

# LESSONS FOR MEASURING RESILIENCE FROM THE BRACC PROGRAMME

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## Acronyms

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|                |  |
|----------------|--|
| <b>AP</b>      | African Parks  |
| <b>BRACC</b>   | Building Resilience and Adapting to Climate Change   |
| <b>CARI</b>    | Consolidated Approach to Reporting Indicators (of Food Security)(index)                      |
| <b>CIS</b>     | Climate Information Services   |
| <b>CRS</b>     | Catholic Relief Services   |
| <b>CSA</b>     | Climate-Smart Agriculture  |
| <b>DHS</b>     | Demographic and Health Survey  |
| <b>EWS</b>     | Early Warning Systems  |
| <b>FANTA</b>   | Food And Nutrition Technical Assistance project  |
| <b>FAO</b>     | Food and Agriculture Organisation  |
| <b>FCDO</b>    | Foreign, Commonwealth and Development Office   |
| <b>FIES</b>    | Food Insecurity Experience Score   |
| <b>FSN</b>     | Food Security and Nutrition (Network)  |
| <b>GIZ</b>     | Gesellschaft für Internationale Zusammenarbeit (German Agency for International Cooperation) |
| <b>GoM</b>     | Government of Malawi   |
| <b>ICF</b>     | International Climate Finance  |
| <b>IFPRI</b>   | International Food Policy Research Institute   |
| <b>KPI</b>     | Key Performance Indicator  |
| <b>MAD</b>     | Minimum Acceptable Diet  |
| <b>MDDW</b>    | Minimum Dietary Diversity score for Women  |
| <b>MCHF</b>    | Modern Cooking for Healthy Forests   |
| <b>MIRA</b>    | Measurement Indicators for Resilience Analysis   |
| <b>MVAC</b>    | Malawi Vulnerability Assessment Committee  |
| <b>NRS</b>     | National Resilience Strategy   |
| <b>PROSPER</b> | Promoting Sustainable Partnerships for Empowered Resilience                                  |
| <b>PWP</b>     | Public Works Programme   |
| <b>RFMS</b>    | Rapid Feedback Monitoring System   |
| <b>RI</b>      | Resilience Index   |
| <b>RIMA-II</b> | Resilience Index Measurement and Analysis-II   |
| <b>SCTP</b>    | Social Cash Transfer Programme   |
| <b>TA</b>      | Traditional Authority  |
| <b>TANGO</b>   | Technical Assistance to NGOs (International)   |
| <b>TBD</b>     | To Be Determined   |
| <b>WEIA</b>    | Women's Empowerment in Agriculture (index)   |
| <b>WFP</b>     | World Food Programme   |
| <b>WFP/VAM</b> | World Food Programme/Vulnerability Analysis and Mapping                                      |

## Key messages

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- ▶ Growing interest in resilience has been accompanied by the emergence of varying approaches to measuring progress towards resilience.
- ▶ The UK's Foreign, Commonwealth and Development Office (FCDO) funded BRACC programme experimented with different configurations of a resilience index as part of its reporting obligations to the UK's International Climate Finance (ICF) commitment. Composite indices, together with thresholds that lacked a clear meaning, led to difficulties interpreting the resilience index outcomes.
- ▶ In addition to challenges with interpretation of the resilience index results, BRACC faced additional challenges with resilience measurement, including developing a sufficiently nuanced theory of change for a highly complex programme, a short timeline, use of some indicators that were not sensitive to intervention impact, and some evaluation approaches that were difficult to adapt to match adaptations in implementation.
- ▶ The relationship between welfare outcomes/development and resilience needs to be unpacked – improvements in the former do not automatically reflect or translate into improvements in the latter. This observation is critical given the evolving nature of climate hazards and risks, which means that resilience in the face of current exposure to shocks may not be adequate in the face of future change.
- ▶ Future resilience measurement attempts, including in the context of Malawi's National Resilience Strategy, should:
  - leave space to customise resilience measurement frameworks that specifically relate to programme theories of change with respect to the *resilience: of what, to what shock or hazard, and for whom*
  - differentiate between general welfare outcomes (which may be short-term priorities) and targeted, hazard-specific resilience outcomes (which may be long-term priorities)
  - select impact evaluation approaches carefully to balance the need for rigour, flexibility and cost-effectiveness
  - use simple, transparent approaches, while focusing on a few high-quality, well-understood indicators
  - avoid resilience index thresholds, unless there is a specific rationale or meaning for the threshold
  - consider the need for data collection and research to provide the empirical basis for resilience measurement, and do this at appropriate scale based on needs and resources.



# 1 RESILIENCE MEASUREMENT: APPROACHES AND CHALLENGES

## DEFINING RESILIENCE

Resilience has been a growing area of focus in international development in recent years, building from the well-established theory of ecological resilience. As use of the concept has grown in development, the focus on measuring resilience has also increased.<sup>1</sup>

Development actors have recognised that both good resilience programming and resilience measurement start with nuanced and detailed definitions of resilience that fully capture policy and programme objectives. For example, many definitions now recognise that a status quo of high poverty and inequality is undesirable, and reference not only a return to previous equilibrium, but achieving long-term growth or development (Box 1). BRACC defines resilience succinctly as ‘the capacity to withstand and recover from shocks and stresses.’<sup>2</sup> Some definitions of resilience specifically refer to climate resilience, while others encompass a broader range of shocks and stressors. The BRACC baseline report<sup>3</sup> contextualises resilience as a means to an end, namely improved human well-being in the face of evolving climate stresses and shocks linked to climate change, with a specific focus on food security and disaster risk.

## BOX 1 Definitions of resilience

**Malawi National Resilience Strategy** – ‘The ability of urban and rural communities, households and individuals to withstand, recover from, and reorganise in response to crises, so that all members of Malawian society can develop and maintain their ability to benefit from opportunities to thrive.’

**FCDO** – ‘The ability of countries, communities and households to manage change by maintaining or transforming living standards in the face of shocks or stresses without compromising their long-term prospects.’

**USAID** – ‘The ability of people, households, communities, countries and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth.’

**Resilience Alliance** – ‘The capacity of a system to absorb disturbance and reorganise while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks.’

It is common for resilience to be conceptualised in terms of types of capacities that contribute to resilience. The most common of these are adaptive, absorptive and anticipatory capacities; transformation is often recognised as either an additional resilience capacity, or a higher-level factor that can influence the other three capacities (Box 2). Although these capacities had been previously recognised in resilience literature, these ‘3As’ were first brought together into a framework under the UKAID Building Resilience and Adaptation to Climate Extremes and Disasters (BRACED) programme.<sup>4</sup>

## BOX 2 Definitions of the 3As and transformation in the context of resilience measurement

- ▶ **Anticipatory capacity** – ‘Ability of social systems to anticipate and reduce the impact of climate variability and extremes through preparedness and planning.’
- ▶ **Adaptive capacity** – ‘Ability of social systems to adapt to multiple, long-term and future climate change risks, and also to learn and adjust after a disaster.’
- ▶ **Absorptive capacity** – ‘Ability of social systems to absorb and cope with the impacts of climate variability and extremes; that is, to use available skills and resources, to face and manage adverse conditions, emergencies or disasters.’
- ▶ **Transformation** – ‘Pertains to the holistic and fundamental ways in which people’s capacity to adapt to, anticipate and absorb shocks can be built, reshaped and enhanced.’



## INDICATORS OF RESILIENCE

A proliferation of widely varying indicators, tools and methods for measuring resilience and the impact of programmes has evolved. Differences in approaches, in part, reflect differences in definitions of resilience and the context in which resilience is being measured. However, even where there is agreement about the resilience of *what* (such as food security) to *what* (such as natural hazards), measurement and evaluation methodologies differ.

Brooks et al.<sup>5</sup> describe three approaches to resilience measurement:

1. A **hazards-based approach** measures the magnitude of a hazard (such as a drought, flood or extreme river level) that can be accommodated by a given system or population.
2. An **impacts-based approach** measures resilience in terms of the impacts (losses, damages, costs) experienced when a hazard occurs.
3. A **systems- or capacities-based approach** measures indicators that are believed to be proxies for people's or systems' ability to anticipate, prepare for, cope with, recover from, and adapt to evolving hazards.

