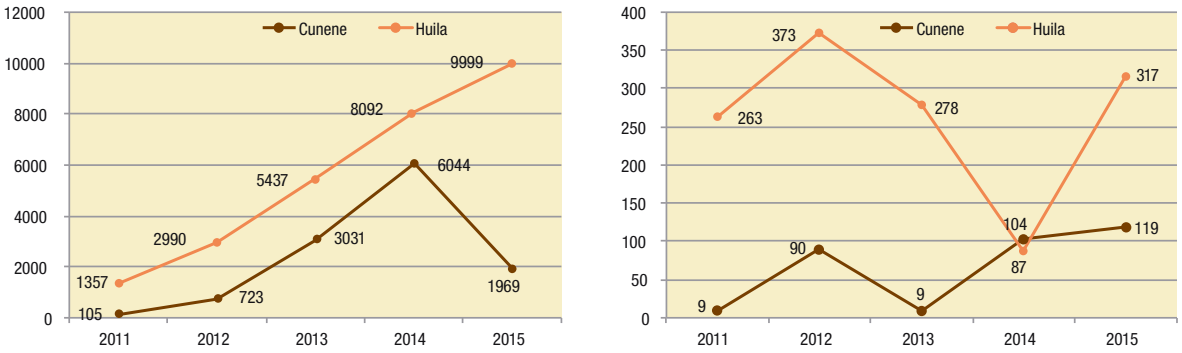
both quantity and dietary diversity. The fresh but small harvest from the past agricultural season is predicted to last until September-October 2016, when food security is expected to further worsen.

The prolonged drought has been progressively eroding the capacity of agro- pastoralist communities to cope as they face cyclical hardships and environmental degradation. The water table is steadily declining and the short and irregular rains have not sufficiently re-charged the water table. The quantity and quality of water continues to decrease, pastures and rangeland are unable to regenerate sufficiently, livestock health conditions diminish and mortality rates are on the increase, and the capacity to cultivate crops is lost due to the lack of seeds and to the increasing degradation of soils.

The level of food insecurity can be observed in the caseload of malnutrition cases. As shown in figure 23 below, there is a clear increase in admission cases of malnutrition in the provinces of Cunene and Huila between 2012 and 2015, when compared to 2011 prior to the drought. The data reflects admission cases to both Special Nutrition Units (UEN) which are inpatient therapeutic centers, and mobile therapeutic programs (PTPA). In Cunene, the Ministry of Health reports that the fall in admission cases in 2015 does not signify improved conditions but rather reflects the closure of some centers due to a lack of nutrition supplies.

Mortality cases due to malnutrition vary between 2012 and 2015 in both provinces. According to the government, the fluctuation is largely due to disruptions in the supply of nutritional supplements and consequent closure of inpatient and outpatient treatment centers (UEN and PTPA). Therefore mortality records are most likely under-reported, and it is expected that mortality due to malnutrition is higher than indicated by the data.

Fig. 23: **Malnutrition: admission cases and mortality in Cunene and Huila**



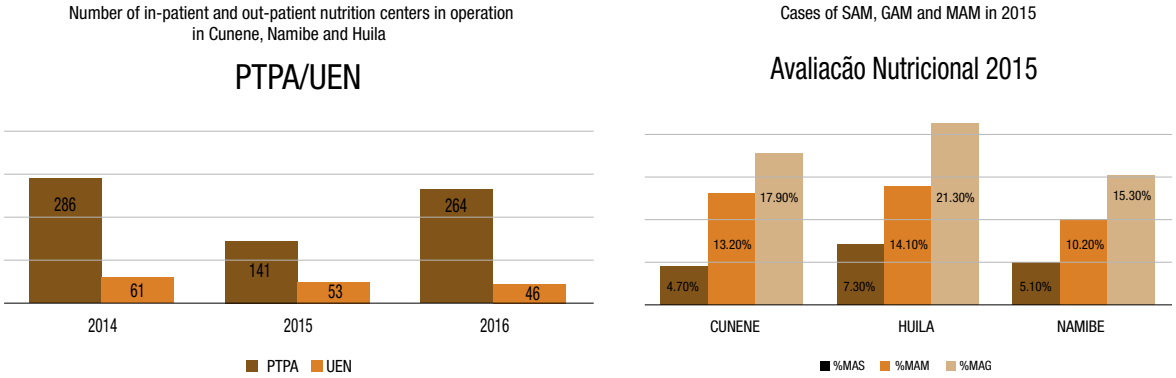
Source: Government of Angola, Ministerio da Saude

Figure 24 below indicates the number of mobile units (PTPA) and inpatient therapeutic centers (UEN) between 2014 and 2016, clearly showing a decreasing trend in government facilities able to treat the growing number of malnutrition cases in the three provinces. This added to a pre-existing limited capacity in the outreach of Angola's rural health system, due to a lack of physical infrastructure and health staff.

Overall, the reduction in facilities and supplies is symptomatic of the broader economic crisis in the country which has prompted the government to reduce public expenditures. This situation increases the level of vulnerability of the drought-affected population, and the food security and nutrition situation requires very close monitoring and additional support. The latest estimates report 44,511 cases of severe acute malnutrition (SAM) registered in

the three provinces as of May 2016[41]. Figure 24 summarizes as well those cases of global acute malnutrition (GAM), and moderate acute malnutrition (MAM) [42]

Fig. 24: **number of nutrition centers in operation in the 3 provinces; and cases of SAM, GAM and MAM in 2015.**



Source: Government of Angola, Ministerio da Saude

Damage and losses

As with most sectors there were no damages incurred by the drought in the food security and nutrition sector. The losses were estimated based on the total amount spent or executed by the Government in this sector. After agriculture, the second greatest losses were in food security with US$82 million or AKZ 13.3 billion, representing 18 percent of all losses. The nutrition sector also had significant losses valued at US$32.8 million or AKZ 5.4 billion. These losses reflect the additional costs incurred by the government and the international community to reduce food insecurity and malnutrition among the drought-affected population in the three provinces.[43]

[41] UNICEF, 2016 May, Angola Humanitarian Situation Report

[42] WHO describes Moderate Acute Malnutrition (MAM) as GAM in the 79% - 70% range, and Severe Acute Malnutrition (SAM) as GAM below 70%

[43] These are estimated losses, based on data provided by the GoA and the UN which was not disaggregated by sector. Source: Relatorio de balanco da implementacao do plano de contingencia sobre os efeitos da seca, April 2015.

WATER AND SANITATION

Context analysis

In the three provinces, access to drinking water and sanitation services were already low prior to the drought, although with differences among the provinces. In Huila, 35.5 percent of households has access to drinking water, while in Namibe it is 48 percent. In Cunene only 23 percent of households has access to water and only 12 percent of households use toilets. Boreholes are the chief means of water supply in rural areas, but rivers are also an important source of water particularly for livestock. In many areas, there are no proper sanitation facilities and open defecation is common practice.

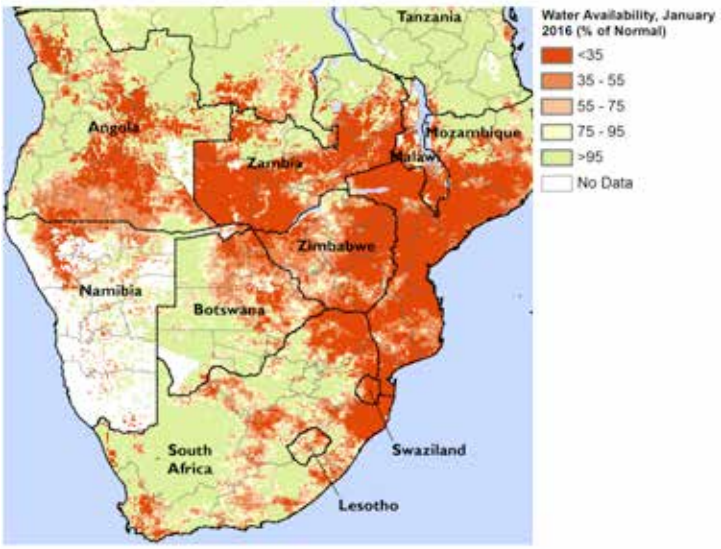
As early as 2012, assessments already called attention to the reduction in the availability of drinking water as rivers were drying up and the water table started to decline. In some of the drought affected areas, average water consumption was 3 to 7 liters per day per person, instead of the 20 recommended.

The most recent assessments (2016) on water conditions in southern Angola report that water availability has diminished further, as reservoirs have dried up due to the low and steady decline of the water table following four consecutively drought years. In some areas of Cunene potable water is estimated at 250m in depth and found to be saline. According to government reports, the Cuvelai River in Cunene, which serves as a barometer to assess overall water levels and the severity of drought in Cunene, ran dry.

These assessments are consistent with models on water surface conditions. The map below illustrates the outputs of a surface water availability model run by NASA as part of the FEWS NET Land Data Assimilation System (FLDAS). The model incorporates data on rainfall, humidity, winds, soil type, and temperature to estimate surface water availability and compare it to the 1982-2015 historical record. The data suggest serious surface water deficits in Angola especially in the central and southern areas, although less severe than

in some of the neighboring countries in southern Africa such as Zambia, Zimbabwe and Mozambique.

Map 4: **Surface water availability per capita anomaly**
January 2016 (percent of the 1982-2015 average)



Source: FewsNet Southern Africa Special Report, March 2016

The short and irregular rains in 2015/16 did not sufficiently recharge the underground water table. It is estimated that 80 percent of the existing boreholes are non-functional and that less than 20 percent of communities have access to safe water. Many boreholes are not working due to shortages of spare parts or fuel for pumps. Other boreholes are not operating due to inaccessibility to current levels of aquifers. Those which are functioning do not have the capacity required to meet the demand of the existing population and livestock.

Repairs and the purchase of spare parts has been constrained due to high inflation. Also, the construction of new boreholes and water projects, which form part of the government's contingency plans for the drought response, have not been fully implemented due to the lack of financial resources.

In 2014 the Ministry of Energy and Water started the construction and rehabilitation of water points to improve the supply in southern provinces. In 2016, the government reported that in Namibe, the government built 20 boreholes but they all remain inoperable because the necessary infrastructure was not put in place (such as elevated tanks and pumps) due to lack of payment to contractors. Similarly, in Huila 30 boreholes were planned but only 5 were started and none have been completed for the same reason. In Cunene water projects appear to have made better progress but access to water remains a problem.[44]

Women and children are traveling longer distances to fetch drinking water (2 to 40 km). Water scarcity and depletion of pastures has also influenced transhumance migrations of livestock which are starting earlier and covering larger distances. People continue to use unclean water for consumption and cooking and are forced to share untreated stagnant water with animals (livestock, goats), giving rise to diarrhea and other water-borne diseases. Malaria caseloads have increased by as much as 76 percent since 2015. Sanitary conditions in many areas are poor, due to the widespread practice of open defecation, water

[44] Relatório De Missão Técnica Multissectorial Às Províncias De Benguela, Cuando Cubango, Cuanza Sul, Cunene, Huila E Namibe. Agosto 2015; Relatório De Avaliação, Plano De Contingencia Sobre Os Efeitos Da Seca, Dec 2014.

scarcity and poor hygiene practices which are likely to increase the prevalence of diarrhea, malaria, measles and respiratory tract infections.

The few water points remaining, mostly depressions made by machines or manually (chimpacas) that collect rainwater are now being shared between humans and animals for various uses. Due to lack of alternatives the local population is drinking water directly from the water holes without any treatment. Water quality is a growing problem, and a potential source of water-borne diseases. The poor water quality, lack of sanitation and hygiene have resulted in 3,747 cases of cholera diagnosed in Cunene province alone.[45]

Damage

For the purpose of this analysis, damages in the WASH sector refer to water and sanitation infrastructure that was not functioning in all three provinces as a result of lack of water, including water collect and distribution systems, boreholes and the traditional ***chimpacas***, ***chafarizes, cacimbas***. Several reports emphasized that more than 80 percent of the existing boreholes (estimated at 3000) are currently non-functional and lack safe water. Damage estimates are based on 2400 (80 percent of total) boreholes needing either repair or full replacement. Out of these, 75 percent are considered to require some kind of repair and the rest need full replacement. Total damages are estimated to be US52.5 million as shown in table 6 below.

Table 6: **Damage to water and sanitation (USD millions)**

ITEM	Public (Government)		Total
	Unit Cost USD	Number	Million USD
Boreholes to be repaired	2,500	1800	4.5
Boreholes to be replaced	80,000	600	48.0
Total			**52.5**

Losses

Losses in the PDNA methodology refer to the additional economic flows that have been incurred by the government or the private sector to ensure the provision of goods and services and access to these. Losses in the WASH sector due to the prolonged drought are accounted for by considering the costs that the government and other partners have incurred to repair the water and sanitation systems between 2012 and 2016. Also, this sector has invested additional resources in water treatment and quality assurance. The costs associated with communication campaigns to promote the use of safe water and appropriate sanitary practices are also included in the losses for this sector.

Other costs associated with the loss in revenue by the sector are not included in this analysis due to lack of information. However, the costs incurred to improve the quality and distribution of water and sanitation facilities were estimated as losses for the WASH sector.

Based on the reports provided by the GoA and the UN agencies, it is estimated that a total of AKZ 18.78 billion (USD 192.5 million) was provided by the GoA to assist the affected population in the three most affected provinces. Table 7 below summarizes the items that were provided as part of this assistance, which includes WASH support under non-

[45] PDNA Angola Report Final MT 30Sept2016

food items. In addition, reports from the UN CERF indicate that Humanitarian Partners mobilized USD 20 million in the period 20012-2013, with funding from the CERF, bilateral donors, and other partners.

