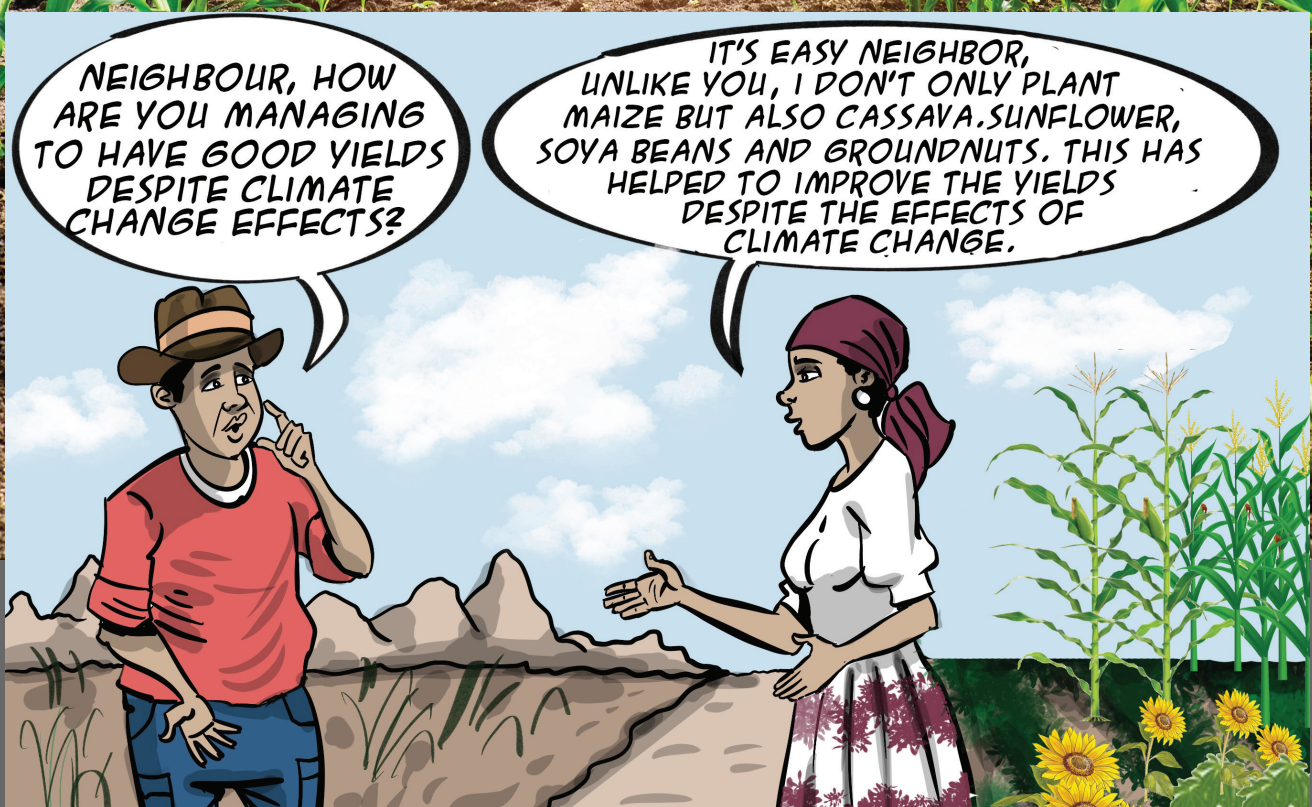




REPUBLIC OF ZAMBIA
OFFICE OF THE AUDITOR GENERAL

**SIMPLIFIED PERFORMANCE AUDIT REPORT OF THE
AUDITOR GENERAL ON GOVERNMENT MEASURES TO
ADDRESS THE IMPACT OF CLIMATE CHANGE ON FOOD
SECURITY IN ZAMBIA: A FOCUS ON MAIN CROPS**





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FOREWORD



It gives me great pleasure to issue the first simplified Performance Audit Report of the Auditor General on Government Measures to address the impact of climate change on food security in Zambia with a focus on main crops. This report is intended to inform our stakeholders on the effectiveness of measures Government has put in place to address the impact of climate change on food security in the country. The overall objective of the audit was to assess whether the measures developed to adapt to climate change were effective in ensuring that Zambia was food secure.

My mandate is not only to audit public resources, but also to ensure that there is value for money in Government programmes and activities. Performance Audit which is different from the traditional financial audits focuses mainly on economy, efficiency and effectiveness of the Government Programmes. In this regard, it is important that stakeholders understand these reports as they reveal the impact of such programmes on the lives of the citizens.

This simplified report will go a long way in helping both decision makers and the ordinary citizens to make informed decisions on climate change and its impact on food security.

My Office remains committed to engaging with its stakeholders and requests you to evaluate this simplified report by filling in an evaluation form that is at the end of the report and also on the website www.ago.go.zm. The feedback is of great importance in our quest to serve you better.

A handwritten signature in black ink, which appears to read "Dick Chellah Sichembe". The signature is fluid and cursive.

Dr. Dick Chellah Sichembe
AUDITOR GENERAL



CONTENTS

| | |
|----------------------------------|----|
| Acronyms | 3 |
| Mandate | 4 |
| Role of the Auditor General | 5 |
| Scope of Audit | 7 |
| Constraint/Limitation | 8 |
| Highlights of the Audit Findings | 9 |
| Recommendations | 18 |
| How Citizens can use the Report | 19 |
| Glossary of Terms | 20 |
| Appendices | 21 |
| Evaluation Form | 23 |



