Calculating the Women's Empowerment in Agriculture Index
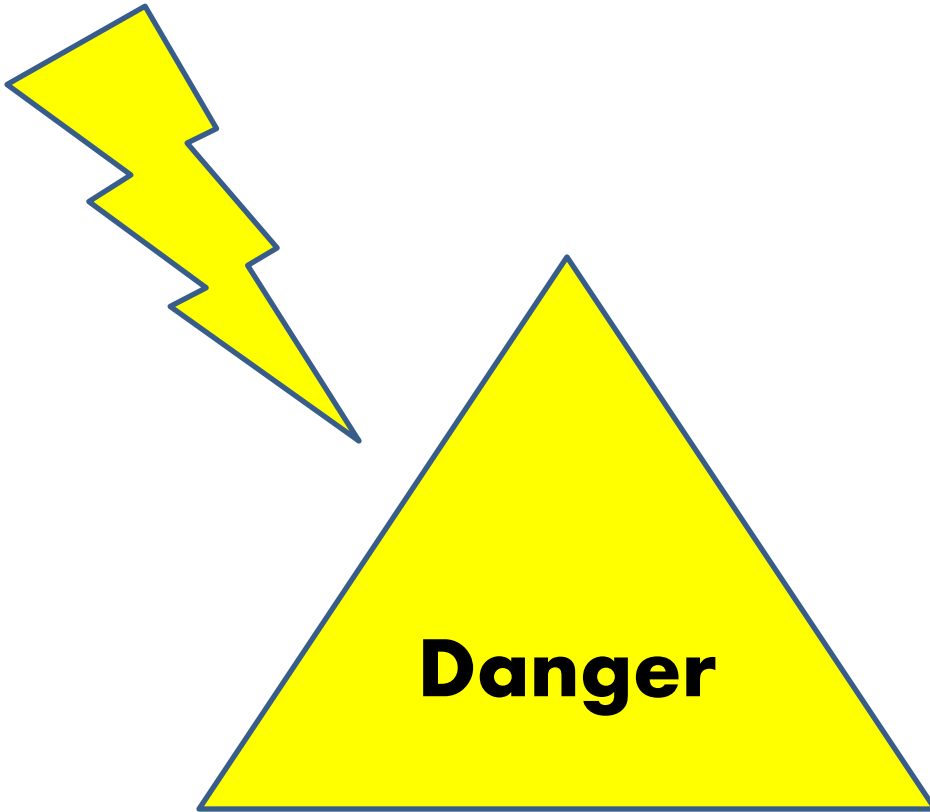
Sabina Alkire and Ana Vaz, 27 June 2012

Welcome to

the back room

Danger

Details ahead

5DE Methodology

Alkire and Foster 2011. *J of Public Economics.*

- The 5DE is based on the Alkire Foster methodology and reflects:
  - **Incidence of Empowerment -** The percentage of women who are empowered
  - **Adequacy among the Disempowered -** The weighted share of indicators in which disempowered women enjoy adequate achievements
- Based on each woman's empowerment profile
- Identifies *who* is empowered
- Shows *how* women are disempowered
- Rigorous properties