Table 7. **Food and Non-Food Items provided to the affected populations**

Food items	Rice, maize flour, beans, oil, preserved meat, preserved fish, iodized salt, dry fish, maize, massango, condensed milk
Non-food items	Water tanks (5000 and 10000 lt), pails, bowls, survival kit, water pumps, blankets, soap
Inputs and seeds	Horticultures, beans, maize, "massambala" (sorghum), fertilizers (NPK 12-24-12, ammonia sulphate, plows ("charruas") for animal traction, veterinary products, agrometeorological stations, automatic pluviometers and odometers
Transport and other equipment	Tractors, 5 ton capacity tipper trailers, 4 by 4 Unimog vehicles, Tanker trucks, Land Cruiser vehicles (Diesel, 4 by 4)

Overall, it was estimated that approximately US$ 5.3 million or AKZ 0.9 billion of all expenditures correspond to the WASH sector, as shown in table 8 below.[46]

Recovery needs

According to the PDNA methodology, the recovery needs are estimated in each one of the sectors of analysis considering the following: a) the repair or reconstruction of physical assets, b) the resumption of the production of services and access to goods and services, c) the restoration of governance and decision making processes, and d) the reduction of existing vulnerabilities and risks.

The concept of building back better, BBB, and increased resilience, are considered fundamental and are included in this analysis to ensure a sound recovery process and to avoid the reconstruction of the vulnerabilities that lead in the first place to the disaster being analyzed. Further, it would be important to prioritize and sequence the identified needs as much as possible.

Based on the desk review of a number of documents and reports on the effects and impacts of the droughts in Angola and from the field visit to the three most affected provinces which included dialogue with provincial and municipal authorities, as well as through the field visits and exchange with the traditional authorities, ***Sobas***, and the direct exchange with the community, it is evident that the **most immediate short-term needs** (6 months to 1 year) relate to the following priorities:

1. Provision of safe water for people and their animals to meet daily minimum requirements of 15 l/day.

2. Promotion of community led total sanitation, CLTS, and prevention of water borne diseases initiated by the Government of Angola with the support of UNICEF.

3. Promotion of public and personal hygiene practices, to prevent the spread of di-

[46] These are estimated losses, based on data provided by the GoA and the UN which was not disaggregated by sector. Source: Relatorio de balanco da implementacao do plano de contingencia sobre os efeitos da seca, April 2015.

arrheal disease such as cholera, dysentery, ameobiasis, and others, especially in children under five years of age throughout the CLTS as well as the HHWTSS.

4. Strengthening synergies between provincial directorates in order to improve efficiency of national/provincial programs, for example providing safe water to health centers, schools and open markets.

5. Further develop the MODEGA tool to promote participatory processes to manage the rehabilitation of water points and communities through additional investment and ownership.

In the medium-term (1 to 2 years) and long term (2 to 4 years), more in depth discussions are needed at the technical and political decision making levels, to better understand climate change and its consequences within the southern region. This will help make well informed decisions linked to investments to either substantially improve access to water for both consumption and agricultural production, or alternatively decide on other more structural solutions if there is a structural problem with water availability in the southern region.

In accordance to the SADC Regional Humanitarian Appeal of June 2016, the construction or rehabilitation of water provision, retention and distribution systems for people and livestock, along with the construction of dams and the re-channeling of rivers are considered a high priority and a significant need in the medium and long run. Alternatives such as the underground dams used in the early 20th century by Portuguese, in the affected areas, should be also explored as an option.

In the long run, ways to divert river flows to areas with water deficits and the construction of irrigation systems adapted to local specific conditions and requirements have been identified as relevant. Additional detailed scientific studies are needed to verify the existence of sufficient underground sources of water, suitability for human consumption or agricultural use, expected volumes and sustainable ways to making use of it.

Table 8: **Summary of Damage, Losses and Needs in the WASH Sector**
(Millions of US$)

Sector	Damage	Loss	Recovery Needs
WASH	52.5	5.3	72.5

EDUCATION

Context analysis

As with most other sectors, the education sector in Angola was significantly affected by the civil war, which destroyed school infrastructure and caused the loss of financial and human resources. The Education Reform implemented since 2004, however, has had the objective of enhancing the quality of education and much progress has been made. An assessment carried out in 2010 by the Comissão de Acompanhamento das Acções da Reforma Educativa (CAARE) revealed three main problems that continue to be a challenge in education:

1. Lack of quantity and quality of human resources especially in primary education
2. Shortage of classes and low student attendance in rural areas
3. Classes overcrowded in urban areas

In addition, the 2014 Census showed that the literacy rate at national level is 65.6%, yet in urban areas the rate is almost double compared to rural areas with 79.4 percent against 41.1 percent respectively. As seen in table 9 below, in Cunene nearly 29 percent of children and youth aged 6 to 17 have never attended school, while in Huila and Namibe it is about 20 to 21 percent. In Cunene about 25 percent of the population between 15 and 24 years of age cannot read or write, while in Huila and Namibe it increases to 35 and 36 percent respectively.

Table 9: **Education in Cunene, Huila and Namibe**

Province	Population Total	Population Rural	Proportion of population aged 6-17 years who have never attended school	Proportion of population aged 15-24 who can read and write	Proportion of population aged 15 or more in rural areas that can read and write	Proportion of women aged 15 or more in rural areas that can read and write
Cunene	990,087	782,931	28.7%	75.2%	45.9%	22.8%
Huila	2,497,422	1,680,383	20.3%	64.8%	36.3%	13.3%
Namibe	495,326	179,670	21.2%	63.6%	29.1%	10.1%

Source: National Census 2014

The Government of Angola has been implementing a massive literacy program since 2009 to eliminate illiteracy in the country among adults by 2017. It has also been implementing a School Lunch Program (SME), at the multi-sectoral level with the involvement of the Ministries of Education, Trade and Industry, to encourage school enrollment, reduce absenteeism due to hunger, increase student achievement, and improve the nutritional and health status of children.

Another challenge in the education sector is the lack of adequate water and sanitation facilities in schools. A survey conducted by the Ministry of Education with support from UNICEF in 2016 shows that about 70% of schools in the country do not have connections to water supply and those that are connected to the network are not supplied 78% of the time.

Only 35% of schools have drinking water available and 76% of schools said they did not treat the water and had major health problems with students. In rural areas, access to water is even more difficult because the water is usually acquired through wells or distant rivers. For instance, in Cunene only 7% of schools have water, 86% in Namibia and 45% in Huíla. In Namibe the higher access to water is because most schools are in urban areas and therefore are connected to the water supply network. Schools, particularly in rural areas are designed and built without taking account of a water supply system and sanitation.

Water and sanitation facilities in schools have a strong positive impact on reducing the dropout rate, increase the enrollment of girls, and increase the retention and completion rates of education.

The impact of drought on education

The assessment in the three provinces indicates that the drought is affecting the education sector in five main ways, as described below:

1. **Early and longer transhumance livestock migrations have increased school absenteeism and dropout rates**

As explained in other sector chapters, most of the drought-affected communities are primarily agropastoralists engaged in subsistence livestock farming and agriculture. Children and youth are responsible for livestock, and the drought-induced early and longer transhumance livestock migrations in search of pastures and water across wider distances has

increased school absenteeism and drop-out rates. In some cases, families are forced to migrate together, a situation that forces children to leave school.

Traditionally, it is boys who accompany livestock, and school dropouts among boys is due to transhumance migration. They are not integrated into schools in points of arrival. This implies that most of the children following transhumance interrupt their school year until they return to their communities of origin.

2. Longer distances to fetch water for human consumption have forced some children to drop out of school

In addition to its impact on transhumance migrations, the drought has increased the distance traveled by families to fetch water for human consumption, requiring significantly more time and effort, especially by women and children who have this household responsibility. Once again, the greater burden has forced some children to drop out of school, both to fetch water longer distances or to care for younger siblings when women take this added responsibility.

3. Increased food insecurity and lower food consumption has led some children to drop out of school and affected students' performance

As noted in earlier chapters, families affected by the drought have had to reduce their food consumption, as a result of crop and livestock production losses and limited access to market purchases due to high inflation and other economic pressures facing the country. Both the quantity and the quality of food consumption has diminished and, as shown in the chapter on food security and nutrition, cases of malnutrition have increased in the three provinces. Families that cannot feed their children in the morning or have malnourished children, especially younger children, prefer to keep them at home. For children who are still able to attend school, they cannot focus or concentrate on learning and overall performance is lower.

4. Increase in household chores for children has increased the number of school attendance irregularities

During the field visits, the Education Provincial Directorates (DPE) reported that in the three provinces school performance had fallen due to the increase in household tasks among children during the day and the reduction of food consumption. Drought increased household chores especially for girls who are the first to leave school to help the family. They do not go to school every day because they are dedicated to domestic work such as fetching water and preparing food in the absence of mothers.

5. Migration in search of employment

The drought has forced some families or household members, including children and youth, to migrate in search of alternative employment and income. In the province of Huila, there has been an increase in the number of school children moving to the province of Namibe in search of employment on farms or in urban areas for small informal jobs (peddling). The impact in this province for the period 2012-2015 was more evident in the municipalities of Gambos, Humpata, Chibia and Quipungo.

In Cunene province, closer ties with neighboring Namibia and the ease of language mainly due to ethnic ties among the population in the border areas, facilitates migration flows for employment, food and basic services (health, education and water).

Concluding remarks

Losses in the education sector is typically estimated by calculating the cost of school drop-outs by students, absenteeism by teachers and school directors, and additional costs incurred by the government to address the impact of drought on education. However, it was not possible to obtain the necessary data from provincial and municipal authorities to estimate losses, including because of the limited capacity to monitor migration and trans-humance movements of the local agropastoral populations.

Nonetheless, the assesment found that the prolonged drought in southern Angola has exacerbated the structural weaknesses of the education system in the country, while also worsening access to education by children and youth. As a result of drought, there has been an increase in school absenteeism and school dropouts as well as a fall in school performance. It is estimated, for example, that in Namibe province students are missing an average of 60 days per elective year as a result of the drought. Also, 9 schools in the municipalities of Curoca and Cahama were closed as a result of dropouts and absenteeism by students and teachers.

The economic crisis in Angola, caused by reduced revenues due to the global fall in oil prices, has also exacerbated the situation in drought-affected areas, especially since 2015 as the GoA has had to reduce public spending. Lower transfers from the central level has further limited the capacity of local authorities to provide basic public services including schools. There are reports that the school lunch program or SMEs are not operating in several municipalities.

THE ENVIRONMENT

Context analysis

It is estimated that 23.3 percent of the forest lands are in pastoralist areas with a total of 290.481km2, which falls within the region most affected by drought in southern Angola (PANCOD 2014; FAO-WFP 2004). Generally, the region is subject to recurrent drought and flooding.

Rural areas depend entirely on the consumption of firewood and charcoal. In Angola roughly 32% of households has access to electricity and it is estimated that charcoal consumption represents 57 percent of the total energy consumed in the country (UNDP 2014).

As noted elsewhere, this is a typical area of pastoral transhumance systems where pastoral communities from more arid areas migrate seasonally in search of pastures and water. In general, the municipalities where migrations originate from are characterized by a drier climate, compared to the areas of arrival which are mostly devoted to agriculture.

Charcoal production is allowed in restricted areas and licenses granted. Licenses are for a period of 6 months, from May to December, followed by a moratorium period from January to March whose purpose is to allow producers to sell stockpiled coal. From January to May logging is forbidden. 4.966 and 1.730 have a sufficient number of inspectors to control illegal felling and charcoal production.

With regard to timber production in planted areas, Angola had 148,000 ha of Eucalyptus, Cupressus and Pinus plantations in 2012. Timber production is substantial in the province of Huila, and in the province of Cunene, areas in the municipalities of Cuvelai and Namacunde. Have timber potential (in natural areas and not planted).

The collection and production of Non Timber Forest Products (NTFP) is significant for the food security of rural communities. Some of the main NTFPs include bushmeat, honey, edible and medicinal mushrooms, berries, insects, fodder for livestock, medicinal plants and roots, fish from inland waters, grass and fibers for the construction of homes, and raw material for handicrafts, resins, tannins, latex, bark, etc. (IDF 2006). Some NTFP products have a higher commercial value, such as honey, medicinal plants and mumpeke oil.

Another traditional product is the annual collection of maungo, imbrasia larva belina that grows on the leaves of mopane (mopane C.), which is an important source of proteins for communities throughout the southern region. Honey production is common among ethnic groups that practice some agriculture and live in areas with slightly higher rainfall compared with pastoral areas.

