



University of Zimbabwe

Enhancing the contribution of legumes and small grains to household food & nutrition security among smallholder women farmers of Zimbabwe

Florence Mtambanengwe¹, Paul Mapfumo¹, Grace Manzeke¹, Hatirarami Nezomba¹ and Maud Muchuweti²

¹ - SOFECSA -UZ Research Group, Dept of Soil Science & Agricultural Engineering, University of Zimbabwe HARARE

² - Faculty of Science, University of Zimbabwe, HARARE

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The Problem

➔ Smallholder farmers faced with a myriad of challenges in their quest to attain food and nutrition security



**1: Poor & declining soil fertility/
Degraded soils:**
negatively affecting staple food production



2. Persistently high costs and non-availability of fertilizers against unfavourable prices of agricultural produce



The Problem...

3. Climate variability and change



High Frequency in flush floods



High frequency of hail storms



Poor rainfall distribution within the same season



4. Maize dependency syndrome... “Maize poverty trap”



Maize... but challenging soils



Maize ... despite input and labour investments



Maize...fertility gradients common



Reality on the ground

- Household food and nutrition insecurity
- Women and children among the majority going to bed hungry
- Women farmers are custodians of germplasm of a wide range of food crops, including small grains and grain legumes
- Indigenous knowledge on:
 - home processing and
 - dietary formulationlargely ignored in formal institutions including industry (public and private)



Food legumes



Small grain cereals



Maize and sorghum



What can we tap on? – Theory of change

- Realization that climate changing is negatively impacting on daily livelihoods of rural communities
- General acceptance that maize continues to fail under prevailing climatic conditions
- Both the Government of Zimbabwe and Research promoting growing of small grain cereal to enhance climate change adaptation
- Knowledge on processing and value-addition exist among a few (mostly elderly community members) but is not readily shared