ACRONYMS

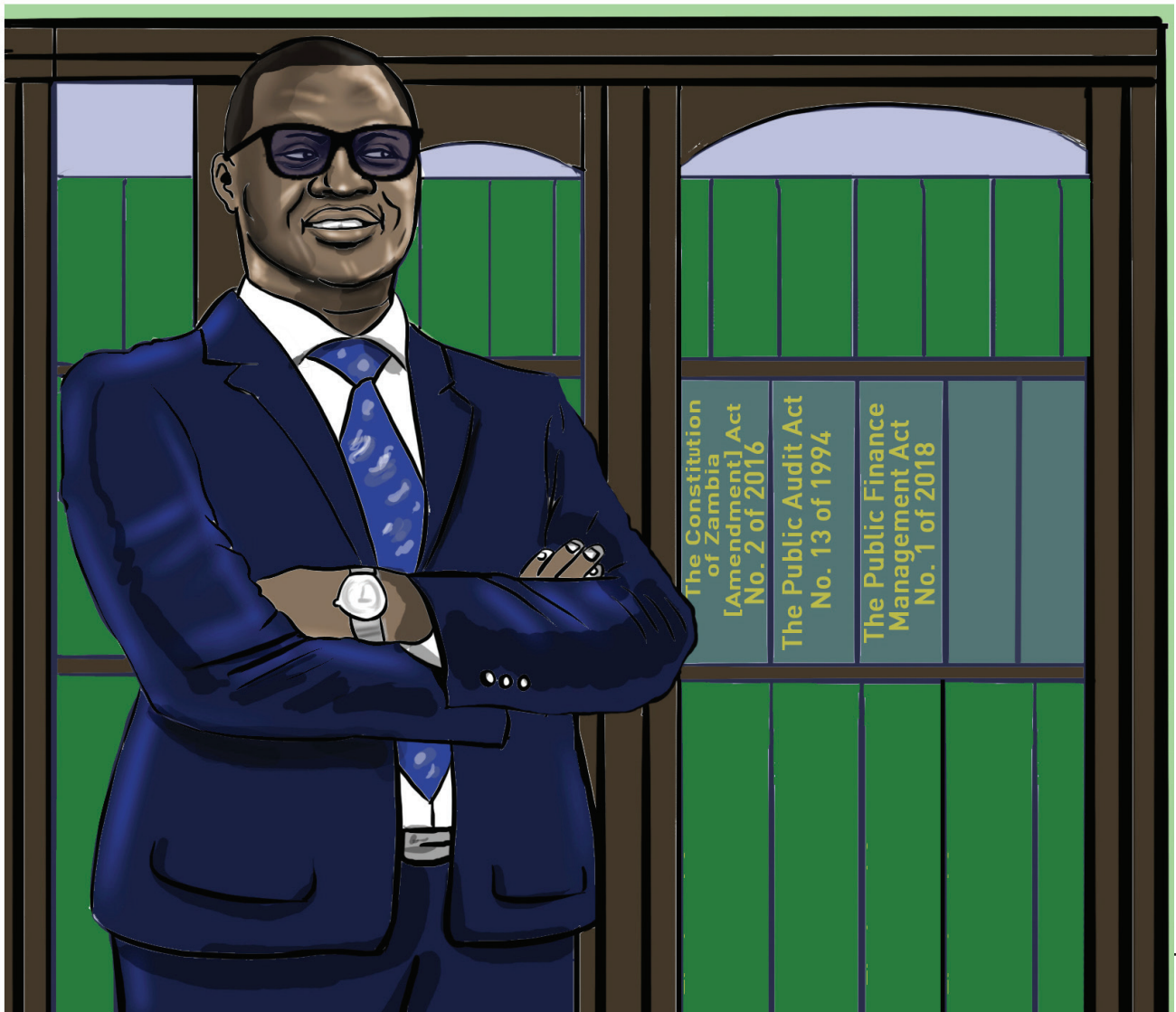
| | |
|-------------|---|
| AERs | Agro-Ecological Regions |
| AFROSAI-E | African Organization of Supreme Audit Institution – English Speaking |
| CA | Conservation Agriculture |
| CFU | Conservation Farming Unit |
| CSAZ | Climate Smart Agriculture Zambia |
| DACO | District Agriculture Coordinating Officer |
| DAO | District Administrative Officer |
| EWS | Early Warning System |
| FAO | Food and Agriculture Organisation |
| FISP | Farmer Input Support Programme |
| GDP | Gross Domestic Product |
| GRZ | Government of the Republic of Zambia |
| IAPRI | Indaba Agricultural Policy Research Institute |
| INTOSAI-P12 | International Organisation of Supreme Audit Institutions - Principle 12 |
| IPCC | Intergovernmental Panel on Climate Change |
| ISSAI | International Standards for Supreme Audit Institutions |
| MDGs | Millennium Development Goals |
| MoA | Ministry of Agriculture |
| NCCRS | National Climate Change Response Strategy |
| NAESS | National Agricultural Extension and Advisory Services Strategy |
| NAIP | National Agricultural Investment Plan |
| NAPA | National Adaptation Programme of Action on Climate Change |
| NPCC | National Policy on Climate Change |
| OAGZ | Office of the Auditor General Zambia |
| PACO | Provincial Agriculture Coordinating Officer |
| PPCR | Pilot Programme on Climate Resilience |
| SAI | Supreme Audit Institution |
| SDGs | Sustainable Development Goals |
| SNAP | Second National Agriculture Policy |
| 7NDP | Seventh National Development Plan |
| ZMD | Zambia Meteorological Department |
| ZSA | Zambia Statistics Agency |



MANDATE

01

In accordance with the provisions of Article 250 of the Constitution of Zambia (Amendment) Act No.2 of 2016, Public Audit Act No.8 of 1980 and Public Finance Management Act No.1 of 2018, the Office of the Auditor General (OAG) is mandated to carry out performance audits in Ministries, Provinces and Agencies and to report the results to the President and Parliament for debate. With this mandate, the OAG undertook the performance /value for money audit for purposes of establishing the economy, efficiency and effectiveness of government programmes and operations.





ROLE OF THE AUDITOR GENERAL

02

The role of the Auditor General is to provide assurance that public resources are being used for the intended purpose and that there is value for money.



03 Value and benefits of the OAG – INTOSAI-P12

...Making a difference to the Lives of the Citizens

According to the INTOSAI - P 12, SAIs are expected to make a difference in three (3) ways:

- Strengthening the accountability, transparency and Integrity of government and public sector entities.
- Demonstrating ongoing relevance to citizens, Parliament and other stakeholders.
- Being a model organization through leading by example.



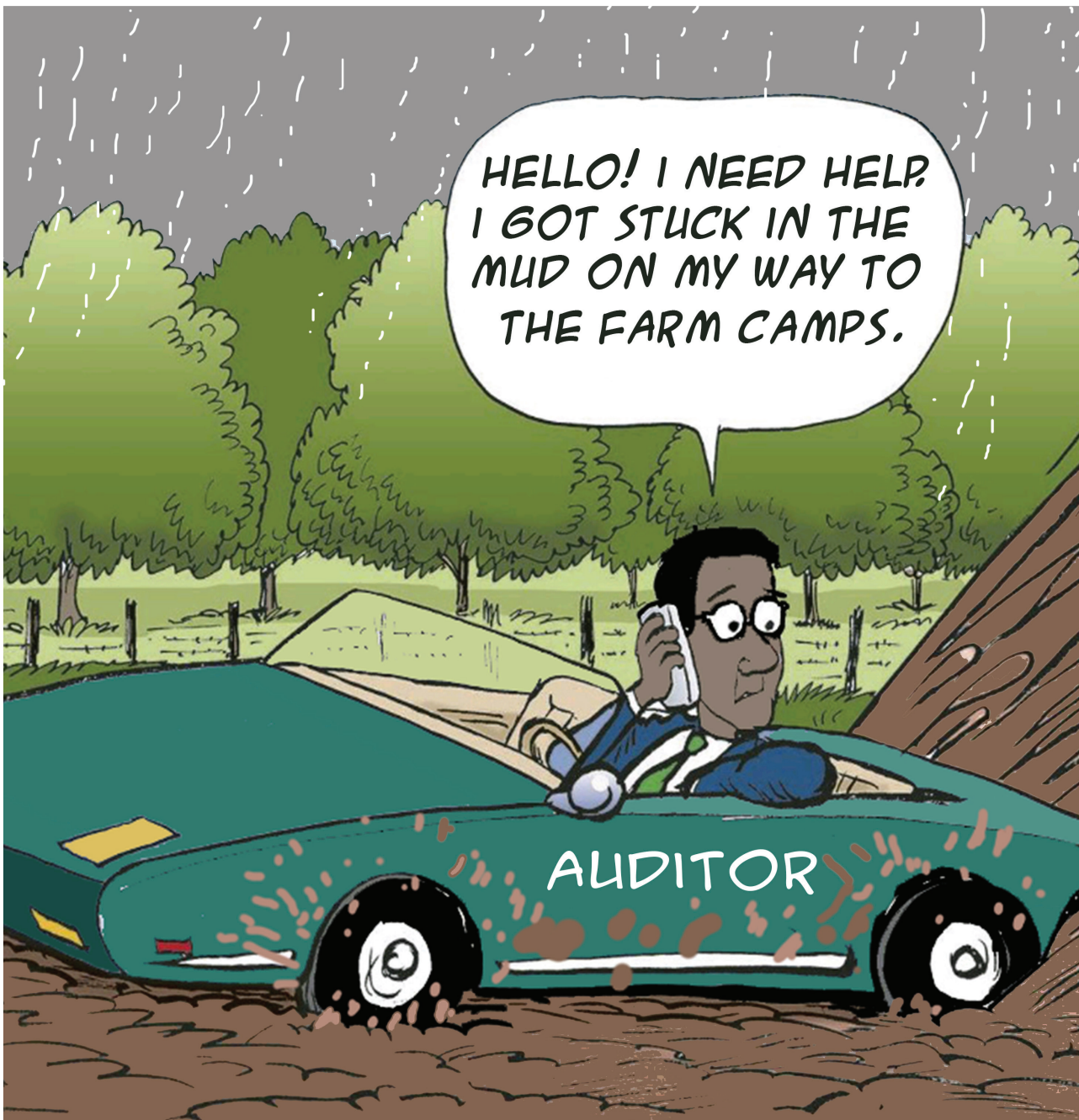
04 SCOPE OF AUDIT

The audit client was the Ministry of Agriculture (MoA). The audit examined whether the measures put in place by the Ministry were effective in ensuring that the country is food secure in terms of crops despite the challenges presented by climate change conditions. **It focused on main crops such as maize, groundnuts, mixed beans, sorghum and rice.** The audit also focused on **Zambia Meteorological Department (ZMD), a stakeholder with a role of providing early warning information to the agricultural sector.** The audit covered the period January 2016 to December 2020.