The impact of drought on the environment

The drought has had several effects on the natural resources of the southern region:

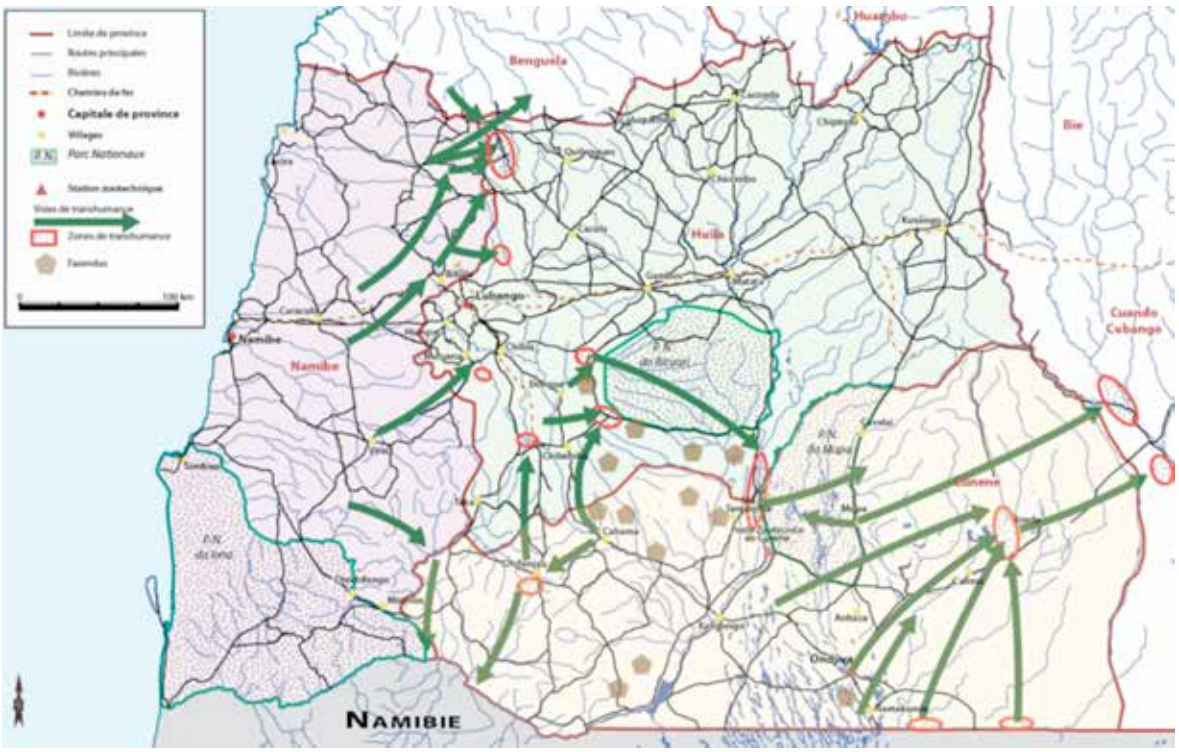
1. A decrease of natural pastures and forage, due to drought and intensive livestock migration;
2. A reduction of water resources that are key to ecosystems, fauna and local populations;
3. Increased charcoal production, leading to rapid deforestation and biodiversity loss;
4. Wild animals in national parks.

The effect of transhumance migration in areas of origin and arrival

As mentioned, pastoral transhumance systems typical of the region involve seasonal migrations of livestock from areas with a dryer climate in search of pastures and water. The map 5 below indicates the transhumance migraton routes in the southern region of Angola.

As a result of cyclical drought there has been a reduction of areas with pastures. Herds of cattle tend to concentrate in certain areas generating pressure on water, soil and forest resources in these areas. These conditions have contributed to the decrease and disappearance of certain fodder grasses and shrubs and the consumption of less palatable species. The savanna which has plentiful grasses are prone to forest fires, and subjected to greater encroachment as the land for agriculture, pastures and hunting expands (PANCOD 2014).

Map 5: **Transhumance livestock migrtion routes in southern region**



Source: FAO 2014

The decrease in pastures and water, especially in 2013, 2014 and 2015, in areas where transhumance livestock migrations originate has led to a greater movement of livestock. In the arrival areas, which have slightly higher rainfall, severe drought in 2015 caused losses in crops and pastures, and consequently had much less capacity to host livestock migrations. The lack of pasture, herbaceous and woody, has been more traumatic for cattle than for goats as they can feed on bush thorns which have a higher drought resistance. The decrease of pasture, along with the reduction of water availability in tchimpacas has increased animal pressure on the few available water points, and overgrazing has increased erosion. This in turn has led to an increase in the consumption of less palatable weeds, and to feeding, in other grazing areas. The decrease in pasture and water resources has been a key cause of livetock deaths.

Increased charcoal production and deforestation

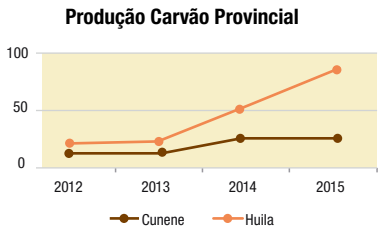
In the three provinces, charcoal production is common and largely practiced in rural communities by farmers or agro-pastoralists as a subsistence activity and also as an emergency strategy that is replacing agriculture in areas with low rainfall. Pastoral ethnic groups have no tradition of producing charcoal, but it is a trend that is changing. The production of charcoal has replaced food production as a key cash crop in some rural areas, with up to 50 percent of rural people depending on charcoal production for their livelihood.

Charcoal production uses native species, especially the Colophospermum mopane species, which can survive in rocky areas and whose regeneration is made by strains. Tree felling and charcoal production is a male-dominated activity, while its sale is done by women (UNDP 2014).

Charcoal production in the provinces of Huila and Cunene (and apparently Namibe too) has increased significantly since 2012, and by 2014 it had increased 270 and 200 percent respectively. At national level, the data shows increases as well. The following Fig. 25 shows charcoal production quantities registered for tax purposes in the province of Huila and Cunene. It is important to note that these estimates are not representative of actual production, but only the production trend over the years.

Fig. 25: **Charcoal production**

Produção Carvão registrada (ton)	2012	2013	2014	2015
Cunene	9,7	11	22,4	22,8
Huila	19,6	19,8	53,6	86,6
Namibe				
Produção Nacional estimada (FAOSTAT 2015)	314.056	314.056	336.058	
Produção áreas pastoris e agro-pastoris (23%)	72.232	75.410	77.293	
Valor da produção de carvão em USD	253.103,6 ton/ano 265 M USD		6M m3/y 510M USD	
Tacìxa de desflorestação	0,2		0,4	



As mentioned, pastoral ethnic groups have no tradition of producing coal, yet they are increasingly relying on it as an alternative income source. In Cunene, where ethnic groups are pastoralists, charcoal production has doubled since 2013, which alarmed the authorities who report "the indiscriminate felling of trees has been gaining alarming proportions along the southern border with Namibia and in the municipalities of Cuanhama and Ombandja" (annual report 2014 DPA), due to the illegal trade of charcoal with neighboring Namibia where tree felling for charcoal is illegal. The situation has added pressure on local authorities to strengthen control measures especially in the province of Namibe where no licenses were granted in 2015. Although this helps to arrest deforestation it also ignores the reality of the local drought-affected populations in need of alternative sources of income to survive. In Cunene there are no control measures and deforestation is likely increasing.

The intensification of charcoal production as a coping strategy among the drought affected population has increased the rate of deforestation and reduced the capacity of soils to retain moisture, which in turn accelerates soil degradation and reduces the capacity of local forests to sequester carbon.

The effects on water resources

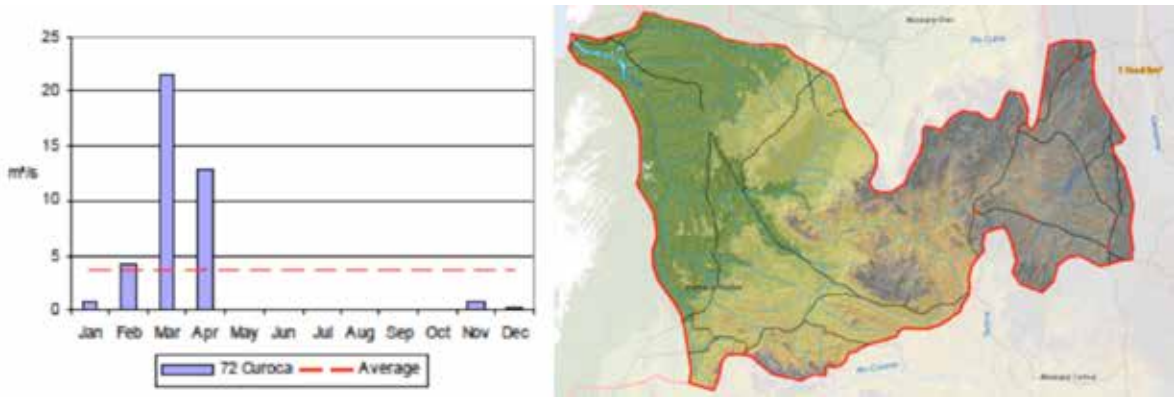
The region has three major river basins, the Cunene river basin, the Cuvelai river basin, and the basin of the rivers Curoca, Giraul and Lucira, in addition to many rivers and streams. Large estuaries, such as Cunene, constitute the basis for an intricate and rich network of species that support the livelihoods of the local populations with essential food supplies (MDG 2010).

As explained in the chapter on water, the drought has depleted the water table, and has dried rivers which has reduced the water flow to the aquifer of river basins. Over the past three years, since 2013, there has been a progressive drying of two fertile oasis which are rich in biological resources and ecosystems. For example, the municipality of Tombwa receives the waters of the river Curoca, which is a tributary of the Cunene River. Ecologically

the area of Tômbwa is a desert with 6,000 km2 of sand dunes and the river forms a fertile oasis, particularly in Curoca town (PANCOD 2014).

These oases are important for migrating birds such as flamingos and pelicans, and also for the livelihood of the villages living in the area. The effect of the drought represents a loss not quantified in terms of biodiversity and the socioeconomic condition of local communities.

Fig. 26: **Curoca river basin, Namibe**

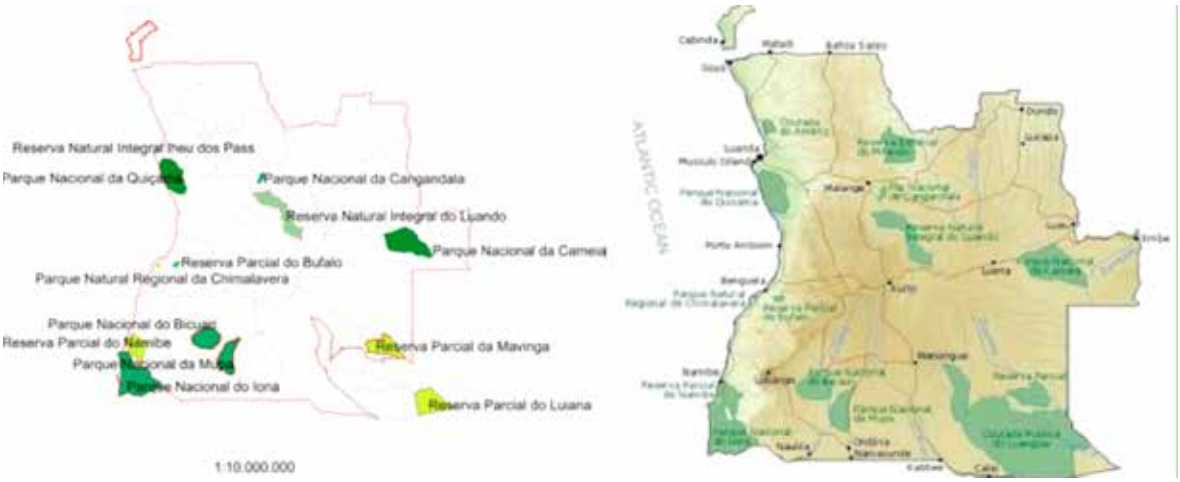


Source: Relatorio 2015 Direção Nacional das Aguas

National parks and animals

There are three natural parks and a partial reserve in the sourthern region (three provinces), covering a total of 35,100 km2 which represents 21.6 percent of the country's territory with national parks.

Map 6: **das reservas nacionais no 2010 e no 2015, após a ampliação das áreas de conservação.**



Source: UNDP

The parks of Mupa and Bikuar is within the ecological corridor between the Ocavango and park Bikuar and and part of a migration corridor for large and small animals. The authorities in Cunene report an increase of registered deaths of large animals, including elephants. It is worth emphasizing that communities are not used to reporting cases to the authorities, an attitude that is slowly changing. The increase in cases of animal death, especially in the park of Mupa in northern Cunene is an indicator of the need for animals to approach the Cunene river for water and food.

Disaster risk reduction and climate change adaptation

In the affected provinces the overall environmental impact of prolonged drought is rapidly accelerating deforestation, soil degradation and depleting vital water resources, especially in Namibe and Cunene. These conditions in turn increase the level of future risks, for example desertification and the potential increase of flooding due to soil erosion, increasing the level of vulnerability of the local populations. Therefore, the drought recovery strategy will need to redress negative coping mechanisms that contribute to environmental degradation, support alternative livelihoods that are more sustainable, promote sustainable natural resource management and agricultural practices, and implement measures that help to reduce future disaster risks. It will be important to scale-up adaptation strategies to climate change, which in this region is likely to increase the frequency and severity of drought.

SOCIAL IMPACT

Context analysis

The social impacts of the Angolan drought are the cumulative result of the various sector effects and which are experienced daily in the lives of the affected populations. The experience of drought is not uniform. Population sub-groups are differentially exposed to drought risks, have differing abilities to cope, and thus experience drought in different ways. Social impacts encompass the direct impacts of drought and the indirect impacts of human behaviors in response to the drought. Adequate comprehension of social impacts requires an analysis of the ways in which drought impacts livelihoods, the ways in which people respond, and the consequences of these responses.

Table 10 below highlights key indicators that are relevant to drought impacts and the ability of households to respond. Access to potable water is based on a year of regular rainfall and is an ongoing priority concern. Fewer than half of all households have access to potable water in a normal year. Education indicators are low in all three provinces. Preschool attendance is limited and literacy rates remain low. The prevalence of child labor, even in years with normal rainfall is high. Such structural deficits are exacerbated during drought years when negative coping strategies can worsen conditions.

Table 10: **well-being indicators for the three provinces**[47]

Province	Population Total	Population Rural	Proportion of population aged 6-17 years who have never attended school	Proportion of households with access to drinking water	Proportion of households with access to adequate sanitation facilities	Proportion of households with access to electricity
Cunene	990,087	782,931	28,7	23,3	11,8	11,7
Huila	2,497,422	1,680,383	20,3	35,5	26,4	16,0
Namibe	495,326	179,670	21,2	48,1	41,0	48,6

Source: Government of Angola, National Census 2014

Traditional livelihood adaptations did not sufficiently buffer the local population from the effects of the extended four-year drought. As a result, response strategies have shifted away from traditional adaptations towards coping strategies. By definition, these strategies are post-hoc responses to drought and frequently undermine future response capacity, reducing options and potentially locking populations into trajectories of diminishing wellbeing. The following table 11 presents a summary of the range of coping strategies encountered and their immediate and long-term impacts on the drought-affected population. Here, we refer to the relationship of effect, response, and consequences as cascading impacts. The cascading impacts of drought have implications for the present, and the immediate and long-term future.