A woman's empowerment score shows her own achievements
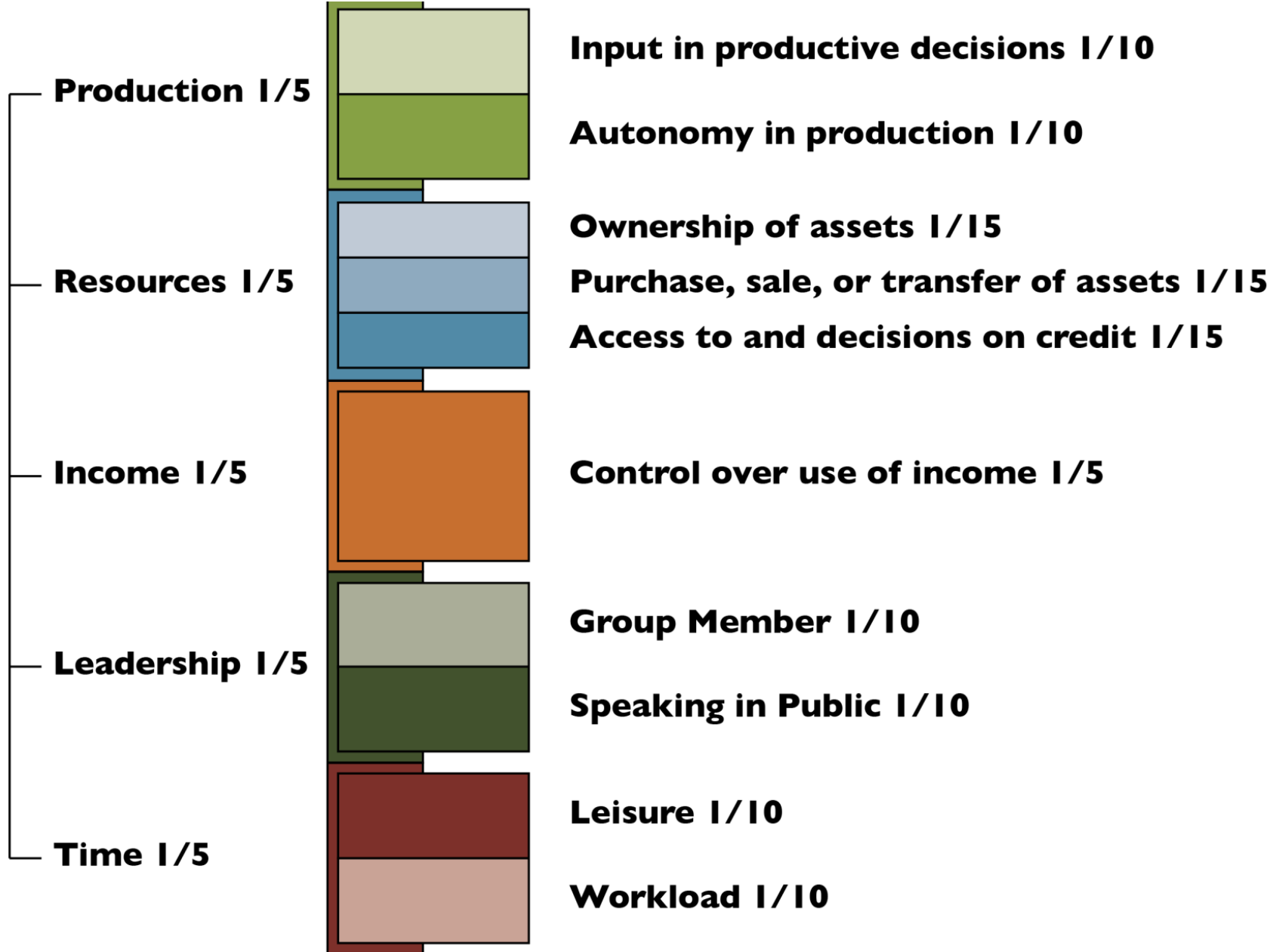
Five domains of empowerment

