

Food Security in Zimbabwe

Improving small-holder rain-fed farming systems



Key Messages for Nkayi District, Zimbabwe

Improving small-holder crop and livestock management practices and soil amendment today can help reduce vulnerability and poverty rates. In areas where poverty levels are already very high this will also reduce future losses and vulnerability due to climate change.

CLIMATE

- **Minimum and maximum temperatures** are consistently increasing over the region.
- **In the 2050s, temperatures** are expected to increase from 2°C up to 3°C.
- **Precipitation changes are variable:** a decrease by about 25% is possible by the 2050s in the region.

IMPACTS

- **Negative impacts on the rangelands** result in reduced feed intake for **livestock** and hence productivity. Farms with higher stocking density would be more at risk.
- **Groundnuts** as cultivated today, in most cases can benefit from climate change.
- **Maize** and **sorghum** on today's farms, with low productivity, would not experience large impacts.

VULNERABILITY

- **70% of current farming households** may be exposed to greater vulnerability due to climate change.
- **Improved management practices** implemented today, and geared towards farmers at different levels of resource endowments, could improve farm yields from 130% to 200%.
- **The poorest farmers, under a sustainable development pathway, could benefit from climate change**, stemming from limited impacts on cereals and positive effects on groundnuts, that will play a major role in farmers' income.

CLIMATE VULNERABILITY IN NKAYI DISTRICT, ZIMBABWE

Nkayi is a poor rural district in Zimbabwe of predominately rainfed agriculture vulnerable to low and variable precipitation (<650 mm annual average) and droughts that occur every 2 out of 5 years. Poor soil fertility of the prevailing sandy loam soils, continuous cultivation, and limited input use result in low agricultural productivity.

According to national statistics, more than 70% of the national population depends on agriculture for their livelihoods. Poverty in Nkayi is the highest in the country, with more than 76% of the rural population estimated below the poverty line (1.5 USD per capita expenditure per day), and more than 22% considered extremely poor (<1 USD per capita expenditure per day, ZimVac, 2013). Food self-sufficiency varies from 3 to 10 months depending on the annual rainfall, leaving rural households extremely vulnerable to the adverse effects of climate change.

Farms are predominately maize and cattle producing; all grow maize, and about two thirds keep cattle. Farmers with cattle cultivate more land, intensify and diversify more into alternative crops, and earn more off-farm income than those without cattle. Current crop yield levels are extremely low, similar to the national average.

Vulnerability of farms in Nkayi district is already high. According to this study, about 95% of the very poor without cattle live below the