[47] Source: National Institute of Statistics, Angola – INE; Accessed 28-08-2016

Table 11: **Typology of coping strategies and cascading impacts**

Drought effect	Coping strategy	Immediate impacts	Future consequences
Reduced agricultural and livestock production	Reduction in number of meals	Malnutrition; lowered school attendance; domestic conflict; reduced harvests and food stocks; lack of seed stock;	Low educational attainment; social exclusion; long-term health consequences; inability to plant sufficient acreage;
	Reduced food quantity		
	Reduced food diversity		
	Early harvest		
	Food sharing		
	Consumption of wild foods		
Reduced access to potable water	Manual well digging	Neglect of other responsibilities; children unattended; increased child labor; reduced school attendance; increased illness; asset divestment	Low educational attainment; social exclusion; long-term health consequences; increased social risk
	Consume low quality water		
	Procure water at long distances		
	Water purchase		
Reduced access to water and forage for animals	Animal sales	School abandonment; social conflict; lack of animal traction; impoverishment; change in herd composition	Inability to plant sufficient acreage; breakdown in social cohesion; locked in poverty trap; inability to rebuild herds;
	Transhumance (early)		
Secondary economic impacts	Adult migration	Breakdown in family structure; reduced availability of household labor; unattended children; school abandonment; impoverishment; child exploitation; delinquency; crime	Increased social risk; breakdown in social organization; disintegration of family structure

Impact analysis

Strategies in response to reduced agricultural and livestock production: Agricultural and livestock losses have undermined household food consumption due to direct losses of food normally consumed by the affected households and through lost income. Many households reported going one to two full days without food in 2015. The majority of respondents in the focus groups reported eating only one or two meals per day, primarily consisting of a millet porridge. Also, the drought has reduced milk production and the early departure of transhumance migrations further limited milk consumption and hence dietary diversity. There is an increased consumption of wild foods in the three provinces, many of which are consumed only to fill the stomach and don't provide sufficient calories or nutrients.

Most of the households reported a better harvest in 2016 than 2015, nevertheless food stocks are predicted to last only until November or December. A majority of households reported harvesting millet and sorghum before it was mature. This practice lowers yields, provides lower nutritional value, and reinforces the cycle of insufficient seed stock for planting. Seed prices have increased from 50 Kz in 2012 to over 225 Kz, limiting the ability of households to purchase the seed in the quantities necessary to meet their needs.

Mothers, professors, and public administrators all cited hunger as a direct cause for school delinquency and dropout. Even when children do attend school, often without eating breakfast, their performance is diminished due to the inability to concentrate. There are no data figures available, but in Cunene many schools are reported to be closed due to the drought.

Box 1 **amount of food and number of meals diminishing in 2015**

The amount of food and the number of meals has diminished substantially as a result of the drought. In 2015, many families reported going 1-2 days without eating anything. The recent 2016 harvests have improved the situation, but consumption is still far below normal and the toll on health and nutritional status continues.

A woman in Cunene, whose story is similar to many that we recorded, reports that her household eats only 1-2 meals a day. The most common food in her home is a thin millet porridge, made from water drawn from the ***tchimpaca***, 4 Km distant, and polluted with animal waste. She sacrifices her own food to ensure that her three children eat, but they still are frequently ill due to the polluted water and the limited dietary diversity.

Her options for accessing additional food are limited and she expressed considerable concern that the limited food stocks that they have, even tightly rationed, will not last beyond the first half of October.

Strategies in response to reduced access to potable water: Government programs have focused on digging deep wells in the region, which has alleviated some of the water stress during normal years. However, as noted in previous chapters, many of the pumps are run on gasoline engines and the cut in fuel subsidies has priced gasoline out of reach for many people. Even with these investments, water access during the last four years has been a major constraint for nearly all households. During the drought many wells dried up and others became saline as a result of less water. As the water sources dry up, the available water becomes more polluted. More animals and more people are all forced to use the same water source. This year, many wells have already dried up entirely. For many, the only choice is to procure water from long distances.

Women and children provide water for their households and for the animals. Often the search for water takes many hours, either because they have to walk great distances, or because the amount of water produced at closer wells is low enough that it may take all day to fill the water containers. Some households choose to consume water of very poor

quality rather than invest the time and labor to travel long distances. The time demands of water procurement have profound impacts on the ability of women and children to attend to other tasks and responsibilities. Older children who fetch longer distances for water do so at the expense of attending school, resulting in long-term impacts on school performance and social exclusion.

Box 2 **Young kids struggle getting water for consumption**

In southern Namibe, four brothers (12,13,16, and 17 years of age) are responsible for maintaining the family's livestock. Their father lives in town, a distance of nearly 35 Km away. Only one of the boys has ever been to school.

Water access is a constant worry for the girls. They live approximately 2 Km from a recently installed water tank, which tank is filled by a government water truck. However, the truck doesn't have a regular schedule and the tank frequently runs dry. As a result, the girls end up travelling 5 Km to the nearest well. The well produces saline water, that is best suited for livestock needs. Lacking other options this is the water source for the girls.

Strategies in response to reduced access to water and forage for livestock: As reported, transhumance began earlier during the last four years as a result of water stress. This year, respondents in Cunene and Huíla indicated that they will begin moving two months earlier than usual. According to herders and cattle owners, the lack of water and forage over the last four years contributed to significant cattle mortality. Cattle are sold or traded to access cereals or other necessary food and non-food items. The rate of offsale has increased as a result of the drought. For the population, which gains significant status from cattle ownership, the offsale of animals for survival is a significant step and indicates high stress. The combination of the increased cattle supply due to distress sales with the weak currency, contributed to depressed livestock prices, particularly during 2015. While prices were depressed across the region, the difficult road access to these communities increases costs either through transportation costs or increased prices paid to merchants that visit the communities.

Cattle management and transhumance is typically the responsibility of young men and boys. Though the cattle owners may accompany the initial movement, the youth are responsible for maintaining the herds in the new regions, moving them between the available forage and water resources. This movement, which results in school absence and dropout in regular years, is exacerbated in drought years since the youth may spend 9 months away from their villages.

Strategies in response to the economic effects of drought: The economic effects of the drought derive from lost income due to reduced agricultural and livestock production and the need to purchase food items normally produced by a household. In order to make up for these shortfalls, households engage in a number of responses including adult and child migration, asset sales, informal labor, other income generating strategies such as charcoal production, and the abandonment of family or children. The incidence of migration, long an adaptive strategy in the region, has increased as a result of the drought. Migration was a strategy mentioned in nearly every focus group and key informant interview. Increased migration has impacts on the sending and receiving communities. In-migration in receiving communities causes significant stress on the receiving households, and this additional burden has increased requests for food assistance.

Box 3 **Child abandonment and migration increased as a result of household economic stress**

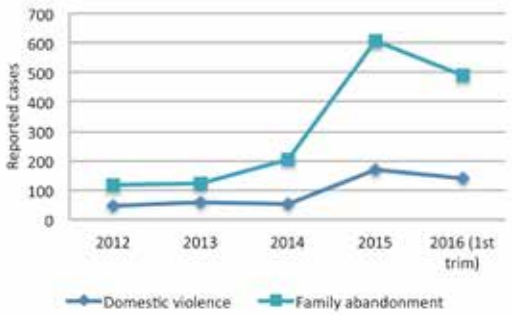
This summer, three minors were placed on a bus in Huíla and sent to Namibe to live with their extended family. But the extended family was fictitious. The children, abandoned by their family, arrived in Namibe, without identification, looking for relatives that didn't exist.

Child abandonment and migration increased as a result of household economic stress caused by the drought. These children, as young as 8 years of age, face significant risks – social, physical, and mental – as they try to make their way in the world. They are exploited for their labor and for sex and are at risk of becoming drug addicts and turning to crime to support themselves.

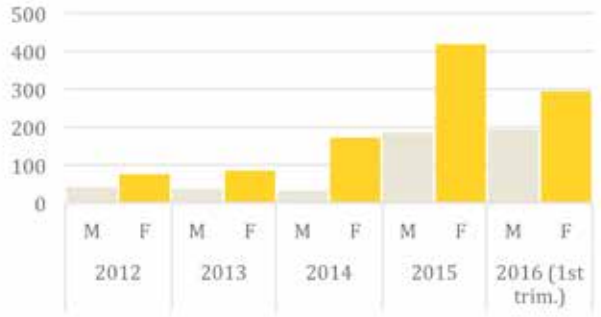
Government officials work to repatriate minors with their families but the challenge is great. Some families repudiate their children when confronted and other children simply leave again after being reunited.

Economic stress on families has also led to increased abandonment of families and elderly, by both men and women, and the abandonment or repudiation of children. Women reported that males have left for the city to look for work and end up building new families, abandoning those that they left behind. In other cases, individuals simply leave because of fighting and stress related to the lack of resources. When a man loses all his cattle, there is an increased chance that he will abandon his family since he has very limited options for supporting his family. Focus groups report that women also abandon households when livestock are lost, moving back to their own family. Figure 27 below shows the rising trend in family abandonment in the province of Huila and its breakdown by gender.

Fig. 27: **Reports of domestic violence and family abandonment in Huila**



Domestic violence and family abandonment total in Huila



Family abandonment by year and gender in Huila

Gender-based analysis: As noted above, the need to fetch water under drought conditions places a greater burden and work load on women and children, and the overall economic and social stress brought about by the drought has increased the incidence of domestic violence. In addition, the greatest consequences of dietary changes are felt by the women and children. In addition to curtailed diets, women provide much of the labor for domestic activities, including water collection, and lack of adequate calories conveys an additional physical burden. Cultural norms dictate that the men are fed first. When there is not enough food for the entire family, mothers will prioritize their children, often going without or with very little food themselves. The nursing mothers' diets have nutritional consequences for their infants, as maternal milk diminishes in quantity and quality.

Drought exacerbates the domestic and pastoral labor burdens of women and children and exposes them to additional social risks. The additional time burden is largely a factor of the scarcity of water and pasture, which requires covering long distances and long waits in line to access resources.

Livestock sales are a livelihood adaptation to variability in resources. In the case of long-term drought, however, sales in combination with livestock death mean that many households are completely divested of livestock. The reconstitution of assets is particularly challenging for women who, traditionally, do not have ***de facto*** ownership of productive assets.

Many key informant interviews and focus groups with women identified and underscored the relationship between drought-related stress and increases in domestic violence. Data in Huila province from the ministry of family (MINFAM) shows an increasing trend in cases of domestic violence reported between 2012 and 2016, as shown in Fig. 27 above. While the increase cannot be directly attributed to drought it does lend credence to the obser-

vations of respondents.

Box 4 **Women and their dependents enter in situation of extreme vulnerability to drought**

"Ester" is a woman from Cunene who lost her husband a year ago. Following his death, his relatives claimed all of Ester's belongings, including livestock and other productive assets, as well as domestic goods such as clothing as cooking utensils. As a result, she and her three children were forced to move in with her extended family in order to survive. Her oldest daughter is 19. She is pregnant but is not together with the father and continues to live in the household of her mother's family. They are dependent on informal labor and the generosity of Ester's relatives.

This is not an isolated incident. Many similar stories were recounted in FGD and household interviews. Following the death or abandonment by their husbands, women and their dependents enter into a situation of extreme vulnerability to drought and other social and economic risks.

Recovery needs

Intervention priorities for recovery should target the drought effects and coping strategies that have the most significant immediate and cascading impacts on the population. Resil-

ience priorities must focus on reducing drought exposure and building adaptive capacity. Cost of recovery needs to address most of the issues raised in this chapter have been incorporated in the specific sector of intervention.

Short term recovery needs:

- Water provision is a key recovery and resilience need. Good access to water will reduce the labor demands on women and children, reducing the need to leave children unattended and will contribute to decreased school dropout rates.

- Food rations will be needed as early as October. By then, many households will run out of food stocks. The low value of livestock in relation to cereals means that many households will struggle to buy food and without help will have to further reduce already constrained consumption levels.

- Seed stocks will be needed prior to the next agricultural campaign. If 2016-2017 rains are good, this will break the cycle of early harvest and lack of seed stock.

- Child repatriation will eliminate the immediate and long-term risks faced by child migrants. Programs already exist and should strengthened and supplemented to with the resources necessary to ensure that the children remain with the family.

- Reinstate the school feeding program in the most drought-affected areas. Schools that provide water and meals encourage school attendance, reducing dropout rates and risk of future social exclusion

Medium term recovery needs:

- Livelihood diversification. Currently, all livelihoods are exposed to the same climate risk. There is urgent need to diversify livelihoods and engage people in activities that aren't climate sensitive. Diversification will reduce the need for more extreme coping strategies, such as outmigration, helping to maintain household and community structure.

- Community outreach programs that demonstrate the value of women's contributions to the household economy. Culturally, women's economic contribution to the household economy is undervalued, which constrains a household's economic diversification. Programs that work with men and women to change this perspective will contribute to more diversified and resilient livelihoods.

- Investment in livelihood activities undertaken by women. In addition to outreach, investment in activities such as the rearing of goats and chickens, frequently the responsibility of women, will help to diversify the household economy and provide more cash income.

- Community outreach programs designed to reduce child migration. In addition to repatriation efforts, there is a need for programs in the sending communities that help keep children at home.

- Enhance the school feeding program to accommodate schools in all the vulnerable areas. This will reduce future vulnerabilities of the children and youth that derive from school dropouts and limited academic achievements.