The **hazards-based approach** is rare in development but common in engineering. The **impacts-based approach** measures resilience retrospectively (or based on modelled impacts), and can involve measuring the total cost of a shock, including costs of anticipatory actions, impact effects (losses and damages) and recovery costs.<sup>6</sup>

The most widespread approach in the field of development is the **systems- or capacities-based approach**, involving 'predictive' resilience indicators that are measured prior to a hazard and serve as proxies of a system or population's ability to anticipate, cope with, and recover from that hazard. This approach avoids the problem of needing to wait for a shock, employing proxy variables or indicators that reflect or contribute to resilience, and which may be combined in indices. However, a key challenge for this approach is determining what proxy variables best capture resilience. Methods for identifying proxy variables range from sophisticated techniques that include causal theories and address challenges with endogeneity and aggregation, such as factor analysis, to simply selecting a collection of indicators believed to be linked to resilience, based on theory, past empirical work, or subjective views (sometimes termed 'descriptive models').<sup>7</sup>

Qualitative indicators may be more contextual or related to outcome mapping.<sup>8</sup> Indicators can be based on objectively measurable quantities (objective indicators) or on subjective perspectives, for example, individual or community scoring exercises (subjective indicators).<sup>9</sup>

As with all indicators, there is often a trade-off between the objective of having rigorous, comparable indicators, and the contextually-specific realities of resilience on the ground.<sup>10</sup> While there is a widespread desire in the development community for standardised quantitative resilience measurement tools and indicators, the highly contextual nature of resilience means that standard tools may not meet the evaluation and measurement needs of many programmes. In addition, context-specific resilience outcomes are often only evident following exposure to a shock. Innovative high-frequency approaches attempt to overcome this challenge by collecting regular data on shocks and outcomes to detect changes in welfare indicators of concern, for example, food security.<sup>11</sup>

If resilience is viewed as an outcome of development interventions, changes in these welfare indicators can be viewed as reflecting the impacts of such interventions. Welfare-related indicators measuring shocks that follow can therefore be used to validate predictive indicators used as proxies for resilience that are measured before the shocks (that is, do the resilience indicators accurately predict which locations, groups and households experience the greatest/least impacts/losses resulting from a shock?).<sup>12</sup> However, such validation is dependent on the availability of appropriate data relating to both resilience and welfare, measured at the right times, and the occurrence of a shock that affects sufficient numbers of people for meaningful relationships to be established between predictive resilience indicators and welfare indicators that reflect the effects of hazards/shocks.

Many systems-based indicators draw on the concept of resilience capacities, commonly the 3As and transformation capacities described in Box 2. In a similar approach, the FAO's Resilience Indicators for Measurement and Analysis - II (RIMA - II) model identifies four 'pillars' of food security resilience: access to basic services, adaptive capacity, assets and social safety nets.<sup>10</sup>

Resilience measurement findings can be very different, depending on the measurement or tool used.<sup>10</sup> In the context of resilience programme evaluation and learning, it is also essential that the underlying theory and methodology for indicator identification and weighting is clear, and can be transparently interpreted.<sup>13</sup> Box 3 gives some examples of commonly used resilience measures which are rigorously designed, but can show very different results.

### **BOX 3** Examples of commonly-used rigorous resilience measurement tools

**Resilience Indicators for Measurement and Analysis - II:** Developed by the FAO, RIMA uses econometric approaches, specifically factor analysis, to identify the key determinants of resilience of welfare outcomes, such as food security. Determinants are grouped into four pillars: access to basic services, adaptive capacity, assets and social safety nets, which are used to calculate a resilience index. RIMA is the recommended approach for UN agencies, and has been used to evaluate programmes in many countries.

**TANGO:** Developed by TANGO International, the TANGO method is very similar to RIMA, also using factor analysis to estimate a resilience index indicator. However, TANGO incorporates variables into three capacities (absorptive, adaptive and transformative) rather than four pillars. There are also differences in the econometric procedures used to carry out the factor analysis.

**Cissé and Barrett:** This method calculates the probability that a household will fall above a threshold for a particular welfare outcome, such as the poverty line or minimum food consumption score, given household and community characteristics and shocks. The welfare outcome, threshold of the welfare outcome, and minimum acceptable probability of meeting that threshold can be selected based on programme objectives. This method has been extensively used in academic work, but has also been applied in programme evaluation and targeting.

Source: Upton et al.<sup>10</sup>

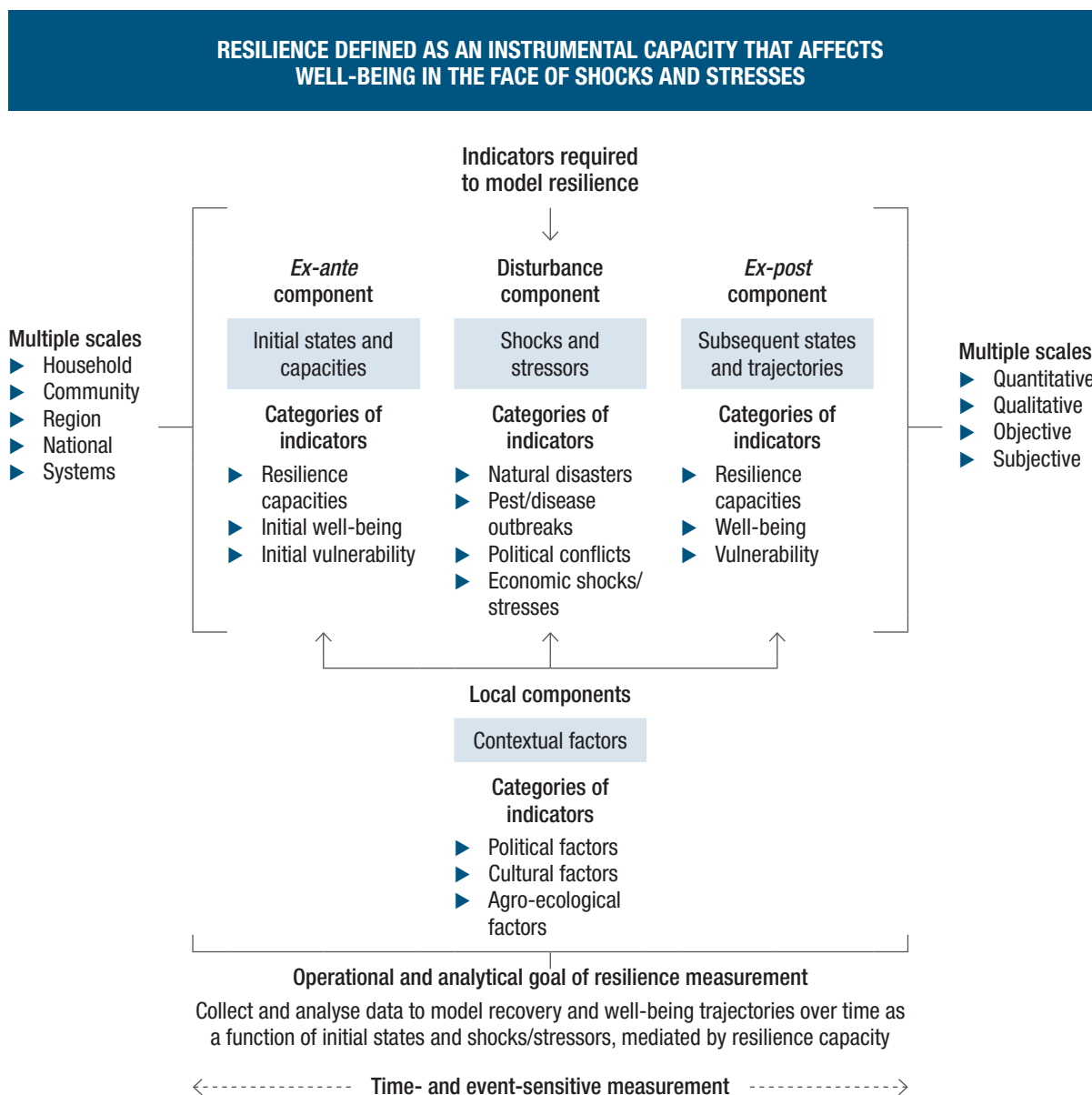


## PRINCIPLES OF RESILIENCE MEASUREMENT AND BEST PRACTICES

Despite there being no universal consensus on approaches or indicators for measuring resilience, there are some emerging themes and best practices. Most guidance for resilience measurement in the context of programme evaluation recommends following a process centred around strong programme theory of change, including understanding the context and relevant systems, to identify indicators and methods that will not only detect changes in resilience, but also contribute to understanding of how and why resilience is changing. (See Figure 1 for an example framework for approaching resilience measurement design). Some common recommendations from resilience measurement guidance include:

