The Farm Resilience Assessment Score Card and Scoring Guidance

The Farm Resilience Assessment Score Card (FRAS) – What is it?

The Farm Resilience Assessment Scorecard was developed based on a conceptual measurement framework that combines a set of three resilience indicators or factors of resilience that include (1) environmental management, (2) social capital and protection, (3) reflective learning. Each indicator has a series of 5 variables that can be used to quantify each aspect of resilience and these are summarized in Table 2 which can be found in the appendix of the dissertation[1]. The variables chosen were based on the BRACC household survey questionnaire used to collect data for impact evaluation at the end of the program. For each of the three indicators, only two variables that could be used to quantify each aspect of resilience were chosen for the development of the Farm Resilience Assessment Scorecard out of the five that were proposed in the conceptual measurement framework. This is because the data for the other variables that were excluded was not fit for purpose or good enough to support the outcomes of the study (some variables had missing data so they would not have been very useful).

To create scores that can be used to quantify each variable in the scorecard, responses to the questions the variables were based on were assigned score values between 0 to 5 where 0 represents the lowest level of resilience and 5 the greatest. The quantification of the variables is useful because it makes it possible to analyze information collected using the scorecard using methods like data analysis which is useful for the identification of patterns and potential contributing factors behind them. The choice to design the Farm Resilience Assessment Scorecard this way was based on studies that have used similar methods to measure resilience in different disciplines (Glasson, Therivel and Chadwick, 2012; Martinez-Bernal, Toro Calderon and Leon-Sicard, 2018; Phillips and Phillips, 2016; Cordoba, Trivino and Calderon, 2020). Assigning values on a scale from 0 to 5 also worked well with the variables chosen from the BRACC household survey questionnaire.

[1] It is important to note that these three indicators of farm system resilience are not set in stone, they can be adapted to suit different contexts. The indicators chosen in the conceptual framework were based on preliminary literature for the research. How they are defined as well as their implications for resilience is outlined in the dissertation.

Table 1: Farm Resilience Assessment Scorecard (FRAS)

Resilience Criteria 1: Environmental Management			
Variable	**Question**	**Response**	**Score**
Access to irrigation technology	Do you use irrigation technology to irrigate all or part of your land?	No	0
		Yes	5
Climate Smart Agriculture Practice Use	Did your household use any of the following practices in your crop cultivation activities: - Applying a protective covering of organic materials (mulching) - Planting a different crop than what was planted the previous year on the same plot (crop rotation) - Applying decomposed organic matter or manure instead of artificial fertilizer - Low soil tillage - Planting Shrubs or trees on the boundaries of crop cultivation land - Growing a specific type of plant along with your crops for diversification (intercropping)	None of these practices were used	0
		Only one of these practices was used	1
		Two of these practices were used	2
		Three of these practices were used	3
		Four of these practices were used	4
		Five or more of these practices were used	5
Resilience Criteria 2: Social Capital and Protection			
Variable	**Question**	**Response**	**Score**
Access to Loans	In the past five years, have you been able to successfully apply for and receive a loan?	No	0
		Yes	5

Accumulated Savings	Do you have a savings account with one or more of the following: - Bank - Credit union - Microfinance company - Village savings organization	None of these	0
		One of these	3
		More than one of these	5
Resilience Criteria 3: Reflective Learning			
Variable	**Question**	**Response**	**Score**
Experience with environmental shocks and their impacts on food production	During the last five years, was your household affected negatively by any of the following: - Drought - Irregular Rains - Floods - Landslides - Unusually high levels of crop pests or diseases	None of these	0
		Only one of these	1
		Two of these	2
		Three of these	3
		Four of these	4
		All of these	5
Climate Information Use	Has your household used climate information to change its farming behavior in any of the following ways: - Grow different crops or crop varieties - Plant at a different time - Planted multiple crops/varieties in a season - Used different inputs or agricultural practices - Invested in non-agricultural activities to diversify income	Household has implemented none of those behavior changes	0
		Household has implemented one of those behavior changes	1
		Household has implemented two of those behavior changes	2
		Household has implemented three of those behavior changes	3
		Household has implemented four of those behavior changes	4

	- Migrated in search for new farmland	Household has implemented five or more of those behavior changes	5

How does it work?

The value of a smallholder farm household's overall resilience is determined as the total scores of the six variables in the scorecard and this is called the full farm resilience assessment score. Sub-Scales can also be used to understand a farm's performance in each of the three indicators for resilience in the scorecard. The value of a smallholder farm household's resilience in each indicator is determined as the total scores of the two variables that make up that particular indicator. The scoring guidance for the Farm Resilience Assessment score card also includes a traffic light like system to help identify different farm systems according to their resilience levels.

The range of summative score values for each of the variables can also be interpreted as follows; households that score between 0.00 – 1.69 for a certain variable are not likely to be able to recover from an environmental shock without extensive intervention. These are households with farm systems whose resilience state implies they are in the red zone. Households that score between 1.70 – 3.39 are those that are likely to recover from environmental shock but some intervention may be necessary and these households have farm systems in the amber zone. Households that score between 3.40 – 5.00 are likely to recover from environmental shock with no intervention at all. These households have farm systems that are in the green zone and can provide lessons for how households that are not in the green zone can improve their scores.

The sub-scales are more useful at providing information on where an intervention to strengthen a system's resilience might be useful. The full farm assessment is not that useful in that regard. The full assessment only gives a quantification of the level of a systems resilience without providing any more information to help determine exactly where the problem that is in need of an intervention lies.

Table 2: Scoring Guidance for Full Farm Resilience Assessment and Sub-scales

Scale or Sub-scale	Number of variables	Possible Range of Summative Scores
Full Farm Resilience Assessment	6	0 – 30 points
Resilience Criteria 1: *Environmental Management*	2	0 – 10 points
Resilience Criteria 2: *Social Capital and Protection*	2	0 – 10 points
Resilience Criteria 3: *Reflective learning*	2	0 – 10 points

*The Range of Summative Scores for each variable is 0 – 5 points. The resilience scores for each variable can also be interpreted through the scale below:

0.00 – 1.69 points	Low Resilience (Red zone) – Farm system is not likely to be able to recover from an environmental shock without extensive intervention
1.70 – 3.39 points	Normal Resilience (Amber zone) - Farm system is likely to recover from environmental shock but some intervention may be needed
3.40 – 5.00 points	High Resilience (Green zone) – Farm system is likely to naturally recover from environmental shock with no intervention at all