Long term recovery needs:

- Transportation infrastructure. Many communities are located two hours or more, by car, from the nearest small market or public services. The wide dispersion of the population combined with difficult access due to extremely poor roads contribute to difficulties in preparing for, responding to, and recovering from, drought events. Improved transportation infrastructure will ease access to health and education services, facilitate access to water, and increase farm gate prices, lowering the comparative costs of purchasing cereals.

Methodology

The field team visited all three provinces, spending an average of 4 days in each province. Data was collected at the province (3), município (9), comuna (15), and aldeia (20) levels. Locations for data collection were identified by the Protecção Civil. On arrival, key informant interviews (KI) were carried out with sector representatives and individuals from the provincial Protecção Civil. During the subsequent days the teams visited local communities. Key informant interviews were carried out with the município and comuna administrators. In the aldeias, data was collected through a combination of individual interviews and focus group discussions (FGD). FGD respondents were divided into four different groups, where possible. These included female respondents, young males, local authorities (Sobas and Secúlos), and youth. The objective of the differing group composition was to get diverse perspectives on the situation and to triangulate data. Data collection focused on how the four-year drought has impacted lives and livelihoods directly and the ways in which people are coping. Targeted data included changes in agricultural and livestock production, water access, health, nutrition, food security, social cohesion, social capital, gender, and social protection.

DISASTER RISK REDUCTION AND RESILIENCE

Context analysis

Hazards

Angola is most frequently affected by disasters linked to climate variability and change, namely droughts and floods. Other biological hazards from infectious diseases or generated by poor water and sanitation management have also impacted the country imposing large economic and human costs.

Floods are recurrent and affect the provinces of Cunene, Luanda, Moxico, Bengo, Kwanza-Sul, Benguela, Bié, Huambo, Huíla, Namibe, Cabinda and the western part of Kuando Kubango. Droughts are also frequent and affect mostly Cunene, Huila and Namibe, nonetheless other provinces in the Central, Western and Southwestern region can also be affected. Landslides, seismic activity, water erosion also affect the country but with less frequency. Communicable and other diseases such as malaria, diarrheal and acute respiratory diseases, typhoid, cholera, tuberculosis have high probability of occurrence in all provinces, some of them aggravated by poor sanitation facilities.

In the period 1981 to 2016, the country has witnessed at least six drought events, 12 floods and one epidemic outbreak produced by the Margurg virus in 2005, which together have affected nearly 7 million people. Table 12 captures 19 of the most severe events in the last 35 years, including the number of people affected by each event.

Table 12. **Disaster Events in Angola (1981-2016)**

N.º	Type of Event	Year	Affected Population	N.º	Type of Event	Year	Affected Population
1	Drought	1981	80.000	11	Floods	2010	192.061
2	Drought	1989	1.900.000	12	Floods	2011	16.670
3	Floods	1989	100.000	13	Floods	2012	28.567
4	Drought	1997	105.000	14	Drought	2012	932.927
5	Floods	2004	331.700	15	Floods	2013	120.352
6	Marburg	2004-2005	357	16	Floods	2014	96.209
7	Drought	2005	500.000	17	Drought	2014	1.317.172
8	Floods	2007	94.972	18	Floods	2015	73.559
9	Floods	2008	52.346	19	Floods	2016	427.668
10	Floods	2009	213.502				
19 disasters have been registered in the last 35 years, with a total of 6,583,062 people affected.							

Source EM-DAT and NCPC

Vulnerabilities

Angola achieved independence only in 1975 and is still recovering from a long civil war, and as a result the level of vulnerability is high in terms of socio-economic development but also institutional capacity and physical infrastructure.

As mentioned earlier in the report, large pockets of the population still remain in poverty and without adequate access to basic services. Only 32% of households has access to electricity, and only 44% of households[48] has access to appropriate sources of drinking water (22.4% in rural areas)[49]. An estimated 60% of households at the national level use appropriate locations to defecate, although in rural areas it is 26%. At present, only some 30 percent of the households has access to government health facilities, and malnutrition is acute with 30 percent of children less than five years of age suffering from stunting.[50]

Angola ranks low on human development. It's HDI value for 2014 was 0.532— positioning the country at 149 out of 188 countries and territories. The rural poverty rate is almost 58 percent, in contrast with an urban poverty rate of less than 30 percent.[51]

The South and South-west of Angola which includes the provinces of Cunene, Namibe and Huíla and extends to the south of Benguela is an ecologically fragile region with predominantly subsistence agro-pastoral and pastoral populations. It is a marginalized region with lower levels of socio-economic development than other provinces.

In many areas, there are no proper sanitation facilities and open defecation is common practice. In Huila, 35.5% of households has access to drinking water, while in Namibe it is 48%. In Cunene only 23% of households has access to water and less than 12% of households has access to sanitation facilities. In Cunene only 11,7 of family households has electricity while in Huila it is 16%, which is well below the national average.

The high level of physical, social, economic and institutional vulnerability, explained by the long years of war and unrest in the country, coupled with little capacity to cope with the negative impact of disasters has resulted in high levels of risk.

Institutional mechanisms for response and DRR

Angola's National Civil Protection System was established in 2003, to facilitate inter-sectoral coordination and synergies on prevention, mitigation, preparedness, emergency response and recovery across sectors, and at the different government levels. The system consists of the following:

National Council of Civil Protection – an inter-ministerial body for consultation chaired by the President of the Republic and integrated by the sector Ministers and the Director of the National Civil Protection Service. The coordination of disaster response is done by the President.

[48] A typical household in Angola comprises 4.6 members.

[49] Appropriate sources of drinking water are tap sources connected to the public network, public fountain, pump hole, *cacimba* or protected springs.

[50] African Development Bank, 2011, Angola 2011-2015 Country Strategy Paper.

[51] UNDP, 2015, Human Development Report 2015

National Civil Protection Commission (CNPC) – a specialized body responsible for technical assistance and operational coordination. It depends on the Minister of Interior and is composed of representatives of ministries and representatives of other relevant institutions. Response actions are coordinated by the Minister of the Interior.

The National Civil Protection Commission is technically supported by the Executive Secretariat of the National Civil Protection Commission, a permanent multi-sectoral body coordinated by the National Commander of Civil and Fire Protection.

This national structure is replicated at the provincial and municipal level through the Provincial and Municipal Committees of Civil Protection (SCLC WACC), and are coordinated by the Provincial and Municipal Administrators Governors respectively.

Coordination between the national system and the United Nations, but also through technical groups that can count on support and participation of all partners. In a crisis situation, the technical groups are organized according to response sectors.

In year 2013, the GoA established an Inter-ministerial Commission that would coordinate all the sectorial efforts to support the affected population in the country, led by the Minister of Planning and comprised by the heads of MINAGRI, MINEA, MINARS, MAT, and MININT, which not fully followed the structure established in the National Civil Protection System.

In recent years, the CNPC has achieved several milestones both in its governance structure and Disaster Risk Reduction initiatives, among them the following:

- 2007: Early Warning System for floods in Benguela province
- 2008: Integration of disaster risk management in school curricula.
- 2010: Adoption of the National Plan for Disaster Preparedness, Contingency, Response and Recovery. This plan introduced the concept of recovery for the first time in the country.
- 2010: The National Centre for Operational Coordination (CNCO) established via Presidential Decree 229/10.
- 2011: Strategic Plan for Risk Management with Emphasis on Poverty Reduction and Adaptation to Climate Change 2009/2014 to contribute to sustainable development by reducing vulnerabilities and the impact of disasters, with priority on geographic areas with higher levels of poverty and environmental degradation.
- 2015: The National Plan for Disaster Preparedness, Contingency, Response and Recovery, PNPCRD 2015-2017, was approved. Chapter A of this plan makes provision for the formulation of a National Recovery Framework by 2016, under the responsibility of the National Civil Protection Commission and with the participation of the Ministry of Planning and Territorial Development.
- 2015: Approval of the Strategic Plan for Disaster Prevention and Risk Reduction. The plan is considered as a contribution to the National Development Strategic Plan (2013-2017), and is structured according to the Sendai Framework for Disaster Risk Reduction 2015- 2030.
- 2015: Development of Provincial Plans for Disaster Preparedness, Contingency, Response and Recovery for Cunene, Huíla and Namibe.
- 2015: Early Warning System in the province of Cunene (Cunene River) in place.

Damage and losses

No damage to infrastructure or equipment related to DRR was caused by the drought. In terms of losses, the estimate for this sector is based on the total amount spent or executed by the Government to respond to the drought crisis, primarily the provision of transport and logistic support by Civil Protection (CNPC) to facilitate the drought response. It is estimated that losses in disaster risk reduction amount to US$ 8.1 million or AKZ 1.3 billion, which represents approximately 4 percent of the USD 192.5 million total government expenditure for the drought response (AKZ 18.78 billion).[52]

Recovery needs

In defining the recovery needs in disaster risk reduction, the following major constraints have been identified during the PDNA:

- The government's capacity for response is limited, due to institutional limitations such as human resources, logistic infrastructure and equipment, and technical expertise. This affects all ministries as well as Civil Protection.
- The government's capacity for response is also limited due to reduced public spending and transfers to provinces from the central level, as a consequence of lower revenues and the country's economic crisis.
- The process of planning for prevention and risk reduction is affected by the emergency response to the disaster. In this sense, the priorities of the provinces are still concentrated in the drought response.
- The recovery planning and implementation is still not a process that has been integrated and institutionalized by the government, and capacity building is needed to strengthen the recovery process now and in the future.

In order to address the above challenges and to ensure resilient drought recovery, the recovery strategy in DRR has identified key actions that should be implemented in a phased manner, as outlined below:

Short-term (6 months - 1 year):

a) Additional logistic support and equipment to enable the drought response and recovery to continue, particularly to strengthen the capacity of Civil Protection which plays a critical role in the process.

b) Formulation of the Recovery Framework based on the PDNA findings, as established in PNPCRD, under the coordination of the National Civil Protection Commission.

Medium term (1-2 years):

a) Implementation of integrated sectoral programs/projects for resilient recovery.

Within the framework of the National and Provincial Development Plans sector specific programs and project will be designed and implemented to increase community resilience to droughts.

[52] These are estimated losses, based on data provided by the GoA and the UN which was not disaggregated by sector. Source: Relatorio de balanco da implementacao do plano de contingencia sobre os efeitos da seca, April 2015.

b) Strengthening the technical capacity of Civil Protection Staff Members in the three affected provinces, through national and international capacity building training to a core group of staff, who will replicate the training with other colleagues.

Long-term (2-4 years):

a) Establishment of Contingency centers in provinces for better management of stocks

Contingency centers will be established to store basic stock with local management mechanisms, to improve the timeliness and efficiency of responses.

b) Operationalization of the Operations Center of Regional Coordination of Disaster Prevention and Risk Reduction

The needs are summarized in the following four lines of intervention, aimed at strengthening the National Protection System, inter-sectorial coordination, and its capacity to assist local communities in the distribution of basic items such as water, food, sanitation.

- Strengthen the capacity of Civil Protection to support the drought recovery program
- Strengthen drought early warning systems and food security monitoring in the region
- Strengthen governance in DRR at local, provincial and national level (coordination, technical support)
- Strengthen logistic capacity of the Civil Protection at the provincial and local levels.

Needs are estimated in USD 12 million dollars, details are presented in the section on needs analysis and recovery.

Disaster risk reduction and climate change adaptation

According to Angola's Initial National Communication to the United Nations Framework Convention on Climate Change[53], there is limited understanding of factors that contribute to weather variations in the country and of the potential impact of climate change. Climate models for the southern Africa region don't include Angola or the Democratic Republic of Congo due to a lack of data from these areas. For this reason, the country needs to consider the expected impact of climate change in other neighboring countries. Regional climate models indicate that the weather in Namibia will be dryer in the future, as is the case for other countries south of Angola, and there is therefore a chance that this trend will be similar for southern Angola. By contrast, based on models in other neighboring countries, there are certain indications that the east and northeast of Angola could experience heavier precipitation in the future and a higher incidence of extreme rainfall.

Rising temperatures will have a negative impact in agricultural production due to the increase in evaporation and transpiration. Changes in precipitation and hydrology affect dry and wet agriculture. Impacts will depend on the area of the country, the agricultural systems used in each area and current vulnerabilities. For example, in the central plateau, years with extended dry periods during rainy seasons have reduced harvests. Further south, there are signs of precipitation reduction and increase in precipitation variability.

[53] Government of Angola, Angola's Initial National Communication To The United Nations Framework Convention On Climate Change

Access to seeds adapted to local conditions and climate variability is difficult and contributes to higher vulnerability.

Rises in temperature can also have an impact on the livestock sector, through changes in the geographical distribution of diseases (such as sleeping sickness) or through the water availability in pastoral regions in southern Angola.

A government's study of capacity among ministries, public institutions, local administrations, and universities found that in most institutions there is not enough awareness of climate change or proper understanding of its impact on the sectors or activities of each institution. The vast majority (90%) of those consulted in the study indicated that there is a need for institutional strengthening to address challenges presented by climate change.

Given the expected impact of climate change in southern Angola, based on models for Namibia, the drought recovery strategy should consider the likely increase in the frequency and scale of future droughts in the three provinces affected. It is recommended that national and provincial efforts to adapt to climate change be supported in the drought recovery effort.

The post disaster needs assessment for the DRR sector suggests that in regions such as the southern provinces of Angola where livelihoods are largely agropastoral and highly dependent on rainfall, it is imperative to jointly address the need for disaster risk reduction and climate change adaptation to increase resilience and improve the coping capacities of local communities. This would be a key element in the formulation of a successful resilient recovery strategy.

