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# Indigenous fruit use in Zimbabwe and Malawi

Dagmar Mithöfer

World Agroforestry Centre & University of Hannover
F. Akinnifesi, L. Fiedler, T. Kruse, D. Mithöfer, T. Ramadhani, E. Schmidt, H. Waibel

Background

- ➤ Poverty incidence high in the rural areas of Zimbabwe, vulnerabilty to poverty may be even more serious

- ➤ High degree of seasonality of production and income

- ➤ Although they are a small share in total annual income indigenous fruits (IF) are important source of food and income during crisis time

- ➤ Fruits mostly collected from wild and semi wild trees

- ➤ Fruits consumed widely by rural and urban population

Fruit consumption by gender
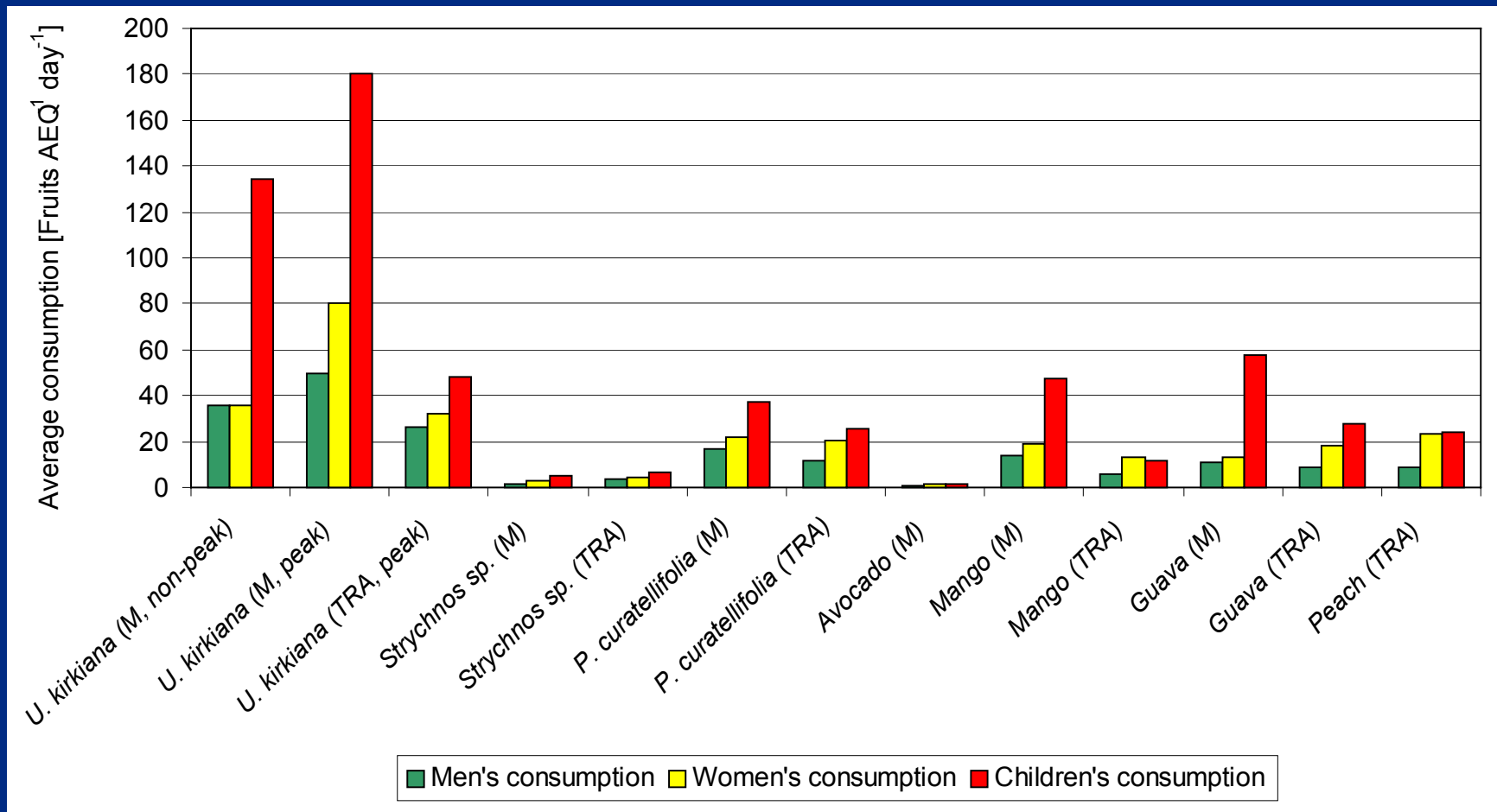
Source: Mithöfer and Waibel, 2003

