



Household Vulnerability Index (HVI) for Quantifying the Impact of HIV and AIDS on Rural Livelihoods

- Presentation by *Tendayi Kureya and Lindiwe Majele Sibanda*
- For World Vision International, Global Office, South Africa
- Date: 12th April 2007
- Study Commissioned by FANRPAN
- Regional research coordinated by Development Data
- In country research coordinators: *M. Khoeli-Lesotho and B. Sithole, Swaziland*
- Research Funded by Southern Africa Trust/SADC-EU



Outline

- **Background to the tool**
- **Objectives and Practical Outputs**
- **The Tool: Household Vulnerability Index**
- **Ongoing research**
- **Regional Collaboration**

Background of the tool

- In 2004 FANRPAN conducted a study in 7 SADC countries on the Impact of HIV and AIDS on Agriculture and Food Security
- The study qualitatively established common ground on how HIV and AIDS impact agriculture and food security at the household level and established a baseline database on relevant household information.
- Previous studies had not put a quantitative measure to household vulnerability in the presence of HIV and AIDS, which FANRPAN believes is pivotal to effective interventions in the HIV and AIDS crisis.
- The 2004 study explored the prospects of developing an index for measuring household vulnerability-the *Household Vulnerability Index (HVI)*.
- What is Vulnerability?

Definition of vulnerability

- *“Vulnerability encompasses the factors that lead to variation in the impact of disease between different communities and individuals”*
Bates et al, 2004
- *“Vulnerability of a person is the prospect that a person has now of being poor in the future i.e., the prospect of becoming poor if currently not poor, or the prospect of continuing to be poor if currently poor.”*
Christensen and Subbarao (2004)
- *“Vulnerability of rural households to HIV and AIDS is the capacity of households to cope with, resist and recover from HIV and AIDS infection.”* Oyekale, (2004)
- *“Vulnerability is a function of exposure to risk and inability to cope.”*
World Food Programme (1999)