- Production 1/5
  - Input in productive decisions 1/10
  - Autonomy in production 1/10
- Resources 1/5
  - Ownership of assets 1/15
  - Purchase, sale, or transfer of assets 1/15
  - Access to and decisions on credit 1/15
- Income 1/5
  - Control over use of income 1/5
- Leadership 1/5
  - Group Member 1/10
  - Speaking in Public 1/10
- Time 1/5
  - Leisure 1/10
  - Workload 1/10
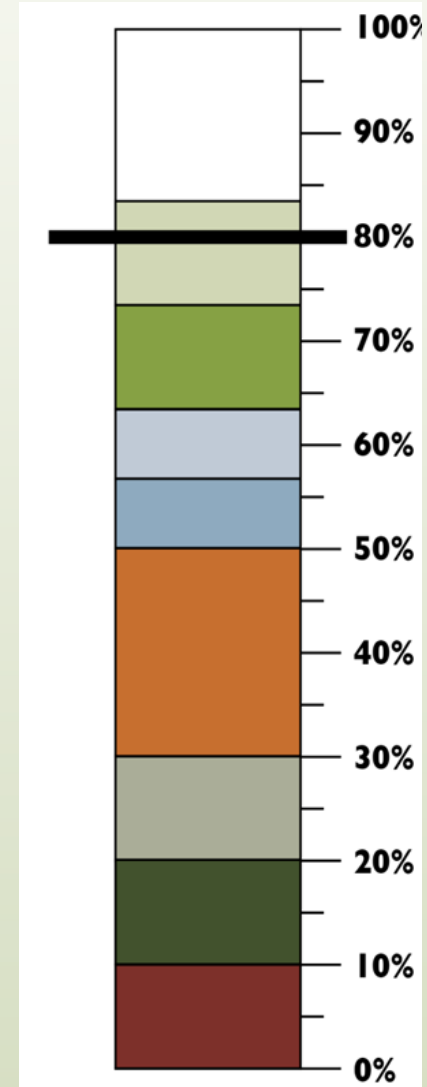
Five domains of empowerment

The terminology of '<u>adequacy</u>' is the positive corollary of '<u>deprivation</u>'

A person is deprived in j if $y_{ij} < z_j$

A person has achieved adequacy in j if $y_{ij} \geq z_j$

The <u>empowerment score</u> reflects the weighted percentage of dimensions in which a person has achieved adequacy.