- ▶ **Resilience indicators and frameworks are more likely to be useful if they are specific and contain good detail.** Resilience for the purposes of the evaluation should be clearly defined, and be clear about the resilience of *what*, *to what shock or hazard*, and *for whom*.<sup>14</sup>
- ▶ **Resilience measurement should be context-specific.** Tools, approaches and indicators should reflect local conditions and the specific systems relating to resilience. Incorporating both objective and subjective experiences related to shocks and resilience outcomes can help ensure that resilience measures are appropriate.<sup>15,8</sup>
- ▶ **Resilience measurement should be realist and theory-based.** Nearly all guidance for resilience measurement for programme monitoring and evaluation recommends starting with a theory of change. Consistent with recommendations regarding the importance of context, theories of resilience and theories of change should incorporate understanding of systems and the linkages within them that contribute to resilience. Different system levels should be incorporated where appropriate, such as household, community, markets, etc.<sup>15,13,8</sup>
- ▶ **Traditional development indicators play a role in resilience measurement but are insufficient.** Traditional livelihood and welfare indicators, such as food security or poverty rates, which commonly form a large share of the indicators or inputs used in resilience measurement, are an important aspect of resilience measurement but, on their own, do not fully capture resilience as conceptualised in most contexts, and are themselves affected by shocks.<sup>14</sup>
- ▶ **Resilience measurement should be tailored to programme needs and capacity.** One of the biggest issues with resilience measurement frameworks is often that they are complex and challenging to implement;<sup>14</sup> resilience measurement approaches should be suited to institutional capacity and evaluation needs.
- ▶ **Resilience measurement should be sensitive to time frames,** including expected rates of change, timing of data collection, seasonality and frequency of shocks.<sup>15</sup>
- ▶ **General practices apply.** The same standards for good general research, monitoring and evaluation should be applied in resilience measurement. Measurement frameworks should be well grounded in programme theory, and resilience indicators should meet the SMART criteria (specific, measurable, actionable, realistic and time-bound).<sup>7</sup>
- ▶ **Strong methods are crucial for resilience impact evaluation.** Regardless of what indicators are used, strong approaches to developing counterfactual scenarios are critical for meaningful resilience impact evaluation; even in the absence of rigorous quantitative methods for estimating a counterfactual, the concept can be used in qualitative evaluation to better understand how and why resilience changes occur.<sup>16</sup>

Figure 1: Food Security and Nutrition (FSN) Network's Resilience Causal Framework







## 2 RESILIENCE MEASUREMENT IN MALAWI

### NATIONAL RESILIENCE STRATEGY

Malawi's high exposure and vulnerability to climate shocks has resulted in the prioritisation of building climate resilience by both the Government of Malawi (GoM) and its development partners, to 'break the cycle' of expensive humanitarian response. The overarching guiding document for resilience policy in Malawi is the government's National Resilience Strategy (NRS), a 12-year strategy adopted in 2017, covering the period of 2018 to 2030. The overarching goal of the NRS is to break the cycle of food insecurity in Malawi by bridging development and humanitarian interventions and prioritising a continuum of more predictable livelihood support packages that target vulnerable households.<sup>17</sup> The National Resilience Strategy includes a short section on monitoring and evaluation, and a Preliminary NRS Common Programme Framework, a basic results framework listing indicators and targets.

The NRS monitoring and evaluation section raises a number of important issues related to resilience measurement, including knowledge gaps around evaluating climate resilience, graduation strategies and the impact of combinations of interventions. It also notes the challenge of establishing good counterfactuals. The NRS observes that most resilience indicators in use in the country are adapted from standard development indicators, or are based on traits theorised to be associated with better outcomes in the face of shocks.

The indicators included in the Preliminary NRS Common Programme Framework are listed in Table 1. Many of them, such as reduction in extreme poverty, growth in agricultural GDP and reduction in stunting, are standard development indicators, which may be best viewed as measuring development performance in a context of frequent climate shocks and stressors. Some of them are process-related, for example on funding levels and coordination. For many of the process-related and standard development indicators, the extent and nature of the contributions to resilience represented by these indicators are opaque and largely notional. However, several of them have links to climate-specific outcomes, for example, reduction in number of people requiring food and cash assistance as a result of flood and drought emergencies.

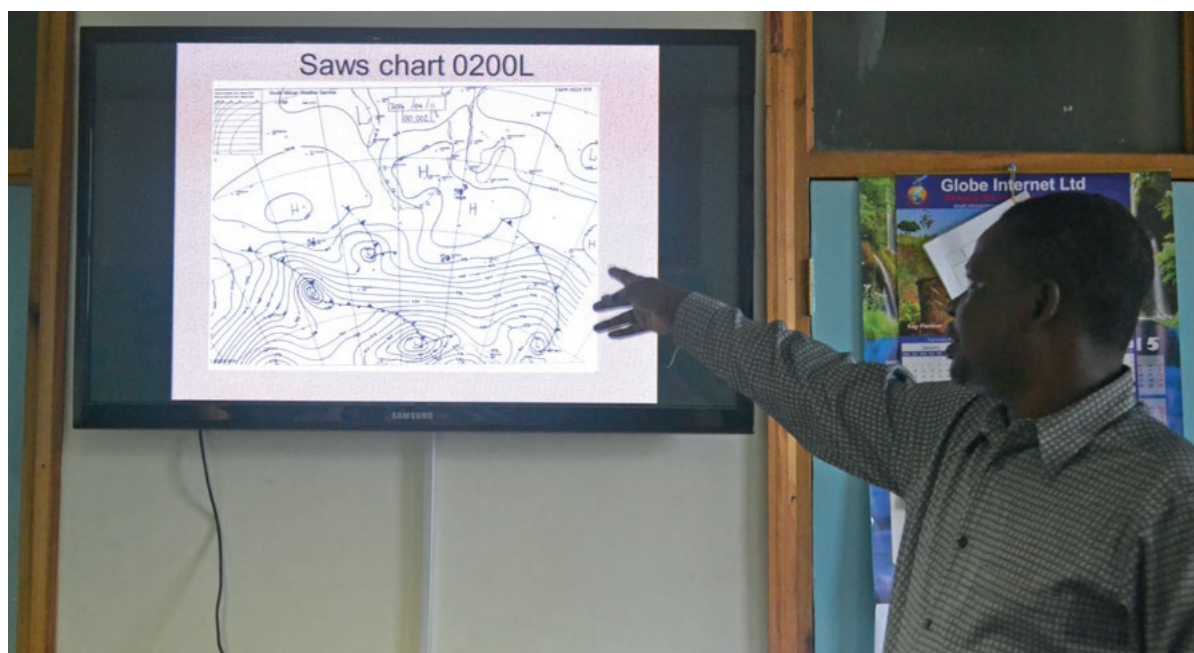
**Table 1:** Malawi National Resilience Strategy Indicators, as listed in the Preliminary NRS Common Programme Framework

| INDICATOR   | 2018–2022      | 2023–2027 | 2028–2030 | DATA SOURCE                               |
|---|----------------|-----------|-----------|---|
| Percentage reduction in extreme poverty   | 8%             | TBD       | TBD       | IHS                                       |
| Reduction and prevalence and depth of food insecurity   | 10%            | TBD       | TBD       | FIES                                      |
| Reduction in number of people requiring food and cash assistance as a result of flood and drought emergencies   | 30%            | 30%       | 30%       | MVAC surveys                              |
| Return on investment money and livelihoods saved from averting food and nutrition crisis compared to past crises  | TBD            | TBD       | TBD       | Joint post-disaster assessment studies    |
| Percentage of poor Malawians graduated from the SCTP  | TBD            | TBD       | 50%       | Population survey and specialised studies |
| Percentage of poor Malawians living above the poverty line who do not backslide into poverty  | TBD            | TBD       | TBD       | Population survey                         |
| Percentage annual growth in agriculture GDP*  | 6%             | 6%        | 6%        | Survey                                    |
| Annual reduction in percentage of children under five years of age stunted  | 5%             | 5%        | 5%        | DHS                                       |
| Percentage reduction in anaemia in under-fives and MCBA   | 57%            | 52%       | 47%       | DHS                                       |
| Percentage annual growth in agriculture GDP*  | 6%             | 6%        | 6%        | DHS                                       |
| Increase in availability, access, quality and affordability of recommended food groups in Malawi in local and regional markets                              | TBD            | TBD       | TBD       | Market surveys                            |
| Percentage increase in hectares managed through improved land management practices (protective forest cover in priority catchments)                         | 15%<br>(4m ha) | TBD       | TBD       | Project assessments                       |
| Percentage change in women's empowerment  | TBD            | TBD       | TBD       | WEIA studies                              |
| Optimal funding levels for multi-sector programmes and programming in priority NRS areas is allocated by the GoM Treasury and Development Partners (yes/no) | Yes            | Yes       | Yes       | Government records                        |
| National and devolved government institutions fund and implement coordinated multi-sectoral plans supporting NRS priorities                                 | Yes            | Yes       | Yes       | Government records                        |