Policies regarding fruit use

➢ Not formally regulated or licensed (not enforced, Matose, 2006)

➢ Use/ sale of fruits from planted trees under the by-laws on plantations (Moyo, 2000)

➢ People are not supposed to shake IFs from trees (54%) and/ or harvest green IFs (61%) (Policy Maker Survey, Ramadhani 2002)

➢ In resettlement areas higher number of institutions/ leaders responsible for implementing regulations than in communal areas (Policy Maker Survey Ramadhani, 2002)

Marketing of IFs

➢ In Murehwa marketing of the fruits started in '97, initially 'hidden', has steadily increased since then

Ramadhani, 2002:

➢ Fruits and trees are highly valued, consumers support marketing of IFs

➢ Consumers are willing to pay double of the current price

➢ Consumers prefer small brown fruits of *U. kirkiana*

➢ Informal marketing, no product differentiation

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Marketing of IFs

➢ Problem in increasing commercialization: user rights need to be addressed (Ramadhani, 2002)

➢ From public to open access resource due to increased rivalry with unclear rules over ownership and use (Ramadhani, 2002)

➢ Increased competition over the fruits results in non-sustainable harvesting techniques

➢ Traditional leaders revert back to traditional rules and taboos, however does not work in resettled communities
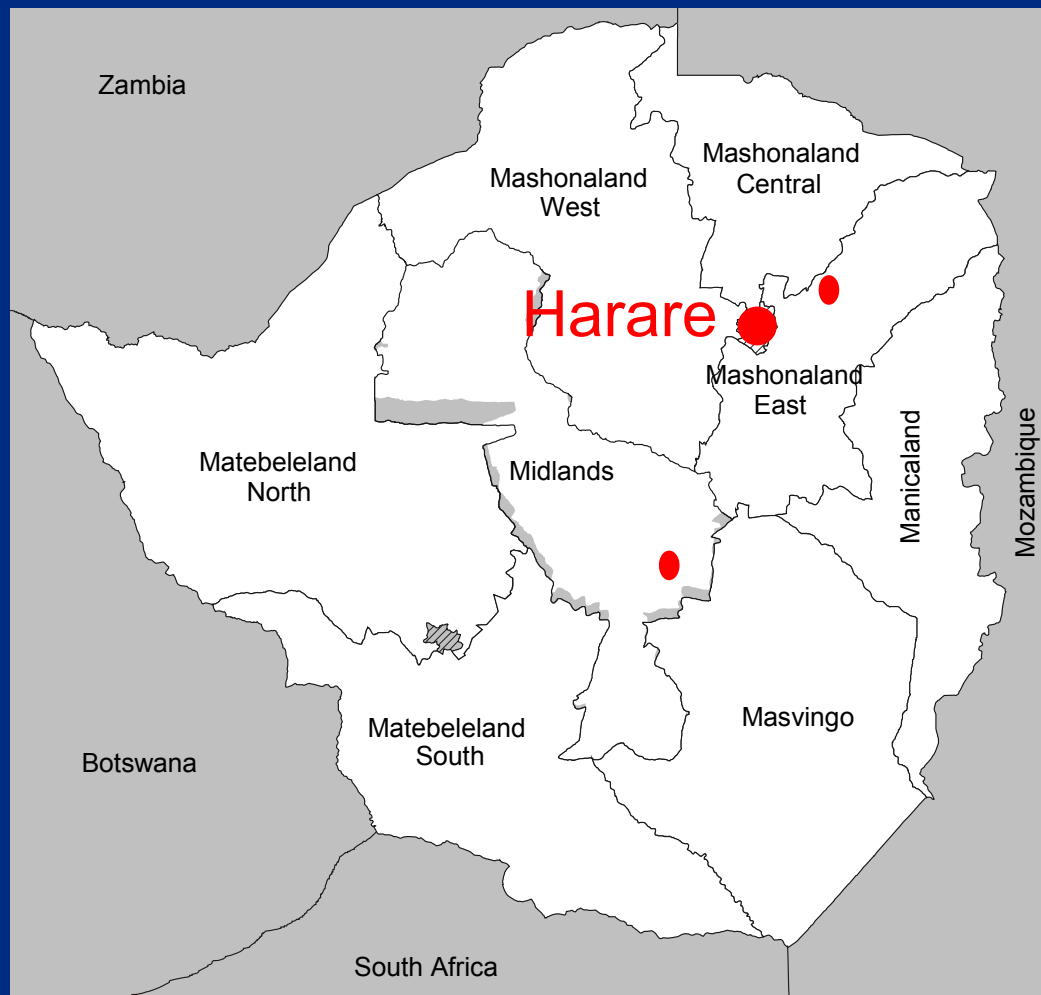
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Seasonal vulnerability to poverty and indigenous fruit use in Zimbabwe