5

A woman's **empowerment score** shows her own achievements

Five domains of empowerment

- Product... ns 1/10
  /10
- Resour... of assets 1/15
  credit 1/15
- Income 1/5
- Leadership 1/5
  - Group Member 1/10
  - Speaking in Public 1/10
- Time 1/5
  - Leisure 1/10
  - Workload 1/10
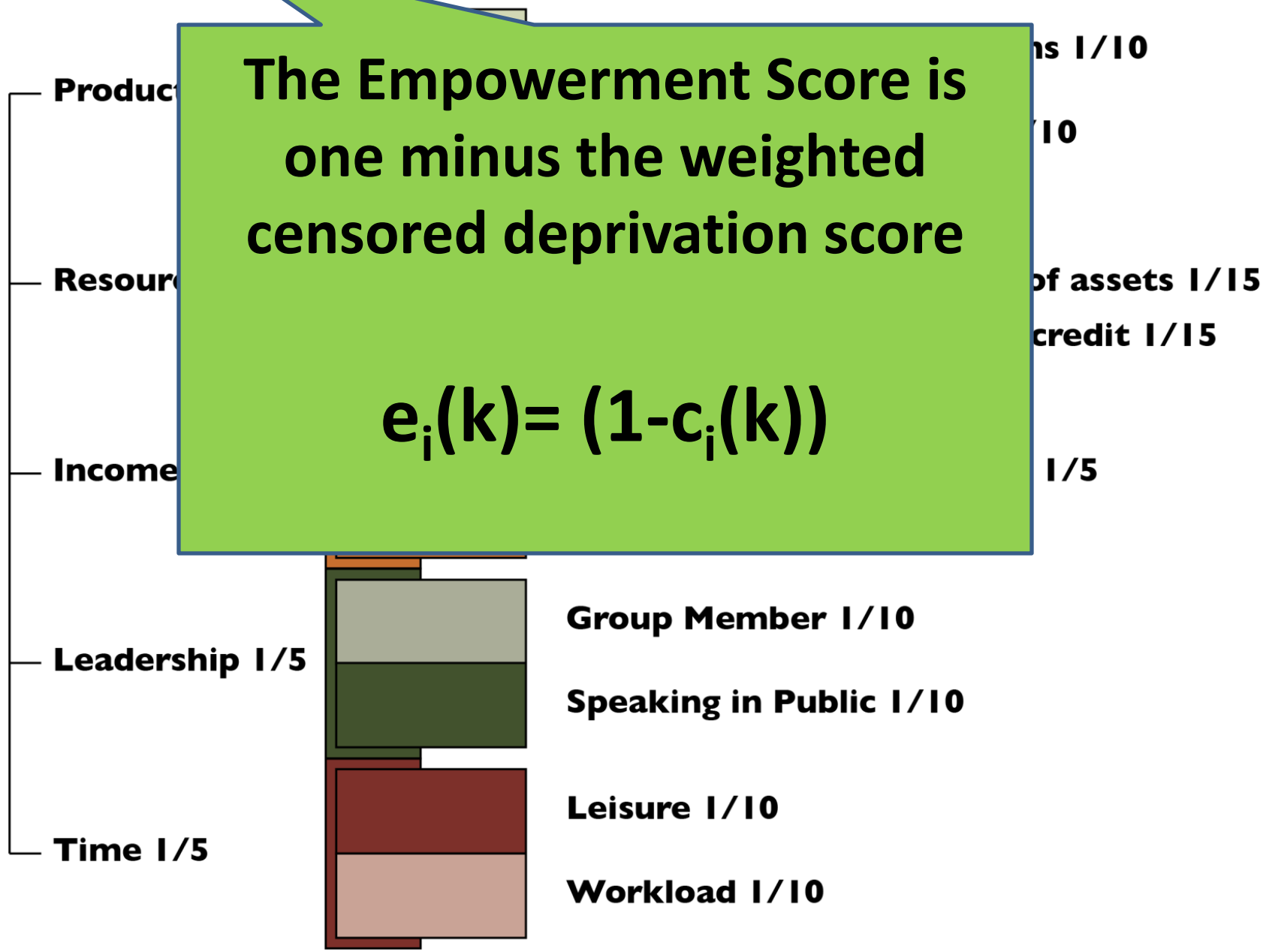
The Empowerment Score is one minus the weighted censored deprivation score
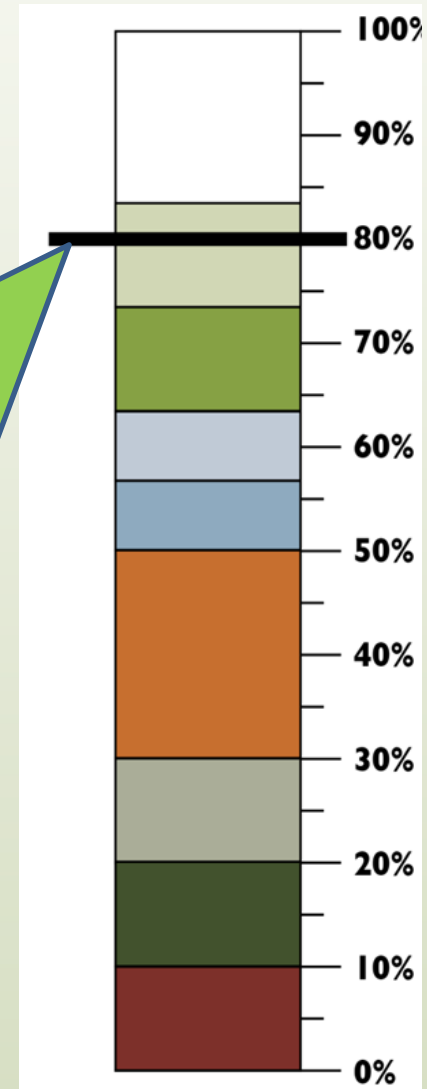
$$e_i(k) = (1 - c_i(k))$$

Who is empowered?

A person is empowered if
$e_i \geq 80\%$

Hence a person is empowered
if $c_i < 20\%$

So k = 20%, and is strict

5DE methodology

- Unit = man or woman (construct for both)
- Construct Indicators as per dofile.
- Nested Weights: equal across dimensions; equal across indicators within a dimension
- Construct weighted deprivation score c_i
- k=20% - but note that it is strict not weak.
- Identify who is poor (disempowered)
- Construct M_0
- Construct $(1-M_0)$

Gender Parity Index (GPI)

Reflects two things:

1. **The percentage of women who enjoy gender parity.** A woman **enjoys gender parity** if

   – she is empowered or

   – if her empowerment score is equal to or greater than the empowerment score of the primary male in her household.