\* indicator listed twice in NRS document

## APPROACHES TO RESILIENCE MEASUREMENT APPLIED IN MALAWI

In parallel with the recommendations of the NRS, donor projects and NGOs have implemented a variety of approaches to resilience measurement and evaluation. For example, the FAO-developed Resilience Index Measurement and Analysis-II (RIMA-II) framework has been used for the monitoring and evaluation of WFP projects in Malawi, including its Food Assistance for Assets programme.<sup>18</sup> The UBALE Project, funded by USAID and implemented by Catholic Relief Services (CRS), collaborated with Cornell University to spearhead the Measurement Indicators for Resilience Analysis (MIRA) project. This project used high-frequency data on outcomes related to shocks, food security and coping strategies, collected by community data collection agents on a monthly basis, to track resilience outcomes over time and measure the impact of the UBALE project on resilience.<sup>11</sup> This high-frequency resilience approach has been replicated by the Rapid Feedback Monitoring System (RFMS), a joint project led by CRS, the World Bank, donors including FCDO and USAID, and Malawi's National Statistical Office, which has the objective of producing high-frequency resilience data with broad geographical coverage in Malawi for use in shock monitoring, programme evaluation and resilience research.







# 3 RESILIENCE MEASUREMENT IN BRACC

## FCDO AND RESILIENCE MEASUREMENT

In 2011, the UK government committed to integrating resilience objectives into all of its country programmes and published a report detailing its planned approach to addressing disaster resilience.<sup>19</sup> UK-funded resilience work is largely supported through the UK International Climate Finance (ICF) instrument, in which resilience is defined with respect to climate change.<sup>20</sup> One of the Key Performance Indicators (KPI) in the ICF results framework is *KPI 4: Number of people whose resilience has been improved as a result of ICF support*, and this is the most relevant KPI for measuring resilience outcomes at the level of individuals, households and communities.

Measuring resilience for the purpose of reporting on KPI 4 requires being able to measure improvements in resilience attributable to an ICF – supported project – the improvement in resilience relative to the counterfactual of no project taking place. Reflecting the need to be applicable across a variety of contexts, guidance on KPI 4 allows for broad latitude in defining the indicators used to measure resilience, but they must reflect improvements in at least two of the 3A resilience capacities, or a resilience index that includes a balance of indicators representing at least two of these capacities.<sup>20</sup> KPI 4 has many strengths, including that it is flexible and can be applied to a wide range of projects. However, it also has shortcomings, especially the fact that it does not capture the degree to which resilience is improved, nor the importance of the improvement.<sup>16</sup>



## Resilience measurement in the FCDO BRACC programme

As an ICF-funded programme through FCDO,<sup>21</sup> the BRACC programme applied a resilience index to track progress towards KPI 4. BRACC's operational approach to resilience is based on the 3As framework, viewing resilience as:

'a product of interlinked capacities to anticipate, absorb, and adapt to shocks and stresses, underpinned by measures which reduce exposure to shocks and the governance mechanisms, market systems, policies/regulations, infrastructure, community networks, and formal and informal social protection mechanisms that constitute the enabling environment necessary for systemic change and transformation'.<sup>22</sup>

”

### About the BRACC programme

The Building Resilience and Adapting to Climate Change (BRACC) programme is a £90.6 million programme funded by the UK Foreign, Commonwealth and Development Office, which began in 2018 and will have components continuing through 2023.

BRACC is being implemented at various levels and locations by a consortium of partners ('implementing partners').

- ▶ **Promoting Sustainable Partnerships for Empowered Resilience (PROSPER)** is a consortium of UN organisation partners and a consortium of NGO partners working in Balaka, Chikwawa, Mangochi, and Phalombe; the UN consortium activities of PROSPER will continue through 2023.
- ▶ **African Parks (AP)**, focused on Nkhotakota, closed in 2021.
- ▶ **Gesellschaft für Internationale Zusammenarbeit (GIZ)** worked nationally and through training in 15 districts; closed in 2021.
- ▶ **Modern Cooking for Healthy Forests (MCHF)** is working nationally; it will continue through 2023 with USAID funding.

BRACC seeks to reduce extreme poverty and end the cycle of hunger and humanitarian assistance in Malawi by strengthening the resilience of around 300 000 poor and vulnerable households. There are several unique features of the BRACC programme. The consortium structure facilitates drawing on the strengths of different organisations to deliver layered bundles of complementary resilience interventions, including interventions targeting different systems, such as market and government systems. Another notable approach was that different bundles of interventions were targeted to households based on their wealth rankings, which correspond to the three resilience categories in the NRS: 'hanging in', 'stepping up' and 'stepping out'.

The implementing partners are responsible for reporting performance indicators, but were supported by a knowledge management partner, BRACC Hub, which was responsible for conducting performance evaluation and rigorous impact evaluation of the programme, and providing technical support to the implementing partners.

In addition to performance indicator reporting, BRACC evaluation activities also included ad hoc activities supporting rapid assessment, partnering with the Rapid Feedback Monitoring System (RFMS) programme to collect high-frequency resilience data in PROSPER districts, and the BRACC Hub evaluations, which included an evaluation of programme impact using qualitative data and a randomised control trial evaluating the impact of the PROSPER component.

## BRACC RESILIENCE INDICATORS AND DATA SOURCES

### Resilience index and KPI 4

PROSPER chose to use a resilience index (RI) approach to report on KPI 4. Per FCDO guidance, PROSPER identified indicators related to the 3As resilience capacities. For each indicator, the household was classified as either resilient or not resilient. The index score was the number of indicators for which the household was classified as resilient. Also, in line with KPI 4 guidance, PROSPER identified a threshold score; households above that score were categorised as resilient overall, while those below the score were considered not resilient. Reporting on KPI 4 was to be based on the number of households that went from *not resilient* to *resilient with programme support*.

Ultimately, three different versions of the resilience index were constructed as part of the 2021 evaluation conducted by the BRACC Hub. The first two versions were constructed to reflect two different resilience index specifications in PROSPER documentation, as it was unclear which was the intended specification. One specification included 12 indicators, and had a threshold of 5 to be classified as resilient, while the second specification included 8 indicators with a threshold of 5. The BRACC Hub also proposed a third version of the RI, containing 7 indicators and a threshold of 4, removing indicators with an ambiguous relationship with resilience. For example, on the one hand, the receipt of assistance in advance of, or during, a shock might improve a household's absorptive capacity and ability to cope with the shock. On the other hand, such assistance is likely to be targeted at the most vulnerable households, with the lowest adaptive capacity that are least able to withstand the effects of a shock. The three resilience index specifications are reported in Table 2. For all index specifications, the threshold for 'resilience' for each version of the index is arbitrary; the cut-off has no particular meaning or empirical basis.