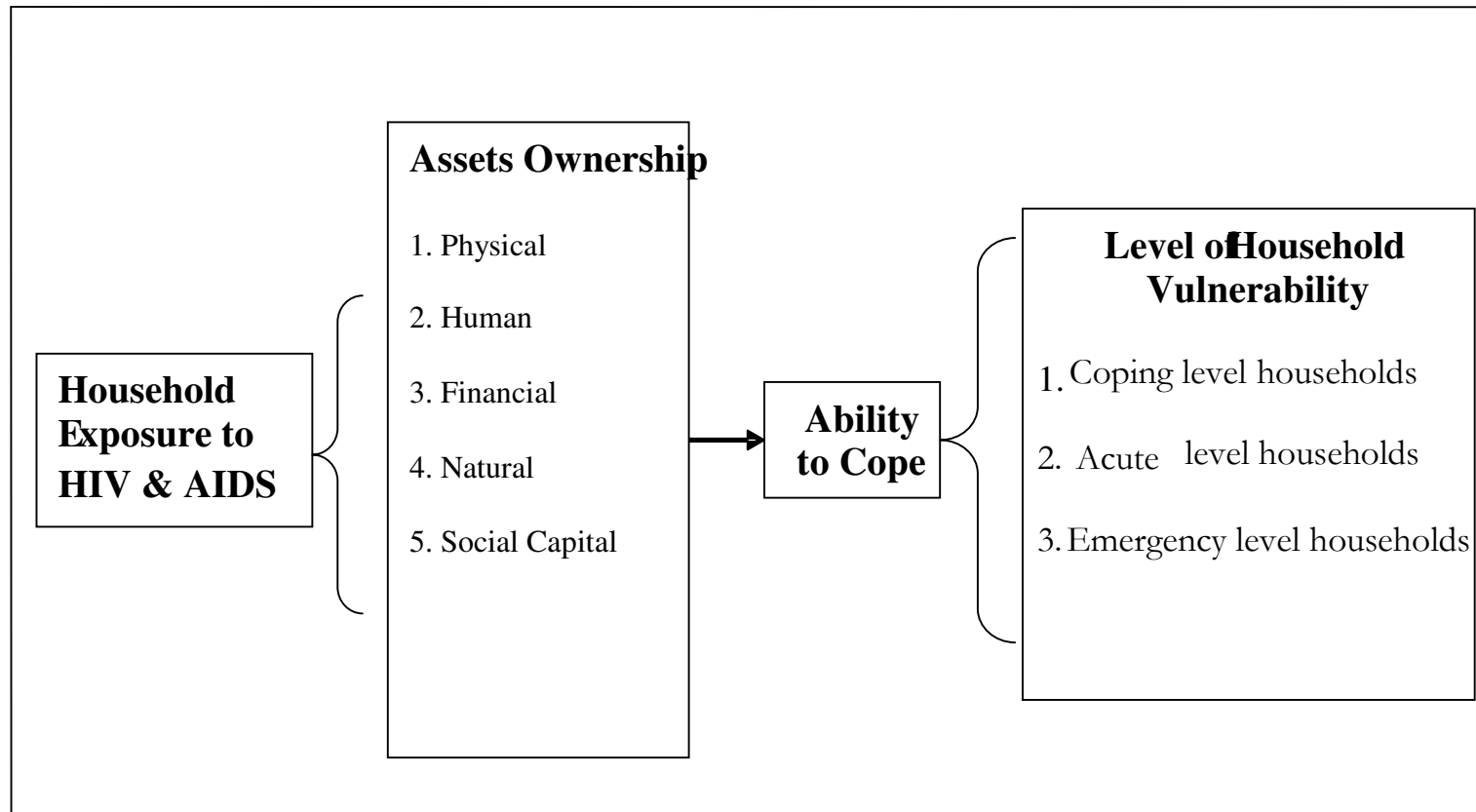
Definition ct'd

- Vulnerability encompasses the factors that lead to variation in the impact of disease between different communities and individuals
- It is often described as having two components: “**external vulnerability**”, which refers to exposure to shocks or hazards; and “**internal vulnerability**”, which refers to the capacity to cope with or withstand those shocks.
- The HVI study considered vulnerability to shocks such as HIV and AIDS and determined the severity of impact on rural households.

Study framework

- A detailed literature review gathered evidence on
 - the impacts of HIV and AIDS on agriculture and food security
 - Vulnerability assessment methods and models
- A regional methodology workshop refined the indicators and dimensions used in the model
- A team guided by the FARPAN regional secretariat developed the draft HVI tool.
- The tool was pre-tested in Lesotho, Swaziland and Zimbabwe using data from 650 households.

Framework ct'd



Study Objectives

- 1. **to develop a refined method for constructing the Household Vulnerability Index (HVI).** The HVI would shed new light on the different degrees and levels of household vulnerability introduced by HIV and AIDS on agriculture and food security.
- 2. **to develop a computerized statistical tool for computing HVI.** The HVI tool would be useful for vulnerability assessments in general and in particular, introduce a quantitative aspect of the impact of the epidemic in vulnerability assessments.
- 3. **to develop HVI as a usable indicator for monitoring how assisted households graduate or deteriorate from one level of vulnerability to another.**

Anticipated Uses of the HVI

- The index can categorize household into three levels of vulnerability: “Copying”, “Acute” and “emergency”. Sensitivity analysis is possible, and the class cut-off points can be adjusted to suit the purpose
- Based on the different vulnerability levels specific relief or development packages can be recommended to assist the affected households overcome both their internal and external vulnerability.
- A tracking system can then be recommended to monitor how supported households graduate/deteriorate from one level of vulnerability to another.

Steps Adopted In Computing HVI

Step 1. Developed overall framework for HVI i.e. theory, methods and conceptual thinking

Step 2. Linked theory to practice, identifying data sources and variables that could be used

Step 3: defined dimensions and identified impact areas (hypotheses) that could be used to test vulnerability

Step 4: Assigned weights and transformations to impact areas using evidence from other statistical models and previous studies.

HVI Computation cont....d

- **Step 5: Determined the contribution of each dimension/impact area to the HVI:**

Using the chosen variable calculate the weight of each dimension ($X\omega_j$) to a given impact area as:

$$X\omega_j = \beta_{ij} (v_{ij}^n \times w_j)$$

where:

area

β_{ij} - Extent to which dimension j determines impact

v_{ij} - Normalized value of the variable j used to assess dimension i

Computation Ct'd

Step 6: Calculated the weighted vulnerability of each household to a given impact area

