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# **An integrated approach towards moderating the effects of climate change on agriculture: A policy perspective for Zimbabwe**

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## List of abbreviations

AFC	Agricultural Finance Cooperation
AGRITEX	Agricultural, Technical and Extension Services Department
BoP	Balance of Payments
CCAA	Climate Change Adaptation in Africa
CEEPA	Centre for Environmental Economics and Policy in Africa
CFU	Commercial Farmers Union
ESAP	Economic Structural Adjustment Programme
EMA	Environmental Management Agency
FTLRP	Fast Track Land Reform Programme
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gas
IDRC	International Development Research Centre
IPCC	Inter-governmental Panel on Climate Change
MDC	Movement for Democratic Change
MDG	Millennium Development Goal
MENRM	Ministry of Environment and Natural Resources Management
NCCRS	National Climate Change Response Strategy
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
ZFU	Zimbabwe Farmers Union
ZANU PF	Zimbabwe African National Union – Patriotic Front
ZimVAC	Zimbabwe Vulnerability Assessment Committee

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## Abstract

This study was undertaken to provide a succinct assessment of the linkages between agricultural policy reform in Zimbabwe and the challenges that climate change poses to smallholder farmers in the country. The study is motivated by a lack of analysis of how post-independence agrarian reform processes in Zimbabwe may affect adaptation to climate change in the agricultural sector. The key driving factor behind land redistribution has largely been to enhance equity in the ownership of arable land. So far there has been less focus on assisting beneficiary farmers to adapt to climate change, which is increasingly becoming a reality and further aggravating the stresses already associated with smallholder production, including small farm sizes, informal land tenure, poorly developed infrastructure and unpredictable and uneven exposure to markets. The paper reveals that while the current status of land reforms has enabled previously disadvantaged peasants to acquire land, smallholders still face production challenges such as tenure insecurity, inadequate technical support, poorly developed infrastructure, limited access to markets and the effects of HIV/AIDS. These factors also remain key concerns for farmers in the face of the risks posed by climate change. The study found that smallholder farmers would benefit from climate change adaptation goals that focus on irrigation development, appropriate soil and water conservation technologies and sustainable utilisation of forest resources. While the government has been investing heavily in input support to smallholder farmers, this paper argues for a more systemic targeting in resource allocation which is anchored on crop diversification in response to productivity trends across the agro-ecological zones of the country. A 'market-oriented' climate change adaptation approach which guarantees high returns to farmers who grow adaptable crop varieties like small grains should be considered, rather than the current situation where emphasis is put on cash crops like cotton and tobacco. Finally, the paper suggests a multi-sectoral and inter-disciplinary approach that involves government ministries, community based organisations, the private sector and other non-state actors. This would ensure a holistic approach in achieving climate change adaptation policy goals, and also help address other socio-economic challenges that smallholder farmers currently face.

## 1.0 Introduction

Climate change will have far-reaching consequences for Zimbabwe's agriculture sector, and will particularly affect smallholder farmers whose livelihoods are mainly dependent on rain-fed agriculture and have a low capacity to adapt. The realities of climate change are unfolding; in-season dry spells, prolonged droughts, short duration rains, erratic rainfall patterns and floods are already adding risks to the livelihoods of more than three quarters of the world's population (Oxfam, 2012). For Zimbabwe, anticipated increasing temperature coupled with water stress will affect crop productivity (Brown et al., 2012), in turn reducing agriculture-based employment and income opportunities, and could significantly curtail the contribution of the agriculture sector to the national Gross Domestic Product (GDP).

While the negative impact of climate change in the smallholder agriculture sector of Zimbabwe is evident, post-independence agrarian policy reforms have not been climate-sensitive. The policy reforms that were implemented focused more on redistributing land and providing input support to benefit traditionally disadvantaged socio-economic groups. Zimbabwe's post-independence agriculture policies have undergone a number of reforms which were intended to enhance equity in the ownership of arable land and support smallholder productivity. At independence, the country inherited an enclave economy<sup>1</sup> in which a few white settler farmers, representing at most 4 percent of the country's population, controlled the bulk of the arable land, while the majority of blacks were concentrated in hilly, sandy and uncultivable communal areas (Chung, 2012). While the post-independence land reform processes, such as the Fast Track Land Reform Program (FTLRP), have successfully transferred land from the hands of a few white commercial farmers to the black majority, it has been argued that the exercise has not been able to address other intrinsic challenges that characterise the smallholder agriculture sector. For example, smallholder agricultural productivity has been affected by lack of tenure security, weak agricultural extension support services, capacity challenges, poor infrastructure and acute shortages of inputs (Scoones et al., 2011b; Dekker, 2009). Changing climatic conditions have added to this plethora of challenges by affecting planting seasons and exposing farmers to increased frequency and severity of droughts and floods (Falco et al., 2011; Mtambanengwe et al., 2012).

Observations by Dekker (2009) reveal that tenure insecurity and persistent droughts have drastically reduced areas under cultivation across the country, especially between the 1999/2000 and 2007/8 planting seasons. Within this period, for example, maize and soybean planting areas fell from 850,000ha to 500,000ha and 220,000ha to 60,000ha respectively. Furthermore, policy frameworks on agriculture that were announced within the 1998-2008 decade had little impact because they were politically motivated and emotionally enacted, and lacked technical support, processes and systems to

support implementation. The frameworks did not put into consideration alternatives and options in light of the changing climatic patterns, hence exposing the vulnerable farmers to the impacts of changing weather conditions (Gwarazimba, 2011).

Realising policy framework gaps that have failed to cushion vulnerable farmers from livelihood threats posed by climate change, the government has in recent years made inroads to support smallholder farmers to better manage multiple climate change impacts. Through the Ministry of Agriculture, Mechanization and Irrigation Development, the government has formulated a Comprehensive Agriculture Policy Framework 2012–2032 which establishes clear climate change adaptation goals including irrigation development, crop diversification, conservation agriculture, climate change research and increased extension support as well as farmer capacity building and awareness. In addition, the Ministry of Environment and Natural Resources Management through its Climate Change Office is leading the formulation of a comprehensive National Climate Change Response Strategy (NCCRS), aiming to coordinate efforts in implementing programs that respond to risks associated with climate change. These climate change adaptation policy goals have the potential to benefit smallholder farmers as they are anchored on a vision of 'a prosperous, diverse and competitive agriculture sector that ensures food and nutrition security and significantly contributes to national development' (Government of Zimbabwe, 2012: 48). However, tangible gains will only be realised if the impacts of climate change are not treated in isolation, but rather are integrated into policy measures that seek to address the many productivity and livelihood challenges that farmers already face.

The integration of smallholder farmers into the recent NCCRS formulation process has been limited, and yet due to their dependence on rain-fed agriculture, they are deeply exposed to the negative impacts of climate change. This paper unmask the chronology of post-independence land reform processes in Zimbabwe and provides a detailed analysis of the extent to which national climate change adaptation goals contribute towards addressing the constraints that smallholder farmers already face. Results of the analysis help to generate recommendations that can be adopted by agricultural policy stakeholders to deal with the various challenges smallholder farmers face while at the same time addressing the negative impacts of climate change.