**Table 2:** PROSPER KPI 4 resilience index component indicators

| INDICATOR   | 8-indicator index | 12-indicator index | Proposed 7-indicator index |
|---|-------------------|--------------------|----------------------------|
| Household with women in control of income                     | x                 | x                  | x                          |
| Household spent income to improve resilience                  | x                 | x                  |                            |
| Household received assistance during lean season              | x                 | x                  |                            |
| Household able to access insurance                            | x                 | x                  |                            |
| Household adopting climate-smart agriculture (CSA)            | x                 | x                  |                            |
| Household has an expenditure share of less than 50%           | x                 | x                  |                            |
| Household with adequate food provisioning over past 12 months | x                 | x                  | x                          |
| Household with savings amount of >\$10                        | x                 | x                  | x                          |
| Household using climate information for agricultural planning |                   | x                  |                            |
| Household attaining incremental sales                         |                   | x                  | x                          |
| Household using climate information to avert risk             |                   | x                  | x                          |
| Household has weather-independent income source               |                   | x                  | x                          |
| Household made a deposit in a savings account in past year    |                   |                    | x                          |

## Other performance indicators

Reflecting the holistic approach to resilience building employed in the programme, BRACC uses a number of indicators to track performance and impact, listed in Table 3. Additional indicators have been used in evaluations, such as the programme impact evaluation, ad hoc surveys feeding into adaptive management and RFMS data collection, whose indicators are listed in Table 4. Many of these indicators are related to resilience, in that they reflect:

- ▶ household attributes that affect resilience, such as education level
- ▶ household experiences in response to shocks, such as the use of coping strategies
- ▶ factors that can both be affected by shocks and affect resilience to shocks, such as income or ownership of assets.

However, the key BRACC indicator for resilience measurement is *KPI 4: Number of people whose resilience has been improved*. This is measured based on a resilience index that incorporates a number of indicators theorised to be linked to resilience.

**Table 3:** BRACC results framework indicators

| INDICATORS  |   |
|---|---|
| <b>IMPACT</b>   | <b>A reduction in extreme poverty and to end the recurrent cycle of hunger and humanitarian assistance in Malawi</b>  |
| Percentage of the population in target districts living below the national poverty line   |   |
| Difference in difference comparison of targeted TAs and non-targeted TAs for the proportion of population being in Integrated Phase Classification Phase 3 (Crisis) |   |
| <b>OUTCOME</b>  | <b>Strengthened resilience of an estimated 300 000 poor and vulnerable households (around 1.7 million people) to withstand current and future weather – and climate – related shocks and stresses</b> |
| Number of people whose resilience has been improved as a result of project support (KPI 4)  |   |
| Cumulative aggregate increase in incomes among poor people  |   |
| Percentage households classified as being marginally food secure or food secure, disaggregated by group (marginally and food secure) – Using CARL index             |   |
| Difference in difference comparison of change in yield of maize and other crops against the baseline figure in PROSPER and non-PROSPER target areas                 |   |
| <b>OUTPUT 1</b>   | <b>Intensified and diversified agricultural production and improved nutrition for targeted vulnerable communities</b>   |
| 1.1 Number of households implementing climate-smart agriculture (CSA) practices (changed to %)  |   |
| 1.2 Number of farmers who report improvements in extension services received (by type of extension provider: public, community-based, private) (changed to %)       |   |
| 1.3 Hectares of farmland under irrigation (disaggregated by size of scheme, type of technology)   |   |
| 1.4 Percentage of women between 15 and 49 reaching the minimum dietary diversity score for women (MDDW)   |   |
| 1.5 Percentage of children between 6 and 23 months consuming a minimum acceptable diet (MAD)  |   |
| 1.6 Number of farmers that received agricultural inputs to promote increased productivity during the reporting year   |   |
| <b>OUTPUT 2</b>   | <b>Enhanced and inclusive access to the productive resources necessary to develop increased, secure and predictable incomes</b>   |
| 2.1 Number of market system actors that invest in pro-poor business models  |   |
| 2.2 Number of poor people with increased access to productivity or income enhancing inputs or services /markets   |   |
| 2.3 Number of households with access to financial services as a result of FCDO support – FCDO Global Indicator List   |   |

## INDICATORS

### OUTPUT 3 Vulnerable households and communities in targeted areas have reduced exposure to drought and floods

|     |  |
|-----|--|
| 3.1 | Number of people supported by FCDO programmes to cope with the effects of climate change (KPI 1)   |
| 3.2 | Areas (ha) of degraded microcatchment/watershed rehabilitated or conserved   |
| 3.3 | Number of people reached during the lean season response with cash transfers   |
| 3.4 | Percentage of people affected who receive humanitarian assistance via government social protection channels in districts above 20% MVAC need                 |
| 3.5 | Household(s) using Early Warning Systems (EWS) and Climate Information Services (CIS) for floods and droughts to reduce risks to their lives and/or property |

### OUTPUT 4 Increased capacity of national, sub-national and non-state actors to prepare for, plan, monitor and respond to shocks

|     |  |
|-----|--|
| 4.1 | Number of districts with integrated coordination, monitoring and social accountability systems for social protection/resilience and emergency interventions          |
| 4.2 | Number of district development plans that implement local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030 |
| 4.3 | Number of shock-responsive features of key social protection programmes put in place within the Malawi social protection programme (preparedness)                    |

### OUTPUT 5 A strengthened and more shock-sensitive social protection system

|     |  |
|-----|--|
| 5.1 | Number of districts where 50% of Social Cash Transfer Programme (SCTP) and Public Works Programme (PWP) beneficiary households received their transfers through e-payments   |
| 5.2 | Number of districts where 70% of the total complaints submitted have been closed according to the guidelines   |
| 5.3 | Number of additional social protection beneficiary households (out of which at least 55% are female-headed) which are purposively linked to complementary interventions (e.g. livelihood projects and nutrition-sensitive interventions) |
| 5.4 | Number of micro-watersheds where watershed rehabilitation activities have been implemented by communities as part of Public Works activities   |

### OUTPUT 6 Forest deforestation and degradation are reduced, and forest-dependent communities in targeted areas have more sustainable livelihoods

|     |  |
|-----|--|
| 6.1 | Number of people with livelihood co-benefits from improved forest management                                 |
| 6.2 | Number hectares of degraded landscapes under improved management   |
| 6.3 | Tons of sustainable charcoal produced  |
| 6.4 | Amount of private sector finance leveraged for alternative energy options and efficient cooking technologies |

### OUTPUT 7 More effective, coordinated and targeted government and donor investments

|     |   |
|-----|---|
| 7.1 | Number of politically responsive technical assistance workstreams developed and under active implementation, using adaptive management principles<br>Do these integrate climate risks and adaptation? |
| 7.2 | Number of days of technical assistance provided / average fee rate per day in £   |
| 7.3 | Number of communications/evidence products generated by programme partners, including a publicly accessible data/document store that can be handed over to GoM  |

**Table 4:** RFMS High-frequency data indicators

| CORE (MONTHLY) FOOD SECURITY INDICATORS COLLECTED |   |   |
|---|---|---|
| Indicator   | Description   | Source                                  |
| Household Dietary Diversity Score (HDDS)          | Sum across 11 food groups (unweighted, 24-hours)  | Swindale & Bilinsky (2006), USAID/FANTA |
| Food Consumption Score (FCS)                      | Sum across 8 food groups, weighted for quality and frequency (7 days)   | Weisman et al. (2009), WFPNAM.          |
| Household Hunger Scale (HHS)                      | Weighted sum of 3 extreme strategies, over the last month (no food at all available, days without eating ...) | Ballard et al. (2011), USAID/FANTA-III  |
| Reduced Coping Strategies Index (RCSI)            | Weighted sum of 5 less severe strategies, over the last week (loan, reduction, less-preferred foods ...)      | Maxwell & Caldwell (2008), USAID        |

## Surveys and data sources

Indicators for monitoring and evaluation of the BRACC programme are derived from several sources. A baseline survey was conducted by IFPRI in 2019 in Balaka and Phalombe, which was revisited as part of the BRACC Hub evaluation in 2021. In addition, annual collection was undertaken for reporting indicators listed in Table 3 in four districts in 2020. High-frequency data under the RFMS project were collected by RFMS monthly surveys administered by local data collection surveyors. Implementing partners also used a variety of data collection approaches, including household and market surveys, in their ad hoc evaluation activities. Data used to construct the resilience index (RI) for reporting against KPI 4 were drawn from representative surveys of households targeted by PROSPER in its four districts (Balaka, Chikwawa, Mangochi and Phalombe) in 2020 and 2021.

## RESILIENCE RESULTS UNDER THE BRACC PROGRAMME

### KPI 4

Resilience index scores for the three versions of the index from the 2021 evaluation are shown in Table 5. The share of households achieving 'resilience' varied highly by specification and resilience threshold. Regardless of index specification, relative results were mostly similar with respect to different groups:

- ▶ The 'hanging in', or lowest wealth group, consistently had worse average resilience index scores than the 'stepping up', or middle wealth group.
- ▶ The 'stepping out', or highest wealth group generally, though not always, had resilience scores above those of the middle wealth group.
- ▶ Chikwawa generally had lower scores than the other districts, while Mangochi had higher scores.
- ▶ However, there were also examples where relative resilience index scores depended on the resilience index specification. For example, using the 12-indicator specification, Phalombe district had higher than average resilience scores; but using the 8-indicator specification, it had lower than average scores.