2. The **empowerment gap -** the average percentage shortfall that a woman without parity experiences relative to the male in her household.

The GPI adapts the Foster Greer Thorbecke Poverty Gap measure to reflect gender parity.

Gender Parity Index (GPI)

Construction is based only on households that have a man and woman (no female only hh).

Requires empowerment scores of man and woman for each hh.

Note the average 'gap' is divided by the number of hh with a man and woman, not all households.

GPI methodology

- Unit = woman in hh with resident male too
- Use censored deprivation scores. But to explain:
- Construct $e_i(k) = (1-c_i(k))$ for male and female
- By household, compare $e_i(k)$ & identify parity
  - If women's $e_i(k) \geq 80\%$, gender parity
  - If woman's $e_i(k) < 80\%$ and Women's $e_i(k) \geq$ Man's $e_i(k)$ for same household, gender parity
  - If woman's $e_i(k) < 80\%$ and Women's $e_i(k) <$ Man's $e_i(k)$ for same household, no gender parity
- Gap: by household: Man's $e_i(k)$ - Women's $e_i(k)$ for same hh

Measurement Interlude
5DE uses $1\text{-}M_0$ and GPI uses $1\text{-}P_1$:

- **Key Properties:** both have decomposability; 5DE has dimensional monotonicity; GPI monotonicity

- **Similar structure:**

    - $1\text{-}M_0 = 1\text{-}HA$

    - $1 - P_1 = 1\text{-}H\,\mathrm{I}$

- **Both can be re-written by using:**

    1. The empowered $(1\text{-}H)$
    2. The 'achievements' of the disempowered $(1\text{-}A)$, $(1\text{-}\mathrm{I})$
    3. The disempowered (H)

Formula

$$5DE = H_e + H_d A_e = (1 - H_d A)$$

H_e is the percentage of empowered women
H_d is the percentage of disempowered women
A_e is the average absolute empowerment score among the disempowered

$$GPI = H_p + H_w R_p = (1 - H_w I)$$

H_p is percentage of women with gender parity
H_w is the percentage of women without gender parity
R_p is the women's relative parity score compared to men

$H_e + H_d = 100\%$ $H_p + H_w = 100\%$
$A_e + A = 100\%$

Formula

Writing the $(1-M_0)$ or $(1-P_1)$ in this way is algebra, only.

It is for the purposes of communication.

It does not affect indicator construction.

Note that you may analyse the empowerment score, which is not standard for poverty.

Assumptions:

We assume you have received the cleaned survey data.

We assume that the survey was implemented correctly.

We use the variable names that are given in the survey.

We presume you take time getting to know the dataset and variables before embarking on indicator construction.

In addition you probably want to check out a few things:

Some Preliminary Issues

Non-response in 5DE questions needs to be checked, to ensure that at least some domains or categories have responses (so aggregated indicators have low non-response).

Check percentage of respondents who are engaged in any agricultural activity (thus have the potential of being empowered).

Check the percentage of female-only hh.

Some Preliminary Issues

- **Compare responses of men and women from the same household:** (Access to productive capital and credit and household decision-making). One would expect these answers to coincide; however in the pilot,
  - Responses of men and women within the same household agreed in 43% of cases, if all questions are considered together
  - However, the same responses unambiguously contradicted each other in 28% of cases.
  - Suggests that although men and women in the same household may not exactly agree on who makes a decision. Their perspectives directly contradict each other in just over a quarter of cases.

These data issues will also affect analysis.

Validity testing

- Check the variables that will be aggregated into an indicator. For example, for autonomy, analyse correlations between the 3 indicators you will aggregate, by domain. We expect:
  - H1: corr(g03, g04)>0
  - H2: corr(g03, g05)<0
  - H3: corr(g04, g05)<0

- Do exploratory factor analysis to test whether indicators of different areas of decisionmaking converged in the same factor and that factors discriminate well so indicators from different types of questions refer to different constructs

Indicator Construction

- Check that the variable names and labels in the dataset correspond to the correct survey questions and answer codes.