The research project was guided by the following key research questions:

- What is the current status of agricultural policy processes in Zimbabwe, and who are the main stakeholders?
- What are the different constraints on smallholder agricultural production in Zimbabwe, and how is climate change expected to affect these?

- What are the likely impacts of climate change adaptation goals on smallholder agriculture in Zimbabwe?

## 2.0 Methodology

The paper limited its scope to challenges faced by smallholder farmers, who by definition are mainly household units characterised by limited access to land and capital resources, and who significantly depend on agricultural production (of which a significant proportion is normally used for subsistence consumption) and utilised mainly family labour for farm production (Dorward and Kydd, 2002).

A multi-pronged approach was adopted for data collection. First, a review of existing policy evidence was undertaken. This included documents found through web searches as well as grey literature obtained from informants in Harare. Second, semi-structured interviews were conducted with officials from the Ministry of Agriculture, Mechanization and Irrigation Development; the Climate Change Office in the Ministry of Environment and Natural Resources Management; farmer unions including the Commercial Farmers Union (CFU) and the Zimbabwe Farmers Union (ZFU); academics at the University of Zimbabwe; and climate change specialists within civil society. A third source of data was the author's participation in the committee meetings of the National Climate Change Task Team, which is responsible for overseeing the formulation of a National Climate Change Response Strategy. Involvement in this process helped to deepen my understanding of climate change issues in the agriculture sector and of the policy direction that the government is considering.

## 3.0 Agricultural policy processes in Zimbabwe

The following section will review agricultural policy processes as they relate to smallholder farmers' challenges in the face of climate change. The focus will be on land reform processes, which are particularly important as land ownership is a critical determinant of farmers' adaptive capacity.

Smallholder farmers are vulnerable to economic and climatic shocks and have limited capacity to adapt to the impacts of climate change; that is, they have limited capacity to adjust 'in response to observed or expected changes in climatic stimuli and their effects and impacts in order to alleviate adverse impacts of change or take advantage of new opportunities' (Adger et al., 2005: 78). Since their livelihoods are agriculture-based, any agrarian reform policy should seek to address the effects of climate change on smallholder agriculture in relation to other productivity problems that farmers face.

An in-depth understanding of the current agriculture reform process, including key stakeholders and production challenges that smallholder farmers

currently face and exploring the likely impacts of climate change adaptation policy goals, is therefore important because such analysis provides pointers on the nature of problems that policy stakeholders need to address. This section therefore unbundles the country's key post-independence agrarian reform processes and their consequences. It further looks at the motivation for such reforms, as well as key stakeholders who were responsible for driving the processes.

### 3.1 Overview of Zimbabwe's post independence land reform processes and legal frameworks

#### 3.1.1 Chronology of post-independence land policy reforms in Zimbabwe

Reforms of Zimbabwe's agriculture sector have focused on land reforms to address the historically skewed distribution of land. At independence in 1980, ownership of most of the productive land in Zimbabwe was concentrated in the hands of 6,034 white, largely commercial farmers. Half of the land owned by white farmers was in the high agro-ecological potential regions I, II and III (Nyaya and Mazuru, 2010; Villiers, 2003; Government of Zimbabwe, 1998). Black smallholder farmers were concentrated in low potential areas with unpredictable rainfall and poor soils. These were known as communal areas. Smallholder farmers had limited access to extension support and restrictive measures limited smallholders' access to the white-dominated agricultural markets.

#### 3.1.2 Phase 1 Land Redistribution and Resettlement Programme

The first phase of land redistribution was implemented soon after independence to redress production challenges that smallholder farmers were already facing. This phase of land redistribution was based on agreements made with the British government during the 1979 Lancaster House negotiations. These negotiations, which among other things aimed to redress the land issue, saw the governments of Britain and Zimbabwe agree on several principles, including the acquisition of land on a willing seller/willing buyer basis and the provision of compensation, at full market value denominated in foreign currency, to commercial farmers. Donor contributions from the British and US governments as well as other donor countries were met on a pound for pound basis by Zimbabwe. The government of Britain promised £75m and the US promised US\$500m, but unfortunately the agreement did not contain a detailed and enforceable commitment from any of the foreign donors to actually contribute to land reform (Moyo, 2005). The government had targeted to secure 8.3m hectares of land to resettle 162,000 smallholder farmers, mainly refugees, displaced people, squatters and the landless, during the 1982–1985 period (Government of Zimbabwe, 1998; Masiwa, 2001). However, by 1985 only 60,000 families had been resettled, while an additional



10,000 were resettled by 1990 (Masiwa, 2001). By 1997 only about 3.5m hectares had been made available for resettlement and 71,000 families had benefited from the program (Juana, 2006). Scarcity of land, exorbitant market prices of the available land, and the inability of the government to pay such prices limited its capacity to achieve its 8.3 million hectare target (Government of Zimbabwe, 1998). By the year 2000 Zimbabwe had only received approximately £30 million of the pledged amounts (Moyo, 2005).

The 14th Constitutional Amendment and the 1992 Land Acquisition Act were intended to speed up the land redistribution program through land designation and compulsory land acquisition. These legal instruments had the effect of freeing the government from the willing seller/willing buyer clause. However, because the government then valued 'due legal processes, fairness and justice, the land acquisition process remained slow, cumbersome and expensive' (Government of Zimbabwe, 1998). However, other sources blame government complacency, lethargy and lack of political will for the slowness in implementing Phase 1 of the land resettlement program. The key actors then were the central government and its line ministries, dominated by the ZANU-PF party, which had been following a top-down approach and not consulting widely with other stakeholders (Masiwa, 2001).

### 3.1.3 *The 1995–2020 Agricultural Policy Framework*

In 1994, the government formulated the 1995–2020 Agricultural Policy Framework in response to agricultural production challenges brought about as a result of the World Bank-driven Economic Structural Adjustment Program (ESAP), which emphasised free-market solutions to agricultural problems (Government of Zimbabwe, 2012). The policy framework was supposed to map the course of agricultural development during the following two decades with the aim of pursuing land and agrarian reforms to ensure productive use of land and increase smallholder production at a faster rate than had prevailed during the first 15 years of post-independence. Key objectives of the policy framework were to:

- improve earnings of the farming population in real terms;
- increase foreign currency earnings from agricultural exports;
- significantly contribute to the regional food supplies;
- improve distribution of incomes for smallholders and farm workers and their families; and
- ensure much greater food security at household level (Mutisi, 2009).