The variation in results across the different resilience index versions underlines the sensitivity of resilience measurement to the types of indicators included, and how the threshold for resilience is set.

**Table 5:** Mean resilience index score and percentage achieving resilience, by group and RI version

|  | Average resilience index score, HUB-7 | Percentage resilient (HUB-7 $\geq$ 4) | Average resilience index score PROSPER-12 | Percentage resilient (PROSPER-11 $\geq$ 5) | Average resilience index score PROSPER-8 | Percentage resilient (PROSPER-8 $\geq$ 5) |
|--|---------------------------------------|---------------------------------------|---|--|--|---|
| All groups                                 | 2.7                                   | 26%                                   | 4.1                                       | 41%  | 2.6                                      | 8%  |
| Hanging in                                 | 2.3                                   | 17%                                   | 3.7                                       | 32%  | 3.1                                      | 3%  |
| Stepping up                                | 3.3                                   | 41%                                   | 4.8                                       | 58%  | 3.4                                      | 12%                                       |
| Stepping out                               | 3.3                                   | 44%                                   | 5.0                                       | 59%  | 3.2                                      | 20%                                       |
| Balaka                                     | 2.3                                   | 20%                                   | 3.6                                       | 32%  | 2.6                                      | 3%  |
| Chikwawa                                   | 2.2                                   | 18%                                   | 3.3                                       | 27%  | 2.2                                      | 3%  |
| Mangochi                                   | 2.9                                   | 33%                                   | 4.5                                       | 50%  | 3.1                                      | 16%                                       |
| Phalombe                                   | 2.8                                   | 27%                                   | 4.3                                       | 44%  | 2.5                                      | 4%  |
| Female-headed households                   | 2.4                                   | 21%                                   | 3.8                                       | 34%  | 2.6                                      | 5%  |
| Single-headed households                   | 2.3                                   | 19%                                   | 3.7                                       | 32%  | 2.5                                      | 3%  |
| Youth-headed households                    | 2.4                                   | 23%                                   | 3.7                                       | 29%  | 2.3                                      | 5%  |
| Elderly-headed households                  | 2.3                                   | 20%                                   | 3.7                                       | 30%  | 2.5                                      | 5%  |
| Households with a member with a disability | 2.5                                   | 23%                                   | 4.0                                       | 40%  | 2.6                                      | 8%  |



## Resilience index components

The results for individual indicators in the KPI resilience indices in the 2021 evaluation survey are shown in Table 6. The individual indicators generally follow the same trends as the indices as a whole, with higher wealth groups more likely to achieve resilience for most indicators. However, there are also some interesting deviations, which highlight the importance of understanding the nuances of resilience indicators:

- ▶ For example, the middle wealth group was most likely to report receiving assistance. The fact that the poorest group, which would be theorised to have the most need of assistance, and the wealthiest group, which would be theorised to be most resilient, both have lower scores on this indicator, suggests that the relationship between this indicator and resilience is likely to be complex, as discussed above.
- ▶ Similarly, the highest wealth group is most likely to report receiving good quality climate information, but is less likely than the middle-income group to report using climate information to take risk reducing actions. It is unclear exactly why this is – perhaps high-income households have less exposure to risk, and less need or incentive to take risk-reducing actions.

The results show that subtle differences in indicators, such as receiving quality information compared to using it, can result in important differences in outcome measurement. It also underscores the importance of having a very detailed understanding of context and mechanisms for building resilience for different groups when designing both interventions and resilience measurement approaches.

## Other resilience findings

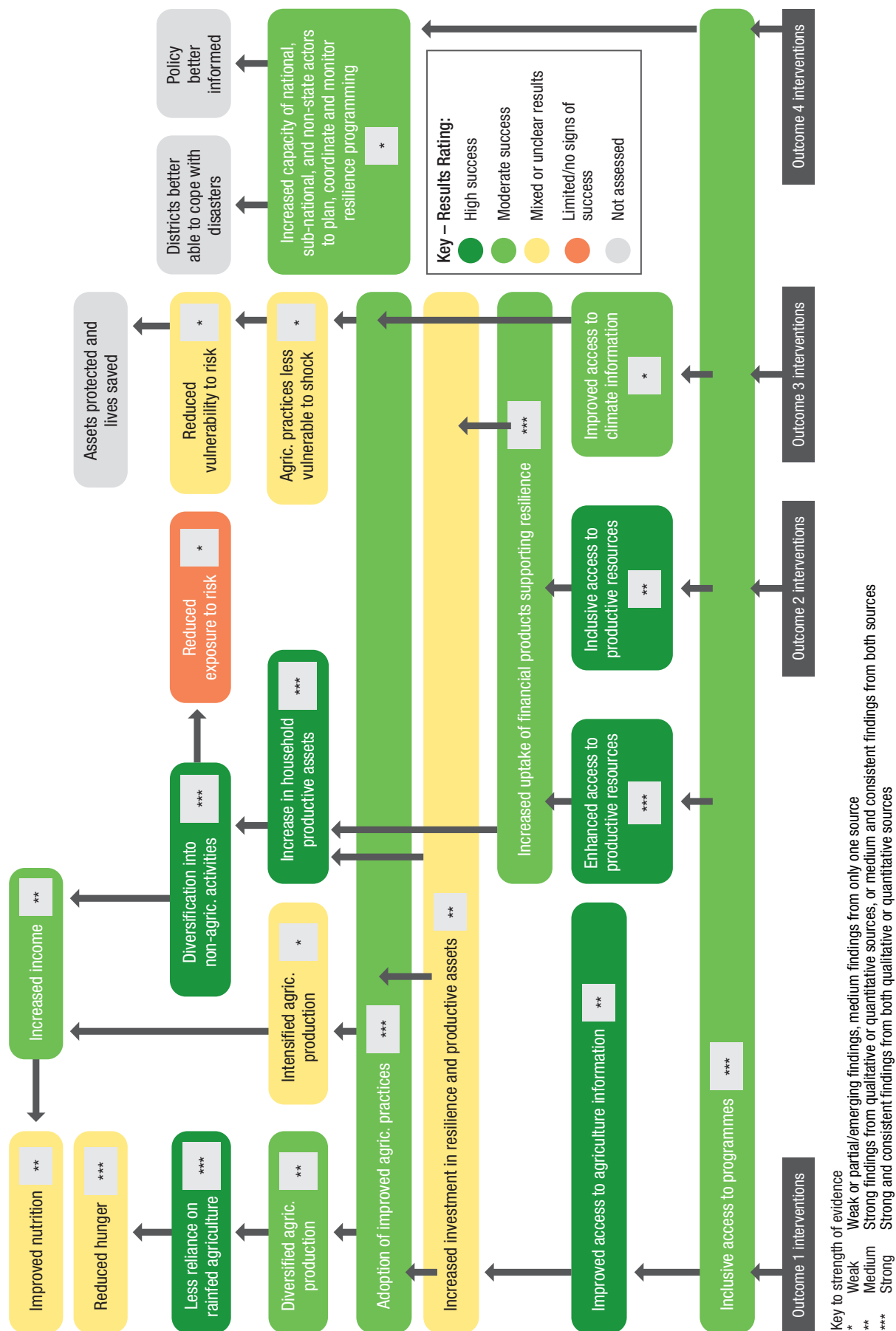
The high-frequency data collection partnership with RFMS was among the components that ended early, so high-frequency data were collected in PROSPER communities for only a year, limiting its use. However, the data did provide some useful information, including the prevalence of dry spells in the 2020/21 growing season, particularly in Chikwawa and Phalombe, where such dry spells ultimately resulted in poor crop yields.

The 2021 impact evaluation conducted by BRACC Hub employed mixed methods to map findings against a theory of resilience building in the context of rural communities in Malawi (Figure 2). While most of the indicators were more traditional development indicators, rather than indicators specifically designed to measure resilience outcomes, these findings were useful for understanding the mechanisms through which BRACC activities could contribute to building resilience capacities.