Step 7: Calculate total vulnerability for every household

Computing HVI

- In the pre-testing study, the HVI was calculated using a model developed in a spreadsheet application. The model computed the sum of the weighted vulnerabilities across all dimensions to give the particular household's total vulnerability to HIV and AIDS, that is

$$\sum_{j=1}^m X_{wj} / \sum_{j=1}^m w_j = V_{hh_i}$$

Other sub-indices (Livestock and food quality) were assimilated into the model

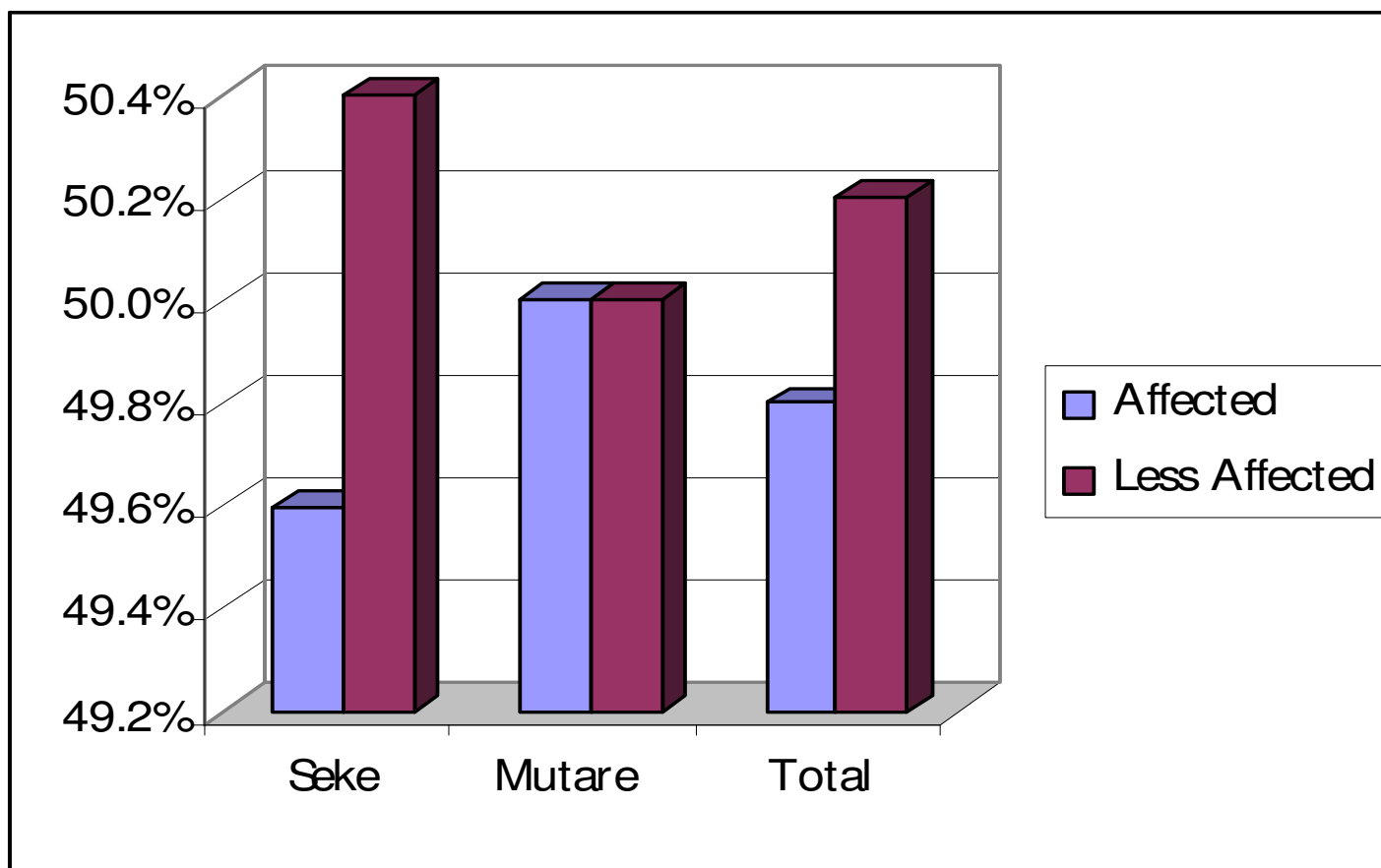
Livestock Index used

Livestock index

Attribute	Cattle	Goats	Poultry	Donkeys	Pigs	Sheep	Rabbits
Productivity (+)	3	1	1	2	1	1	1
Utility (+)	3	1	1	2	2	1	1
Security (low risk(-))	-3	-1	-1	-1	-1	-1	-1
Holding cost (-)	-2	-1	-1	-1	-3	-1	-1
Life (+)	3	1	1	2	1	1	1
Convertibility (+)	-1	2	3	-3	2	2	3
Complementarity (+)	3	-3	-3	1	-3	-3	-3
Aggregate Score	6	0	1	2	-1	0	1

