WORLD BANK GROUP

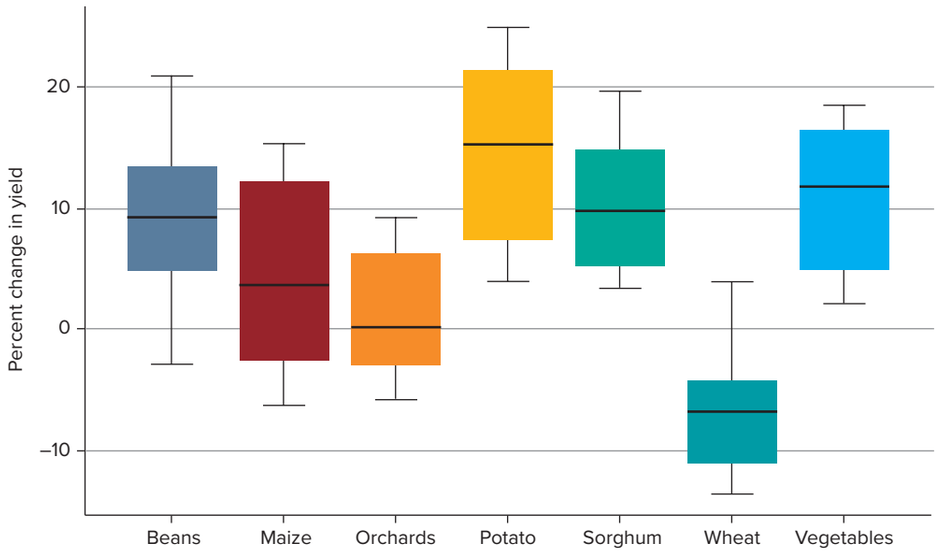
AGRICULTURE GLOBAL PRACTICE NOTE

# Lesotho Climate-Smart Agriculture Investment Plan

Lesotho's agricultural system faces a growing number of climate-related vulnerabilities with droughts, floods, pests, and extreme temperatures occurring more frequently. In response, the Government of Lesotho is collaborating with the World Bank to integrate climate change into the country's agriculture policy agenda through the Lesotho Climate-Smart Agriculture Investment Plan (CSAIP).

AGRICULTURE GLOBAL PRACTICE NOTE—DECEMBER 2019

**FIGURE 1** Projected impact of climate change on major Lesotho crops.




The Lesotho CSAIP aims to identify climate-smart agriculture (CSA) investments that offer the greatest potential to transform Lesotho's agriculture into a more productive, climate-resilient, and low-emissions sector. CSA is an approach for transforming and reorienting agricultural systems to support food security under the new realities of climate change. CSA comprises three pillars: increasing productivity, enhancing resilience and adaptation, and reducing greenhouse gas emissions from the agriculture sector compared to past trends. The CSAIP provides evidence that shows that the adoption of CSA offers multiple wins: increased productivity and incomes; enhanced food security and dietary diversity; reduced impacts of climate change on agricultural produce; and improved commercialization, employment opportunities, and rural livelihoods. The CSAIP shows that CSA can also reduce soil erosion, generate carbon sequestration, conserve biodiversity, and provide other public goods that accrue to society—well beyond the farmers engaged in market transactions alone.

Lesotho's CSAIP is the outcome of a partnership between the Government of Lesotho and the World Bank. The CSAIP represents a commitment by the World Bank's Food and Agriculture Global Practice under the Eighteenth Replenishment of the International Development Association (IDA18) to support the development of country-level CSA strategies and investment plans. The CSAIP builds on existing strategy documents, including Lesotho's Second National Strategic Development Plan (NSDP II), and Lesotho's international climate commitments articulated in its Nationally Determined Contribution (NDC). Through a process that combines several modeling approaches, and consultations with stakeholders in the public and private sectors, civil society, and farmer groups, the CSAIP evaluates context-specific opportunities for scaling up CSA in Lesotho.