Couched within the 1995–2020 Agricultural Policy Framework was the Agricultural Policy in Zimbabwe under the Economic Reform 1994–1997, whose thrust was to drive productive use of land and transform smallholder agriculture into a fully commercial farming system. Lack of funding and limited political commitment to implement the policy resulted in the government failing to address production challenges that smallholder farmers already faced. The country experienced a steady and steep decline in the value of agricultural exports and a corresponding rise in imports. By 2000 the country had resorted to substantial food imports, including food aid, to meet domestic primary food requirements (Mutisi, 2009).

### 3.1.4 *Phase 2 Land Redistribution and Resettlement Programme*

In the first decade after independence the government seemed very enthusiastic about addressing the land issue, and in particular addressing land ownership challenges facing smallholder farmers. Yet the approach taken then was bourgeoisie-oriented, as it encouraged the provision of loans through the Agricultural Finance Corporation (AFC) to the black middle class to enable them to acquire large scale commercial farms at the expense of the landless and the disadvantaged. After benefiting from the skewed land policy, the black middle class later resisted genuine land reforms. The government gradually abandoned issues of equity and instead shifted emphasis during the 1990s towards resettling master farmers and other trained people (Makamure et al., 2001).

By 1997 much of the more fertile land still remained under the control of a few thousand white farmers, and much of the land that had been distributed remained in the hands of a few black elites. The wish for an all-inclusive partnership in addressing the land issue saw the Government of Zimbabwe engaging the international donor community and other interested parties. Under the auspices of the UN, contact was established with the European Union (EU) and other donors and talks between President Mugabe and the EU Commissioner for Development, Mr. Joao Pinheiro, in January 1998 culminated in the hosting of the 9–11 September 1998 Land Donor Conference in Harare<sup>2</sup>. Represented at the conference were 48 countries, including Britain, and some international organisations, who adopted a set of principles in order to guide Phase 2 of land reform in the country. The principles included respect for the legal process, transparency, poverty reduction, consistency and ensuring affordability for acquisition and allocation of land grants (Nyaya and Mazuru, 2010). Phase 2, which was launched in September 1998 (Musemwa and Mushunje, 2011), provided for land acquisition in three ways: (1) land designation, which entailed the designation of land for a specified period up to 10 years during which the government would compulsorily acquire the land; (2) compulsory acquisition, which entailed straightforward compulsory purchase of



identified land by the government within 12 months of serving notice of acquisition; and (3) willing seller/willing buyer, where market-based land purchase through the exercise of the right to first refusal by government would be applied (Government of Zimbabwe, 1998). With an estimated budget of US\$2bn, Phase 2 was expected to be implemented over five years and the government targeted to acquire 1 million hectares annually to benefit 89,381 beneficiaries (ibid).

### 3.1.5 Fast Track Land Redistribution Programme (FTLRP)

#### *The political landscape: Draft Constitution and Farm Invasions*

Dealing with the land issue had been complex, particularly in identifying a methodology of land acquisition and resettling beneficiaries that would not compromise the economy, which by the early 2000s had been heavily anchored in the agriculture sector. Realising dwindling support from the land-hungry peasants, the ZANU-PF led government spearheaded the formulation of a new constitution which was rejected by the Zimbabwean majority during a national referendum in 2000. One of the aims of the new constitution was to make it easier for the government to acquire land for resettlement through compulsory acquisition of agricultural land without compensation. The ruling party saw this defeat as a direct affront to their continued rule and feared the repercussions this would have for the general elections due to be held in June that year. ZANU-PF was not prepared for another electoral setback so the move to launch the FTLRP was viewed by many as a strategy to lure back the rural electorate ahead of the general election (Africa All Party Parliamentary Group, 2009). ZANU-PF had shifted its policy focus towards the rural electoral constituency, and re-mobilised the liberation and nationalist forces around land reform through the FTLRP (Moyo, 2005).

Angered and frustrated by the rejection of the new constitution, war veterans began a wave of invasions of commercial farms. In response, the FTLRP was introduced to enable the government to acquire commercial farms without any obligation to pay for the land, but only for

the farm improvements (Masiwa, 2001; Africa All Party Parliamentary Group, 2009). Table 1 shows the amount of land acquired during the various phases and the respective number of beneficiaries by 2003.

Against the backdrop of commercial farm invasions and the new FTLRP, the Movement for Democratic Change (MDC) emerged as a strong opposition party, campaigning for a 'no' vote during the constitutional referendum in alliance with civil society. The MDC were critical of the FTLRP, viewing the process as hasty, incoherent, haphazard, unsystematic, chaotic and lacking in rigour (Chaumba et al., 2003). The MDC, with support from commercial farmers as well as civil society, publicly denounced the land invasions and advised its supporters not to participate in the farm invasions. However, interviews conducted during this research confirmed that as a result of politicisation of the process it was mostly ZANU-PF supporters, along with a few MDC officials who are now in government, who benefitted from the FTLRP.

Prior to implementation of the FTLRP, the land acquisition process had been slowed down by farmers who appealed to the courts against acquisition of their farms (Marongwe, 1997). The willing seller/willing buyer framework for redistribution did not work well to achieve the objectives of land resettlement (Juana, 2006). Most large scale commercial farmers were unwilling to sell the productive areas of their land, and what they offered for sale to the government or on the open market were marginal areas that were less productive. These areas were also high priced, thereby deliberately pricing out the deserving landless and the poor. In the implementation process, government-acquired land was often transferred to the hands of a minority black elite, thereby reducing the chances of the most vulnerable to benefit from the program. By the late 1990s, about 9,000 black capitalist farmers had established themselves on about 19 percent of former large scale commercial farmland through land purchases, leases and inheritance (Moyo, 2005). While the government blamed a lack of resources and commitment from Western donor countries who did not support the agrarian reform process, some have argued that the Zimbabwean state lacked the political will and capacity to implement land reform prior to 2000 (Moyo, 2005; Masiwa, 2001; Marongwe, 1997).

**Table 1: Amount of land acquired and number of households resettled, 1980-2003**

Method of land acquisition	Amount of land acquired (hectares)	Number of households
Open Market Purchase (1980-85)	2,147,855	60,000
Land Acquisition Act, 1985 (1985-90)	447,791	10,000
Land Acquisition Act, 1990 (1990-97)	789,645	400
Fast Track Land Reform	7,700,000	384,000
<b>Total</b>	<b>11,085,291</b>	<b>454,400</b>