- Note that 8 of the 10 WEAI indicators are themselves indicators which use a counting approach to identify adequacy / deprivation.

- This is useful when:
  - Sub-variables can be conceptualised as proxies (substitutes in the sense of showing depriv.)
  - You do not need to decompose to variable level

Indicator name	Variable(s)	Aggregation method	Inadequacy cut-off
Input in productive decisions	B01-B02 1-3,6, G01-G02 A-E	achievement in two	Inadequate if individual participates BUT does not make the decisions nor feels she/he could, or that has not at least some input in decisions
Autonomy in production	G03-G05 A-E	achievement in any	Inadequate if RAI ≤ 1 RAI is a weighted sum of G03-G05 for each domain
Ownership of assets	C01-C02 1-14	achievement in any if not only one small asset (chickens, non-mechanized equipment, small consumer durables)	Inadequate if household owns the type of asset BUT she/he does not own it solely or jointly

| Indicator name	Variable(s)	Aggregation method	Inadequacy cut-off
Purchase, sale or transfer of assets	C01, C04-C06 1-7 C09 1-7	achievement in any type of asset as long it is not only chickens or farming equipment non-mechanized	Inadequate if: 1) household does not own any asset or 2) if it owns the type of asset BUT she/he does not participate in ANY decisions about it.
Access to and decisions on credit	C10-C12 A-E	achievement in any	Inadequate if household 1) has no credit OR 2) used a source of credit BUT she/he did not participate in ANY decisions about it
Control over use of income	B01, B03 1-6, G01-G02 G-H	achievement in any if not only minor household expenditures	Inadequate if participates in activity BUT has no input or little input on indecisions about income generated

Indicator name	Variable(s)	Aggregation method	Inadequacy cut-off
Group member	E06 A-K	achievement in any	Inadequate is not part of any group
Speaking in public	E02 A-C	achievement in any	Inadequate if not comfortable speaking in public
Time Poverty	F01	n/a	Inadequate if worked more than 10.5 hours in the previous day
Leisure time	F04B	n/a	Inadequate if not satisfied (<5)

WEAI weights

| Domain	Indicators	Weight
Production	Input in productive decisions	1/10
	Autonomy in production	1/10
Resources	Ownership of assets	1/15
	Purchase, sale, or transfer of assets	1/15
	Access to and decisions on credit	1/15
Income	Control over use of income	1/5
Leadership	Group member	1/10
	Speaking in public	1/10
Time	Workload	1/10
	Leisure	1/10