05 CONSTRAINT/ LIMITATION OF AUDIT

The audit faced some challenges such as inadequate funding which resulted in a **reduced sample size, bad roads** that made it difficult to get to the individual farmers and the **absence of farmer registers in the camps** made the **selection of farmers difficult**.



06 HIGHLIGHTS OF THE AUDIT FINDINGS

1. Mainstreaming of Climate Change in Plans

During the period under review, **the MoA had mainstreamed climate change in its plans. It was however, observed that the plans were partially implemented.** This shows a low prioritization of activities related to mainstreaming by MoA.

The effects of climate change on food security are vast. **Climate change is a threat to food security as it has reduced crop yield over the years due to dry spells caused by rainfall variability, flash floods and seasonal pest invasions on crops.** This has gravely affected farmers' yields and incomes.

There is need for more farmers to be sensitized on climate change, its effects and risks. They should also be sensitized on the mitigation measures such as smart agricultural methods. **Furthermore, national institutional capacity needs to be built to supplement these efforts.**

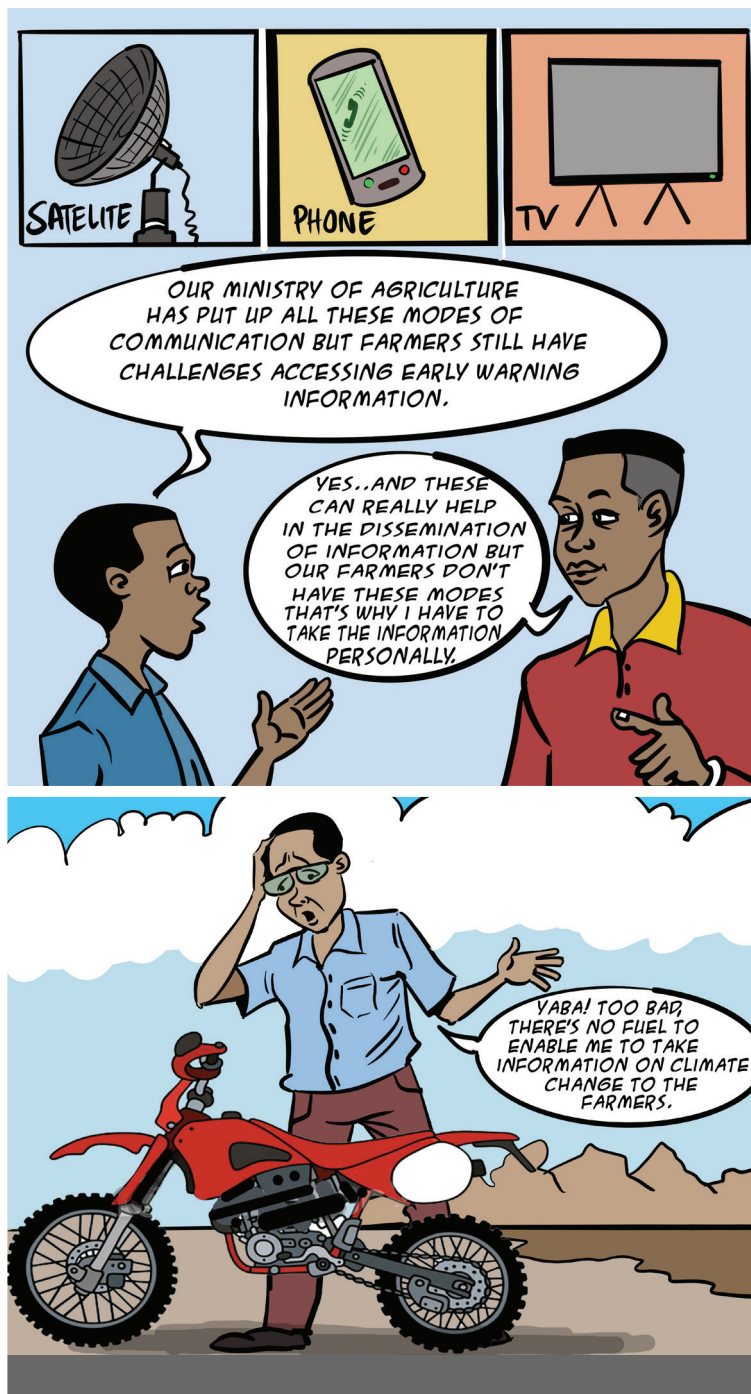




2. Early Warning Systems (EWS)

During the period under review, the early warning system did not provide farmers with information for them to prepare adequately thus affecting their contribution to food security. Despite the strides made, **there is need to invest more into EWS construction (including digitization of the apparatus) as well as to increase its capacity to deliver timely information** and curb vandalism which has been rampant due to inadequate security around these installations. Furthermore, **information dissemination needs to be addressed and improved to give farmers access to any relevant information via the various social media platforms when available.**

Failure to reach farmers on time with early warning information affected the ability of the Ministry and farmers to plan and avert possible crop losses.