Source: Nyaya and Mazuru, 2010

**Table 2: Key stakeholders in Zimbabwe's post-independence land reform processes**

Stakeholder	Level of influence <sup>3</sup>	Role in land reform processes
Government of Zimbabwe	3	<ul style="list-style-type: none"> <li>• Negotiated land reform terms with the British government.</li> <li>• Put in place legal frameworks for land reform.</li> <li>• Coordinated all land reform processes.</li> </ul>
British Government	3	<ul style="list-style-type: none"> <li>• Negotiated land reform terms with the Zimbabwean government.</li> <li>• Failed to honour commitment to support the land reform process, which resulted in slow implementation of land reform.</li> </ul>
Donor countries and international organisations (including USA, Australia, Canada, China, Denmark, UK, IMF)	3	<ul style="list-style-type: none"> <li>• Failed to honour commitments made during the 1998 International Donor Conference to support the land reform process, which resulted in slow implementation of land reform.</li> </ul>
World Bank	2	<ul style="list-style-type: none"> <li>• Blamed for the damaging effects of the Economic Structural Adjustment Plan (ESAP) for Zimbabwe, embarked on in 1991. In response to the effects of ESAP on agricultural production, the government formulated the 1995–2020 Agricultural Policy Framework.</li> </ul>
Political parties (especially ZANU-PF and MDC)	3	<ul style="list-style-type: none"> <li>• Parties used the land reform process to gain political mileage. For example, the 2000 land invasions were mainly driven by ZANU-PF supporters with backing from party superiors.</li> <li>• Emergence of MDC as a strong political contender forced the ZANU-PF led government to use land as an instrument to lure support.</li> </ul>
War veterans	3	<ul style="list-style-type: none"> <li>• Realising the slow pace of the land redistribution process, war veterans led the invasion of previously white-owned commercial farms.</li> <li>• The Chenjerai Hunzvi-led war veterans team forced the government to implement the FTLRP.</li> </ul>
Commercial farmers' organisations – Commercial Farmers Union (CFU)	1	<ul style="list-style-type: none"> <li>• The role of the CFU has been to protect the interests of commercial farmers; however, the CFU had not been engaged in recent land reform processes.</li> </ul>
Landless farmers	1	<ul style="list-style-type: none"> <li>• Landless farmers, especially those aligned with ZANU-PF, joined war veterans in farm invasions. However, though all policy reforms that have been undertaken aim to assist these farmers, their influence on policy reforms has been weak as evidenced by the slow pace in land redistribution between 1980 and 2000.</li> </ul>
Civil society organisations (CSOs)	2	<ul style="list-style-type: none"> <li>• CSOs have been working directly with smallholder farmers, providing technical and capacity building support.</li> <li>• Together with MDC, they campaigned for a 'no' vote during the referendum on the 2000 constitution, which had a provision for acquiring land from commercial farmers without compensation.</li> <li>• CSOs have conducted research and provided policy recommendations on the land reform processes. However, due to the perceived Eurocentric nature of most CSOs, most recommendations have not been incorporated.</li> </ul>

### **3.2 Analysis of key stakeholders in the post-independence land reform processes**

It can be concluded that the post-independence land reform processes in Zimbabwe have been political processes, influenced by many stakeholders at both the national and international levels. Table 2 shows a summary of key players who have participated in and influenced the land reform processes in the country. The level of influence is represented on a scale of 1 to 3, with a score of 1 indicating that a stakeholder had limited influence on land reform policy; 2 indicating slight influence; and 3 indicating extensive influence.

### **3.3 Towards a new agrarian policy framework: The Comprehensive Agriculture Policy Framework (2012–2032)**

The FTLRP that started in 2000 saw ownership of lands held by commercial farmers being shifted to smallholders. The process has been viewed as part of the policy framework that has, so far, resulted in a broadening of the potential agricultural production base through land redistribution to more people. The policy framework brought about major fundamental transformations which had not been foreseen during formulation of the 1995–2020 Zimbabwe Agriculture Policy Framework. These transformations have markedly increased the number of people with access to land, and thus present a number of challenges and opportunities. New and expanded demands for knowledge are emerging given the large number of resettled farmers (Government of Zimbabwe, 2012). Provisions in the 1995–2020 Zimbabwe Agriculture Policy Framework have become obsolete, and the government has recognised the necessity of adhering to international standards that require a robust policy framework to respond to the growing importance of food safety, quality and traceability in production systems that protect the environment and address the new realities of climate change as well as the impact of HIV/AIDS (ibid).

As a response to the dramatic shifts in the agriculture sector that have occurred since 2000, the government formulated the Comprehensive Agriculture Policy Framework (2012–2032) in April 2012. The new framework is premised on a vision of 'a prosperous, diverse and competitive agriculture sector, ensuring food and nutrition security significantly contributing to national development' (Government of Zimbabwe, 2012: 48). The objectives of the framework are to:

1. Assure national and household food and nutrition security;
2. Ensure that the existing agricultural resource base is maintained and improved;

3. Generate income and employment to feasible optimum levels;
4. Increase agriculture's contribution to the Gross Domestic Product (GDP);
5. Contribute to sustainable industrial development through the provision of home-grown agricultural raw materials; and
6. Expand significantly the sector's contribution to the national balance of payments. (Government of Zimbabwe, 2012)

In the new Comprehensive Agriculture Policy Framework the government recognises the undeniable realities of climate change, particularly in the smallholder agriculture sector. Increased diversification in response to the threats posed by climate change has been identified as a priority policy issue with the potential to improve output, farm income stability and balanced household nutrition. The government also prioritises irrigation development as a responsive intervention to sustain agricultural production and food security in the face of climate change in Zimbabwe (ibid). Given the vulnerability of the agriculture sector to changing weather patterns, total commitment is required to cushion smallholder farmers from the impacts of climate change. In the new framework, however, 'climate change' is only mentioned 3 times while 'agricultural productivity' is mentioned more than 20 times – an indication that no clear links are being emphasised between agricultural productivity and the threats posed by climate change. Consequently, there is a high possibility that government priority actions to improve agricultural productivity may ignore the essential impacts of climate change.

## **4.0 Challenges faced by smallholder farmers and challenges of climate change**

We have seen that past land reform processes have failed to put in place mechanisms to address agricultural productivity challenges posed by climate change. The new Zimbabwe Comprehensive Agriculture Policy Framework which came into force in 2012 has also not put much emphasis on priority actions to enable farmers to deal with productivity challenges that they face while at the same time enabling them to adapt to the negative impact of climate change. In this section, we critically examine production challenges that smallholder farmers in Zimbabwe face as well as threats posed by climate change.

A ten-year study in Zimbabwe by Scoones et al. (2011a) into the nature of the radical transformation of the agrarian structure that occurred both nationally and within the province of Masvingo revealed that challenges affecting smallholder farmers increased after the government implemented the 2000 FTLRP. National crop

production has been affected by tenure insecurity, weak agricultural support services, capacity challenges, acute shortages of inputs and changing climatic conditions (Scoones et al., 2011b; Dekker, 2009). Effects of these factors are discussed in detail in the sections below.

#### **4.1 Inadequate land tenure security**

Just like during the pre-2000 period, beneficiaries of land redistribution are supposed to get 99-year leases on the land they receive. However, the FTLRP that has been implemented does not offer title deeds to the recipients of the farms. Prior to 2000, ownership of land in Zimbabwe passed from one person to another legally by way of a deed of transfer (title deed) prepared by a conveyancer and executed by the Registrar of Deeds (Matondi and Dekker, 2011). The title deeds were conclusive proof of ownership and that ownership was guaranteed by the state. The ability of pre-2000 farmers to provide collateral when borrowing from financial institutions was founded upon title to the ownership of their farms (Bloch, 2012).

