

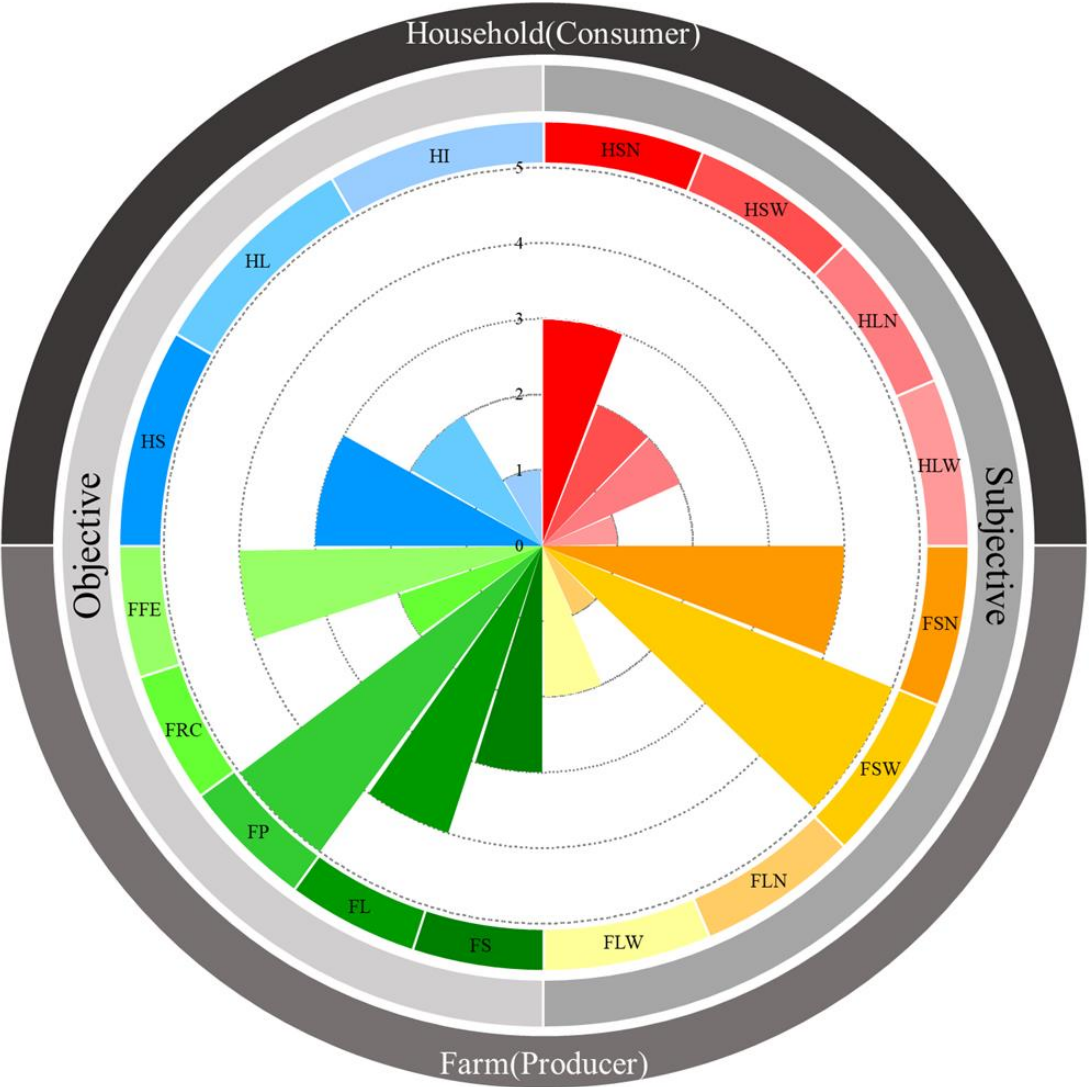
The figure illustrates the 16 dimensions to measure farmers' FWB.

In the **subjective-household category**, we have four dimensions: 1) household short-term needs (HSN), 2) household short-term wants (HSW), 3) household long-term needs (HLN), and 4) household long-term wants (HLW).

