GLSCRP
GIYANI LOCAL SCALE CLIMATE RESILIENCE PROGRAMME

WATER RESEARCH COMMISSION

GUIDELINES FOR SMALL FARMERS IN GIYANI

CLIMATE RESILIENT AGRICULTURE IN SMALLHOLDER FARMING SYSTEMS

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WATER RESEARCH COMMISSION

The Giyani Local Scale Climate Resilience Programme (GLSCRP) aims to develop and implement activities that will research, develop and demonstrate climate adaptive responses and solutions for optimising water utilisation in drought-stricken areas.

The programme will focus on the Greater Giyani Municipal area within the Mopani district and aims to impact an estimated 5000 beneficiaries over a three-year period in terms of water utilisation, improved water mix, and socio-economic opportunities as responses to climate adaptation.

A 2019 WRC study on droughts and adaptation strategies has highlighted risks to reduced productivity, livelihoods and food security, and an increase in vector and water-borne diseases in communities such as Giyani. Ultimately, climate change impacts on water resources in the Giyani area cannot be underestimated.

The programme has three key areas that will support for improving local scale adaptation and resilience in Giyani.

They are:

1) a strengthened enabling environment whereby local authorities, institutions, communities, traditional authorities and market players are mobilised to improve climate resilience and water utilisation;

2) improved energy, ground and surface water solutions developed with communities to optimise and diversify water sources;

3) activities that support livelihoods and local economic development opportunities.

The programme will cover a spectrum of rural and rural residential areas in Giyani, working closely with the Mopani District Municipality and the Greater Giyani Local Municipality. Implementation partners include Tsogang Water and Sanitation as the lead on water projects and infrastructure; Association for Water and Rural Development (AWARD) in support of capacity development and stakeholder engagement, University of the Western Cape (UWC) as the water and energy technical partner and the WRC's TTO Enterprise Development arm on social enterprise development supporting local economic development projects.

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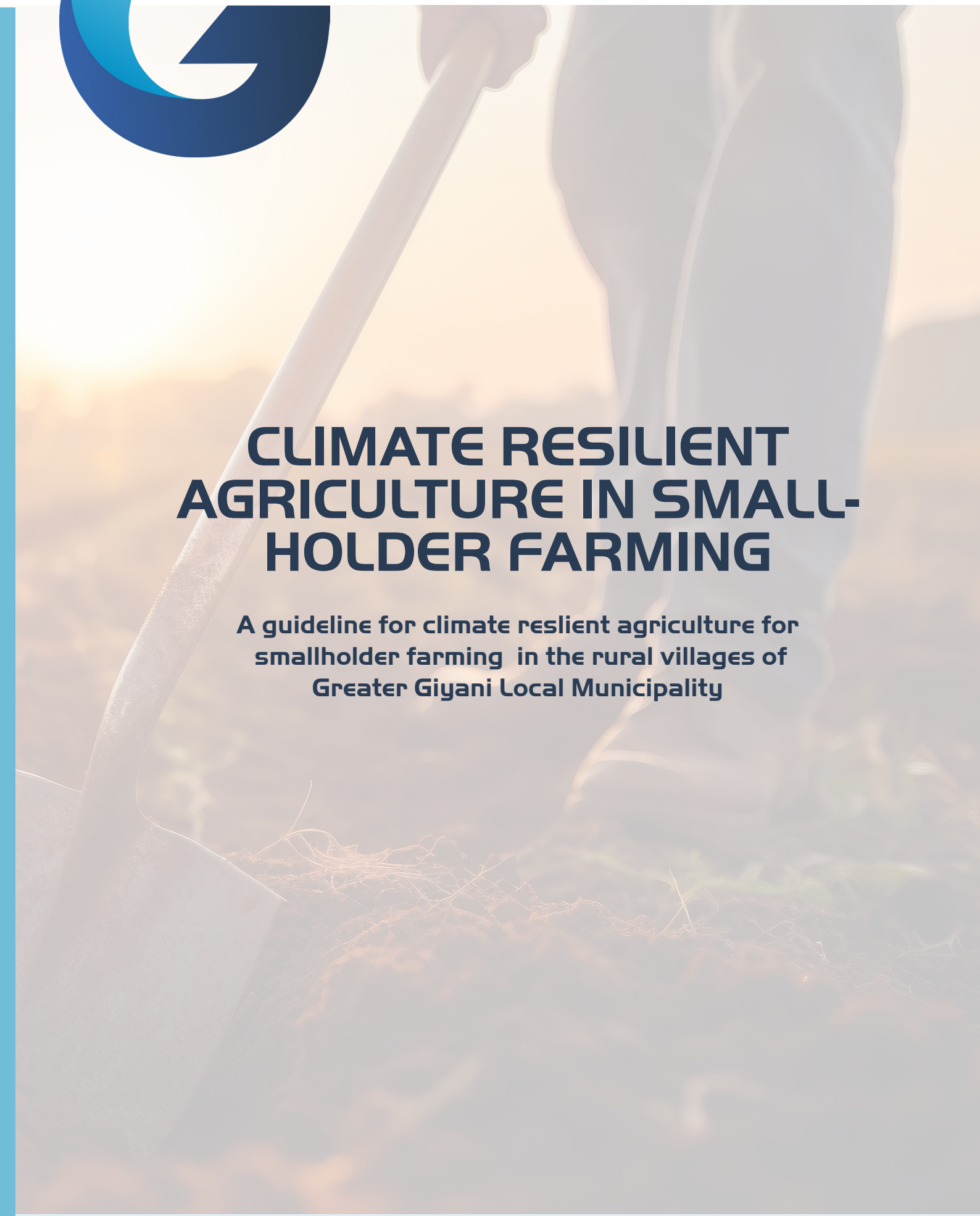