INDUSTRY AND TRADE

Effects on industry and trade are negligible in terms of the number of establishments and employment posts created. As to the volume and value of industrial activities by subsector and municipality, the information was obtained from Ministry of Industry. The general impression is that the drought has not affected the trade sector as most of the losses in the agricultural sector are in the non-market, informal, self-subsistence activities of isolated small communities.

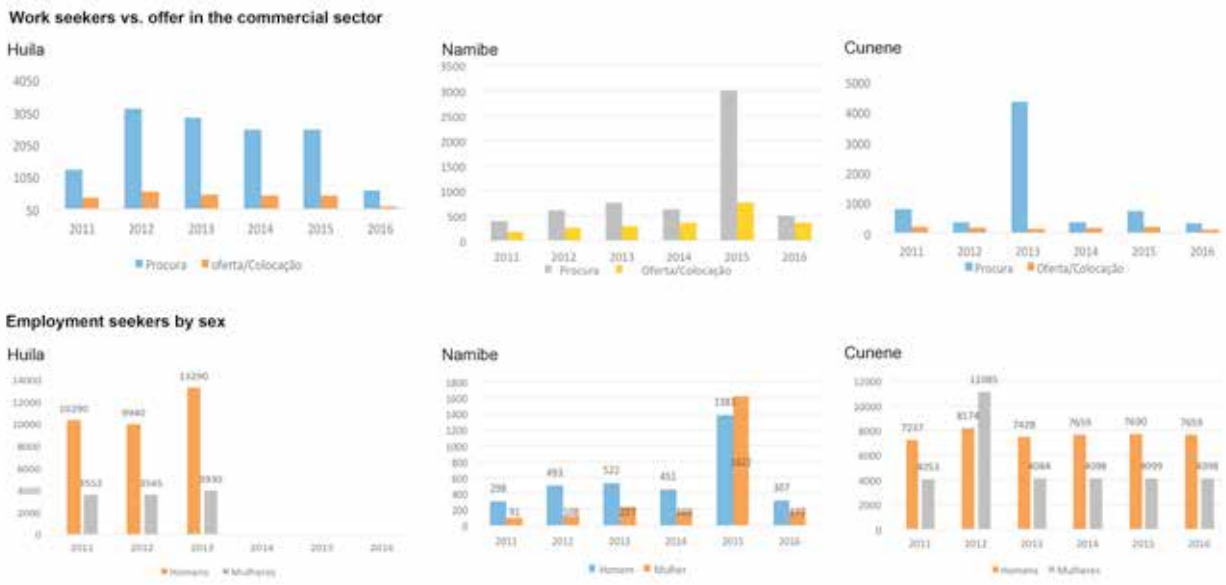
The rate of growth of industry and commerce in the three provinces does not show a drought-related pattern of change, neither does the employment in these sectors. Minor increases in purchases from Government in order to provide assistance may have even had a positive effect, and rural pastoral men and youth may have moved to urban jobs or migrated to neighbouring Namibia.

Employment, commercial and industrial activities

The impact on the industry and commerce sectors was obtained from Ministry of Industry at national and provincial levels shows that business of commercial enterprises did vary without a clear trend.

As shown in Fig. 28 below, the number of job seekers increased, probably as men looked for work to compensate for their livelihood losses. In Huila the number of job seekers was significantly high between 2012 and 2015, while in Namibe it peaked in 2015 and in Cunene in 2013. In terms of gender, the information obtained indicate that it is men that tend to move in search of work, although in the case of Cunene and Namibe in 2012 and 2015 more women sought employment.

Fig. 28: **work seekers vs. offer in the commercial sector; and employment seekers by sex.**



THE MACRO-ECONOMIC IMPACT

Overall, despite its severity, the drought did not affect trade and industry nor did it have an impact at the macroeconomic level, leading to an estimated nominal decline of GDP of 0.08 percent in the 2012-2016 period, compared to the pre-drought baseline. It is important to note that the difficulties in data collection and the resulting scarcity of detailed information severely limit the analysis and the conclusions of the macroeconomic assessment. The hardest hit economic sector was agriculture, but given its limited size compared to the oil economy, the event had no relevant effects on inflation, trade balance, or government revenues. On the fiscal front, the main concern is that within a context of declining revenues (due to oil price drops) the budgetary resources for drought response, mitigation and prevention are very limited.

1.1 Pre-floods economic context

In Angola, a heavily oil-dependent economy, the drop in oil prices since mid-2014 has had a significant economic impact, including a severe devaluation of the kwanza, declining growth rates of the oil sector GDP (Gross Domestic Product), and a drastic reduction of the national budget given the still very high dependence on oil for revenue. Since 2015 the Angolan economy has been slowing down as seen in Fig. 29. GDP growth slowed to 3 percent in 2015 and is expected to be close to zero in 2016.

Fig. 29: **Comparative evolution of oil and non-oil GDP**

Source: National Development Plan 2013-2017

On the fiscal front, the oil price drops led to falling government revenues. Revenues showed a steep decline of 11 percentage points (p.p.) of GDP in 2015. Non-oil revenues showed a small increase, but are not compensating the reduction in oil revenues. The government has recently increased the consumption tax over several products – mainly on luxury goods, but has also introduced the same tax on fuels to help boost revenues in 2016.

The government also responded with spending cuts and recently revised its 2016 budget to reflect further deterioration of the macro environment. With growth prospects lower than initially expected (1.1 percent against 3.3 percent in the initial budget), an average crude oil price of $37.5/bbl during the first semester, a 23 percent depreciation of the kwanza and inflation above 30 percent, the government prepared a revised budget. The revision had a negative impact on social sector expenditure, which were reduced by about 8 percent.

Angola's exports are dominated by oil, with oil prices being the most important determinant in the overall value of the country´s exports. Angola's total exports earned USD59.2 billion in 2014, down from USD68.2 billion in 2013. Over the last 10 years oil exports accounted for a yearly average of 97 percent of Angola´s exports. In 2014 and 2015, the share of oil in total exports remained at around the same level. A direct effect from the drop in oil prices has been reduced oil exports accompanied by reduced foreign currency inflows (Angola is heavily dependent on oil exports to generate foreign currency). Increased oil exports in volume terms in 2015 failed to offset the lower oil prices.

Annual inflation reached 38.2 percent in August and keeps accelerating, reflecting the 69 percent depreciation of the kwanza against the dollar since September 2014, and loose monetary conditions. The main driver of inflation has been exchange rate devaluation (official and parallel), tax rates increases, scarcity of good due to restricted imports and reduced subsidies for fuel and public utilities.

1.2 Overall GDP impact

Despite the severity of the 2012-2014 droughts, the event had a limited impact on the Angola economy since agriculture, the most affected sector, is small compared to the oil economy: from 2003 to 2013, the share of agriculture in the total value added was on average 5.5%, while the share of the oil and gas industry sector was on average 44%.

The incremental impact of the droughts in the 2012-2016 period GDP is estimated at -0.08 percent (Table 13). In nominal terms, from 2012 to 2016 GDP is estimated to be lower by about AKZ 53.4 billion compared to the pre-droughts projections.

Table 13: **Impact on GDP (current prices, in million AKZ)**

Sector	VA Coef.	2012-2016 (AKZ Million)				Change (%)
		Loss	Impact on GDP	Expected GDP	Revised GDP	
Agriculture	0.73	70,700	51,459	6,815,644	6,764,185	-0.755
Water and Energy	0.54	900	482	125,253	124,771	-0.385
Other sectors	0.62	2,500	1,544	55,214,385.42	55,212,842	-0.003
Total		74,100	53,485	62,155,282	62,101,797	-0.086

Source: PDNA sector reports, INE - Departamento de Contas Nacionais e Coordenação Estatística, and WB staff estimates.

The highest impact on GDP comes from losses in agriculture, which dragged down GDP by AKZ51.4 billion between 2012-2014. The nominal losses in the agriculture sector represent a decline of 0.7% compared to the baseline Agriculture GDP projections. It is important to note, however, that following the decline in agriculture production in 2012 measures were taken to boost activity in the sector. Therefore, the overall cumulative impact from 2012 to 2016 reflects the mitigation efforts in place since the early stages of the event.

1.3 Fiscal impact

Since the Government relies mostly on oil revenues, the losses in the agriculture sector have not significantly impacted tax revenues and within a context of declining oil revenues, there are reports of limited transfers from the central level to provinces.

In Angola, tax revenues at provincial level go to the general treasury and the actual resources available to provinces depends on the transfers allocated by the general budget. In some provinces their contribution to the general treasury exceeds the transfers allocated. Local officials reported great uncertainty with respect to resource availability, and in some cases reported receiving less than the original allocations budgeted.

While the transfers to the three most affected provinces have increased since 2010, it must be noted that the rate of growth of central government transfers to the drought-affected provinces has been declining. In fact, since 2013 the national drought response, through its contingency drought plan has faced the challenge of limited budgetary resources.

Table 14: **Evolution of budget allocations to drought affected provinces.**

Millions of AKZ	2010	2011	2012	2013	2014
Transfers to six drought affected provinces	109,026	174,116	212,055	247,649	274,067
Transfers to three most affected provinces	58,719	81,584	100,566	124,867	136,870
Transfers to six drought affected provinces. As percent of total	3.4%	4.0%	4.7%	4.0%	4.0%
Transfers to three most affected provinces. As % of total	1.8%	1.9%	2.2%	2.0%	2.0%
Rate of growth (for the three most affected)		39%	23%	24%	10%
Rate of growth of transfers		60%	22%	17%	11%

Source: República de Angola, Ministério das finanças, Gabinete de Estudos e Relações Internacionais, Departamento de Estudos e Estatística.

More generally, in the agriculture sector public spending has been declining as well. The share of agriculture in the national budget in 2013 was US$702 million; in 2014, US$597 million; and in 2015, US$544 million. The decline mirrors the overall lower public expenditures associated with the country's oil crisis and illustrates that from a fiscal perspective, the main issue regarding the 2012-2016 drought is the lack of room to accommodate drought response, including longer term drought mitigation and prevention, within the budget.

1.4 Impacts on Inflation and External Sector

With respect to the external sector, the prolonged drought has had no major impact on the balance of trade, as seen in Table 15, since commercial exports were not affected, in spite of the increase in food distributions to the affected population and consequent increase of food imports.

Table 15. **External trade balance**

	2010	2011	2012	2013	2014
Total Exports	4,852,940	6,243,818	6,777,367	6,543,972	5,761,440
Agricultural exports	2,645	2,397	4,254	4,814	4,940
Oil sector	4,751,404	6,132,211	6,666,927	6,433,497	5,637,526
Total Imports	1,672,813	1,955,950	2,766,106	2,680,598	2,818,495
Agricultural imports	161,305	225,569	334,675	297,880	259,312
Food imports	94,614	141,270	216,493	188,614	173,886
Other	1,416,894	1,589,111	2,214,938	2,194,104	2,385,297
Total trade balance	3,180,127	4,287,868	4,011,261	3,863,374	2,942,945
Agricultural Balance	-158,660	-223,172	-330,421	-293,066	-254,372

Source: Angola, 40 anos de estatística, 1975-2015

Price variations caused by disruptions in agriculture production due to the drought were minor compared to the main determinants of price fluctuations in Angola in the 2012-2016 period. From 2012 to mid 2014, the CPI (Consumer Price Index) presented a declining trend. Since mid June 2014, inflation in Angola has increased steadily from the record low of 6.89 percent in June 2014, and almost doubled (14.3 percent) in 2015. Producer prices followed a similar pattern: from 6.05 percent in late 2014 to 11.3 percent in November 2015. Currently, the main driver of inflation has been exchange rate devaluation (official and parallel), tax increases, and reduced subsidies for fuel and public utilities

DROUGHT RESPONSE AND COORDINATION

Since 2012, the government and the international community have been providing humanitarian aid to support drought-affected populations, primarily in the southern provinces. In 2012, the United Nations Country Team (UNCT) launched a joint drought response in collaboration with the Government of Angolan through CERF support. The CERF was in response to the drought experienced during the agricultural calendar season in 2011-12, which was marked by rainfall deficit of more than 60 percent compared to normal years. Ministry of Agriculture (MINAGRI) completed a food security assessment in 11 provinces and the results indicated that agricultural output in general and cereals in particular fell by an average of 30 percent, and that an estimated 1.8 million people were affected especially in Bengo, Kwanza-Sul, Benguela, Huila, Namibe, Cunene, Moxico, Bie, Huambo and Zai. In 2012 the international community mobilized USD 6.5 million. Of this amount, the CERF rapid response mechanism mobilized $5.1 million for humanitarian projects to: a) provide emergency nutrition and lifesaving care to under-5 children with global acute malnutrition to reduce to less than 5 per cent case fatality rate of severely acute malnourished children treated in the Therapeutic Feeding Centers (SAM in-patients); b) alleviate 16,550 drought affected families in three provinces; and c) enable drought affected families to better overcome similar situation in the future. The projects were implemented in collaboration with MINAGRI, the Ministry of Health (MoH), MINSA, and Ministry of Social Welfare (MINARS).

In 2013 the international community significantly increased its contributions reaching a total figure of USD 13.4 million, which were mostly distributed in three key areas of support: nutrition (91.3%), food security (7.9%) and disaster risk reduction (0.7%).

The Angolan Government put in place a multi-sectoral response plan in 2013 which consisted of food and non-food distributions, the construction of boreholes and distribution of water through tankers, agricultural inputs, construction and rehabilitation of dams, and health and nutrition support. This response plan, with a budget of roughly US$234 million or 38 billion AKZ, targeted the most vulnerable in the drought-affected provinces of Benguela, Cuanza Sul, Huíla, Cunene, Namibe and Kuando Kubango. At the same time, the GoA established an Inter-ministerial Commission to coordinate all the sectoral humanitarian responses, led by the Minister of Planning and comprised of MINAGRI, MINARS, and other ministries.