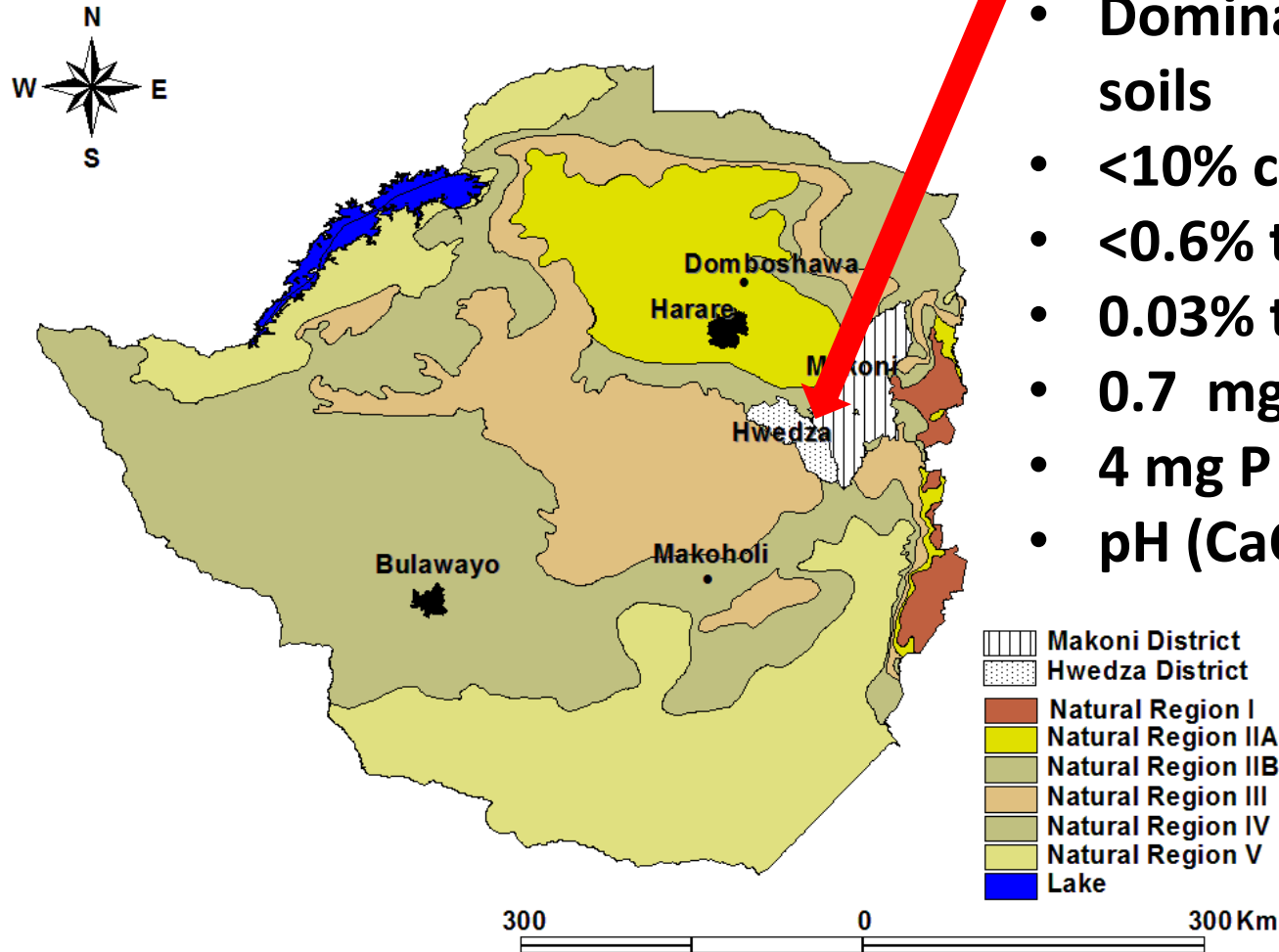
Overall objective

To build the capacity of women farmers to share information and knowledge on production of small grain cereals and grain legumes for household food and nutrition security, and climate change adaptation in smallholder farming communities in Zimbabwe



Study site

- Hwedza District
- Dominant soils: sandy soils
- <10% clay
- <0.6% total C
- 0.03% total N
- 0.7 mg Zn kg⁻¹
- 4 mg P kg⁻¹
- pH (CaCl): – 4.2



Approach

- Participatory action research – key steps
 1. Community engagement to understand the entry points
 2. Formation of Learning alliances
 3. Co-establishment of field-based Learning Centres for crop production



Understanding the entry points

1. Food insecurity linked to the poor performance of the climate sensitive staple maize
2. Finger millet and sorghum drought tolerant but deemed unattractive for a variety of reasons by the youthful households?!
 - Food crops for the old, the aged and the sick!!
 - Range of dishes available too restricted

Understanding the entry points

1. Lack of a shared knowledge and information on processing and utilization of small grain cereals and legumes
2. Millets, sorghum and grain legumes nutritionally robust and important for the weak and the sick
3. As a starch source, they are perceived to last longer in the stomach compared to maize

Establishment of field-based Learning Centres for crop production

- Two learning alliances were formed in two different wards
- Key crops were:
 - finger millet
 - Cowpea
 - bambara nut
 - Maize
- A mix of local and improved germplasm where available
- Major mgt differences in the two alliances were in:
 - Soil fertility management
 - suitable cultivar selection
 - planting times



Farmer preferred attributes for crop choice

1. Contribution to household food security
 - E.g. a smaller amount of millet/ sorghum flour is needed to cook the main meal compared to maize
2. Known nutritional attributes (e.g. role in primary health complexities; contribution to child and maternal health)
3. Seed available locally (no need for expensive hybrids)
4. Tolerance to drought
5. Value the food crop had in home-based diets
6. Ease of processing and utilization
7. Scope for generating income through value addition.
8. Better storability



Land allocation & expected yield

- USHE ALLIANCE (600 mm yr⁻¹)

1. Finger millet	~ 35%	1.5 t ha ⁻¹
2. Cowpea	~30%	1.2 t ha ⁻¹
3. Maize	~ 25%	<1 t ha ⁻¹
4. Bambara nut	<10%	300 kg ha ⁻¹
5. Sorghum	< 1%	bird damaged

- GONESO ALLIANCE (<600 mm yr⁻¹)

1. Finger millet	~ 40%	2.0 t ha ⁻¹
2. Cowpea	~30%	1.0 t ha ⁻¹
3. Maize	~ 25%	< 500 kg ha ⁻¹
4. Bambara nut	< 5%	< 300 kg ha ⁻¹



Enhancing contribution to household nutrition

- Cowpea and fingermillet satisfied most of the criteria.
 - Cowpea was superior because of its multiple edible forms including dry grain, leaves, green pods (which can arrest the ‘hunger period’).



Enhancing contribution to household nutrition

- Finger millet is not as prone to bird damage compared to millets.
- Also fingermillet also encouraged the participation of men (*basic ingredient for traditional brew*) therefore land for its growing would not be a problem



Enhancing contribution ...

- Finger millet is a key sources of:
 - Protein (~7%). Essential amino acids important for human health e.g. tryptophan, cystine, which are often absent in maize
 - Minerals e.g. zinc, iron, calcium and phosphorus
- Contribution of legumes to protein nutrition is undoubted



What does all this mean?

- There is scope to enhance the production and consumption of millets, sorghum and nitrogen-fixing grain legumes in smallholder communities
 - Germplasm exhibitions
- Establish how soil fertility management regimes influence grain quality



Way forward

- Need to establish the range of food products that can be produced from such crops, particularly targeting the young
 - Can recipes be co-developed, documented and shared for wider uptake?
 - Cooking competitions and food tasting.
- Document nutritional enhancement and losses from product formulations and value addition

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Sorghum *sadza* with cowpea leaves



fmtamba@gmail.com / fmtamba@agric.uz.ac.zw