**Table 6:** Percentage of households achieving resilience for each resilience indicator, by group

|  | Overall | Hanging in | Stepping up | Stepping out | Balaka | Chikwawa | Mangochi | Phalombe | Female-headed households | Single-headed households | Youth-headed households | Elderly-headed households | Households w/ member with a disability |
|--|---------|------------|-------------|--------------|--------|----------|----------|----------|--------------------------|--------------------------|-------------------------|---------------------------|--|
| Household spent income to improve resilience   | 87%     | 84%        | 91%         | 90%          | 89%    | 77%      | 88%      | 89%      | 88%                      | 85%                      | 74%                     | 81%                       | 88%                                    |
| Household with women with control of income decisions in at least 3 out of 4 areas*    | 62%     | 62%        | 63%         | 61%          | 65%    | 59%      | 65%      | 59%      | 66%                      | 61%                      | 58%                     | 62%                       | 60%                                    |
| Household received assistance during lean season                                       | 34%     | 32%        | 39%         | 33%          | 37%    | 19%      | 39%      | 37%      | 35%                      | 36%                      | 25%                     | 34%                       | 36%                                    |
| Household has at least one type of insurance*  | 2%      | 3%         | 3%          | 3%           | 0%     | 0%       | 4%       | 3%       | 1%                       | 1%                       | 5%                      | 1%                        | 3%                                     |
| Household has adopted 6 or more prompted climate-smart agriculture practices*          | 3%      | 2%         | 4%          | 6%           | 0%     | 1%       | 6%       | 2%       | 1%                       | 1%                       | 2%                      | 3%                        | 3%                                     |
| Household has cash food expenditures equal to less than 50% of total cash expenditures | 36%     | 28%        | 45%         | 49%          | 39%    | 33%      | 43%      | 28%      | 32%                      | 31%                      | 27%                     | 30%                       | 37%                                    |
| Household had adequate food provisioning past 12 months                                | 22%     | 12%        | 32%         | 48%          | 16%    | 18%      | 37%      | 13%      | 20%                      | 19%                      | 22%                     | 23%                       | 19%                                    |
| Household reports being able to build savings*   | 17%     | 12%        | 25%         | 29%          | 11%    | 13%      | 25%      | 15%      | 14%                      | 13%                      | 17%                     | 13%                       | 16%                                    |
| Household had access to timely and good quality climate information*                   | 38%     | 35%        | 43%         | 54%          | 30%    | 28%      | 38%      | 48%      | 31%                      | 31%                      | 32%                     | 35%                       | 40%                                    |
| Household made use of climate information for risk reduction or mitigation*            | 50%     | 46%        | 70%         | 59%          | 40%    | 40%      | 58%      | 55%      | 45%                      | 45%                      | 44%                     | 42%                       | 48%                                    |
| Household reports increased sales for at least one crop type*                          | 24%     | 22%        | 32%         | 26%          | 9%     | 15%      | 27%      | 35%      | 20%                      | 19%                      | 28%                     | 23%                       | 24%                                    |
| Household has weather-independent income source  | 34%     | 31%        | 40%         | 41%          | 28%    | 31%      | 25%      | 50%      | 26%                      | 27%                      | 34%                     | 28%                       | 32%                                    |
| Household has made a deposit in a savings account in last year                         | 31%     | 23%        | 39%         | 37%          | 39%    | 32%      | 34%      | 23%      | 26%                      | 25%                      | 23%                     | 23%                       | 28%                                    |

Figure 2: Summary of 2021 impact evaluation findings



## CHALLENGES WITH BRACC RESILIENCE MEASUREMENT INDICATORS AND APPROACHES

**An adaptive approach to the targeted groups and interventions in BRACC, combined with the lack of specificity around hazards, created a challenge for developing a theory of change that was both complete and nuanced.**

There is a tendency within the programme to refer to resilience in absolute terms, rather than to resilience to a specific hazard. BRACC also includes a large number of interventions, at different system levels, expected to have complementary effects. The programme targeting also added complexity, with different interventions targeted to groups with different attributes and vulnerabilities. Arguably, each of these groups could have had its own theory of change; the idea that these different groups may have different pathways to resilience is fundamental to the logic of the NRS in defining the ‘hanging in’, ‘stepping up’, and ‘stepping out’ groups.

Another aspect of the theory of change that posed a challenge was specifying the relationship between poverty and resilience, and the balance between factors and indicators relating to poverty and other general aspects of social and economic development, and more climate- or hazard-specific factors and indicators. Poverty is both a driver of vulnerability to recurrent shocks and stresses, and a consequence of shocks and stresses.<sup>22</sup> The complex relationship between poverty and vulnerability does mean that close attention needs to be paid to issues of timing and causality in assessing the effectiveness of the programme. Without clarity on the conceptual underpinnings of resilience, and for whom it will be built and how, it is difficult to choose indicators that are both valid and appropriately sensitive to capture change.

**The short timeline for the programme limited the ability to detect change, since resilience outcomes may only be observable when shocks occur.**

As outlined above, a common theme for good resilience measurement is ensuring that tools and approaches are timeline-sensitive. Meaningful resilience outcomes may only be observable over multiple years. Even where resilience capacities have significantly improved, short-run outcomes measured with indicators such as those used by BRACC will be contingent on the presence or absence of shocks, which may occur one year, but not the next. A true picture of resilience using these indicators can only be inferred through repeated measurement over periods of sufficient duration to encompass multiple climate stresses and shocks against which resilience performance can be addressed. In addition, resilience will need to evolve and improve to keep pace with the uncertain nature of future climate change and the implication that has for the (likely increasing) frequency and magnitude of climate hazards.

**Ambiguity about the relationship between indicators and resilience, and lack of a theoretical framework for aggregating the KPI 4 resilience index and defining the threshold for resilience, resulted in challenges in interpreting BRACC resilience measures.**

Most of the indicators used to construct the RI represent characteristics or activities that reasonably can be assumed to influence a household’s ability to anticipate, absorb and adapt to climate stresses and shocks. However, the relationship of some indicators to resilience is more ambiguous, such as the receipt of assistance during the lean season.

The resilience index was constructed by simply adding up the number of index indicators for which the household met the definition of resilience. This approach has the benefit of transparency, but does not take into account possible differences in the importance of each indicator, nor the degree to which additional indicators might provide new, compared to redundant, information about resilience. The thresholds used to define households as resilient in the RI are also potentially problematic. No rationale is provided for the thresholds, which are not based on any empirical examination of how the factors captured by the resilience indicators relate to losses, damages and other consequences of climate hazards. The use of these thresholds may underestimate improvements in resilience, as households might achieve significant improvements in resilience by adopting multiple practices reflected in the indicators, without crossing the threshold. Taken together, these aspects of the methodology used for constructing the resilience index and reporting against KPI 4 made it difficult to determine the degree to which being classified as having improved resilience correlates with meaningful resilience-building in the Malawi context.

**Resilience indicators were not always sensitive to the effects of interventions, so some impacts may have been missed.**

In some cases, resilience evaluation approaches appeared to fail to capture results, in part because the indicators were not sufficiently sensitive to the likely effects of interventions, or to mechanisms for building resilience. For example, the resilience indicator related to women with decision-making power relied on households reporting whether three types of household decisions were made by men, women or both. Survey results in 2020 showed that the vast majority of households reported all decisions were made by both, meaning that, even if the programme improved women's empowerment, there was very little room for improving this specific metric. In this case, alternative data sources to capture the change, for example, through qualitative assessment, may have been more useful. In another example, building assets through livestock pass-on was a highly successful programme intervention, but the resilience index does not include any indicators related to increased non-cash asset levels. Positive impact on this aspect of absorptive capacity may therefore not have been captured by the resilience index.

**The BRACC programme was successful at adaptive management in implementation of its interventions, but simultaneous adaptation of some aspects of resilience measurement was more challenging.**

The BRACC programme successfully adapted many of its implementation approaches in response to COVID-19, as well as in response to monitoring data that highlighted what was working and what was not working so well. However, not all aspects of the programme's monitoring and evaluation were equally agile. For example, the methodology for reporting on KPI 4 requires a comparable index score each year, which makes it difficult to improve measurement methodology or update it based on changes in the programme implementation approach. Another aspect of the BRACC evaluation approach that was relatively rigid was the randomised control trial aspect of the impact evaluation. Randomised control trials require a reasonably-defined intervention to be implemented strictly according to research protocols, including random assignment to the treatment and control group. This challenge reflects a general challenge in the field of development programme evaluation of balancing rigorous evaluation approaches with adaptive management, especially in the context of large, complex programmes.