In contrast, with effect from 2000 all right and title in and to the land was vested in the state. New farmers who settled on the land were not accorded any ownership rights, only being entitled to occupy and work the farms by virtue of 99-year leases (although government reserved the right, in many of the leases, to terminate them on three months' notice!) (Bloch, 2012: 1).

As a result, small scale farmers who benefited from the program have not had completely transparent land use rights, leaving them uncertain about the security of their tenures (Maguranyanga and Moyo, 2006). The insecurity of land tenure has discouraged beneficiary smallholder farmers from long-term investments. Without security of tenure, new beneficiaries cannot access loans from financial institutions as white commercial farmers had done. To date, because they lack assets to show as collateral, farmers still can't access loans from banks. Deriving lessons from FTLRP, Scoones (2009) observed that tenure insecurity does not necessarily derive from the nature of the regime, but from the wider political setting, including the capacity to administrate land and the ability to assure a rule of law. According to Scoones, when important basic governance conditions are not in place, no tenure security can be guaranteed (2009). The poorly enforced land rights have resulted in unsustainable management of common resources and degradation of land and this has led to a decline in land value and productivity (Mutisi, 2009). As a result of poor tenure security, most of the land lies idle, people are not committed to farming and infrastructure is destroyed, neglected or non-existent (Scoones et al., 2011b).

#### **4.2 Weak agricultural support services**

Adequate technical and financial support service are critical elements for enhancing sustained productivity of smallholder agriculture. Cognisant of the need to drive its post-independence mandate of making Zimbabwe the breadbasket of Africa, the government invested heavily in strengthening the Department of Agricultural, Technical and Extension Services (AGRITEX) who are mandated to deliver agricultural extension in Zimbabwe. Following the FTLRP, agriculture support services declined because the limited number of trained Extension Officers could not cope with the wholesale acquisition of farms that were quickly subdivided into small, medium and large-scale self-contained units. Reforms introduced in 2002 saw the government training close to 8,000 extension workers through an accelerated curriculum, which reduced the training period from three years to eighteen months (Moyo, 2004). As a result, extension staff who graduated through this system were not adequately equipped with knowledge and skills to deal with smallholder agricultural production. In response to the situation, some non-governmental organisations (NGOs) tried to assist the government by providing technical support to farmers, but again, financial and capacity limitations influenced their levels of assistance. Due to the free-fall economic situation that the country experienced after the 2000 FTLRP, the Ministry of Agriculture, Mechanisation and Irrigation Development has not been able to provide adequate resources to its core extension departments, and as a result smallholder farmers still face challenges accessing technical, veterinary and research support.

#### **4.3 Input support**

The farmers who benefited from land reform varied in characteristics, ranging from business people and former farm labourers to landless and unemployed families. By 2008, Zimbabwe had experienced an astronomical rate of inflation (11.2 million percent from unofficial reports). The high inflation rate put the cost of farm inputs beyond the reach of most, and in many cases the inputs were not available in the shops at all. Until 2007, the fertiliser sector was operating at below 30 percent capacity, failing to meet the input needs of farmers (Government of Zimbabwe, 2012).

Although government-initiated post-2000 programs like the Agricultural Sector Productivity Enhancement Facility, Operation Maguta and the Champion Farmer Programme aimed at providing inputs to smallholder farmers, these did not yield the intended results (Scoones et al., 2011b). Instead, these schemes have largely fuelled corruption. Elite politicians benefitted most at



the expense of smallholder farmers (Masiwa, 2001). As a result, the use of fertilizer declined drastically, and coupled with limited technical skills, the soils in most resettlements have been disturbed (Scoones et al., 2011b; Maguwu, 2007). Consequently, the lack of an input and technical support base continues to affect productivity in the smallholder agriculture sector (Mutema, 2012). Most smallholder farmers are using ox-drawn ploughs for tillage instead of improved mechanisation which would otherwise improve their productivity. Although the majority of beneficiary farmers inherited fertile pieces of land, they can no longer maintain the soil fertility and as a result some pieces of land have been abandoned (Sithole et al., 2003; Scoones et al., 2011a).

#### **4.4 Poor infrastructure**

Lack of adequate and suitable infrastructure has been one of the major constraints faced by smallholder farmers in Zimbabwe. Most of the farming areas are inaccessible due to lack of or dilapidated infrastructure. Studies done by Scoones et al. (2011b) shows that smallholder farmers in Masvingo, especially those who benefited through the FTLRP, occupied former rangelands and virgin land where there were no road networks, clinics or schools. In some areas roads no longer exist because of years of neglect and as a result they cannot access inputs or markets for their produce. The marketing challenges diminish agricultural production and lock the farmers into an inescapable poverty trap (Mutisi, 2009).

In the last five years smallholder farmers have tended to focus more on production of cash crops, especially tobacco. Since the tobacco floors are centralised in Harare, smallholder farmers have faced challenges ferrying their product to the market mainly due to poor road networks serving the farms where they settled. The widespread interest in venturing into tobacco farming has also triggered widespread deforestation; the number of registered tobacco growers has gone beyond 70,000, with more than 80 percent of them belonging to the smallholder category. Because they do not have alternative means, the majority of the smallholder farmers rely solely on wood for curing their tobacco, resulting in extensive destruction of natural forests. It is estimated that over 46,000 hectares of forests were destroyed, while 1.38m cubic metres of firewood were burned to cure part of the 127m kilograms of tobacco delivered to the auction floors in 2011<sup>4</sup>.

#### **4.5 High HIV/AIDS infection**

The labour force in the agriculture sector has been negatively affected by the HIV/AIDS pandemic. Smallholder agricultural productivity is very sensitive to labour availability because it mainly depends on household labour. At the national level, the disease has significantly reduced the numbers of skilled agricultural professionals and labour through both death and morbidity, and at the small scale farmer level, HIV/AIDS has negatively affected agricultural productivity

through death, the time spent caring for the afflicted, and limited income and resources diverted to health care and funerals (Mutisi, 2009).