The 2015-16 agricultural season was struck again by drought associated with El Niño, which affected much of southern Africa. In October 2015, the GoA set up an interagency commission to assess the situation and provide recommendations for response. In November 2015 a food and nutrition rapid assessment was undertaken by FAO along with the Provincial Directorates of Health (DPS) and of Agriculture (DPA) in the affected provinces of Cunene, Cuando Cubango, Huila and Namibe. Based on the assessments, the National Civil Protection Commission (CNPC) prepared the Presidential Aid programme to support the affected population.

In January 2016, a UN team visited the province of Cunene and assessed the dire situation, confirming the need for humanitarian aid to support the efforts of the GoA. The UN's emergency assistance addressed the needs of 585,000 vulnerable people with support in Health, Nutrition, Water, Sanitation and Hygiene (WASH), Food Security and Agriculture in the three target provinces of Cunene, Huila and Namibe.

Under the Regional Inter-agency Standing Committee (RIASCO) Angola developed an action plan, along with other drought-affected countries in Southern Africa, to provide assistance in the southern provinces of Benguela, Cuando Cubango, Cunene, Huila, Kwanza

Sul, and Namibe the most affected. The funding requirement for the response was US$69 million, of which US$8 million has been received.

To strengthen coordination, the UN established an Emergency Country Team with a humanitarian field officer based in Ondjiva, Cunene to coordinate efforts, create synergies and update the UN and the Government on ongoing responses.

Yet, the government recognized the need to develop a medium to long-term programme to enhance the resilience of drought-affected communities in those provinces and to break the cycle of recurrent drought, based on the results of the Post Disaster Needs Assessment (PDNA).

SUMMARY OF DAMAGE AND LOSSES

Table 16 below presents a summary of the damage and losses estimated for the provinces of Cunene, Huila and Namibe for each sector. Total damage for all sectors is estimated at just over US$297 million or AKZ 48.5 billions, while total losses at US$452 million or AKZ 74 billion. The losses overall are much higher than the damages since drought typically does not cause physical destruction as do other types of disasters.

Table 16: **total damage and losses in Cunene, Namibe and Huila**

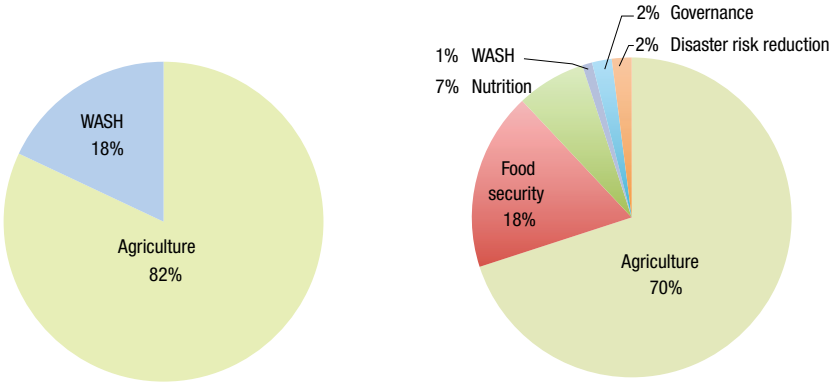
Sector	Damage USD millions	Losses USD Millions	Damage AKZ billions	Losses AKZ billions
Agriculture	244,7	316,9	40,0	52,0
Food security		82,0		13,3
Nutrition		32,8		5,4
WASH	52,5	5,3	8,5	0,9
Education				
The environment				
Disaster risk reduction		8,1		1,3
Governance		7,3		1,2
Total	**297,2**	**452,4**	**48,5**	**74,1**

As shown in Fig. 30 below, the agriculture sector is by far the most affected. Total damage in the sector is estimated at US$244.7 million ($40 billion AKZ) which represents about 82 percent of all damage, while sector losses are estimated at US$317 million (52 billion AKZ) which is equivalent to 70 percent of all losses.

For the water, sanitation and hygiene sector (WASH), total damage is estimated at US$52.5 million or 8.5 billion AKZ, while losses is US$5.3 million or AKZ 0.86 billion.

After agriculture, the second greatest losses were in food security with US$82 million or AKZ 13.3 billion, representing 18 percent of all losses. The nutrition sector also had significant losses valued at US$32.8 million or AKZ 5.4 billion.

Fig. 30: **distribution of damage and losses**



Recovery Needs and Budge

SECTOR	ACTIVITY	RECOVERY NEEDS					
AGRICULTURE		**Short term**	**Medium term**	**Long term**	**TOTAL USD (millions)**	**TOTAL AKZ (billion)**	**TOTAL AKZ**
Short term	Rehabilitation of crops production (Agric inputs), resistant varieties	34			**34**	**5,50**	5.531.173.414
	Increase crop diversification						
	Establish animal watering points						
	Regenerationof pasture						
	Livestock vaccination and veterinary care for affected animals						
Medium term	Promotion of Climate Smart Agriculture to promote resilience and adaptation		152		**152**	**24,70**	24.727.598.792
	Rehabilitation of community water infra-structure to support irrigation						
	Enhance mechanisms for multi-sector food and Nutrition Security information management and data analysis, including information and animal health surveillance system						
	Promote income diversification activities and agro-industry,						
	Communitarian governance and gender approach						
	Livestock infrastructure						
	Promotion of livestock diversification and restocking						
	Support studies for sustainable farming technologies and practices in drought-prone area						
Long term	Strategic grain reserve, infrastructures and management			3	**3**	**0,49**	488.044.713
	Support livestock value chain and agro-industry to strengthen sub-sectors						
	Governance (capacity building, technical support, coordination, and information management)						
Total Needs Agriculture		**34**	**152**	**3**	**189**	**30,70**	**30.746.816.919**

FOOD SECURITY							
Short term	Safety nets programs, cash vouchers, to the most vulnerable households;	10			**10**	**1,63**	1.626.815.710
	Communication campaigns						
	Governance (capacity building, technical support, coordination, and information management)						
Total Needs Food Security		**10**			**10**	**1,63**	**1.626.815.710**

NUTRITION							
Short term	Acquisition of nutritional supplements	35				**5,70**	5.693.854.985
	Revitalization and Creation of Special Nutrition Units and PTPA						
	Reactivation of municipal emergency teams						
	Strengthening Epidemiological Surveillance						
	Active search for diseases resulting from drought						
	Administration of Vitamin A to children under 5 years of age						
	Regular assurance in medical-medicine media						
	Periodic supervision of local level interventions						
	Training of Health Technicians in Integrated Malnutrition Management						
	Community Agents Training						
	Reproduction of material for data collection						
Medium term	Establishment of a Community Strategy		8			**1,30**	1.301.452.568
	Logistics System Improvement						
	Revitalization of the Sentinela de Vigilância Nutricional						
	Creation of Community Support Groups						
	Creation of Community kitchens						
	Review and standardization of data collection instruments						
Long term	Conducting Assessments to follow up on the Implementation of the Malnutrition Management Program / Studies to know the nutritional situation in the provinces affected by Drought			5		**0,81**	813.407.855
	Governance (capacity building, technical support, coordination, and information management)						
Total Needs Nutrition		**35**	**8**	**5**	**48**	**7,81**	**7.808.715.408**

WATER, SANITATION AND HYGIENE							
Short term	Provision of safe water for people and their animals to meet minimum requirements	52,5				**8,54**	8.540.782.478
	Promotion of community led total sanitation, CLTS, and prevention of water borne diseases.						
	Promotion of public and personal hygiene practices, to prevent the spread of disease						
	Strengthen synergies between provincial directorates to improve efficiency of national/provincial programs						
	Promote participatory processes to manage the rehabilitation of water points						
Medium term	Rehabilitation of wells / boreholes (water pumps, repairs, other parts)		30			**4,88**	4.880.447.130
	Constructon of boreholes						
	Water harvesting to improve access to water and sustainable water management						
Long term	Study of water sector, to identify sustainable alternatives in view of recurring drought and cimate change			14		**2,30**	2.277.541.994
	Governance (capacity building, technical support, coordination, and information management)						
Total Needs WASH		**52,5**	**30**	**14**	**97**	**15,78**	**15.780.112.387**

EDUCATION							
Short term	Reactivate and adapt school feeding program (Programa de Merenda Escolar (PME))	35				**5,69**	5.693.854.985
	Sensitization and awareness raising to encourage the return of students to schools						
	Provision of water and sanitation services for local schools to provide incentive for the return to schools						
Medium term	Adaptation of school calendar to the reality of local communities and transhumance		20			**3,25**	3.253.631.420
	Design curriculum program for students who form part of pastoral communities						
	Capacity building of professors and development of school material for mobile schoolsfor pastoral transhumance communities						
	Promote horituclture in schools for children						
	Governance (capacity building, technical support, coordination, and information management)						
Total Needs Education		**35**	**20**		**55**	**8,95**	**8.947.486.405**

THE ENVIRONMENT							
Short term	Promote pasture rotation and herd management, the livestock value chain	**15**				**2,44**	**2.440.223.565**
	Creation of ornamental nurseries to produce seedlings						
	Implement water-harvesting system in drought-prone areas (UNDER WASH)						
Medium term	Sub-program for the enhancement of the NTFP line: Promotion of NWFP production		**23**			**3,74**	**3.741.676.133**
	Establishment of forestry plantations for community protection and research						
	Soil erosion control through organic methods						
	Arrest land degradation, SLM techniques promotion and rotational pasture						
	Improve livestock Value chain (UNDER AGRIC)						
Long term	Map areas of erosion risk			**10**		**1,63**	**1.626.815.710**
	Fight against desertification in the costal region and Cunene						
	Climate monitoring and data management system						
	Study of climate change impact in southern region						
Total Needs Environment		**15**	**23**	**10**	**48**	**7,81**	**7.808.715.408**

SOCIAL IMPACT							
Short term	Reinstate school feeding program, ensure water-sanitation in schools to encourage return to schools & prevent drop outs	Sector					
	Water provision, to reduce the labor demands on women and children and to decrease school drop out rates						
Medium term	Strengthen existing programs to encourage child repatriation (reduce child migration)		Sector				
	Diversify livelihoods to reduce the risk and vulnerability to recurring droughts and better adapt to climate change						
	Livelihood and income-generating economic activities for women and outreach programs on gender						
DISASTER RISK REDUCTION							
Short term	Strengthen the capacity of Civil Protection to support the drought recovery program	12			**12**	**1,95**	1.952.178.852
	Strengthen drought early warning systems and food security monitoring in the region						
	Strengthen governance in DRR at local, provincial and natiional level (coordination, technical support)						
GOVERNANCE							
	Strengthen drought recovery institutional capacity for coordination, implementacion (technical expertise, personnel, equip,)	2	2	2	**6**	**0,98**	976.089.426
TOTAL		**195,5**	**235**	**34**	**464,5**	**75,60**	**75.565.589.730**

RECOVERY STRATEGY

RECOVERY NEEDS

Recovery needs were estimated on the basis of the PDNA results for disaster effects and disaster impacts and were determined for the following four components:

- Reconstruction physical assets;
- Resumption of production, service delivery and access to goods and services;
- Restoration of governance and decision making processes;
- Reduction of vulnerabilities and risks.

The short and medium-term recovery needs refer to measures required to address the current drought crisis while also rehabilitating crop and livestock production, water sources to improve water availability for people and livestock, support to nutrition centers for the treatment of malnutrition including supplies and trained personnel, support to reinstate school feeding programs to encourage the return to schools and arrest school drop-outs, alternative income-generation activities to as well as to reduce charcoal production, deforestation, and soil and land degradation, among other recovery measures.

The longer-term recovery needs include measures to reduce the risk associated to droughts and its possible impact in the southern region of Angola, for example through the better management of natural resources such as reforestation, the introduction of water harvesting techniques, community irrigation systems to support crop production, the introduction of farming technologies and practices that are more sustainable (e.g. drought-resistant crop varieties), alternative livelihood strategies and income-generating activities, among other measures to reduce risk and vulnerability and support adaptation, particularly in view of the likely increase in the frequency and severity of drought in the region due to climate change.

The proposed needs also take into consideration the issues of governance, particularly those measures required to strengthen the capacity of local authorities across all sectors to implement and manage the recovery programme, through additional expertise and human resources, equipment and information management systems to facilitate monitoring and inter-institutional coordination.

The identified needs include disaster risk reduction measures to build resilience and reduce the impact of future droughts in the southern region. The proposed DRR interventions are integrated within each of the sectors as part of the proposed sectoral long-term measures, and are reflected as such in the matrix below outlining the recovery needs and budget.

Table 17 below presents the proposed budget for recovery, totaling US$464.5 million or AKZ 75.6 billion. The greatest needs are in the agriculture and water sectors, which require US$189 million and US$97 million respectively. The recovery needs include measures required in the short-term (6 months to 1 year), medium-term (1 to 2 years) and long-term (2 to 4 years).

Table 17: **Recovery needs in Cunene, Namibe and Huila, by sector (USD and AKZ)**

Sector	short term USD millions	medium term USD millions	long term USD millions	Total USD millions	Total AKZ billions
Agriculture	34	152	3	**189**	**30,75**
Food security	10			**10**	**1,63**
Nutrition	35	8	5	**48**	**7,81**
WASH	52,5	30	14	**97**	**15,7**
Education	35	20		**55**	**9**
The environment	15	23	10	**48**	**7,81**
Disaster risk reduction	12			**12**	**1,95**
Governance	2	2	2	**6**	**0,98**
Total	**195,5**	**235**	**34**	**464,5**	**75,63**

Note: short-term (6 months to 1 year), medium-term (1 to 2 years) and long-term (2 to 4 years).