Results from the pre-testing study:

Distribution of affected and less affected families by District, Zimbabwe study

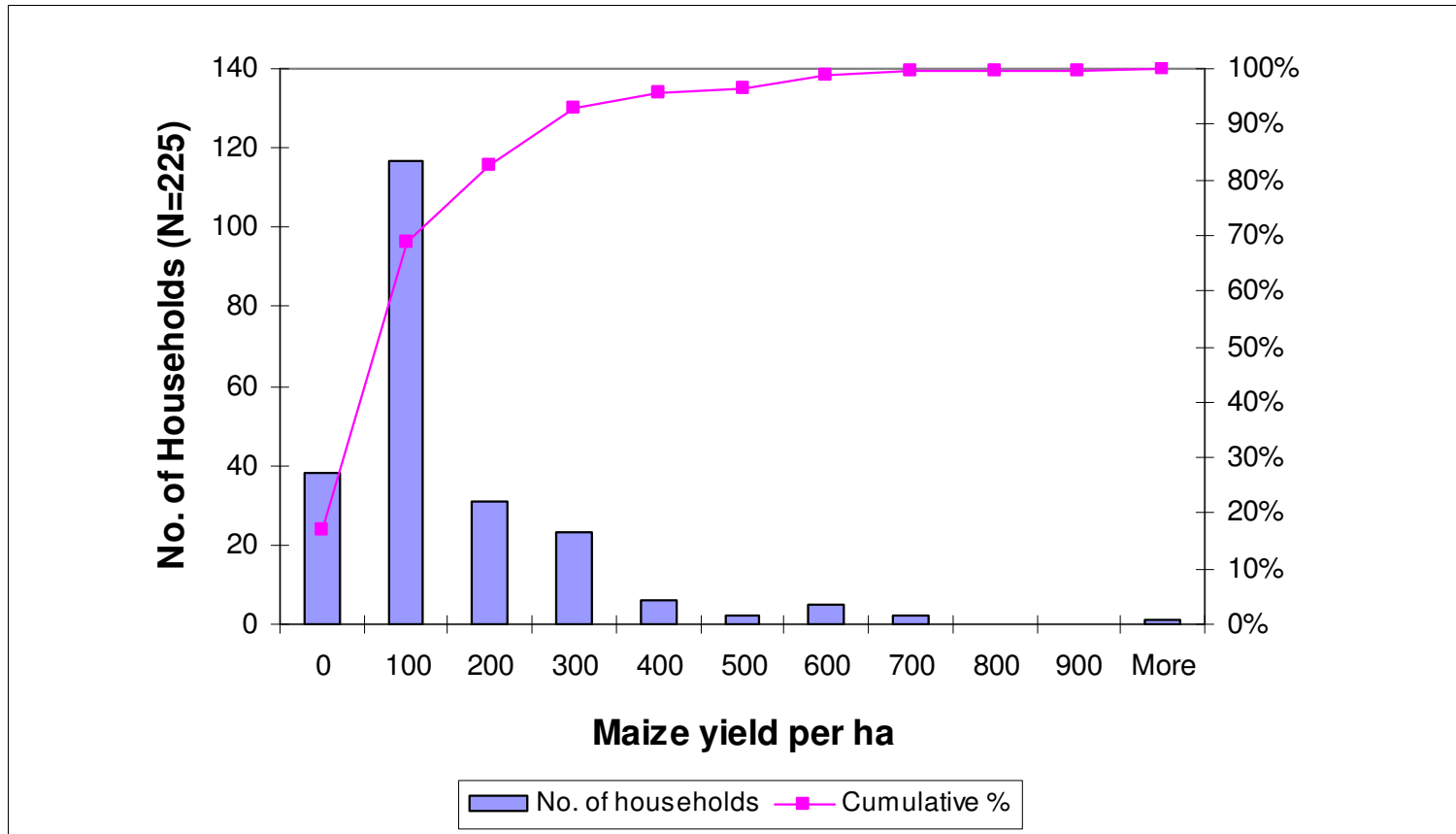


Results: Basic indicators

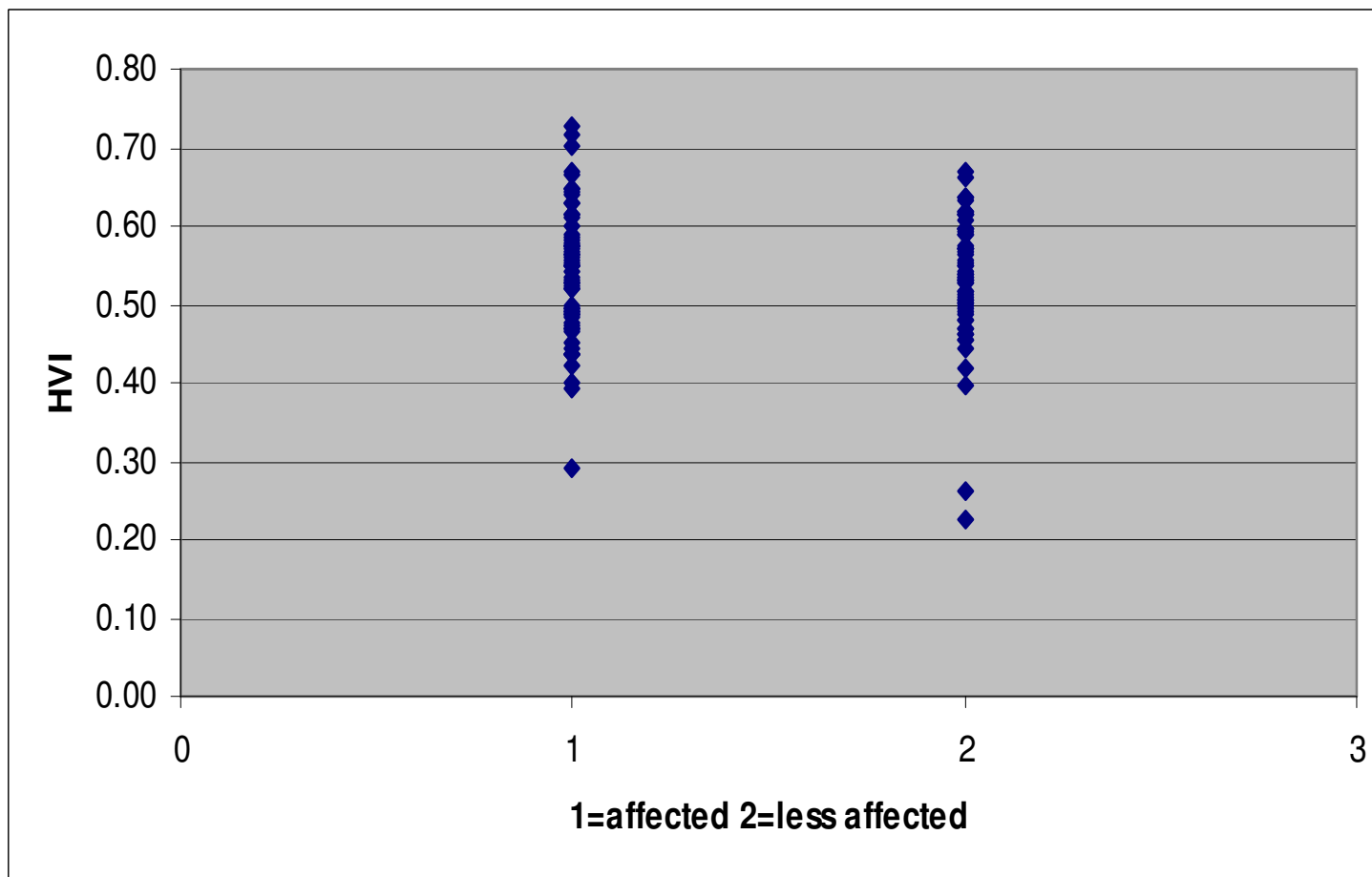
	Affected households		Less affected households	
	Mean	Standard Deviation	Mean	Standard Deviation
Dependency Ratio	1.2	0.97	0.93	0.93
Per capita cereal consumption (kg/year)	111.9	156.3	152.8	204.9
Nutrition diversity	6.0	1.8	5.6	1.6
Livestock index	11.7	14.1	12.6	18.5
Household regular income ¹¹	205.3	678.4	332.5	1321.2
Maize yield (kg/ha)	136.5	259.1	240.2	660.7

¹¹ Converted using the official exchange rate of US\$ =Z\$250

Productivity



The Computed HVIs



Findings

- Although there is slight evidence of differenced between affected and less affected, traditional targeting is largely inaccurate, eg the HBC method used above.
- Some vulnerable households are left out because they do not meet a rigid criteria
- For targeting, flexible tools should be used.