CLIMATE RESILIENT AGRICULTURE IN SMALL-HOLDER FARMING

A guideline for climate reslient agriculture for smallholder farming in the rural villages of Greater Giyani Local Municipality

ABOUT THIS GUIDELINE

The Climate Resilient Agriculture (CRA) guidelines provide a comprehensive framework for sustainable farming in the face of climate change.

They focus on increasing agricultural productivity and income while ensuring long-term environmental preservation. The guidelines advocate for a holistic approach that incorporates diverse cropping systems, efficient resource use, and resilience to climate risks. They emphasize recycling nutrients, considering local culture and social values, promoting responsible governance, and encouraging circular economies within communities. By adopting these practices, farmers can enhance their resilience to climate variability and contribute to sustainable agricultural systems for future generations.

Who is the guideline for?

The Climate Resilient Agriculture (CRA) guidelines are designed for smallholder farmers, agricultural practitioners, and policymakers who aim to enhance agricultural productivity while adapting to climate change. These guidelines emphasize the need for sustainable farming practices at the farm and household levels, ensuring the long-term viability of agriculture and the natural environment. Key principles include promoting diversity in crops and livestock, creating synergies between farming activities, enhancing efficiency in resource use, building resilience to climate shocks, recycling nutrients, and incorporating human and social values into farming. Additionally, the guidelines advocate for responsible governance and the promotion of circular economies within agricultural communities.

What does the guideline contain?

The guideline contains principles of climate resilient agriculture (CRA). Climate change adaptation for smallholder farmers requires a fundamental shift in the way land, water, nutrients, and agriculture resources are managed hence the principles are essentials for CRA. It also contains guidelines on the implementation of CRA which emphasize on starting with what one knows and adapting to local context for being resilient.

The guideline emphasizes practical and community-driven approaches to farming that can lead to increased productivity, resilience and sustainability. These guidelines emphasize that successful practices should align with local conditions, build on existing knowledge and prioritize sustainability and environmental stewardship.

How to use the guideline?

To use the Climate Resilient Agriculture (CRA) guideline effectively, farmers and agricultural practitioners should integrate its principles into their daily farming activities. Begin by assessing the local climate risks and challenges, then adopt diverse cropping systems and integrate livestock to enhance resilience. Use resources like water, soil, and nutrients more efficiently while reducing waste, and create synergies between different farm activities to improve overall productivity.

Implement recycling practices for nutrients and organic matter, and ensure that local traditions and social values are respected. Furthermore, the five fingers practices of agroecology should be implemented. These practices are categorized into five key areas which are water, soil, crop, livestock and natural resources management.

CLIMATE RESILIENT AGRICULTURE

Climate Resilient Agriculture (CRA) is an approach to farming that seeks to increase agricultural productivity and income while adapting to a changing climate. It aims to ensure that agriculture remains sustainable for future generations while preserving and enhancing the natural environment. CRA focuses on sustainable practices at the farm and household level. These guidelines outline the principles and some practices, emphasizing the need for a holistic and adaptable approach.