#### **4.6 Climate and changes in weather patterns**

There is evidence indicating trends of increased global human and environmental vulnerability as a result of the negative impacts of climate change (Cooper et al., 2008; Mutekwa, 2009; Polsky et al., 2003). Zimbabwe has started to exhibit bio-physical and human vulnerabilities associated with the climate change phenomenon. Observed and anticipated trends are testimony that climate change is slowly setting in, presenting a major challenge to smallholder farmers (Unganai, 1996). While projections show that most regions of sub-Saharan Africa will be affected by climate change, Zimbabwe is particularly vulnerable due to its heavy dependence on rain-fed agriculture and climate-sensitive resources (Brown and Dodman, 2012). The majority of smallholder farms in Zimbabwe depend on rainfall as a source of water, and as of 2009 only 7 percent of smallholder areas were under irrigation (Mutisi, 2009). Changing climatic and weather patterns currently pose a serious threat to agriculture, as they have disrupted rains, exposed smallholder farmers to numerous and periodic droughts and floods, and in general contributed to national food insecurity. A recent study done by Mugandani et al. (2012) has shown that major shifts have occurred in the agro-ecological zones of the country (see Annex 1) with drastic livelihood effects to smallholder farmers situated in these regions. The study points to an increase in the size of the dry regions IV and V by 5.6 and 22.5 percent respectively, while the size of wetter regions II and III decreased by 49 and 13.9 percent respectively (Mugandani et al., 2012).

A nationwide rural vulnerability assessment done by the Zimbabwe Vulnerability Assessment Committee (ZimVAC) shows that the majority (76 percent) of smallholder farmers already face water shortage challenges, while 36 percent are food insecure between May 2012 and the next harvesting season (Zimbabwe Vulnerability Assessment Committee, 2012). According to the report, communities in the drier regions IV and V are largely affected. To date, the agrarian reform exercise has focused more on acquiring and distributing large-scale commercial farms to landless peasants and other players. Smallholder farmers have not been equipped with relevant skills to adapt to the changing climate, including drought mitigation strategies, planting materials of appropriate drought resistant varieties, or adequate low-cost and affordable irrigation facilities to mitigate the impacts of recurrent droughts. In lieu of these, a number of response strategies to climate induced livelihood shocks are evident among smallholder farmers. Some are increasing the size of their farms, thereby exposing the bare land to erosion and sun-baking; others are subsisting on rivers, with consequences of high siltation levels in the major water bodies. This study has also shown that

changing climatic conditions have created a form of internal migration and conflict. Households are moving from areas that can no longer provide for their livelihoods (either because of frequent droughts or because the soil nutrients have been depleted) into formerly white owned farms, which are mostly located in the wet ecological zones. Competition for resources has in some instances resulted in deadly clashes. A study to assess the impacts of climatic variability on cotton production in Gokwe District of Midlands province has recorded migration of productive age groups to urban areas in search of alternative livelihoods and increased antisocial behaviour in the town centre (Brown et al., 2012). Limited on-farm opportunities as a result of increased climate variability have accelerated rural-to-urban migration (Tagutah, 2010).

From this section, we observe that the work of smallholder farmers is compounded by a multitude of challenges which are both socio-economic and environmental in nature. Addressing this interdisciplinary linkage requires the implementation of climate change response strategies that encompass all socio-economic and natural factors that influence smallholder farmers' productivity.

## **5.0 Impacts of climate change adaptation policy goals on smallholder agriculture**

The previous sections have shown that smallholder farmers in Zimbabwe already face a number of challenges, including widespread poverty, poor infrastructure, lack of adequate inputs and insecure land tenure, among others. Climate change is further compounding these challenges, placing food and water security, shelter, livelihoods and the health of millions of people at risk. Climate change-induced water stress is expected to intensify existing smallholder production challenges and consequently poses a major threat to sustainable development at the micro and macro levels (Brown and Dodman, 2012).

Recognising the impact of climate change on smallholder agriculture, a wide range of stakeholders have begun to develop response strategies to address agricultural vulnerability. The Initial National Communication submitted to the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) indicated the government's commitment to enhancing the resilience of smallholder farmers and increasing their adaptive capacity through land use changes and implementation of anticipatory adaptive measures such as infrastructure development as well as research and development (Government of Zimbabwe, 1997). In formulating the current Comprehensive Agricultural Policy Framework (2012–2032) the government noted climate change as a major threat to smallholder agricultural production and food security in the coming decades. Although there is not much emphasis on the threats posed by climate

change in the document as a whole (climate change is only mentioned 3 times), the policy framework identifies the need to promote greater crop diversification, adoption of farming techniques that conserve water (e.g. conservation farming), irrigation development and sustainable management of forest resources as key policy goals to increase the resilience of vulnerable smallholder farmers (Government of Zimbabwe, 2012).

Given the risk posed by climate change, the government, within the new policy framework, has prioritised promotion of greater crop diversification as a way of improving output, stabilising farm income and balancing household nutrition. This would involve research and adoption of high value crops such as horticultural produce, as well as investment in the production of small grains in drought prone regions of the country. Soil and water conservation through promotion of sustainable agricultural systems and construction of small dams and weirs would reduce detrimental effects of topsoil loss on crop yield. The new policy framework recognises the importance of irrigation to sustainable agricultural production and food security, especially in the face of climate change in Zimbabwe. In this framework, the government's drive is to ensure that all the previously equipped schemes are functional and to develop new irrigation schemes which will result in full utilisation of available water resources by smallholder farmers. The policy document also emphasises the need to maintain a friendly relationship with the environment by promoting the planting of timber plantations for construction and firewood for domestic use and tobacco curing; assisting in enforcing regulations within the rural areas to reduce veld fires and maintain ecosystem diversity; and promoting agro-forestry (Government of Zimbabwe, 2012).

While these policy goals are critical, and not underestimating the role of the agriculture sector in the country's economy, there are concerns that the government is shifting its focus towards the mining sector following the discovery of diamonds in the Marange fields. In his presentation of the 2012 Mid-Year Fiscal Policy Review, the Minister of Finance acknowledges the fast growth of the mining sector, with its contribution to the country's GDP almost trebling from 4 percent between 1999 and 2008 to current levels of close to 11 percent (Ministry of Finance, 2012). As a result of the changing focus, the government may not commit resources towards implementing agriculture-based climate change adaptation policy goals, but may rather concentrate on financing small scale miners who have benefited through the indigenisation policy, which compels foreign mining companies to transfer 51 percent of their ownership into the hands of Zimbabweans. There is evidence to support a sceptical outlook; since implementation of the FTLRP between 2000 and 2004, the government has been consistently unable to provide enough technical and extension support to newly settled farmers.

In support of the government's move to address climate change-linked challenges facing smallholder farmers, many NGOs and international organisations

have undertaken initiatives to help assist farmers adapt to climate change. However, as observed by Brown and Dodman (2012) and confirmed through interviews with key stakeholders, interventions by the various stakeholders are not coordinated, leading to challenges in targeting the most vulnerable socio-economic groups, and at times resulting in duplication of roles. Musarurwa and Lunga (2012) assert that policy instruments dealing with climate change risks, and disasters in general, are housed in various ministries of the government and consequently it has been difficult to coordinate climate change adaptation activities.