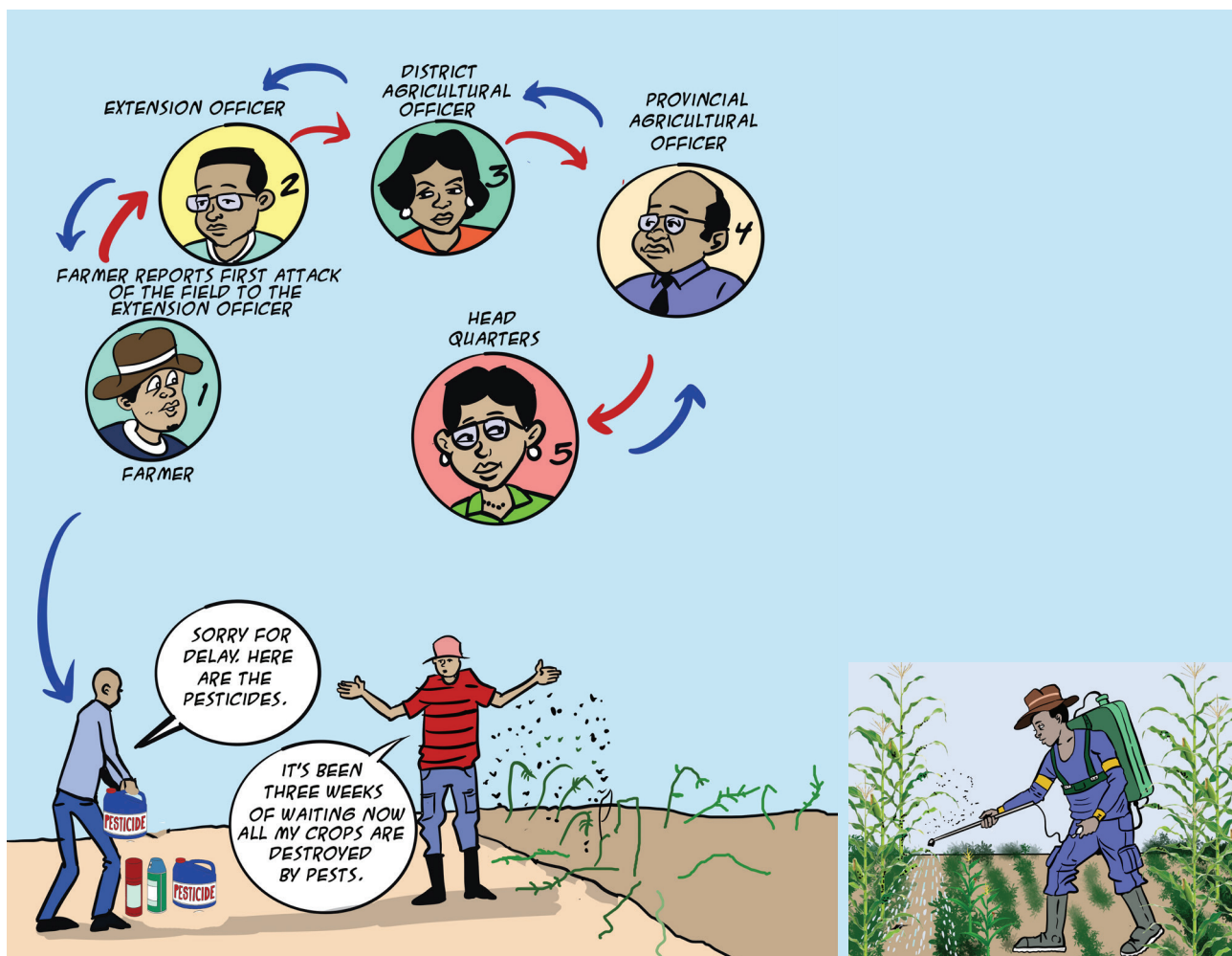
3. Pest Management System

Pest outbreaks are on the rise due to the rising temperatures brought about by global warming. The MoA did not provide pesticides on time to the farmers despite having received reports of pest invasion. Pest outbreaks were reported in six provinces and in all cases these outbreaks resulted in varying percentages of crop loss.

Interviews with the MoA showed that there is no integrated pest management system operated by the Ministry. Although there is an early warning unit at the Ministry, there is no effective early warning/ forecasting system for pests as their primary focus is on food security forecasts. **Furthermore, it was observed that the Ministry did not respond timely to reports of pest invasions as evidenced by the late receipt of pesticides.**

Despite the introduction of the e-voucher system by the Government under FISP which enabled farmers to redeem farming implements as well as pesticides, farmers have been reluctant to do so. **The over emphasis by Government on the provision of free pesticides to farmers has also resulted in the reluctance by farmers to procure their own pesticides or indeed take preventative measures to minimise the impact of pests on their crop.**

Figure 1.0: Field invaded by pests-Mongu (cabbage) and Chongwe (maize and Okra)



4. Conservation Agriculture (CA) as an Adaptation Technique

Conservation Agriculture was mainly driven by non state actors who had discrepancies and provided inconsistent information on the implementation of CA techniques. In addition, CA was given less importance by the MoA. Conservation Agriculture is a farming system that promotes minimum soil disturbance, maintenance of permanent of soil cover, and diversification of plant species (Food and Agriculture Organisation, 2017s).

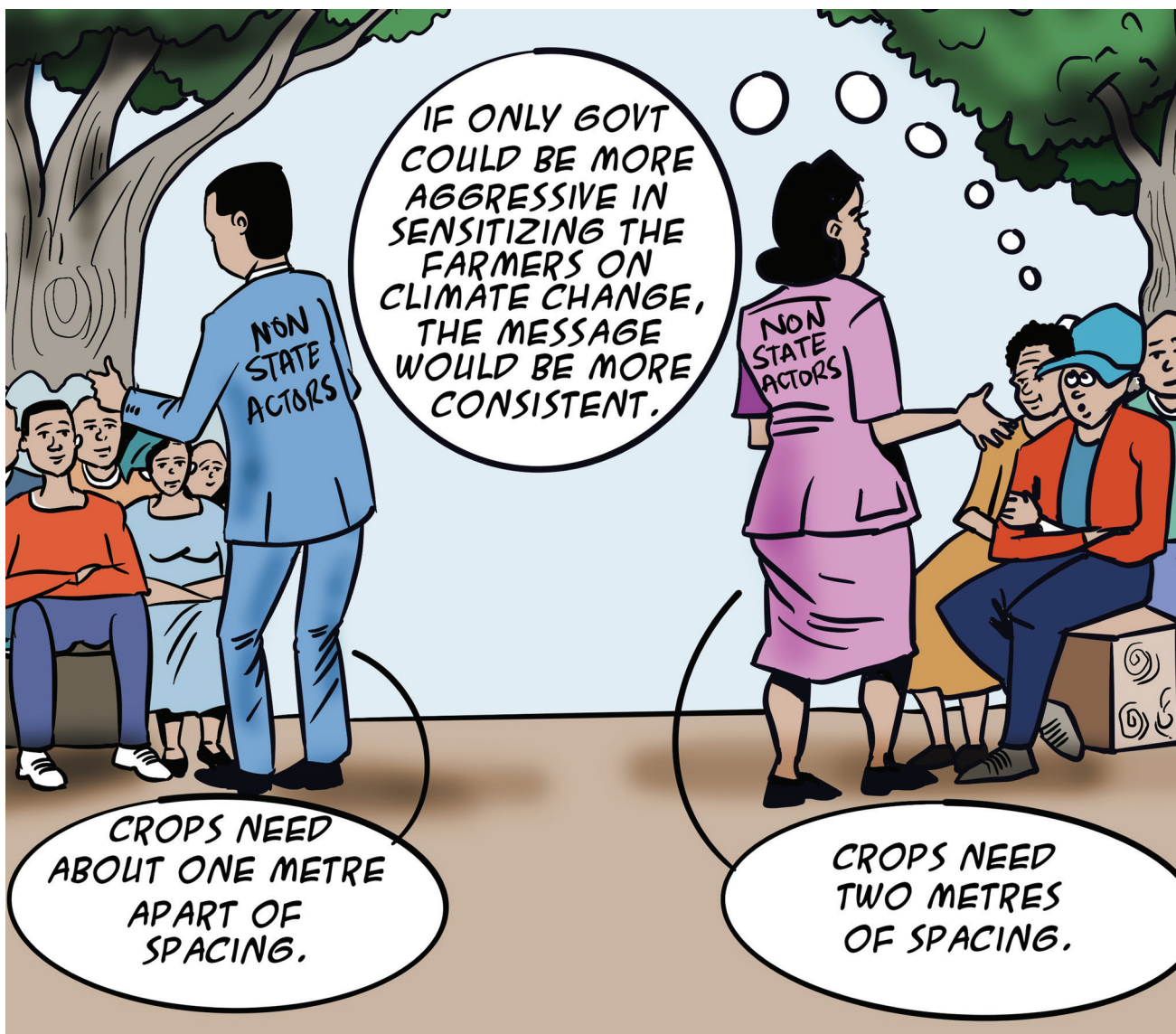


Table 1: ZARI Funds for Research 2016-2020

Below shows the percentage of funding of extension services against the Ministry budget for the period under review.

| | 2016 | 2017 | 2018 | 2019 | 2020 |
|--|-------|-------|-------|-------|-------|
| MoA Budget | 2,382 | 5,435 | 4,701 | 4,213 | 3,484 |
| Extension Services Funding (Under which CA falls) | 38 | 21 | 26.5 | 30 | 9.8 |
| % of budget | 0.016 | 0.04 | 0.056 | 0.071 | 0.028 |