KEY PRINCIPLES

Climate change adaptation for smallholder farmers requires a fundamental shift in the way land, water, soil, nutrients, and genetic resources are managed. The following principles are essential for CRA and also fall within the practices of Agroecology (Wezel, et al., 2020).

DIVERSITY

Promote diverse cropping systems, livestock integration, and natural resource management to enhance resilience.

SYNERGIES

Create synergies between different farming activities to maximize efficiency and productivity.

EFFICIENCY

Use resources more efficiently, minimizing waste and inputs.

RESILIENCE

Develop farming systems that are resilient to risks, shocks, and long-term climate variability.

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RECYCLING

Implement practices that encourage the recycling of nutrients and resources.

HUMAN & SOCIAL VALUES

Consider local culture, food traditions, and social values in agricultural practices.

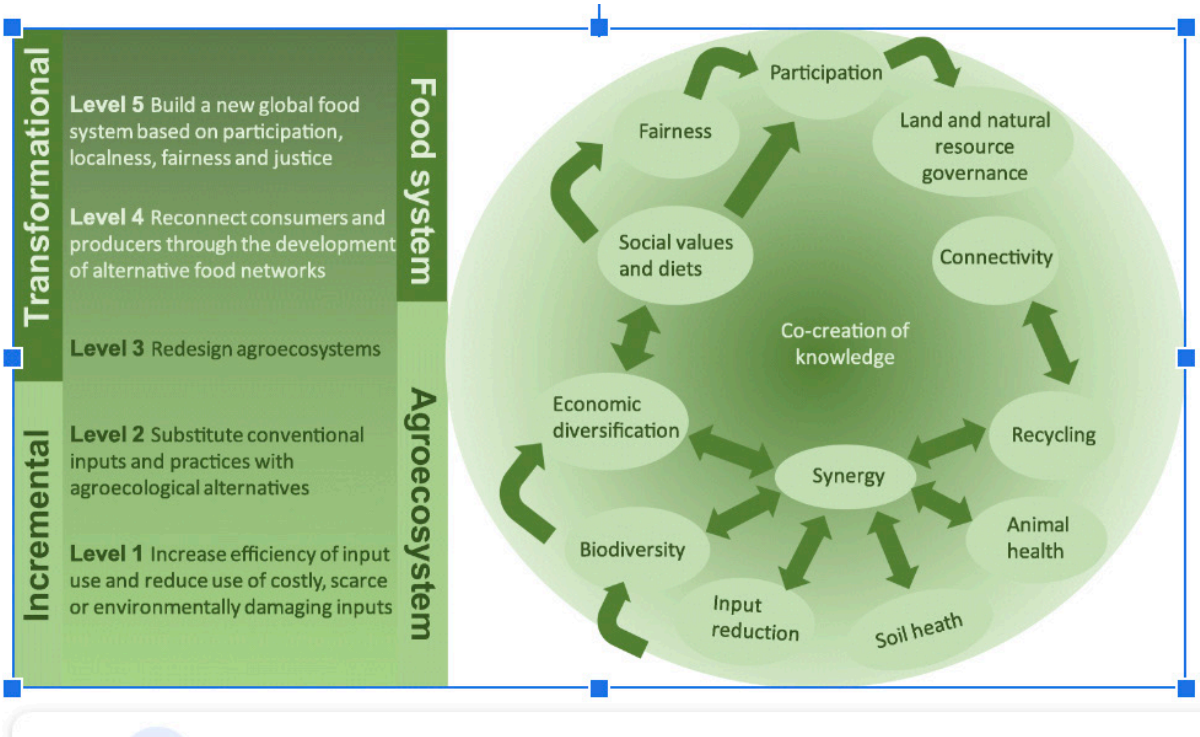
RSPONSIBLE GOVERNANCE

Encourage responsible and sustainable land and resource management.

CIRCULAR & SOLIDARITY ECONOMY

Promote circular economy practices and collaboration within the community.

CRA emphasizes a shift from training-led processes to self-motivated experimentation and from commodity-focused interventions to knowledge co-creation within the smallholder farming system. New ideas and technologies should build on existing practices and understanding, fostering collaboration and adaptability within the community.



GUIDELINES FOR IMPLEMENTATION OF CRA

These simplified guides emphasize practical and community-driven approaches to farming that can lead to increased productivity, resilience, and sustainability. These guidelines are the basis for Climate Resilient Agriculture, emphasizing that successful practices should align with local conditions, build on existing knowledge, and prioritize sustainability and environmental stewardship.