Realising the importance of coordinated efforts in implementing programs that respond to risks associated with climate change, the Government, through the Climate Change Office in the Ministry of Environment and Natural Resources Management and with support from UNDP, has initiated the formulation of a comprehensive National Climate Change Response Strategy (NCCRS), which by March 2013 had not been finalised. Funding for development of the NCCRS was very sparse and the process has stalled. Unfortunately, there is no indication of when the policy will be finalised or implemented<sup>5</sup>. The NCCRS is one of government's efforts to address climate change in the country by ensuring coordination and effectiveness in programs aimed at addressing climate change. The strategy is expected to inform the government on whether there is need for a policy or another legal instrument on climate change, and to provide a framework for a comprehensive and strategic approach on aspects of adaptation, mitigation, technology and financing as well as public education and awareness<sup>6</sup>.

## 6.0 Discussion

This paper has established that challenges currently facing the smallholder agriculture sector in Zimbabwe are multi-faceted in nature. While farmers are confronted with problems of poor infrastructure, lack of adequate inputs and insecure land tenure, the agriculture sector is very sensitive to climatic conditions; hence, recently observed trends signal increased exposure of smallholder farmers to the negative impacts of climate change. Agrarian reform processes which were implemented to address equity issues in land ownership have not tackled other socio-economic challenges that smallholder farmers already face, and at the same time have failed to put in place mechanisms to help farmers adapt to the negative impacts of climate change. Strategies aimed at sustaining the smallholder agriculture sector should therefore be responsive to socio-economic challenges that farmers face as well as to the unavoidable threats posed by climate change.

The paper is cognisant of the enclave nature of the economy that the country inherited at independence, in which the majority of locals were elbowed out of arable and productive land by a few white settler farmers. Post-independence land reform processes, and in particular the 2000 FTLRP, have succeeded in redistributing land to

previously landless citizens. However, the drive of these reforms to boost smallholder agricultural productivity has generally suffered as a result of weak technical support services and the acute shortages of essential inputs such as seeds, fertilizer and fuel. Climate change-related impacts including droughts, floods and erratic rainfall regimes have exacerbated an already difficult situation, making it harder for smallholder farmers to raise their productivity as expected.

Rapid climate change-induced changes in the agriculture sector require technological advancements and coping mechanisms that strengthen the resilience of smallholder farmers. However, failure by the government to invest in training of agricultural extension staff has negatively impacted on smallholder farmers' productivity. During the FTLRP, for example, extension staff training only came as an afterthought which had not been considered at the onset of the program. Later, the government was forced to initiate a makeshift extension staff training program to deal with the unexpected proliferation of beneficiaries under the FTLRP. Government-trained agricultural extension officers who graduated from this system have not been adequately equipped with knowledge to pass on to beneficiary smallholder farmers. Again, challenges of poor infrastructure, lack of adequate inputs and insecure land tenure mean that the government was not prepared to handle an abrupt surge in the number of resettled farmers. Notwithstanding the urgency of land equity from the land-hungry farmers' perspective, an agricultural reform policy that allowed for gradual acquisition could have helped the government to put in place structures and systems to help farmers boost their productivity. The absence of such an instrument has seen the county slip from being a breadbasket of Southern Africa, to a net food importer within the region.

The impacts of climate change will continue to fall hard on smallholder farmers who have little adaptive capacity and who are already crippled by the lack of input and technical support. Because of the high level of vulnerability, there is an urgent need for policies that lessen the risks and ensure farmers understand the threats from climate change. Although the current Comprehensive Agricultural Policy Framework (2012–2032) has noted climate change as a major threat to smallholder agricultural production and food security, without total commitment to address climate change-linked challenges that smallholder farmers face the sector will continue to suffer from productivity deficits.

It is important that national actions to achieve climate change adaptation goals critically consider other productivity challenges that farmers face. In Addition to the Comprehensive Agricultural Policy Framework (2012–2032), the NCCRS should provide for effective coordination in efforts aimed at addressing climate change. This paper argues that tangible benefits from implementing climate change adaptation goals will only be accrued if these goals are not treated in isolation, but rather are integrated into policy measures that seek to address the many productivity and livelihood challenges that farmers already face.



## 7.0 Conclusions and recommendations

This paper has shown close linkages between agriculture reform processes in Zimbabwe, current socio-economic challenges that smallholder farmers face, and their vulnerability to the impacts of climate change. Although post-independence agrarian reforms have successfully transferred land from a few commercial farmers to the black majority, the beneficiaries still face challenges related to capacity gaps, input support, markets for agricultural produce and poor infrastructure. The impacts of climate change are further amplifying these challenges and as a result smallholder farmers remain in poverty and vulnerable to natural disasters. The government has made strides to promote national-level climate change adaptation in the agriculture sector largely by putting in place the Comprehensive Agriculture Policy Framework (2012–2032), which sets out clear climate change adaptation policy goals, and by spearheading formulation of the NCCRS whose emphasis is to set a coordinated strategic framework for climate change adaptation.

Based on the analysis of the current status of agriculture policy reform processes, challenges that smallholder farmers already face and the likely impacts of climate change adaptation policy goals of smallholder agriculture, the following recommendations can be made:

- The government led ‘fast-track’ extension officer training program which was initiated in response to a surge of beneficiaries of land reform from 2000–2005 has not adequately equipped the graduates with the necessary skills. Graduates underwent training for only 6 months, instead of the 2 years that the conventional curriculum covers. Intensive training of agricultural extension officers should be prioritised in order to equip them with practical knowledge on climate change mitigation and adaptation, which they can cascade down to smallholder farmers. This would also help to compliment community-based adaptation activities that are already being carried out by NGOs.
- The Comprehensive Agriculture Policy Framework (2012–2032) identifies the need to promote greater crop diversification, adoption of farming techniques that conserve water (e.g. conservation farming), irrigation development and sustainable management of forest resources as key policy goals to deal with the negative impacts of climate change. A national agricultural action plan couched in line with these climate change adaptation policy goals would ensure that the effects of climate change are critically analysed and appropriate response strategies formulated

in order to ensure a sustainable boost in smallholder agricultural productivity.

- The government initiated the process of developing a NCCRS in 2012, and currently the process is stalled because of lack of funding – which may reflect a lack of goodwill on the part of the government. Resources should be committed and the process expedited so as to facilitate a coordinated approach towards achieving climate change adaptation goals, unlike the current situation where issues of climate change are provided for in various pieces of legislation and strategy documents.
- Farmers still face input support challenges. However, in realisation of the different agro-ecological regions where smallholder farmers are located, there is need for more systemic targeting in agricultural input support which promotes crop diversification and respects productivity trends and variations across the agro-ecological zones of the country.
- Because of market challenges, smallholder farmers are shunning adaptable crop varieties like sorghum and millet and focusing on cash crops like tobacco. As a result they continue to suffer from food deficits. A market-oriented climate change adaptation approach which guarantees high returns to farmers who grow adaptable crop varieties like small grains should be considered, rather than the current situation where emphasis is put on cash crops like cotton and tobacco.