Source - MoA Statistics -2020



Figure 1: Components of Conservation Agriculture

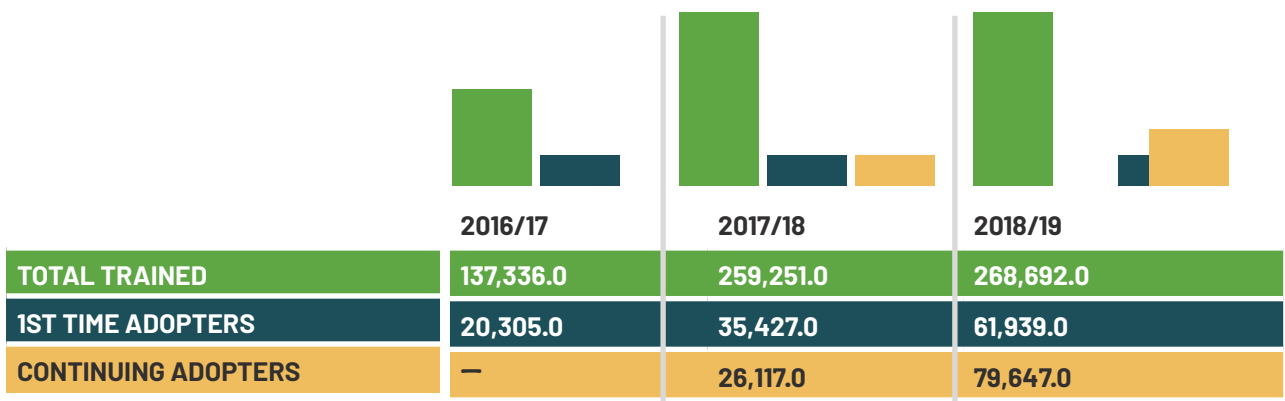
Research has shown that despite the numerous benefits that CA has, the adoption of the practice is still low in the country with most people using conventional farming methods.



Source: IAPRI: Zambia Agriculture Status Report 2016

Figure 2: Adoption Trends – CFU/CSAZ Experiences

below shows adoption trends by farmers under the mentor-ship of CFU.

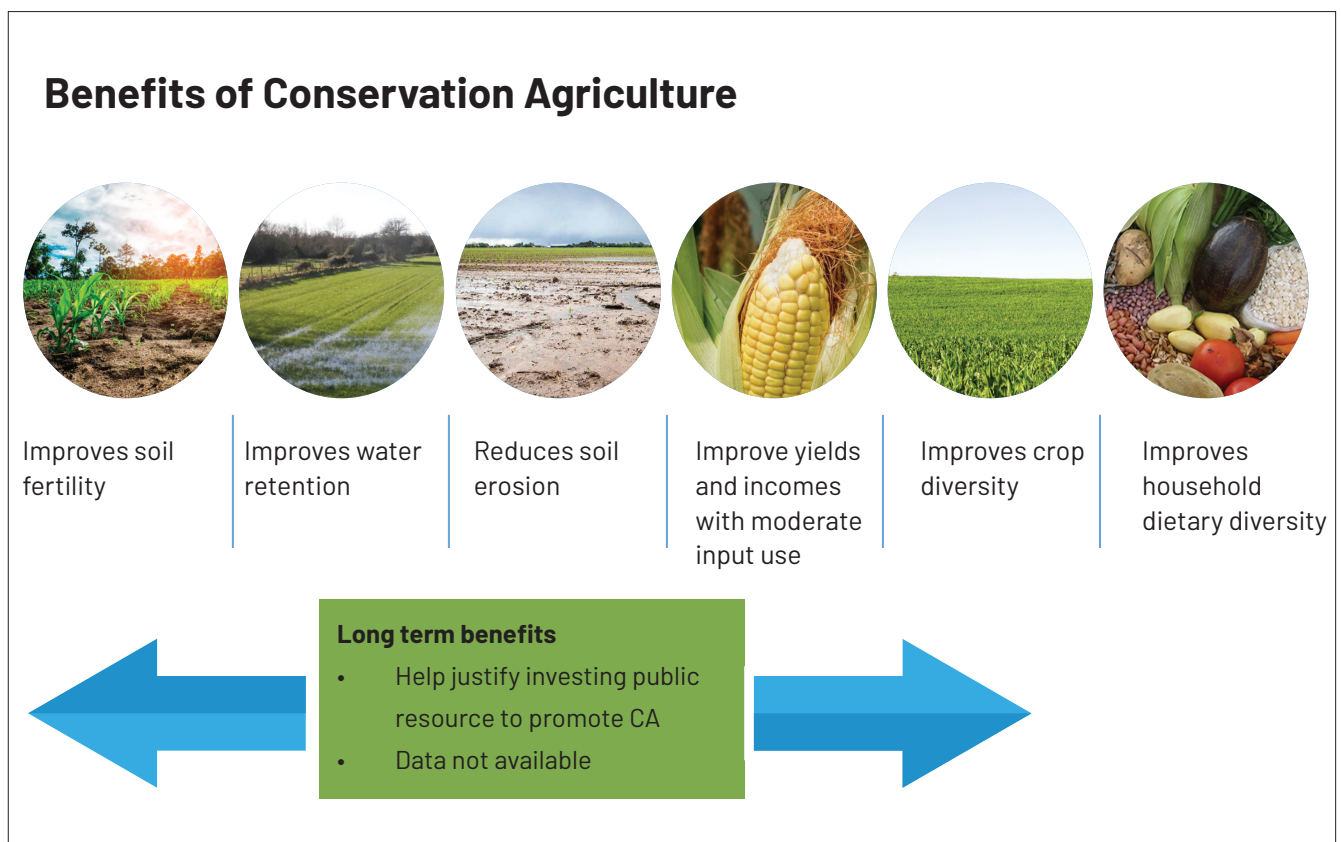


Source: CFU: Conservation Agriculture Adoption in Zambia



Increased resource allocation to CA has had inherent benefits to practicing farmers and the nation at large especially in low rainfall prone areas. However, annual plans showed that Conservation Agriculture and its activities were not prioritised. As a result, different non-state actors have disseminated varying messages. As a result, farmers have tended to adopt practices promoted by non-state actors that had monetary or other resource advantages.

Figure 3: Benefits of Conservation Agriculture



Source: IAPRI- Zambia Agriculture Status Report 2016



5. Crop Diversification

The Ministry of Agriculture (MoA) did not ensure that farmers are engaged in crop diversification, as a result, farmers were mono cropping hence affecting farm households' income, food and nutrition security.

Maize still dominated agricultural production as it was grown in much larger quantities than the next most grown crop - groundnuts. **Zambia had exhibited one of the lowest levels of crop diversification in Africa** with about 48 percent of smallholder farmers cultivating three or more crops and while 14 percent growing maize as a mono crop (Maggio et al. 2018).