The current agricultural production pathway in Lesotho focuses on extensive animal grazing and expansion of agricultural cropland to keep pace with food demand for the population. The pathway is characterized by agricultural support for a monoculture cropping system dominated by maize. This pathway is largely unsustainable and depletes the land resources on which production relies on over time. The CSAIP offers two complementary pathways for scaling up CSA in Lesotho. The first is the commercialization pathway that entails focusing on commodities for which the country has distinct comparative advantage like horticulture, potato, and aquaculture; developing the country's irrigation to its full potential; and developing linkages that connect smallholders to export and domestic markets. The second pathway is the resilient landscape pathway, that combines modern scientific practices such as improved crop varieties with the traditional Machobane farming system, a farming system that

**TABLE 1** Comparison of indicators under Commercialization and Resilient Landscape.

| Indicators | Commercialization | Resilient Landscape |
|---|---|---|
| Net household income (US$ per year) | 1,233 | 698 |
| Increase in crop yields over historical (%) | 60 | 70 |
| Cropland area (ha) | 132,247 | 153,482 |
| Livestock production (ton) | 38,849 | 45,765 |
| Erosion control: Gross erosion (Million ton (Mt) per year) | 39 | 35 |
| Food availability[1] (kcal/capita/day) | 675 | 649 |
| Export potential | moderate | none |
| GHG mitigation: carbon balance, ton carbon dioxide equivalent ($tCO_2$-eq) | −2,521,976 | −26,228,494 |
| Job creation (number of stable jobs) | 39,378 | 27,682 |
| Economic internal rate of return, EIRR (%) | 32 | 13 |
| Carbon benefits (US$ million) | 2–17 | 36–282 |
| EIRR with carbon benefits (%) | 32–34 | 16–73 |
| Financial cost (US$ million) | 208 | 268 |

*Blue color indicates that a pathway performs better on an indicator; red color indicates otherwise.*

combines the use of crop rotation, relay cropping, and intercropping practices with the application of manure and plant ash to conserve soil moisture and replenish soil fertility. The resilient landscape pathway primarily focuses on investing in sustainable landscape and integrated catchment management, and strengthening local institutions to enhance landscape resilience, that is, the ability of the landscape to sustain desired ecological functions, native biodiversity, and critical landscape processes over time in the face of changing conditions and multiple stressors.

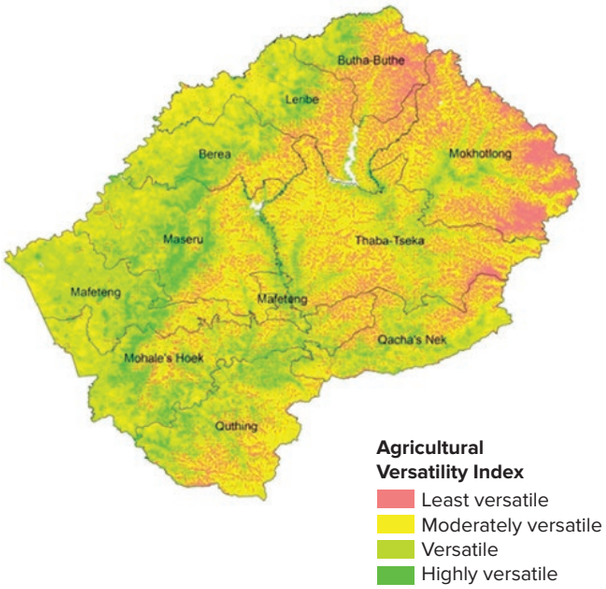
The commercialization pathway is often more profitable; it requires larger farm sizes (greater than 2.5 hectares), takes up less land for the same amount of production, creates more jobs, produces more food calories, and offers Lesotho the potential to export horticulture, potato, and vegetables. It also requires strong market-oriented agricultural policies for it to be successful (Table 1). Furthermore, commercialization would require developing Lesotho's agricultural value chains and ensuring the proper functioning of land markets.

On the other hand, a resilient landscape pathway is often more effective in controlling land degradation and delivers about ten times more carbon benefits compared to commercial agriculture. Thus, compared to the commercialization pathway, the resilient landscape pathway could potentially benefit more from climate finance which can come from a variety of sources including the United Nations Framework Convention on Climate Change (UNFCCC) funding mechanisms, multilateral and bilateral funds, national and regional climate funds, and private-sector investments. The resilient landscape pathway is costlier for the public sector, but is also easier to implement. It is more tailored toward locally adapted technologies that the average smallholder farmer in Lesotho can practice.