In the **subjective-farm category**, there are the four following dimensions: 1) farm short-term needs (FSN), 2) farm short-term wants (FSW), 3) farm long-term needs (FLN), and 4) farm long-term wants (FLW).

In the **objective-farm category**, we have five dimensions: 1) farm solvency (FS), 2) farm liquidity (FL), 3) farm profitability (FP), 4) farm repayment capacity (FRC), and 5) farm financial efficiency (FFE).

In the **objective-household category**, we have the following three dimensions: 1) household solvency (HS), 2) household liquidity (HL), 3) household investment (HI).



Measures of FWB

Household Subjective Measures

Household short-term needs

How often does this statement apply to you: I worry about being able to meet normal monthly living expenses	Score 1-5: Likert Always- Never	Prawitz et al. (2006)
How often does this statement apply to you: I am just getting by financially and living month to month	Score 1-5: Likert Always- Never	Modified from Garman and Sorhaindo (2005) ; Prawitz et al. (2006)
How well does this statement describe you or your situation: I could find the money to pay for a financial emergency that costs about \$1,000	Score 1-5: Likert Not at all- Completely	Modified from Garman and Sorhaindo (2005)

Notes:

Household Subjective Measures

Household short-term wants

How well does this statement describe you or your situation: Because of my money situation, I feel like I will never have the things I want in life

Score 1-5: Likert Completely- Not at all

[Bureau \(2017\)](#); [Netemeyer et al. \(2018\)](#)

How often does this happen to you: I want to go out to eat, go to a movie, or do something else and don't go because I can't afford to

Score 1-5: Likert Always- Never

[Prawitz et al. \(2006\)](#)

How often does this statement apply to you: I have money left over at the end of the month

Score 1-5: Likert Never- Always

Modified from [Bureau \(2017\)](#)

How well does this statement describe you or your situation: My financial situation is better than **the average situation of others** in my community

Score 1-5: Likert Not at all- Completely

Modified from [Hira and Mugenda \(1999\)](#)

How well does this statement describe you or your situation: My current financial situation is better than it was 5 years ago

Score 1-5: Likert Not at all- Completely

Modified from [Hira and Mugenda \(1999\)](#)

Notes:

Household Subjective Measures

Household long-term needs

How well does this statement describe you or your situation: I am becoming financially secure.

Score 1-5: Likert Not at all- Completely

[Netemeyer et al. \(2018\)](#)

How well does this statement describe you or your situation: I have saved (or will be able to save) enough money to last me to the end of my life

Score 1-5: Likert Not at all- Completely

[Netemeyer et al. \(2018\)](#)

How well does this statement describe you or your situation: I am confident that I can repay my long-term debt on time (e.g., housing mortgage or car loan)

Score 1-5: Likert Not at all- Completely

Modified from [Brand et al. \(2022\)](#)

Notes:

Household Subjective Measures

Household long-term wants

How well does this statement describe you or your situation: I will achieve the long-term financial goals that I have set for myself

Score 1-5: Likert Not at all- Completely

Modified from [Garman and Sorhaindo \(2005\)](#); [Hira and Mugenda \(1999\)](#); [Netemeyer et al. \(2018\)](#)

How well does this statement describe you or your situation: I will be able to enjoy life in the future because of the way I'm managing my money

Score 1-5: Likert Not at all- Completely

Modified from [Bureau \(2017\)](#)

How well does this statement describe you or your situation: Over the next 5 years, I think my household's financial situation will be better than **the average situation of others** in my community

Score 1-5: Likert Much worse than them- Much better than them

Modified from [Hira and Mugenda \(1999\)](#)

Notes:

Farm Subjective Measures

Farm short-term needs

How well does this statement describe your farm's situation: My farm's financial condition is **strong** enough to survive the next year

Score 1-5: Likert Not at all- Completely

Constructed by authors

How well does this statement describe your farm's situation: **I am comfortable with the access I have to cash for the farm (cash, sales of inventories, ability to get an operating loan, etc.)**

Score 1-5: Likert Not at all- Completely

Modified from [Johnson, Lessley and Hanson \(n.d.\)](#)