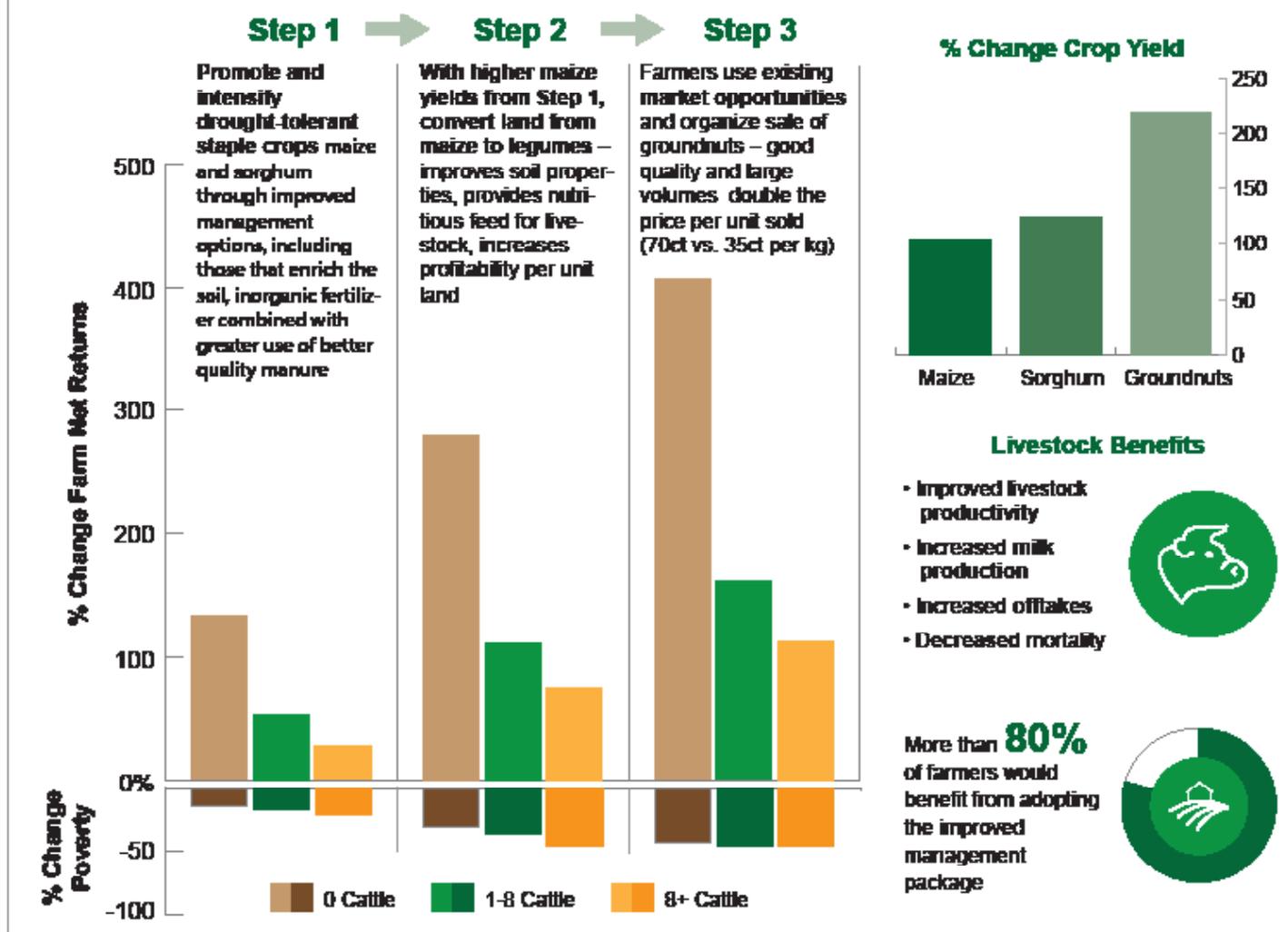
poverty line, 90% of the less poor with small cattle herds, and 60% of the better off.

Assuming a future climate that will rise 3°C in temperature and receive 25% reduced rainfall, with no other changes in the socio-economic context, up to 70% of current farming households could be exposed to greater vulnerability. Climate change will affect mostly those with larger cattle herds (80% vulnerable) and small cattle herds (70%), and less the very poor (60% vulnerable), who however already live under extreme levels of vulnerability. A hotter and drier climate would negatively impact livestock fodder, milk production, and farms with higher stocking density.

Improved management practices implemented today, and geared towards farmers at different levels of poverty, could improve farm yields from 130% to 200%.

By implementing the improved management, farms will have intensified crop and livestock production, grown cereals for food self-sufficiency, and converted more land to groundnuts and forage legumes. The poorest farmers could then benefit from climate change, stemming from limited impacts on cereals and positive effects on groundnuts, that will play a major role in farmers' income. Those with cattle tend to lose from climate change, especially with larger herds, due to negative climate effects on rangelands and insufficient feed.

IMPROVING PRACTICES TODAY



Impact of improved management practices for crops and livestock if implemented today. Poverty rate used is less than \$1.25 per person per day.

FUTURE DEVELOPMENT AND CLIMATE CHANGE VULNERABILITY IN NKAYI, ZIMBABWE

Contrasting future scenarios were developed through dialogue with stakeholders at local and national levels as story-lines of how Zimbabwe could evolve. The two development pathways were sustainable development, “Green Zimbabwe” and fast economic growth, “Grey Zimbabwe.”



Current Farms

40 to 70% of current farming households will be exposed to greater vulnerability

80% farms with larger cattle herds

70% small cattle herds

60% without cattle

Poverty Rate 89%



Green Road - Sustainable Development Pathway

48% farm households would be vulnerable under the Green Road scenario

54% farms with larger cattle herds

49% small cattle herds

42% without cattle

Poverty Rate 40%

Green Road Sustainable Development

The Zimbabwe government policy objective will be to achieve food security, reduce rural poverty and increase agriculture contribution to the national economy, while preserving the natural resource base. Public investments in human health and education will contribute to slow human population growth. Slow economic development will provide limited options alternative income generation.