The HVI story

HVI follows a normal distribution

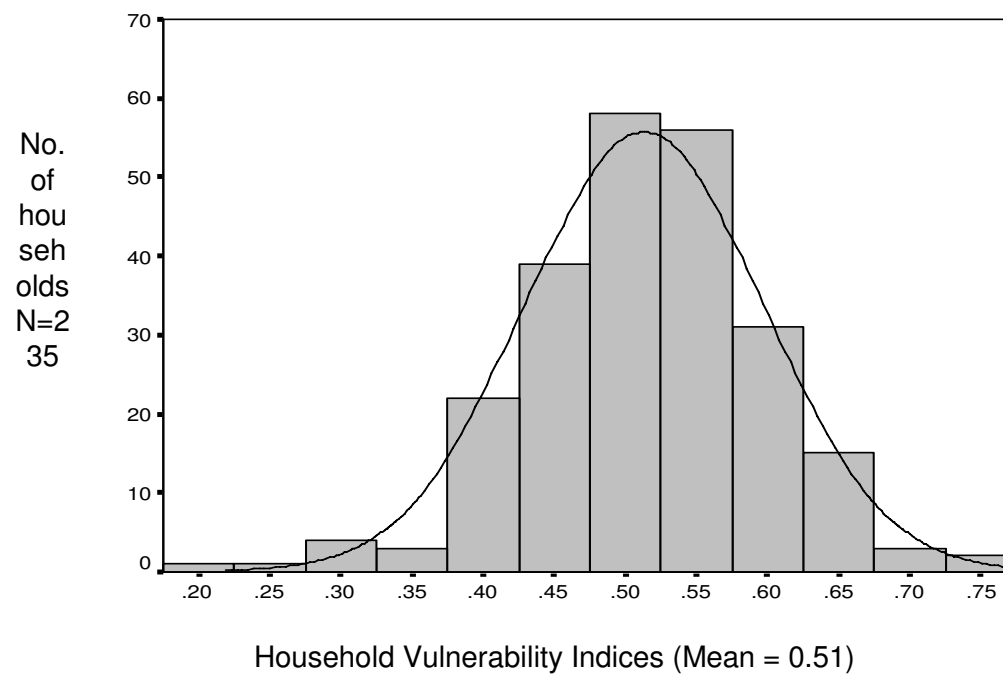


Fig 4.5a Mutare Rural District

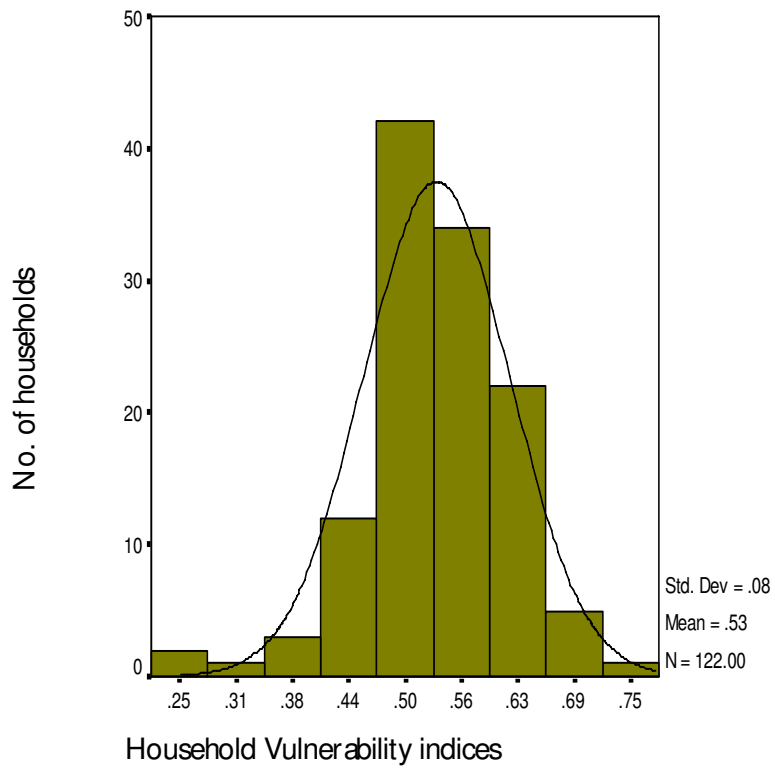
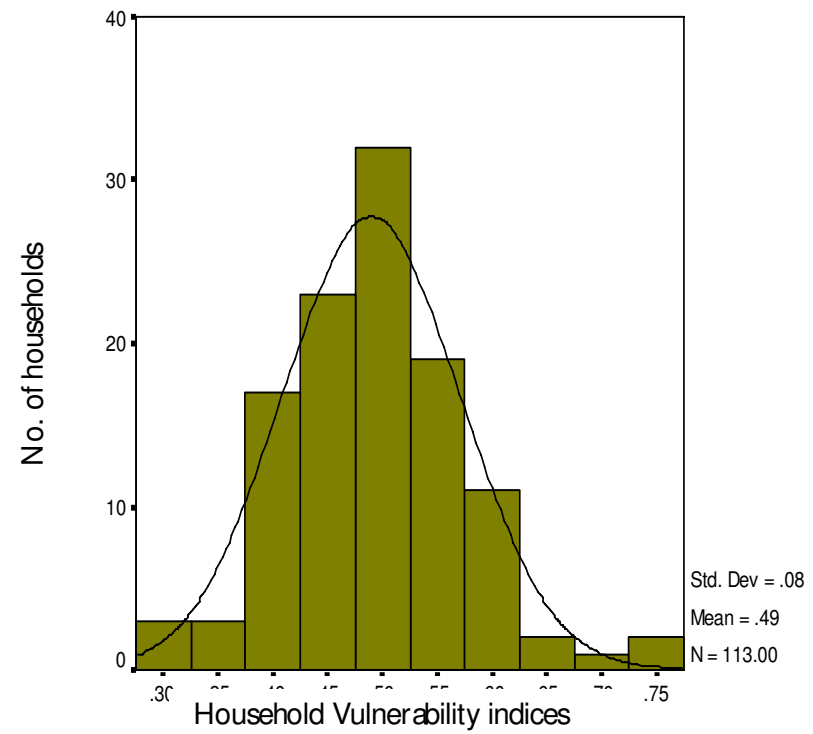