Now, move to stata

Toy Example – Problem? High Male deprivations
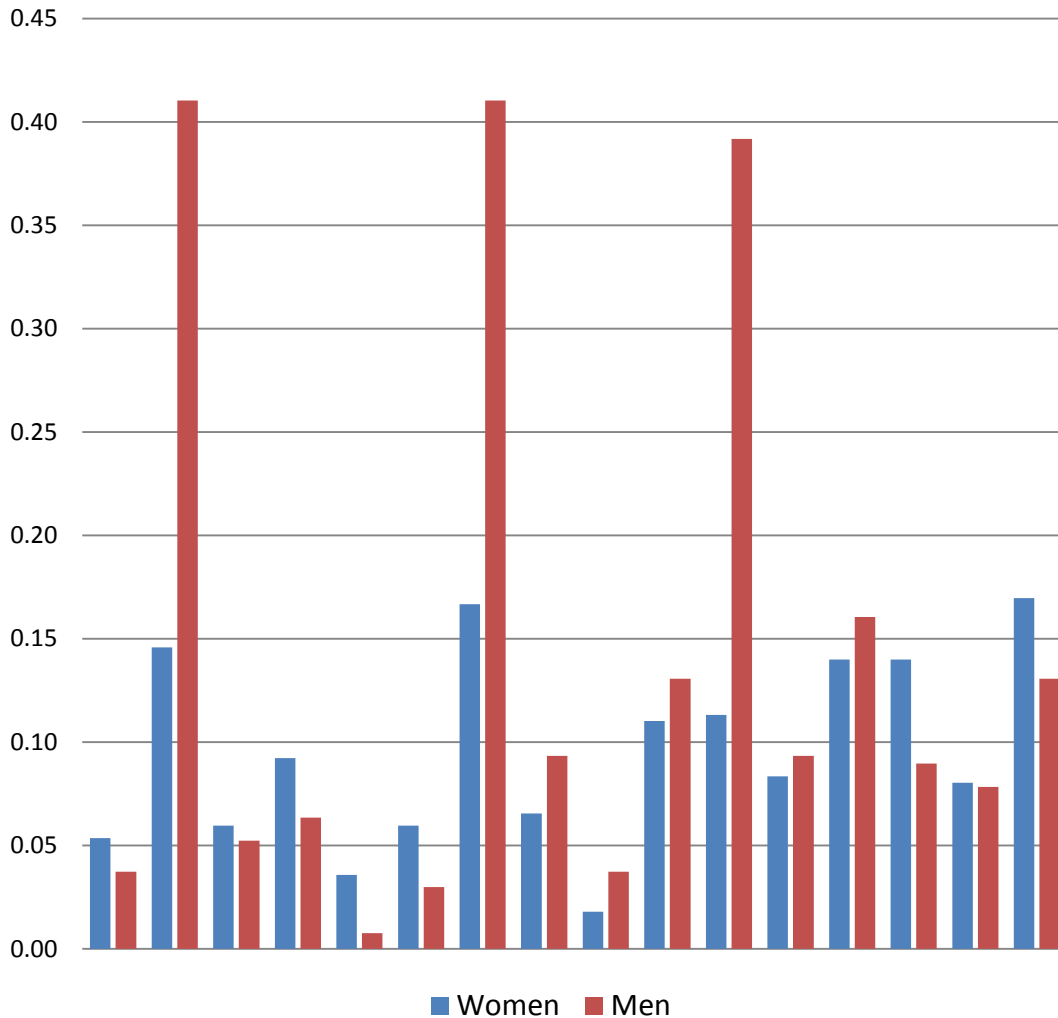
Check/compare male vs female censored deprivation headcounts by indicator

(we expect women to have higher CH in most indicators)
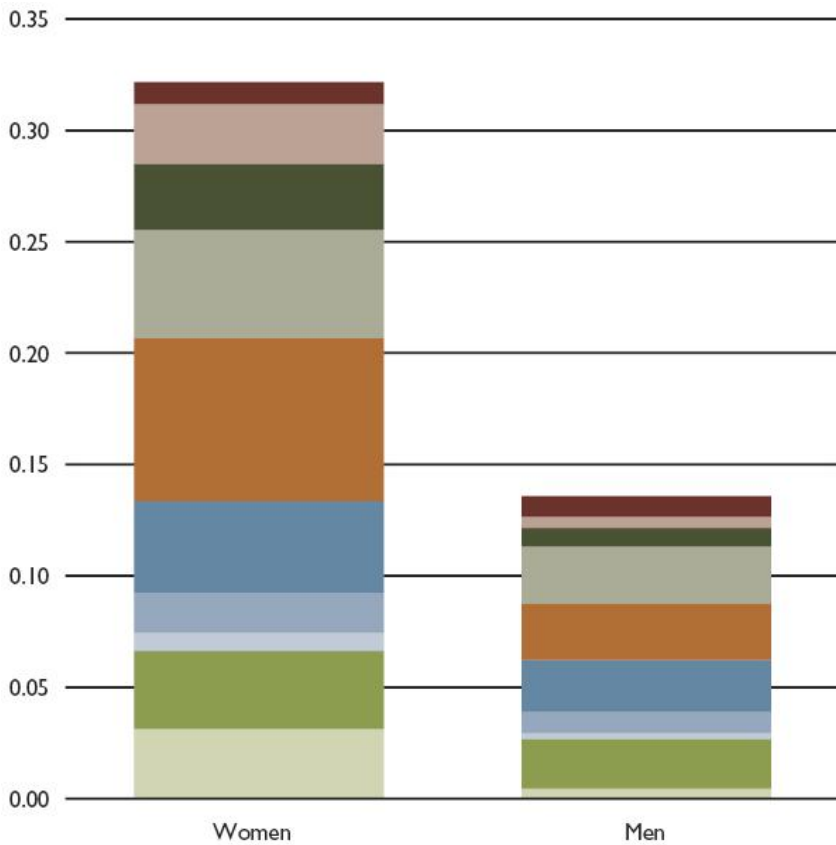
Check/compare male vs female percentage contributions.