VISION AND INTENDED SECTORAL RESULTS

The recovery strategy focuses in assisting 1,139,064 people affected by drought in the provinces of Cunene, Huila and Namibe by implementing the initiatives identified and budgeted in the recovery needs assessment, for a total amount of US$464.5 million or 75.6 billion AKZ as summarized in table 16 above.

Four are the key lines of intervention proposed for the recovery strategy:

1. Address the most immediate needs of the most affected populations.

The planning process should consider the most immediate recovery needs of the drought-affected population and outline as well the most appropriate measures that can ensure a sustainable recovery process over the long-term in view of climate change and future drought risk. Implementation arrangements should be identified, as well as coordination mechanisms, technical expertise required, capacity building measures, and synergies between the recovery strategy and provincial development plans across all sectors.

The short to medium-term recovery strategies proposed focus on such measures as support to nutrition centers for the treatment of malnutrition including supplies and trained personnel, the provision of agricultural inputs to restore crop and livestock production, equipment and other supplies to repair and/or build boreholes and improve water availability for people and livestock, support to reinstate school feeding programs to encourage the return to schools and arrest school drop-outs, provision of alternative livelihood strategies to generate income and diversify livelihood sources, reduce charcoal production and therefore deforestation, among other measures. The longer-term recovery strategies focus on building resilience, as outlined below.

2. Align the drought recovery strategy with the Angola's National and Provincial Development Plans 2013-2017.

The drought recovery strategy and plan should also be aligned with Angola's National Development Plan (NDP) for 2013-2017. The NDP's driving focus is "Stability, Growth and Jobs", to promote the growth of the Angolan economy based on the diversification of the national economic structure. The drought recovery can build on and support the NDP's strategy in priority clusters: Food and Agro-Industry, Energy and Water, Housing and Transport and Logistics.

Of particular relevance is the agriculture development plan, which aims to promote the integrated and sustainable development of the agricultural sector to ensure food security and domestic food supply. Also relevant will be the government's plan for rural development which promotes the socio-economic development of rural and peasant communities and the eradication of poverty.

Figure 31 below is a summary of the national development plans for the provinces of Cunene, Namibe and Huila, which can serve as a reference for developing the Disaster Recovery Framework to ensure synergies and complementarities, especially considering the common ground with some of the proposed recovery strategies such as livelihood diversification and sustainable agricultural development.

Cunene: The province will pursue its development by:

- Promoting rural development and livestock, particularly: rain fed agriculture, namely, cereals, irrigated crops, particularly from the use of hydrographic network of Cuvelai River (based on a study to be carried out) and use of the right bank of the Kuvango river; the existing livestock, with improved health study of the livestock, technology and low cost agricultural instruments, as well as the introduction of alternatives fuels that support the combat against deforestation;
- Studying the possibility of creating a Special Economic Zone in the border region;
- Promoting sedentary lifestyle / agglomeration of populations and / or find suitable alternatives to ensure essential services (education / health);
- Promoting more market-oriented production and the development of meat transformation industries;
- Creating a specialized hub in the agro-industrial value chain in Xangongo;
- Developing urban centres to rebalance cross-border relations;
- Exploring the potential of border warehouses of Ondjiva for the development of commercial, logistical and industrial activities;
- Developing a quality touristic niche that is environmentally and culturally friendly;
- Promoting greater integration with the rest of the country through the rehabilitation and construction of intra and inter provincial road and rail links;
- Promoting responsible exploitation and management of natural resources.

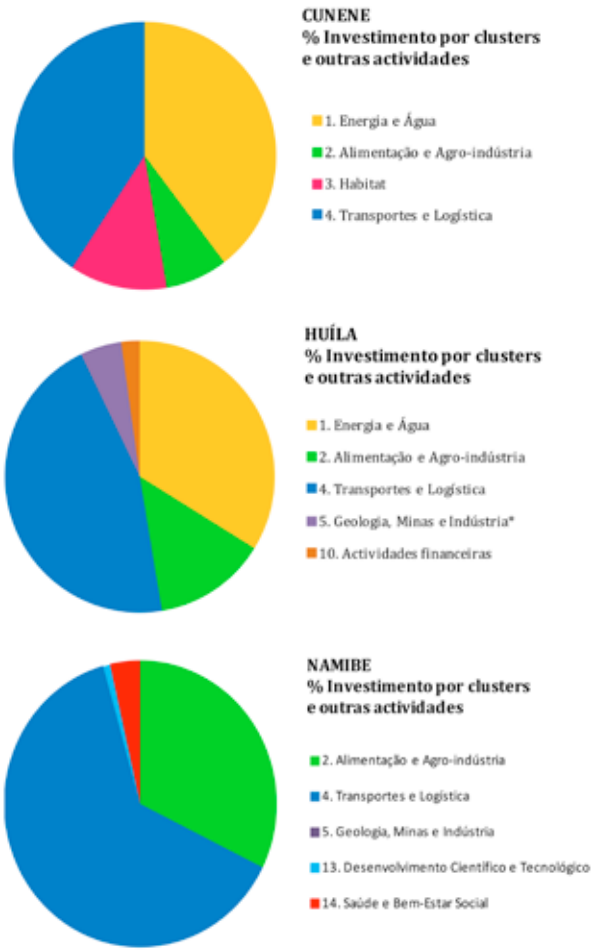
Huila: The province will pursue the following path:

- In terms of specialization of production: position itself as an agricultural and livestock surplus producing province (particularly cereals), and recognize the value of irrigation and traditional agriculture; develop a processing industrial base for agricultural products and a supply base for markets in the southern provinces, particularly to supply farming equipment and instruments, based on an industrial hub to be developed in Lubango, defined as a municipal level industrial zone network;
- Develop a logistical platform, supported by a multi-modal terminal in Lubango, exploring, particularly, the rail links to the Namibe Harbor and a storage and commercial warehouses network;
- Develop touristic niches and high level outsourcing services;
- Develop a Science and Technology Hub linked to the Industrial Hub.

Namibe: The province will pursue its development by:

- In terms of specialization of production: developing the functions of the Namibe Harbor towards Southern Angola and Northern Namibia; a strong fishing and processing industry (Tombwa); the marble and plaster industry; agricultural crops of Mediterranean and subtropical characteristics; and by recognizing the value of livestock;
- Developing an Industrial Development Hub, including sectors such as sea product processing, ornamental rocks and steel products;
- Exploring the enormous touristic potentials;
- Increasing the energy capacity and the water volume of the province;
- Developing a program to combat desertification.

Fig. 31: **government development plan for Cunene, Huila and Namibe**



Summary of Provincial Development Plans

3. Link the agendas of disaster risk reduction and climate change and adaptation.

The long-term recovery strategy proposed includes disaster risk reduction measures to build resilience and reduce the impact of future droughts in the southern region. The proposed DRR interventions are integrated within each of the sectors as part of the proposed sectoral long-term measures, and is reflected as such in the matrix below outlining the recovery needs and budget.

Examples of risk reduction strategies proposed include measures that promote improved management of natural resources such as reforestation, the introduction of water harvesting techniques, community irrigation systems to support crop production, the introduction of farming technologies and practices that are more sustainable (e.g. drought-resistant crop varieties), alternative livelihood strategies and income-generating activities, among other measures to reduce risk and vulnerability, particularly in view of the likely increase in the frequency and severity of drought in the region due to climate change.

A separate budget line in the amount of US$ 12 million is also included in the recovery strategy for disaster risk reduction issues, to support actions recommended in the section on DRR, such as strengthening the technical and logistic capacity of Civil Protection.

The long-term recovery strategy should build on Angola's Strategic Plan for Prevention and Disaster Risk Reduction (PNPRRD) and the National Plan for Preparedness, Contingency, Response, and Recovery (PNPCR) which guide the National Commission of Civil Protection (CNPC) in mainstreaming DRR into sectors and in strengthening the government's capacity for contingency response and disaster recovery in line with the Sendai Framework for Disaster Risk Reduction (DRR) 2015-2030.

Similarly, drought recovery should build on Angola's National Adaptation Plan of Action (NAPA) which aims to reduce the country's vulnerability to climate change and to create adaptation conditions in accordance with the urgent measures and sectoral priorities identified

4. Improve governance and information management

The recovery programme proposed takes into consideration governance, particularly measures to strengthen the capacity of local authorities across all sectors to implement and manage the recovery programme, through additional expertise and human resources, equipment and other measures to strengthen management and coordination. This includes added support to provincial and municipal authorities to facilitate a decentralized management and implementation process.

Given the challenges faced in relation to data collection, processing and management, the drought recovery strategy integrates measures under governance to strengthen the capacity of line ministries and local authorities with the necessary information management systems, including measures to facilitate monitoring.

The budget allocation for governance also considers actions to ensure strong coordination in the recovery process. The recovery process requires a multi-sectorial and inter-institutional approach given the multiple linkages among the sectors, the many national and local institutions and international actors, which require appropriate processes and mechanisms to facilitate collaboration.

IMPLEMENTATION ARRANGEMENTS

Recovery is multi sectoral in nature. It includes reconstruction of physical assets, restoration of livelihoods, and re-establishment of social and community services. This work requires the collective efforts of all governments' ministries, private sector actors, the civil society and national and international organizations.

While it is recognized that recovery should be implemented under the strong leadership of the national government, other partners can bring technical skills and experiences that will improve the quality of recovery. The GoA should consider setting up appropriate coordination mechanisms to bring together the range of technical expertise required for recovery to provide sustained technical assistance to families for the long duration of the recovery process.

The recovery strategy should be inclusive and participative, integrating national and local authorities, the affected communities, community organizations, women's groups, traditional authorities and other relevant local actors.

DISASTER RECOVERY FRAMEWORK

The PDNA and the proposed recovery strategy should be used as a reference to guide the formulation of a Disaster Recovery Framework (DRF) for the three most affected provinces, Cunene, Huila and Namibe.

Prepared under the leadership of the GoA, in consultation with key stakeholders, DRF would provide a systematic, structured and prioritized framework for implementing recovery and reconstruction. DRF is expected to be a common framework meant to serve all of government, as well as national and international partners and other recovery stakeholders, including the affected population. The DRF would support the GoA to approach in an integrated manner the policy decisions, institutional arrangements, financing and financial management strategies, as well as implementation and monitoring systems to plan and manage drought recovery.

A detailed recovery planning exercise should take place as an immediate follow-up to the PDNA, as an inclusive process, with the participation of the national and local government authorities, including sector line ministries, civil society and community-level organizations. The PDNA partners, EU, UN and WB remain committed to supporting the GoA to undertake this planning exercise that could include other relevant/interested partners.

THE PDNA METHODOLOGY

The PDNA follows a methodology jointly developed by the European Union, the World Bank and the UNDG that incorporates a collection of analytical methods, tools and techniques developed for post-disaster assessments and recovery planning, ensuring sector to sector comparability in the definition of the following elements:

1. Pre disaster context and baseline identification

2. The assessment of disaster effects in four dimensions:

    - Damage to infrastructure and physical assets
    - Disruption of access to goods and services
    - Governance and decision making processes
    - Increased risks and vulnerabilities

3. Estimation of the economic value of the disaster effects:

    - Damage refers to the total or partial destruction of physical assets. It occurs during the natural event causing the disaster. Damage is measured in physical units, and its monetary value is expressed in terms of replacement costs;

- Losses refer to changes in flows of production of goods and services that arise from the disaster. They occur after the natural event, over a different timeframe. Losses are expressed in current monetary values;

4. The assessment of disaster impacts in two main aspects:

   - Economic impact at macro and micro levels
   - Human/Social Impact

5. The Recovery Strategy, determining sector recovery needs.

The following sectors and cross-cutting issues were addressed by the PDNA: agriculture, food security, nutrition, water, sanitation and hygiene, education, the environment, social impact, industry and trade, disaster risk reduction, and the macro-economic impact.

The sector teams conducted the assessment through: 1) the collection of pre-disaster baseline data to compare with post-disaster conditions; 2) the evaluation of disaster effects and impacts in each sector to determine the overall recovery needs; and 3) the prioritization of these recovery needs.

Most of the sector teams conducted field visits to the provinces of Cunene, Huila and Namibe to assess conditions in the areas affected by the drought through participant observation techniques, focus group discussions, and key informant interviews with affected households and local authorities.

LIMITATIONS

One of the major challenges in conducting the PDNA was the lack of statistics, especially the most recent data, and the inconsistencies in the data received from different sources. This limited the proper analysis of several sectors and caused delays. The assessment of the agriculture-livestock and fisheries sector was particularly affected by the inconsistency and lack of data, for example on crop and livestock production, which consumed considerable time by the assessment team to address, especially in relation to the assessment of the three provinces prioritized by the PDNA. To cover the gaps, much effort was made by the team to find alternative data, secondary sources of information or alternative methods to facilitate the analysis of damage and losses.

Another challenge was the delay in receiving the necessary information to conduct the analysis during the mission, as well as to prepare the final PDNA report. Some of the necessary data and the sector chapters were significantly delayed. In some cases, two or three versions of the sector chapters were sent with updated or different data, requiring an additional round of translation, revision and editing.

Finally, to complete the PDNA report it was necessary to do additional and unplanned research, analysis and development of content to cover some of the gaps and ensure that the final PDNA included as many sectors as possible. Some sector chapters were received

in Portuguese and others in English, which required in-situ translation to prepare the final report without the support of translation services.

Nonetheless, it has been possible to cover many of the gaps in spite of the limitations. It is worth highlighting that both government authorities and the assessment team that participated in the PDNA made significant efforts to overcome all the challenges to produce the full PDNA.

To support the GoA to strengthen its information management systems, the recovery strategy integrates measures to address the limitations with data and statistics faced by local authorities as well as to facilitate monitoring of the recovery process. It also considers resources to strengthen governance in order to ensure the necessary capacity to successfully implement the recovery programme, as explained further in the section on "Needs Analysis and Recovery".