Start with What You Know
Begin your agricultural journey by using the knowledge and practices you already have. Build upon your existing understanding of farming to make improvements.

Adapt to Your Local Context
Tailor your farming strategies to match the specific conditions in your local area. Your solutions should fit the unique climate, soil, and available resources of your region.

Compare and analyse
When considering new farming ideas, compare them to your current practices. Assess the advantages and disadvantages of these new approaches to make informed decisions.

Work Together in Cycles
Think of your farming activities as interconnected cycles rather than isolated steps. Activities should complement each other, creating a continuous flow of resources and benefits.

Efficient Water Use
Use the water you have as wisely as possible. Collect rain-water and employ efficient irrigation methods to make the most of your water resources.

Reduce External Inputs
Minimize your reliance on outside materials like chemical fertilizers and pesticides. Instead, focus on natural and organic methods to nourish your crops and soil.

Protect Your Soil
Pay attention to soil conservation by preventing erosion and soil degradation. Use techniques like contour farming and cover cropping to safeguard your land.

Nurture Soil Health
Concentrate on keeping your soil healthy by enriching it with natural soil-building techniques such as composting and mulching.

Promote Crop Diversity
Plant a variety of crops to spread risks and boost resilience. Different crops have different strengths and can help each other thrive.

Care for the Environment
Be mindful of the environment. Preserve local ecosystems, conserve natural resources, and maintain biodiversity to ensure a sustainable future.

Collaborate and Learn Together
Work closely with your community. Share knowledge, experiences, and resources to collectively enhance your farming practices. Collaborative learning and planning benefit everyone.

The smallholder farming system - synergise across activities.

THE THINGS THAT WE CAN DO!

Based on the guidelines above we had tested and implemented practices with smallholder farmers in Limpopo and have shown positive impacts on climate resilience. These practices are categorized into five key areas: Water, soil, crop, livestock and local ecology management.

Agroecology is an approach to agriculture that focuses on creating sustainable and resilient farming systems while minimizing negative environmental impacts. It involves a set of practices that align with ecological principles. Let's explore agroecology practices mentioned:

I. WATER MANAGEMENT

Rainwater Harvesting
CRA emphasizes the capture and storage of rainwater for agricultural use. This can involve the construction of rainwater harvesting structures such as ponds, tanks, and swales, which help retain and store rainwater for irrigation during dry periods.

Irrigation Management
CRA promotes efficient and precise irrigation methods, such as drip irrigation and micro-sprinklers, to minimize water wastage and ensure that crops receive just the right amount of moisture.

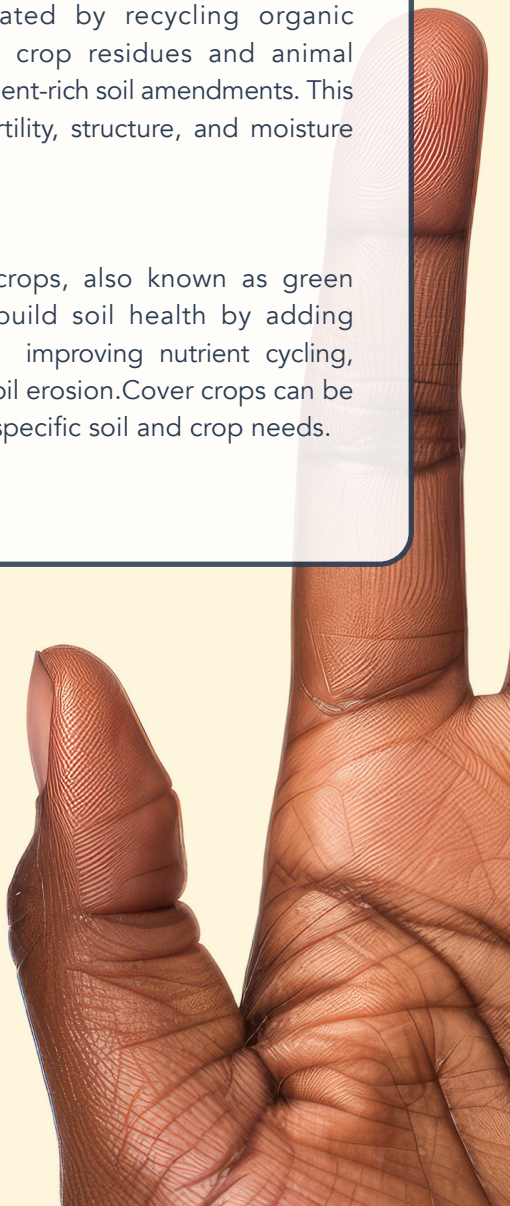
Efficient Water Use in Agriculture
CRA practices aim to maximize the use of available water resources by incorporating strategies like mulching, which reduces evaporation and soil moisture loss, and practicing "dry farming" in regions with limited water resources.