Fig 4.5b Seke District



It is possible to compare two regions accurately

Cut-off points

Table 4.4 Household Vulnerability Index across all households

HVI Level	HVI Range	Situation of households	Seke	Mutare Rural	Total Frequency
Vulnerability Level 1	0.5 and below	Coping Households (CLH)	58 (51.3%)	36 (29.5%)	94 (40%)
Vulnerability Level 2	0.5<HVI<0.7 5	Acute Level Households (ALH)	55 (48.7%)	86 (70.5%)	141 (60%)
Vulnerability Level 3	Greater or equal to 0.75	Emergency Level Households (ELH)	0	0	0
Total			113 (100%)	122 (100%)	235 (100%)

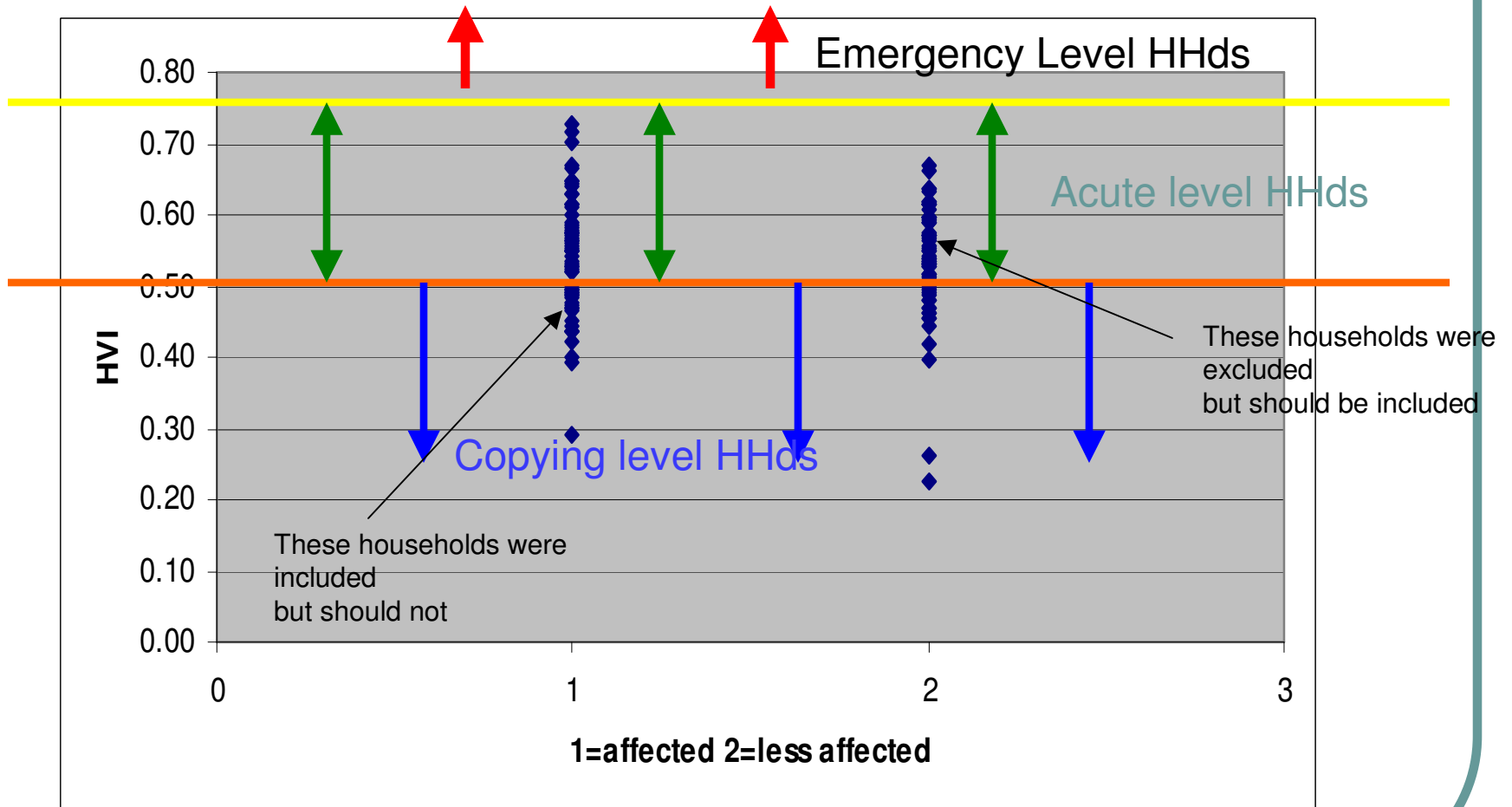
Source: Survey Results

Vulnerability score per dimension

Country	Qn No.	Hhld status	Natural Capital	Human Capital	Physical Capital	Financial Capital	Social Capital	Total score
Zimbabwe	113	1	6.0	9.4	5.9	27.2	7.31	55.8
Zimbabwe	114	2	6.0	18.0	5.8	26.4	7.46	63.7
Zimbabwe	115	1	11.6	9.4	8.4	26.1	7.31	62.9
Zimbabwe	116	2	6.0	0.0	10.0	25.3	7.46	48.7
Zimbabwe	117	1	9.8	9.4	7.9	27.1	7.31	61.5
Zimbabwe	118	2	6.0	2.9	5.5	26.4	7.31	48.1
Zimbabwe	120	2	11.6	5.7	8.1	25.9	8.23	59.5

For each household in the sample, it is possible to trace the source of the vulnerability.

The Computed HVIs



Conclusion

- HVI proposes a new and robust way of tracking and analyzing vulnerability.
- The flexibility within the methodology allows for equitable use of limited resources by beginning at the tail end of vulnerable households, ie, with the most vulnerable.
- The model has been developed into a database that offers a flexible framework for targeting, monitoring and evaluation, and vulnerability assessment. Further tweaking of the model is possible, to adapt to specific user needs.

Some observations...

- **Observation 1:** *Some CSOs that participated in the HVI meetings and presentations that were made throughout the study immediately saw a role for HVI in their current work.*
- **Observation 2:** *CSOs in Zimbabwe fear that though the model is a very useful tool that could improve their targeting systems, few donors are prepared to finance an initial targeting process before the onset of programmes.*
- **Observation 3:** *A number of regional NGOs and other UN agencies have expressed an interest in collaborating with FANRPAN in using the HVI model in their respective programmes or for further studies.*

Next Steps..

- The HVI model has been finalized and final touches are being made to the database driven version.
- An initial pool of variables have been developed, especially for impacts associated with HIV and AIDS, but it is possible to extend this to other shocks.
- Some national organisations have expressed interest in the model, and are applying the technique to improve their current vulnerability assessments.
- Work is in progress to publish the research findings from the pre-testing study.

Regional focus...

- FANRPAN believes that the HVI as a tool has the potential to improve vulnerability assessments and targeting systems in the SADC region
- FANRPAN is engaging all the stakeholders in the region who have an interest in the HVI to find ways of collaboration in using the tool.
- Collaboration in this area will ensure that future vulnerability assessments, targeting and monitoring and evaluation has a common reference point.
- Thank you.