Look at % cont to M_0 by gender.

Women are less empowered than men in Guat

Survey Questions

Dimension	Domains	Examples
Role in household decision-making around production and income generation (Module B)	**Food crop farming; Cash crop farming; Livestock raising; Non-farm economic activities; Wage and salary employment; Fishing or fish pond culture**	How much input did you have in making decisions about [ACTIVITY]?
Role in household decision-making around production and income generation (Module G) **Autonomy** around producton and income generation (Module G)	**Agricultural production?; What inputs to buy for agricultural production?; What types of crops to grow for agricultural production?; When or who takes crops to the market?; Livestock raising?; Non-farm business activity?; Your own wage or salary employment?; Minor household expenditures?**	To what extent do you feel you can make your own personal decisions regarding [DOMAIN] if you want(ed) to? Your actions with respect to [DOMAIN] are motivated by: A desire to avoid punishment or gain reward? A desire to avoid blame or so that other people speak well of you? And reflect your own values and/or interests? How satisfied were you with the decisions made in

Survey Questions

Dimension	Domains	Examples
Access to productive capital, credit, and extension services (Module C)	Agricultural land; Large livestock; Small livestock; Chickens, ducks, turkeys, pigeons; Fish pond or fishing equipment; Farm equipment (non-mechanized); Farm equipment (mechanized); Non-farm business equipment; House (and other structures); Large consumer durables; Small consumer durables; Cell phone; Other non-agricultural land; Means of transportation	How many of [ITEM] does your household currently have? Who would you say can use the [ITEM] the most? Who contributes most to decisions regarding a new purchase of [ITEM]?
Access to productive capital, credit, and extension services (Module C)	NGO; Informal lender; Formal lender; Friends or relatives; SACCOs/ROSCAs; Village savings and loan associations	Who made the decision to borrow from [SOURCE]?

Survey Questions

Dimension	Domains	Examples
Income (Module B)	Food crop farming; Cash crop farming; Livestock raising; Non-farm economic activities; Wage and salary employment; Fishing or fish pond culture	How much input did you have in decisions on the use of income generated from [ACTIVITY]?
Individual leadership and influence in the community (Module E)		Do you feel comfortable speaking up in public to: help decide on infrastructure (like small wells, roads, water supplies) to be built in your community? to ensure proper payment of wages for public works or other similar programs? public to protest the misbehavior of authorities or elected officials?
Individual leadership and influence in the community (Module E)	Agricultural/livestock/fisheries producer's group; Water users' group; Forest users' group; Credit or microfinance group; Trade and business association; Civic or charitable groups; Local government; Religious group; Other women's group	Are you an active member of this [GROUP]?

Survey Questions - time

Dimension	Activities	
Time Allocation (time use module)	Sleeping and resting; Personal care; School (also homework); Work as employed; Own business work; Farming; Construction; Fishing; Shopping/getting service; Weaving, sewing, textile care; Cooking; Domestic work; Care for children/adults/elderly; Commuting; Travelling; Watching TV; Reading; Sitting with family; Exercising; Social activities; Practicing hobbies; Religious activities; Other, specify	
Time allocation (Module F)		How would you rate you satisfaction with: The distribution of work within your household? Your available time for leisure activities? Your power to make important decisions that change the course of your life? Your satisfaction with your life overall?