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Uapaca kirkiana

Strychnos cocculoides

Zambia

Mashonaland West

Mashonaland Central

Harare

Mashonaland East

Matebeleland North

Midlands

Manicaland

Mozambique

Botswana

Matebeleland South

Masvingo

South Africa

IF and maize harvest

Maize harvest	Murehwa			Takawira		
	No consumption	Main meal	Snack	No consumption	Main meal	Snack
Uapaca kirkiana						
Normal	3.6	0.0	95.9	0.0	1.2	98.8
Bumper	1.4	0.0	98.6	0.0	1.2	98.8
Disaster	0.5	0.9	98.6	0.0	50.0	50.0
Strychnos sp.						
Normal	22.6	0.5	76.9	0.0	0.0	100.0
Bumper	21.7	0.5	77.8	0.0	0.0	100.0
Disaster	22.2	0.9	76.9	0.0	34.1	65.9
Parinari curatellifolia						
Normal	32.1	0.5	67.4	1.2	1.2	97.6
Bumper	31.7	0.5	67.9	2.4	1.2	96.3
Disaster	31.7	0.5	67.9	1.2	72.0	26.8

Source: Mithöfer and Waibel, 2003

Objectives

1) To assess the contribution of indigenous fruit trees towards reducing vulnerability to food insecurity and income poverty.

2) To add a seasonal dimension to the vulnerability concept.

3) To provide an empirical example of vulnerability measurement using a stochastic model of household income.

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Definition of Vulnerability

$$Vu(m,PL) = 1 - [(1 - P(Hi_t^n < PL)) * ... * (1 - P(Hi_{t+m}^n < PL))]$$

With:

Vu	vulnerability		*P*	probability
PL	poverty line		*m,t*	*periods,* time
Hi	household income		*n*	household

Household income

$$\widetilde{Hi}_m^n = \widetilde{Hi}_{m-1}^n - \widetilde{Ex}_{m-1}^n - Co_{m-1}^n - \widetilde{SF}_{m-1}^n + \sum_{a=1}^{A} \widetilde{GM}_{am}^n + \widetilde{IC}_m^n$$

with

Hi_m   household income of period *m*

m   period (about monthly length)

n   household

Ex   expenditure, e.g. soap, oil, paraffin

Co   consumption at minimum food requirements

SF   school fees

GM   gross margin

a... A   activities , e.g. agriculture, livestock keeping

IC   additional sources of cash, e.g. informal loans

Data collection

➢ Selection of 20 households of Takawira Resettlement Area

➢ Socioeconomic data on assets, farm size, household members, age structure, gender

➢ From August 1999 - August 2000 monthly monitoring of revenues, costs, and labour inputs, consumption