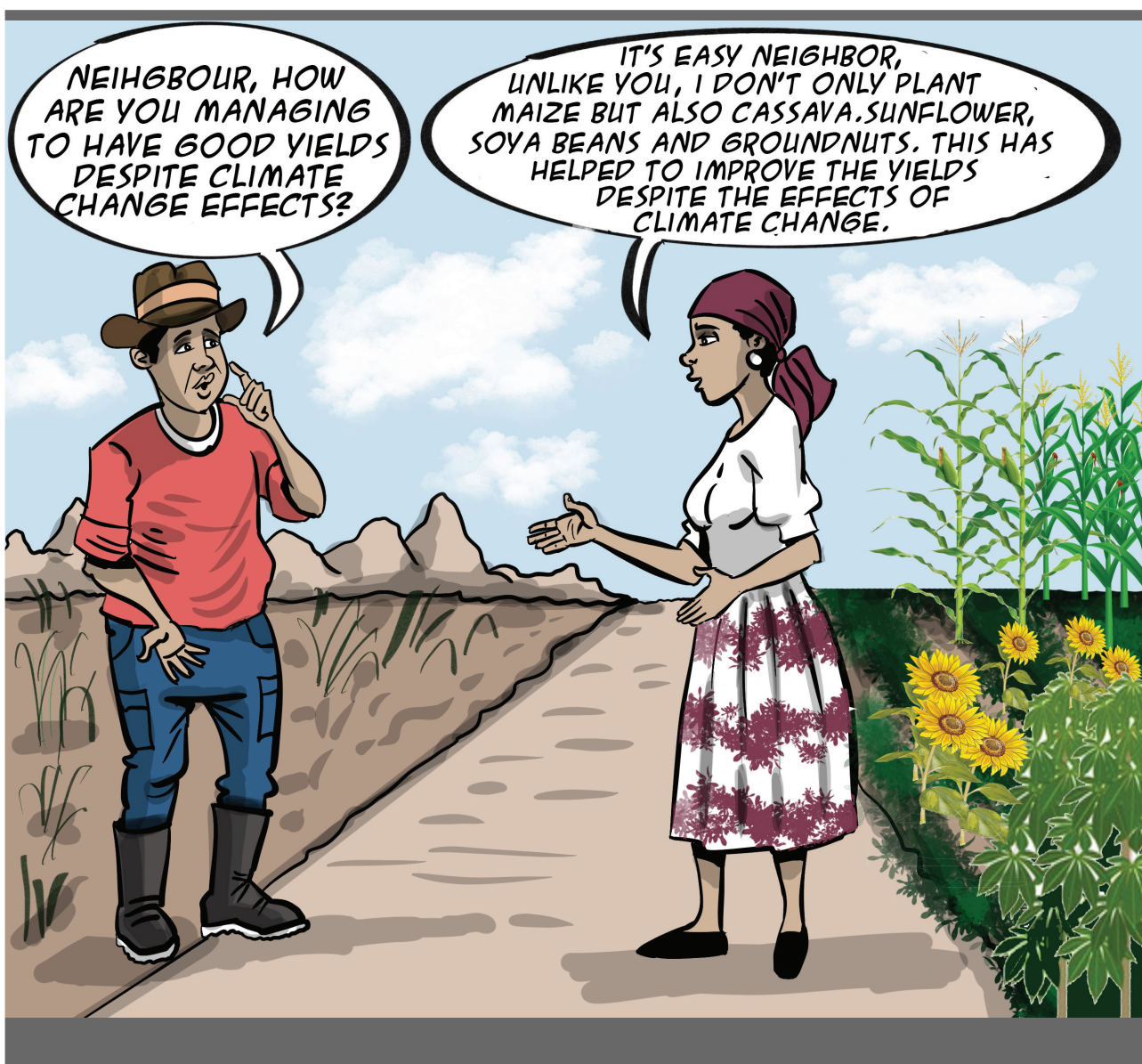
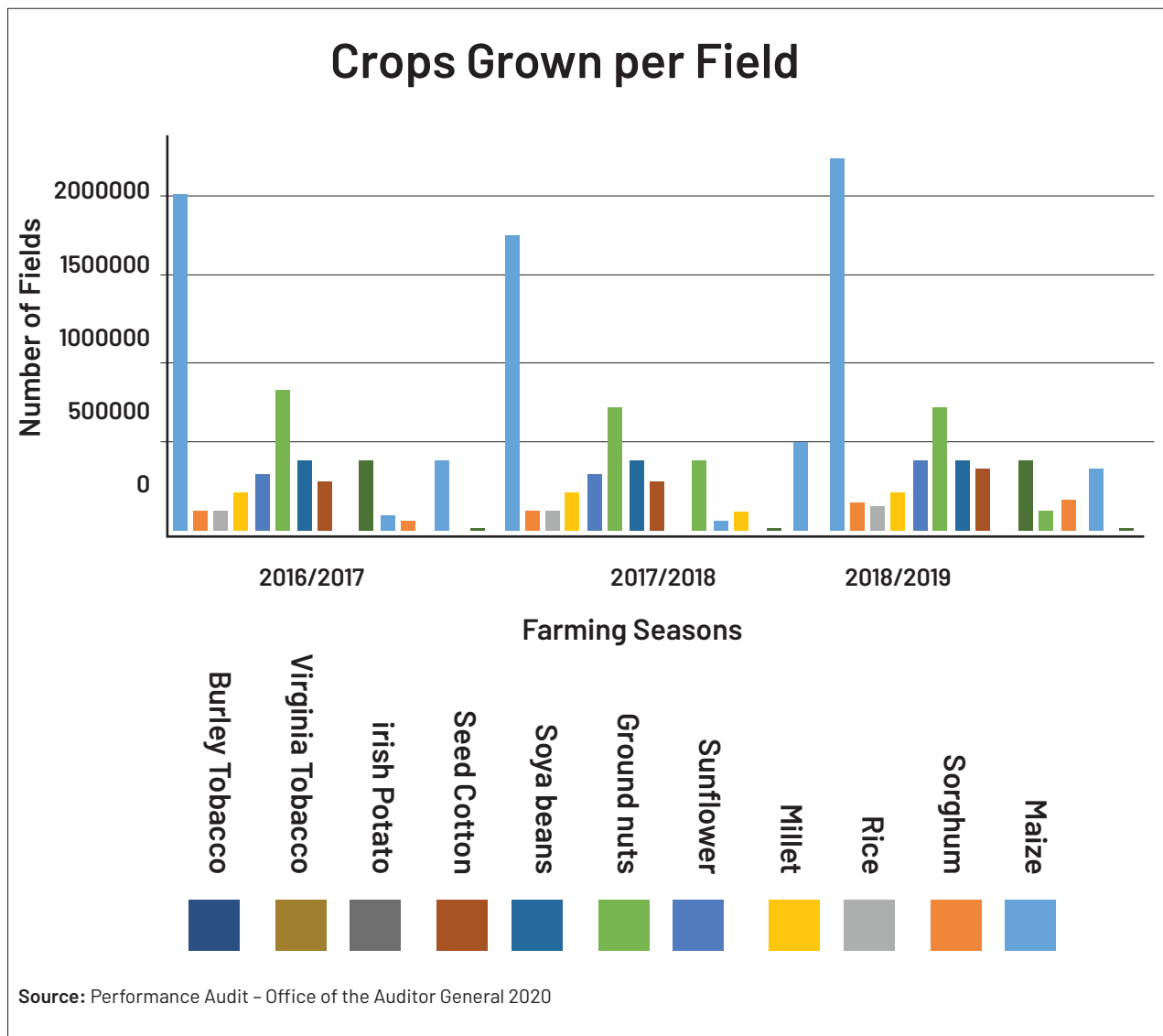




Figure 4: Showing Crops Grown in the Country

Below shows trends in the adoption of tillage methods.



Document review showed that being exposed to climatic shock negatively and significantly affected maize yields, resulting in a decrease in yield by around 20 percent. Considering that around 70 percent of total income comes from crop income and maize income makes up 80 percent of crop income, yield decreases at this level could result in serious welfare implications for smallholders.

Provinces in the north and northeast (agro ecological region III) had the highest crop diversification while south and central regions (agro ecological I and II) of Zambia were the least diversified.