How often does this statement apply to your farm: My farm generated positive profit over the past 5 years

Score 1-5: Likert Never- Always

Modified from [Johnson, Lessley and Hanson \(n.d.\)](#)

How well does this statement describe your farm's situation: My farm could find the money to pay for a financial emergency that costs about 10% of its annual gross revenue

Score 1-5: Likert Not at all- Completely

Modified from [Garman and Sorhaindo \(2005\)](#)

Notes:

Farm Subjective Measures

Farm short-term wants

How well does this statement describe your farm's situation: The farm is generating enough profit to meet manager(s)' short-term goals	Score 1-5: Likert Not at all- Completely	Constructed by authors
How well does this statement describe your farm's situation: If I invested my time and abilities into another job, I would get a higher return than I am getting on my farm	Score 1-5: Likert Completely- Not at all	Modified from Johnson, Lessley and Hanson (n.d.)
How well does this statement describe your farm's situation: My capital(money) investment in the farm business is earning a greater financial return than what I would get if I invested elsewhere	Score 1-5: Likert Not at all- Completely	Modified from Johnson, Lessley and Hanson (n.d.)
How often does this statement apply to your farm: The farm defers purchasing new equipment because of financial strain	Score 1-5: Likert Always- Never	Constructed by authors
My net worth is ___ it was 5 years ago	Score 1-5: Likert A lot less than- A lot more than	Modified from Brand et al. (2022)

Notes:

Farm Subjective Measures

Farm long-term needs

How well does this statement describe your farm's situation: My farm is likely to go bankrupt in the next five years	Score 1-5: Likert Completely- Not at all	Constructed by authors
To the best of your knowledge, what is the ratio of your farm's total debt to total assets?	Score 1-5: Likert More than 80%- Less than 20%	Modified from Johnson, Lessley and Hanson (n.d.)
How well does this statement describe your farm's situation: I am confident that my farm can repay its long-term debt on time (e.g., equipment loan or mortgage)	Score 1-5: Likert Not at all- Completely	Modified from Brand et al. (2022)
How well does this statement describe your farm's situation: I am confident in the long-term outlook of the cattle industry	Score 1-5: Likert Not at all- Completely	Constructed by authors
How well does this statement describe your farm's situation: I am confident that I could adapt to changes in the cattle sector (like policies, technology, etc.) in the next 10 years	Score 1-5: Likert Not at all- Completely	Constructed by authors
How well does this statement describe your farm's situation: I am confident that I could handle the yield or price risks in the next 10 years	Score 1-5: Likert Not at all- Completely	Constructed by authors

Notes:

Farm Subjective Measures

Farm long-term wants

How well does this statement describe your farm's situation: The farm can meet manager(s)' long-term goals (e.g., expand farm operations or generate a certain profit)	Score 1-5: Likert Not at all- Completely	
How well does this statement describe your farm's situation: Over the next 5 years, my farm profits will grow more than other farms in my community	Score 1-5: Likert Not at all- Completely	Modified from Delaney and Huselid (1996) ; Singh (2004)
How well does this statement describe your farm's situation: I still want to be a farmer in 5 years	Score 1-5: Likert Not at all- Completely	Constructed by authors
How well does this statement describe your farm's situation: My business will be able to generate enough income for my successor or heirs	Score 1-5: Likert Not at all- Completely	Constructed by authors
How well does this statement describe your farm's situation: If an opportunity comes up to buy land that I want, I have resources or access to credit that is sufficient to make the purchase	Score 1-5: Likert Not at all- Completely	Constructed by authors

Notes:

Household Objective Measures

Household solvency

The solvency ratio= total assets/total debts

Vulnerable: Less than 1.0; Acceptable: [Kim and Lyons \(2008b\)](#); [Lyons and Yilmazer \(2005\)](#)
Otherwise (need case study to decide)

Household liquidity

The liquidity ratio= liquid assets/monthly income

Vulnerable: Less than 2.5; Acceptable: [Kim and Lyons \(2008b\)](#); [Lyons and Yilmazer \(2005\)](#)
Otherwise (need case study to decide)