2. SOIL MANAGEMENT

Soil Conservation
CRA places a strong emphasis on soil conservation practices to prevent erosion and maintain soil health. This includes terracing on slopes, contour farming, and planting cover crops to protect the soil from erosion.

Natural Soil-Building Techniques
Composting is a key practice in agroecology. Compost is created by recycling organic matter, such as crop residues and animal manure, into nutrient-rich soil amendments. This enhances soil fertility, structure, and moisture retention.

Cover Cropping
Planting cover crops, also known as green manure, helps build soil health by adding organic matter, improving nutrient cycling, and preventing soil erosion.Cover crops can be chosen to meet specific soil and crop needs.



3. CROP MANAGEMENT

Crop Diversity
CRA systems promote diversity in crop selection. This diversity helps reduce the risk of crop failure due to pests, diseases, and adverse weather conditions. Crop rotation and intercropping are common practices.

Sustainable Cropping Practice
CRA discourages the use of synthetic pesticides and fertilizers. Instead, it emphasizes organic farming methods, integrated pest management, and the use of biological controls to manage pests and diseases.

4. LIVESTOCK MANAGEMENT

Integration of Livestock: Agroecological farming systems often integrate livestock, such as cattle, goats, or poultry. Livestock can provide manure for organic fertilizer, and their presence can help with weed and pest control. Proper management ensures the sustainability of these animals in the farming system.

5. LOCAL ECOLOGY MANAGEMENT

Conservation of Natural Resources
CRA emphasizes the conservation of natural resources, including forests, water bodies, and biodiversity. Forested areas and water bodies should be preserved, as they play a critical role in maintaining ecosystem balance and providing habitat for beneficial species.

Sustainable Biodiversity
Agroecological systems are designed to work in harmony with local ecosystems. Promoting biodiversity in and around farms is crucial for pest control, pollination, and overall ecosystem health.

In summary, agroecology practices focus on sustainable and environmentally friendly agricultural methods that seek to improve productivity while safeguarding the environment. These practices, as outlined above, can help farmers adapt to changing conditions, reduce their reliance on external inputs, and contribute to more resilient and sustainable food production systems.

A CASE STUDY

CRA IN ACTION
(Kruger, et al., 2021)

CONSERVATION AGRICULTURE (CA)

To avoid the degradation of the soil structure and organic matter through repeated ploughing, CA is a form of minimal tillage without ploughing. In addition the soil remains covered/mulched by plant resides from previous seasons and diversification for crops is practiced, both through inter cropping and crop rotation. In this way the cropping system builds rather than destroys soil soi health and fertility.

INTENSIVE HOMESTEAD FOOD PRODUCTION

A collection of some, preferably all of the practices below are used in homestead gardens.

Agroecological practices including composting, deep and shallow trench beds, mulching, mixed cropping, natural pest and disease control, multipurpose plants, seed saving, Liquid manures and soil erosion control.

Microclimate management including shade cloth tunnels, windbreaks and shade trees/shelter belts.

Improved water management practices including drip irrigation, irrigation scheduling, deep watering and grey water management.

These practices are supported by a focus on value-adding and local marketing options, as well as a focus on local savings and loans associations linked to small enterprise development. A focus on local water access from improved availability of water is important.

NATURAL RESOURCE MANAGEMENT

At a household level this entails propagation and growing of multipurpose and medicinal plants as well as indigenous fruit trees as well as small nurseries.

In the landscape this includes soil and water conservation practices, such as gulley rehabilitation, veld management, alien clearing and spring protection.

LIVESTOCK INTEGRATION

Livestock integration is an important aspect and cover/fodder crops such as sunflower, Sun hemp, Sorghum, fodder-oats, -rye and -radish, turnips and other legumes such as lab-lab beans, cowpeas and vetch are grown for grazing by livestock in the fileds. Cut and carry options are also possible to feed your animals.

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