A number of factors were attributed to low crop diversification as indicated below:

- Targeting of Input Subsidy Programmes
- Inadequate Market and Transport facilities
- Inadequate Extensions Services Provision
- Insufficient Irrigation Development

6. Research Prioritisation

A financial analysis of Government allocations towards research showed that agricultural research was not prioritised as it received low funding thereby, **reducing agricultural productivity.**

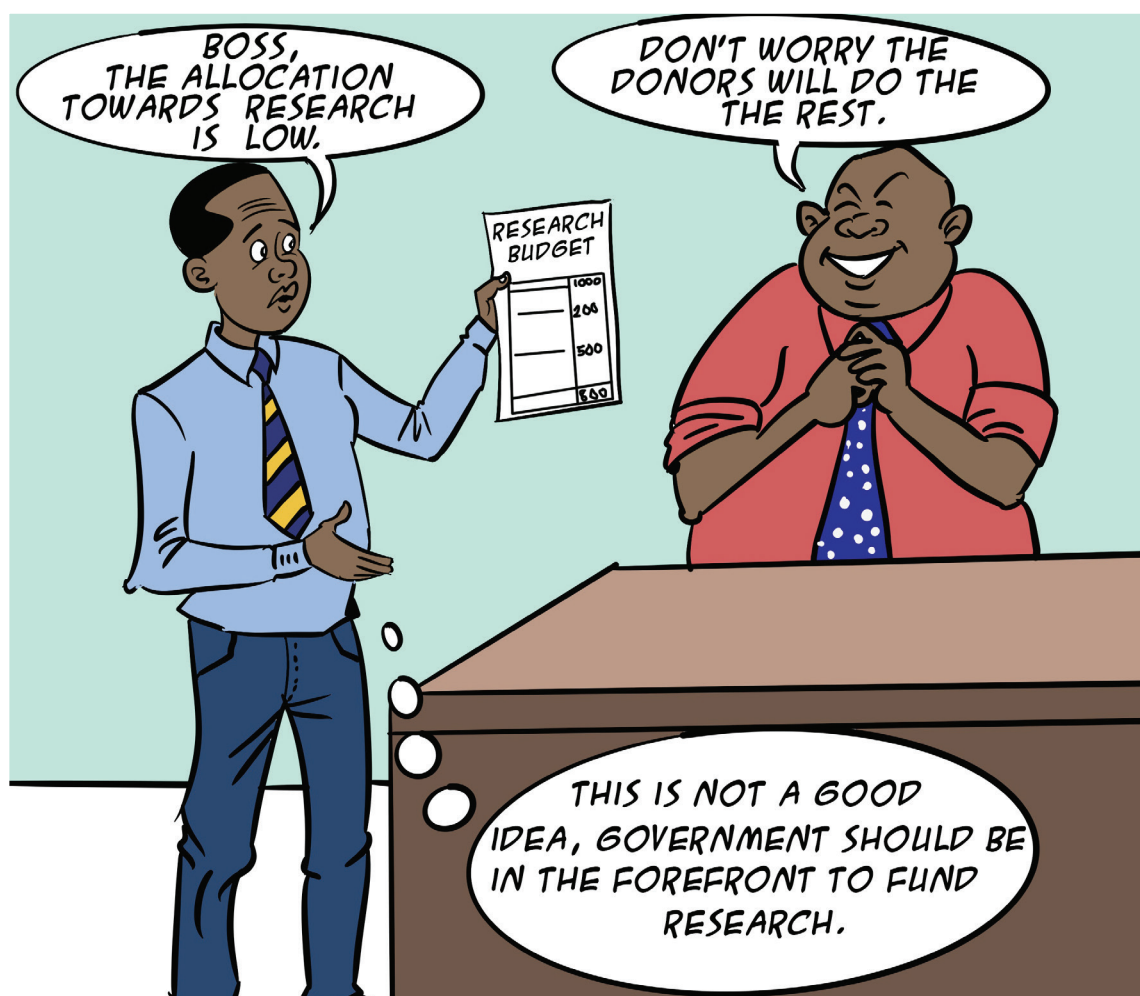
Research activities received less than **1% of the total agricultural budget for the period under review.** Despite an increase in funding between 2017 and 2018, the funded amounts were insignificant for the implementation of most research activities. It was also observed that during the period under review there was no allocation for research infrastructure development. **The lack of prioritisation for research activities by the Government resulted in ZARI not developing appropriate technologies to ensure adaptation to climate change and thereby contribute to sustainable and increased crop production and productivity.**

Table 2: ZARI Funds for Research 2016-2020

Below is the table showing the Funding provision for Research.

| | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|--------|-------|-------|--------|--------|
| MoA Budget | 2,382 | 5,435 | 4,701 | 4,213 | 3,484 |
| Funding for research | 34 | 41 | 41 | 35 | 10 |
| Research % as a total of the MoA budget | 0.0142 | 0.008 | 0.009 | 0.0083 | 0.0029 |

Source - MoA Statistics -2020



07 RECOMMENDATIONS

RECOMMENDATIONS



1. The MoA should demonstrate commitment to its plans by prioritising support to activities that are intended to increase food security in the face of climate change.



2. The MoA must further prioritise activities that ensure smooth mainstreaming of climate change.



3. Early warning information dissemination must be supported through the dedicated use of lead farmers. The early warning unit at the MoA must be active in providing and disseminating various parameters of early warning information including crop disease, flood and low rainfall alerts to farmers in conjunction with ZMD.



4. The MoA must ensure that pesticides get to farmers on time by decentralising the storage of the pesticides.



5. The MoA must also consider using FISP as a tool to compel more farmers affected by climate change to scale up the adoption of conservation agriculture technologies.



6. The MoA must encourage all farmers to take up crop diversification, as it is a risk management strategy which stabilises, diversifies and enhances farm households' income, food and nutrition security.



7. The MoA must enhance material and financial support towards research activities to develop more productive and sustainable agriculture practices according to prevailing conditions.

06

HOW CITIZENS CAN USE THE REPORT

Citizens will be knowledgeable on the effects that have been brought about as a result of Climate Change and the interventions the Ministry of Agriculture has put in place.





GLOSSARY OF TERMS

| Term | Definition |
|----------------------------------|---|
| Agricultural Development | Means providing assistance to crop producers with the help of various agricultural resources. ¹ |
| Agriculture Technology | These are technologies that are employed for the purpose of increasing crop production. ² |
| Adaptation | Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. ³ |
| Climate Change | Refers to any significant change in the measures of climate lasting for an extended period of time. ⁴ |
| Climate Change Adaptation | Is any adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects which moderates harm or exploits beneficial opportunities. ⁵ |
| Climate Change Mitigation | Refers to efforts to reduce or prevent emission of greenhouse gases. ⁶ |
| Climatic Shock | A climate shock is an unpredictable weather event that damages the sustainability of a community. This could be a drought, a flood, storm or extended dry spells. ⁷ |
| Crop Yield | It is a measurement of the amount of agricultural production harvested per unit of land area. ⁸ |
| Climate Smart Agriculture | Is sustainably increasing agricultural productivity and incomes, adapting and building resilience to climate change and reducing greenhouse gas emissions. ⁹ |
| Climatological Normal | The average value of a meteorological element computed over 30 years. ¹⁰ |
| Crop Diversification | Refers to the addition of new crops or cropping systems to agricultural production on a particular farm taking into account the different returns from value added crops with complementary marketing opportunities. ¹¹ |
| Conservation Agriculture | It is a farming system that maintains a permanent soil cover to assure its protection, avoids soil tillage, and cultivates a diverse range of plant species to improve soil conditions, reduce land degradation and increase water and nutrient use efficiency. ¹² |
| Dis-adoption | It is the process of cessation or substantial reduction in the use of a previously valued behaviour or possession. |
| Early Warning | Refers to the provision of timely and effective information, through relevant institutions that follow individuals exposed to any hazard to take action to avoid or reduce their risk and prepare for effective response. ¹³ |
| Food Security | Means that all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life. ¹⁴ |
| Lead Farmer | A farmer picked by the community who voluntarily works with extension officers in training follower farmers in their respective communities. |
| Follower Farmer | These are farmers that are under the mentorship of lead farmers. |
| Irrigation | This is the process of applying water to soil, primarily to meet the water needs of growing plants. ¹⁵ |
| Sustainable Development | Development that meets the needs of the present without compromising the ability of the future generations to meet their own needs. ¹⁶ |