Average and standard deviation of gross margins of household enterprises by period
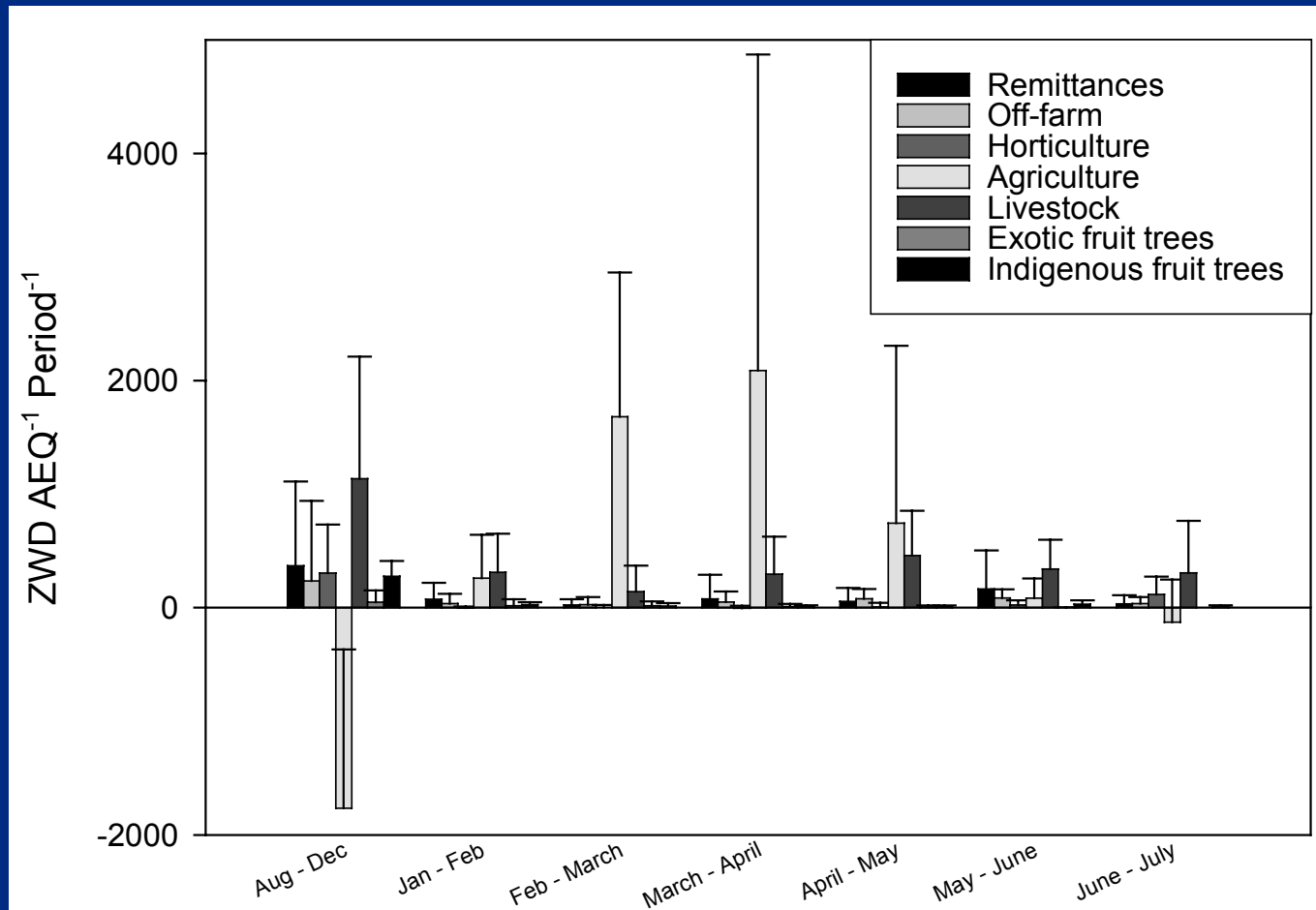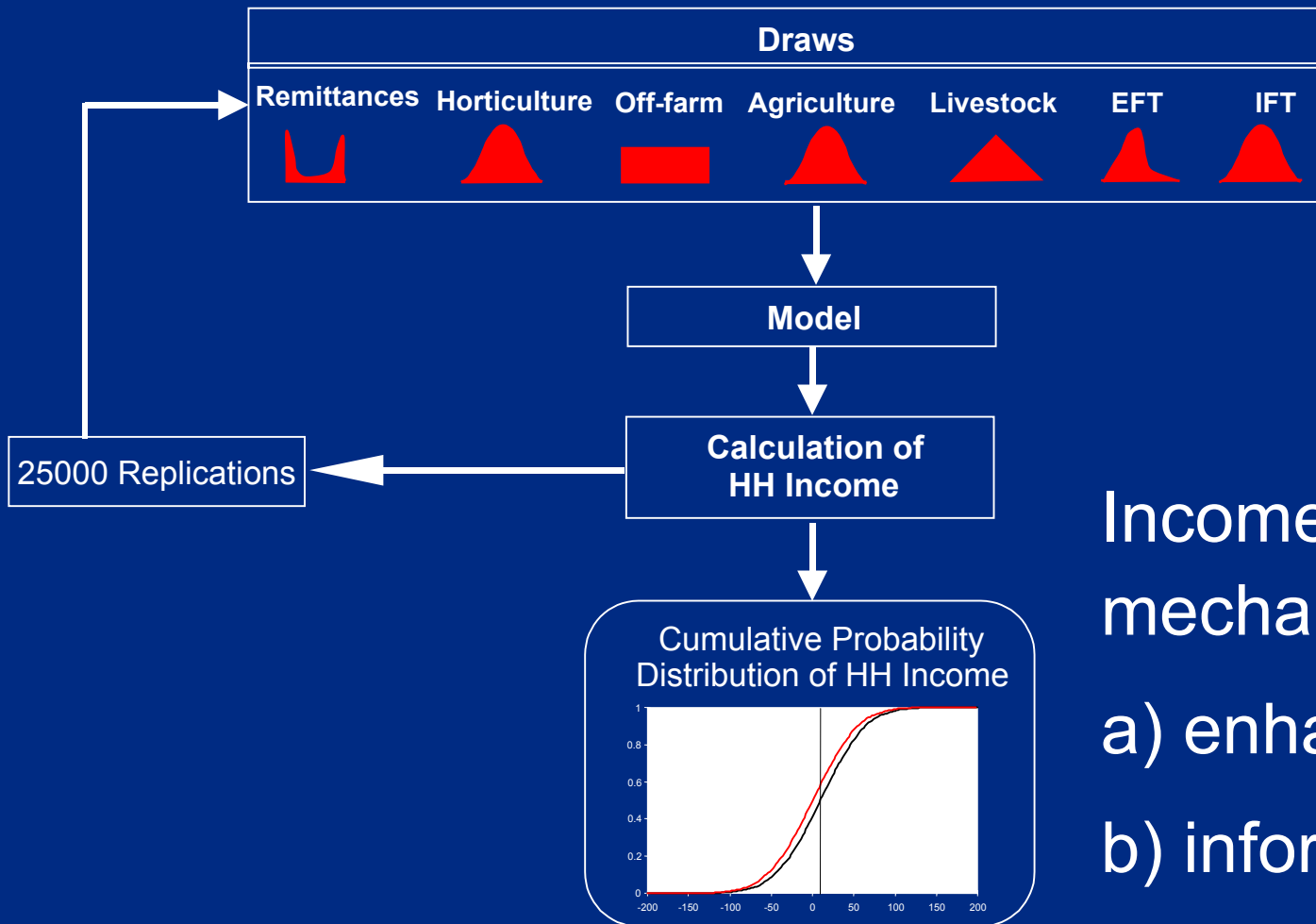