### END NOTES

- <sup>1</sup> Enclave economy – refers to an economy in which there exist small pockets of economically developed regions (often due to the presence of colonial or foreign firms engaged in plantation and mining activities) with the rest of the larger outlying areas experiencing very little progress.
- <sup>2</sup> <http://www.zimbembassy.se/documents/Land.pdf>
- <sup>3</sup> Score 1 = stakeholder had limited influence on land reform policy  
Score 2 = stakeholder had slight influence on land reform policy  
Score 3 = stakeholder extensively influenced land reform policy
- <sup>4</sup> [http://www.herald.co.zw/index.php?option=com\\_content&view=article&id=36561:tobacco-curing-and-deforestation&catid=39:opinion-a-analysis&Itemid=132#.UNF59KywBIU](http://www.herald.co.zw/index.php?option=com_content&view=article&id=36561:tobacco-curing-and-deforestation&catid=39:opinion-a-analysis&Itemid=132#.UNF59KywBIU)
- <sup>5</sup> [http://www.herald.co.zw/index.php?option=com\\_content&view=article&id=72515:climate-change-policy-overdue&catid=41:business&Itemid=133#.UV1eXTdH7IU](http://www.herald.co.zw/index.php?option=com_content&view=article&id=72515:climate-change-policy-overdue&catid=41:business&Itemid=133#.UV1eXTdH7IU)

<sup>6</sup> <http://africabusiness.com/2012/11/13/zimbabwe-formulating-a-national-climate-change-response-strategy/>

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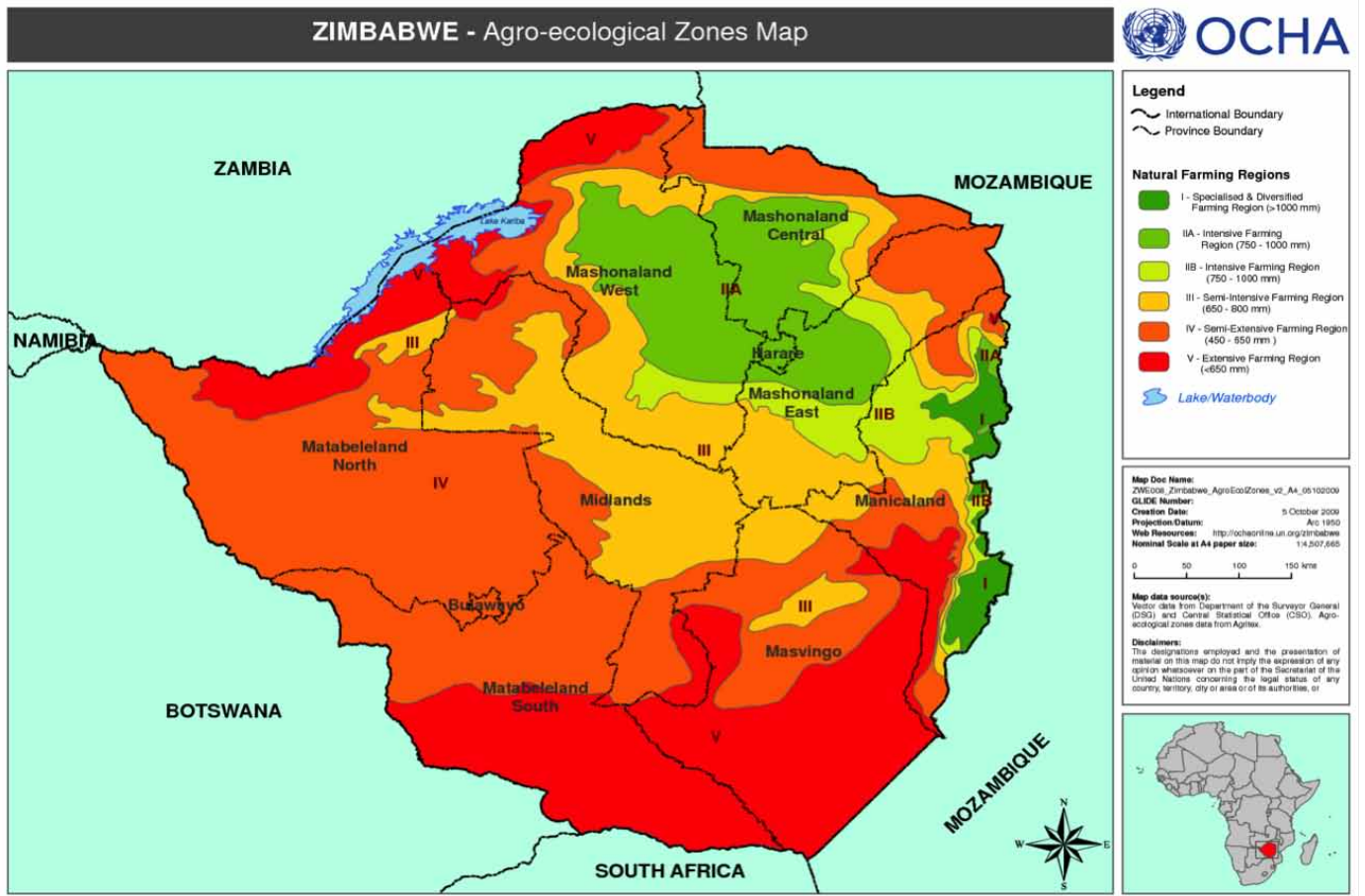
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# Annex 1: Natural ecological zones of Zimbabwe



## Annex 2: List of people interviewed during the study

Name	Institution
<i>Dr. D. Chimanimani</i>	University of Zimbabwe
<i>Dr. M. Masiiwa</i>	University of Zimbabwe
<i>Professor S. B. Feresu</i>	University of Zimbabwe
<i>Dr. J. Manjengwa</i>	University of Zimbabwe
<i>Dr. P. Bongo</i>	University of Zimbabwe
<i>Professor C. Mugadza</i>	University of Zimbabwe
<i>S. Zvigadza</i>	ZERO Regional Environment Organization
<i>W. Zhakata</i>	Climate Change Office – Ministry of Environment and Natural Resources Management
<i>E. Samuriwo</i>	Ministry of Environment and Natural Resources Management
<i>C. Zhuwau</i>	Zimbabwe Parks and Wildlife Management Authority
<i>W. Makotose</i>	Ministry of Agriculture, Mechanization and Irrigation Development
<i>D. Gumbo</i>	Independent Development Consultant
<i>L. Mika</i>	Practical Action
<i>A. Masendeke</i>	Practical Action
<i>F. Mutemachimwe</i>	Africare
<i>J. Machikicho</i>	Africare
<i>T. Fakarayi</i>	Birdlife Zimbabwe
<i>A. Dube</i>	Agritex
<i>J. Sigauke</i>	Beneficiary farmer (Bindura)
<i>F. Jinjika</i>	Beneficiary farmer (Bindura)
<i>A. Zhangazha</i>	Beneficiary farmer (Chimanimani)
<i>M. Mwakachiyenyi</i>	Beneficiary farmer (Chimanimani)

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