1. <https://www.sciencedirect.com>
 2. www.sciencedirect.com/agriculture
 3. <https://unfccc.int/process-and-meetings/the-convention/glossary-of-climate-change-acronyms-and-terms>
 4. United States Environmental Protection, Climate change basic information. 2017
 5. European Union, Adaptation Strategy: Adaptation to Climate Change. 2013
 6. IPCC, Assessment on measures to Mitigate Climate Change. 2014
 7. www.ccpm.scot
 8. www.investopedia.com
 9. Climate Smart Agriculture: An approach for sustainable food security. 2015

10. <https://www.weather.gov/grr/climatenormals>
 11. <http://icar.org>
 12. <http://www.fao.org/3/a-i6169e.pdf>
 13. National Disaster Management Policy, July 2015
 14. United Nations' Committee on World Food Security.
 15. Bjerneberg D.L, IRRIGATION Methods, Earth Systems and Environmental Science. 2013.
 16. United Nations General Assembly, 1987, p. 43

APPENDIX 1: LIST OF INTERVIEWEES

| No | Institution | Designation | Purpose |
|----|------------------------|--|--|
| 1 | MOA | <ul style="list-style-type: none"> ▪ Director- Agriculture ▪ 2 Assistant Directors (Technical services, SCCI) ▪ 4 Researchers (ZARI) ▪ 10 Camp Extension Officers ▪ 2 Crop Husbandry Officer ▪ 1 Chief Extension Officer ▪ 3 PACO's ▪ 8 DACO's | To obtain data on how the various departments in the Ministry have mainstreamed climate change and how they have addressed food security in the time of climate change through the set measures and to ascertain what challenges are faced in implementing measures set. |
| 2 | Local Authorities | 6 District Administration Officers | To obtain data on implementation of climate projects addressing food security and challenges. |
| 3 | Farmers | 57 small scale farmers | To obtain information on whether they obtain early warning information and how they use the information, what farming practices they use and challenges in ensuring they are food secure. |
| 4 | MNDP | Assistant Director- National Development Planning. 02 Senior Officers NDP 1 Officer NDP | To obtain information on mainstreaming of climate change activities that address food security. |
| 5 | DMMU | Director- Disaster Risk Management Assistant Director- Disaster Risk Management | Obtain information and understand their role and how they collaborate with various stakeholders on early warning. |
| 6 | PPCR | Project Manager, 3 Project Officers | Obtain information on the projects being implemented. |
| 7 | SCRALA | Project Manager | Obtain information on how the project is addressing food security. |
| 8 | ZSA | Assistant Director-Agriculture and Environment. | To obtain information on the early warning in the agriculture sector and how they disseminate information and challenges. |
| 9 | IAPRI | 2 Researchers | Obtain information on studies conducted pertaining to food security, Conservation Agriculture, crop diversification and climate change. |
| 10 | CFU CARITAS ZCCN | CEO 2 Project Staff 1 Project Staff | To obtain data on Conservation Agriculture adoption in the country and challenges in implementation of Conservation Agriculture programmes. |
| 11 | WARMA | Director- Water Resource Management. | To get information on their role in irrigation, climate change and early warning. |



APPENDIX 2: DOCUMENTS REVIEWED AND PURPOSE

| Name of Document | Purpose of Review |
|---|--|
| National Policy on Climate Change 2016 | To gain an understanding into the policies the Ministry is putting in place in striving towards meeting SDG 13 (Climate Action) To establish possible assessment criteria. |
| Ministry of Agriculture- Budgets 2016- 2019 | To establish budget allocation for climate change activities and programmes so as to form judgement on the adequacy of funding to the sector |
| Ministry of Agriculture- Second National Agricultural Policy February, 2016 | To familiarise ourselves with its contents in particular on matters related to food security |
| Revised Nationally Appropriate Mitigation Action 30 th May,2016 | Appreciate sustainable agricultural practices |
| Ministry of Lands Strategic Plan 2016-2020 | To familiarise ourselves with its contents in particular on matters related to climate change action |
| National Climate Change Response Strategy December 2010 | To appreciate Governments response to climate change matters |
| Proposal document on strengthening climate resilience of agricultural livelihood in agro ecological regions I and II, November 2017 | To have a broader understanding of climate change impacts on the agriculture sector |
| Briefing Notes for the Secretary to Cabinet February ,2019 | To familiarise ourselves with its contents |
| National Adaptation Programme of Action on Climate Change September 2007 | To understand the strategies and overall plans of the Nation in the adaption of Climate Change. |
| National Climate Change communication and advocacy strategy January 2012 | To gain an understanding of the various challenges/constraints faced by various players and decisions made to try and address them. |
| Climate-change vulnerability in rural Zambia: the impact of an El Niño-induced shock on income and productivity- FAO Agricultural Development Economics Working Paper 19-02 February 2019 | To understand the effect of El Niño in on agriculture in Zambia |
| Report on the 2011 Climate Investment Funds Partnership forum meetings 20 th -30 th June 2011 | To have an understanding of the Nations investment plans and partnerships in Climate Change. |
| Final Report-Study on Information Needs Assessment and Identification of information Gap on Climate Change in Zambia. November 2010 | To gain an understanding of activities, needs and achievements. |
| The Economics of Climate Change in Zambia February 2011 | To understand the effects of Climate change on the economy and measures taken to address them. |
| <ul style="list-style-type: none"> ▪ Agriculture in Zambia IAPRI -2015 ▪ Sustainable Agriculture Research; Vol. 8, No. 2; 2019 ▪ The Role of Strategic Food Reserves in Enhancing Food Security in Developing Countries: The Case of Zambia March 2019 | To gain an understanding into Zambia's agricultural sector |
| <ul style="list-style-type: none"> ▪ Second National Communication to the UNFCC - MTNER 2014 | To appreciate the strides that Government has made in addressing climate related matters |
| <p>Various climate change project reports e.g. Pilot Program for Climate Resilience (PPCR)</p> <p>Promoting climate resilient community based regeneration of indigenous forests in Zambia's Central Province and Zambia integrated forest landscape project. November 2012</p> | To gain an understanding of the objectives of the projects, successes, failures, achievements and lessons learnt. A select sample of projects will also be physically inspected during the pre- study. |

EVALUATION FORM

Name/Organisation:

Province:

Please answer each question honestly. Your response will be treated with complete confidentiality. If the questionnaire has not been hand collected, please email your completed questionnaire to auditorg@ago.gov.zm

Please select the rating for each section based on the following criteria:

5-Excellent 4-Good 3-Average 2-Fair 1-Poor

Please rate the content and structure of the Simplified Performance Audit Report on the following:

1. The structure of the Simplified Performance Audit Report.

05 04 03 02 01

2. Ability to explain and illustrate the Performance Audit Report findings

05 04 03 02 01

3. Ability to give an overview of Government measures to address the impact of climate change on food security in Zambia.

05 04 03 02 01

4. Ability to show the risks that climate change poses to national food security.

05 04 03 02 01

5. The report's ability to demonstrate the value and benefit of the work of the Auditor General in society

05 04 03 02 01

Open-ended comments on the 2019 Simplified Auditor General's Report

6. Has this Simplified Performance Audit Report helped to generate interest in you to know more about Performance Audits? Explain briefly.



7. What did you like the most about the Simplified Performance Audit Report?

8. What specific things did you like the least about the Simplified Performance Audit Report?

9. What improvements do you want to see in the future Simplified Performance Audit Reports?

10. Did the Simplified Performance Audit Report Meet your expectations? Explain

Overall, you would rate the Simplified Performance Audit Report as:

05 04 03 02 01

General Comments:

Thank you for your feedback.



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