Commercialization can be prioritized largely in lowlands and foothills—the fertile and most productive parts of Lesotho that are suitable for orchards, vegetables, wheat, potato, and peas. Resilient landscape can be emphasized largely in the highlands that are suitable for potato, wheat, peas, and orchards. The highlands would also benefit from afforestation and farmer-managed natural regeneration to restore and replenish less fertile land (Figure 2).


[1]This indicator measures food calories derived from national agricultural production. Lesotho's major food calorie requirements are obtained from agricultural imports.

**FIGURE 2** Lesotho Land Versatility Map.




*More versatile soils are more fertile, productive, and suitable for a variety of crops.*

The effective scaling up of CSA in Lesotho will require addressing a number of adoption barriers, including limited implementation capacity, insufficient access to inputs and credits, and insufficient agricultural research (Figure 3).

Some of the policy actions to support effective scaling up of CSA identified in the CSAIP include:

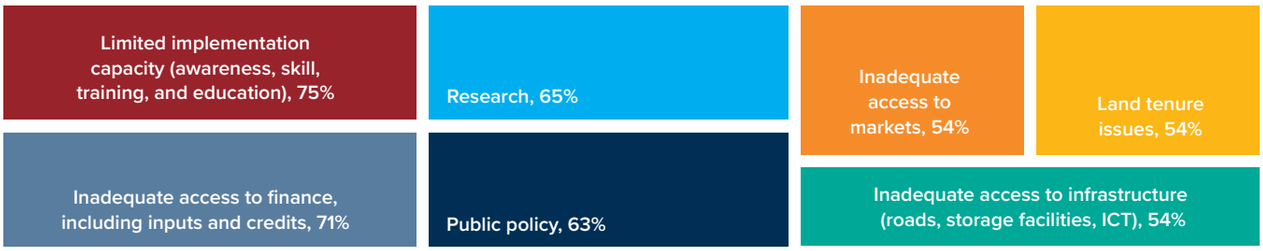
***Realigning agricultural support to promote CSA.*** It is vital that government policies and investments address the demand and supply sides of inputs critical to CSA by building sustainable, private sector–led input markets. Market-smart subsidies, that is, time-bound interventions implemented as part of a comprehensive, long-term input promotion strategy that encourages market development and private investment in fertilizer and other agricultural inputs, are vital. An example is the electronic input voucher system that local microfinance institutions or agricultural credit cooperatives can use to qualify farmers for loans and issue cash or credit vouchers that can be used to redeem inputs such as seeds or fertilizers.

***Strengthening agricultural research and extension.*** There is a need to strengthen research and establish partnerships with international research institutes to develop high-yielding, stress-tolerant, climate-ready varieties. Agricultural extension services should be upgraded to catalyze the agricultural innovation process; improve the CSA knowledge system; facilitate access to information, knowledge, and expertise; and provide technical advice to farmers.

***Building capacity to access climate finance.*** Lesotho faces a financing gap in the agriculture sector with low capacity to access climate finance. Critical areas that need capacity development include identifying funding gaps and needs; assessing public and private financing options; developing payment for ecosystem services programs; developing bankable investment plans, project pipeline, and financing propositions; and developing financially viable opportunities for effective private sector engagement.

CSA could bring about sustainable improvement in the lives and livelihoods of Lesotho's smallholder farmers. Protecting smallholder farmers from falling into poverty in the event of climatic shocks and giving them the tools to thrive are important objectives in the partnership between the Government of Lesotho and the World Bank.

**FIGURE 3** Impact of factors on adoption of CSA in Lesotho.




*Importance of factors for adoption was first rated as 1 = Very low; 2 = Low; 3 = Moderate; 4 = High; and 5 = Very high. Thereafter, scores for each factor were averaged over the number of stakeholder respondents and expressed as a percentage. Higher percentages indicate that it is more critical and urgent to address a factor for effective CSA implementation in Lesotho.*

WORLD BANK GROUP

**Internet:** www.worldbank.org/agriculture **Twitter:** http://twitter.com/wb_agriculture