Household investment

The investment assets ratio= investment assets/net worth

Vulnerable: Less than 0.25; Acceptable: [Kim and Lyons \(2008b\)](#); [Lyons and Yilmazer \(2005\)](#)
Otherwise (need case study to decide)

Notes:

Farm Objective Measures

Farm liquidity

Current ratio= $\frac{\text{Total current farm assets}}{\text{Total current farm liabilities}}$	Vulnerable: Less than 1.3; Acceptable: 1.3-2.0; Strong: Higher than 2.0	Brand et al. (2022)
Working capital to gross revenues= $\frac{(\text{Total current farm assets}-\text{Total current farm liabilities})}{\text{Gross farm income}}$	Vulnerable: Less than 0.1; Acceptable: 0.1-0.3; Strong: Higher than 0.3	Brand et al. (2022)
Working capital to operating expense= $\frac{(\text{Total current farm assets}-\text{Total current farm liabilities})}{(\text{Total operating expense}-\text{Depreciation})}$	Vulnerable: Less than 0.2; Acceptable: 0.2-0.4; Strong: Higher than 0.4	Brand et al. (2022)

Farm Objective Measures

Farm solvency

Farm debt-to-asset ratio= Total farm liabilities / Total farm assets

Vulnerable: Higher than 0.6; Acceptable: 0.6-0.3; Strong: Less than 0.3 [Brand et al. \(2022\)](#)

Farm Objective Measures

Farm profitability

Rate of return on farm assets= $\text{Return on farm assets} / \text{Average farm assets}$

Vulnerable: Less than 0.04; Acceptable: 0.04-0.08; Strong: Higher than 0.08 [Brand et al. \(2022\)](#)

Rate of return on farm equity= $\text{Return on farm equity} / \text{Average farm net worth}$

Vulnerable: Less than 0.03; Acceptable: 0.03-0.1; Strong: Higher than 0.1 [Brand et al. \(2022\)](#)

Operating profit margin= $\text{Return on farm assets} / \text{Value of farm production}$

Vulnerable: Less than 0.15; Acceptable: 0.15-0.25; Strong: Higher than [Brand et al. \(2022\)](#)

Asset turnover ratio= $\text{Value of farm production} / \text{Average farm assets}$

Vulnerable: Less than 0.3; Acceptable: 0.3-0.45; Strong: Higher than 0.45 [Brand et al. \(2022\)](#)

Farm Objective Measures

Farm repayment capacity

Debt coverage ratio= Repayment & Replacement capacity/ Total debt repayment	Vulnerable: Less than 1.25; Acceptable: 1.25-1.75; Strong: Higher than 1.75	Brand et al. (2022)
Replacement coverage ratio= Repayment & Replacement capacity/ (Total debt repayment+Unfunded capital expenditure)	Vulnerable: Less than 1.1; Acceptable: 1.1-1.5; Strong: Higher than 1.5	Brand et al. (2022)
Term debt & Finance lease coverage ratio=Term repayment & replacement capacity/ Total principle & interest on term debt and finance leases	Vulnerable: Less than 1.25; Acceptable: 1.25-1.75; Strong: Higher than 1.75	Brand et al. (2022)

Farm Objective Measures

Farm financial efficiency

Operating-expense ratio= (Total farm operating expense excluding interest- Depreciation)/ Gross farm income
Vulnerable: Higher than 0.8; Acceptable: 0.8-0.6; Strong: Less than 0.6 [Brand et al. \(2022\)](#)

Depreciation-expense ratio= Depreciation/ Gross farm income
Vulnerable: Higher than 0.1; Acceptable: 0.1-0.05; Strong: Less than 0.05 [Brand et al. \(2022\)](#)

Interest-expense ratio= Farm interest/ Gross farm income
Vulnerable: Higher than 0.1; Acceptable: 0.1-0.05; Strong: Less than 0.05 [Brand et al. \(2022\)](#)

Net farm income ratio= Net farm income/ Gross farm income
Vulnerable: Less than 0.1; Acceptable: 0.1-0.2; Strong: Higher than 0.2 [Brand et al. \(2022\)](#)