Source: Mithöfer, Waibel and Akinnifesi, 2006

Simulation model

➢ Fit distributions to sample data of income generating enterprises of the households.

➢ Simulation of household income over m periods under various risk reducing strategies.

➢ Indentification of critical food and consumption income periods.

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Simulation model

Draws

| Remittances | Horticulture | Off-farm | Agriculture | Livestock | EFT | IFT |

↓

Model

↓

Calculation of HH Income

← 25000 Replications

↓

Cumulative Probability
Distribution of HH Income

Income smoothing
mechanisms:

a) enhanced IF use,

b) informal loans.

Vulnerability to poverty by period and IF availability

Source: Mithöfer, Waibel and Akinnifesi, 2006

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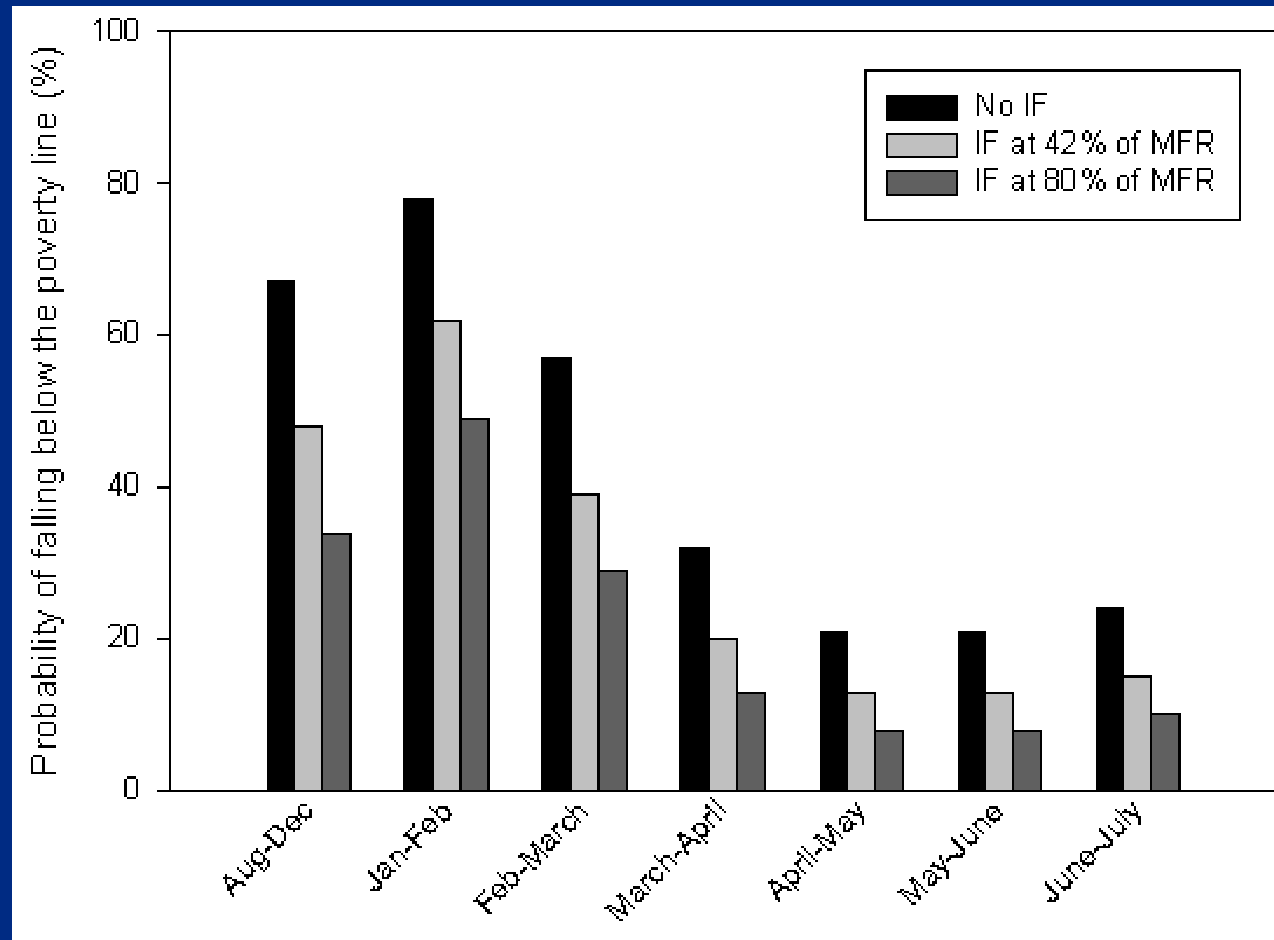
In-situ conservation of IFT

Zimbabwe

- ➢ Opportunity costs of land: 0 US$ (at research site)

- ➢ Labour productivity 5.8-10 US$/ day

- ➢ Income share: 1.2%-4.5% (*U. kirkiana* only)

Source: Mithöfer and Waibel, 2003

Malawi

- ➢ Opportunity costs of land: 92 US$/ha (maize production foregone)

- ➢ Labour productivity: 1.7 US$/ day

- ➢ Income share: 4.1% (*U. kirkiana* only)

Source: Fiedler, 2005

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IFT conservation via planting of domesticated trees

Zimbabwe

Minimum improvement:

➢ fruit production after two years &

➢ increased collection costs or

➢ increased yield

➢ or combination thereof

Source: Mithöfer, Wesseler and Waibel, 2006

Malawi

Minimum improvement:

➢ fruit production after four years without further improvements

Source: Fiedler, 2005

Conservation of semi-wild indigenous trees

Zimbabwe

➢ Indigenous fruit trees preserved on-farm: 24

Malawi

➢ Indigenous fruit trees preserved on-farm: 4-9

➢ Factors increasing likelihood of conserving indigenous trees:

+ RESPON, FRUIT

- ITCASH, CWR, EDUC

Source: Mithöfer, 2005

Source: Kruse, 2006

Conclusions

➢ Vulnerability to poverty is seasonal.

➢ Poverty reduction measures need to target critical periods rather than annual income.

➢ IFT can reduce vulnerability to poverty during the critical period.

➢ Conservation of IFTs useful from food security point of view.

➢ Under current conditions IF use cannot lift rural households out of poverty.

Conclusions

- ➢ Market-based incentives may exist for IFT biodiversty conservation.

- ➢ Policy framework, responsibilities not clear (ZW).

- ➢ IFT planting currently not economically viable in ZW, but may be viable in MW

  - ➢ due to differing conditions: e.g. population pressure, deforestation rate, agricultural intensification, etc.

- ➢ Planting and conservation supplementary activities:

  - ➢ Depending on alternative income sources, opportunity cost of land and labour, proximity to markets, etc.

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Thank you!