- In farming, more drastic changes will be needed for the uptake of environmentally sound productivity enhancing technologies and sustainable market flows.
- Investments will be in improving infrastructure, land tenure security, research, extension and service delivery.
- Better access to input and output markets and services will motivate farmers improving crop and livestock productivity and production.
- Inclusive development approaches will strengthen social organization and ensure that despite different predispositions for farming, all farmers will engage and benefit from improving production to market activities.
- Non-poor farmers (MO), who own larger herds of livestock, will intensify and expand their crop livestock activities, setting more land in value with a greater share of legumes and increase cattle herd sizes, with market oriented technology packages.
- Very poor farmers (FS), who currently don't own cattle, will also intensify crop production and set more land in value, they will start cattle production with few animals and increase goat herd sizes.
- Women will play a strong role in farming, associated with food and nutrition security.

Grey Road Fast Economic Growth

Zimbabwe's agricultural policies will target fast economic growth through trade within the Southern Africa regional network, using the economic pull by more advanced economies and developing its comparative economic advantages within the region.

- The agricultural economy will be driven by the commercializing farming sector, transitioning towards intensified farming.
- Public and private investments will support agricultural innovation and delivery systems, promoting improved varieties and breeds, soil fertility enhancements that maximize productivity and production.
- Social standards and environmental services will be valued for enhancing market flows.
- Intensifying farms and agricultural industries will provide employment opportunities for the poor.
- Growing inequality along with increasing human populations in the marginal areas will aggravate resource degradation, especially for the poor.
- The more market oriented farmers (MO), with cattle and in a better position to intensify, will expand and intensify production of agricultural commodities with comparative advantage, they will increase the use of local labor.
- The poor, who depend more sustaining food security (FS), will maintain a share in agriculture and engage more in off-farm activities, e.g. working on others farms, than farming themselves, labor is a critical constraint to increasing production.

2050s Climate Projections

Nkayi climate is likely to be variable and drier in the future, with higher temperatures across the year.



+ 2 to 3°C



Precipitation variable: a decrease by about 25% is possible

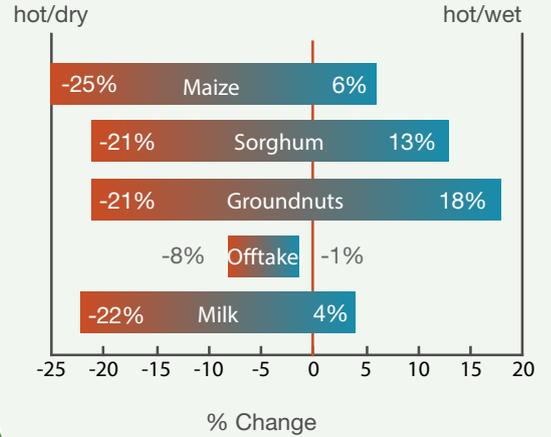
Minimum and maximum temperatures are consistently increasing over the region.

2050s Farm Projections

Changes in climate under high emissions could lead to:

CURRENT FARM SYSTEM

Type: Family Farm
Size: < 1 hecter
Crops: Maize, Sorghum, Groundnuts
Livestock: 60%
Irrigation: Rainfed
Soil Type: Sandy
Food insecurity: High



2050s Economics Projections

Today 40-70% of farms are **Vulnerable** to climate change



With Sustainable Development 48% of farms may be vulnerable to climate change in the future

Today 89% of farms are in **Poverty** earning less than \$1.25 per person per day



With Sustainable Development 40% of farms are in poverty in the future

Management Improvements for Today



Improved cereal production

Micro-dosing, manure, improved varieties, increased planting densities



Improved legume production

Maize land to legumes, P-fertilizer application, improved varieties, increased planting densities



Market incentives

Higher prices for higher quality and larger volumes of groundnuts, mechanized shelling



93% of farms could benefit from improved management practices

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