# 4 RECOMMENDATIONS FOR RESILIENCE MEASUREMENT

**NRS and donor resilience measurement frameworks should leave space for individual programmes and activities to customise their own resilience measurement frameworks that specifically relate to their theories of change with respect to *resilience: of what, to what, and for whom***

---

Resilience is context- and hazard-specific, and this specificity needs to be recognised in the measurement of resilience, as well as in the framing of resilience, and in programme and project design. While this was recognised in BRACC documents and approaches, the programme could have gone further in examining causal pathways for achieving resilience to specific disturbances of different magnitudes, for different groups, particularly the different wealth groups. This is particularly important as the type and magnitude of shocks faced by communities in Malawi evolve over time. While working within the framework of NRS objectives and contributing to its learning goals, projects and activities should be encouraged to develop specific frameworks that allow for greater evaluation and learning around how and why resilience improves, and what approaches are most successful for different groups in rapidly changing contexts.





**Resilience measurement approaches should differentiate between general welfare outcomes (which may be short-term priorities) and targeted, hazard-specific resilience outcomes (which may be long-term priorities).**

While welfare outcomes like poverty and food security are a critical part of resilience measurement, they cannot alone fully capture resilience, particularly in the context of a changing climate. Resilience strategies and measurement frameworks should seek to differentiate between outcomes that are related to better general welfare, and those that contribute to long-term resilience, for example, through specific resilience measures targeted at particular hazards. In many cases, these are likely to be complementary, although there may also be trade-offs between focusing on immediate needs and building longer-term resilience. For example, investments in agroforestry or tree crops, which may provide sustainable, climate-resilient incomes in the future, may require households to forego income from land where trees are planted in the short term.

Resilience measurement approaches should ensure that they reflect long-term resilience. Systems, practices and households that are resilient to the hazards experienced today may not be resilient to future hazards that are more severe and/or occur with greater frequency, or to new hazards emerging as a consequence of climate change. To do this, it is recommended that resilience-building activities and resilience measurement place greater emphasis on defining resilience in terms of coping ranges related to specific hazards (the hazards-based approach as defined by Brooks et al.).<sup>23</sup> This provides a foundation for identifying conditions under which systems fail, and for exploring how likely or plausible it is that these conditions will occur over any given timescale.

In some instances, it may be impractical or impossible to expand the coping range of an existing system or practice to the extent required to accommodate intensifying hazards. In such instances, ‘transformational’ adaptation involving a phased transition to a viable alternative will be desirable.<sup>24</sup> However, this must be balanced with the urgency to meet immediate needs.

**Good methodologies for attribution can be critical for interpreting resilience outcomes, but impact evaluation approaches should be selected carefully to balance the need for rigour, flexibility and cost effectiveness.**

Rigorous experimental or quasi-experimental impact evaluations are a valuable tool for providing evidence of causal impact of interventions in the face of climate shocks that vary from year to year and across geographic locations. They are appropriate for testing well-defined individual interventions or bundles of interventions for which the types of impact and relevant indicators are well known, for the purpose of generating quantitative impact and cost-benefit measurements that feed into future programming. However, these methods may not always be well suited to highly adaptive programmes, with changing interventions, delivery mechanisms, geographic reach, or outcomes and indicators of interest; and where rapid evidence is required to inform mid-course corrections.

For resilience programmes with many layers, learning elements and an adaptive approach, more flexible, mixed-methods approaches may be more suitable. Alternative approaches to attribution, and interpreting observed outcomes in the light of changing climate shock contexts, can be employed. Over timescales of several years or more, interpretation of impact level indicators in the context of climate information can be based on simple narratives, as illustrated in Figure 3. These narratives require climate information of sufficient quality to indicate whether relevant hazards are worsening, diminishing, or not changing significantly. Over shorter timescales, and in contexts where there are no clear narratives (top left and bottom right cases in Figure 3), more sophisticated approaches are required. These might include the development of counterfactuals based on a comparison between observed values of impact level indicators and predicted values based on correlations with climatic variables, where such correlations exist. Alternatively, they might be based on qualitative information derived from beneficiary surveys focusing on whether, and how, resilience and adaptation interventions have delivered benefits.<sup>25,5,26</sup>

**Figure 3 :** Simple resilience/adaptation narratives based on observed changes in development or well-being indicators and climatic indicators describing relevant hazards (i.e. hazards to which the aspects of development captured by the well-being indicators are sensitive). Reproduced from Brooks et al.<sup>5</sup>

|                          | AMELIORATION OF HAZARDS   | NO CHANGE IN HAZARDS  | WORSENING HAZARDS  |
|--------------------------|---|---|--|
| Improved well-being      | Luck?   | Reduced vulnerability   | Successful adaptation  |
|                          | Improved well-being may be due to hazard reduction; may be amplified by adaption actions – counterfactual needed to assess impacts of adaption actions. | Impacts of hazards reduced due to reductions in vulnerability/ increased resilience.                                      | well-being improves and development goals achieved despite possibly severe increase in hazards. Encompasses transformational adaptation.   |
| Stable well-being        | Lost opportunities  | Status quo  | Adequate/stabilising adaptation  |
|                          | Despite reduction in hazards, well-being does not improve – potential gains not realised.   | No change in either hazard prevalence or well-being. If adaptation actions taken they have little impact.                 | While well-being does not improve, worsening hazards do not undermine it. Adaptation has stabilised well-being and prevented losses.   |
| Deteriorating well-being | Maladaptation   | Increased vulnerability   | Inadequate adaptation  |
|                          | Despite reduction in hazards, well-being worsens – development is dramatically increasing vulnerability and reducing resilience.                        | Impacts of hazards increase despite no change in hazards themselves due to increases in vulnerability/reduced resilience. | Adaptation either not effective or not sufficient – may partially offset impacts, but maladaptation may also be occurring – counterfactual needed to access impacts of adaptation actions. |





**For many projects, simple, transparent approaches and focusing on a few high-quality, well-understood indicators may be best.**

Indicators with ambiguous or poorly defined relationships with resilience, and indicators that do not capture programme impact, either because they do not measure the right thing, or because they are not sensitive to the magnitude of impact likely to be achieved within the measurement time frame, pose challenges for interpreting measurement results. Interpretation of indicators can become further muddled in the case of composite indicators, such as the PROSPER KPI 4 resilience index, if the implications of the methodology used to aggregate the composite indicator are not fully understood. As shown by BRACC's experience with different versions of its resilience index, and by academic research comparing resilience rankings using difference resilience measurement tools, resilience measures can be extremely sensitive to the details of the methodology used to construct them, so understanding the implications of methodological choices in index construction is crucial to ensuring that an index captures the outcomes intended.

When constructing a resilience index, key questions to consider include:

1. Does any improvement in one or more indicators tell us that a household's resilience has increased?
2. Do improvements in resilience require improvements in multiple indicators, and if so, how many, and which ones?
3. Should some indicators be weighted differently to others?
4. Do improvements in certain combinations of indicators imply greater increases in resilience than the summative nature of the RI would suggest? For example, does combining climate-smart agriculture with insurance and climate information amplify resilience?
5. To what extent can we view the indicators as independent? For example, incremental increases in sales of agricultural products might be directly linked to the adoption of CSA, the use of insurance and/or climate information, or investment in resilience.

Having a definition of resilience and a theory of change that are specific and appropriate to the context being targeted is critical for ensuring that individual indicators capture resilience impact. In addition, indicators must be well-defined, and evaluators should have a detailed understanding of the data collection methods being used to generate the indicators, and how data collection methodology may affect the indicators themselves. Using indicators from previous evaluations or research, rather than creating new indicators, can be advantageous in terms of longitudinal comparisons, but can constrain adaptive approaches to monitoring, evaluation and learning.

Challenges in interpreting composite indicators, such as indexes, can be addressed by avoiding composite indicators altogether. This may be a good option for programmes with limited capacity for data analysis. Instead of using composite measures, individual indicators whose relationships to each other and to a theory of change are well understood can be used to ensure that findings are grounded in an understanding of the causal relationships that contribute to resilience. Alternatively, sophisticated statistical approaches, such as the factor analysis used by the RIMA or TANGO resilience measurement tools, can be used to ensure that the aggregation method has a clear theoretical underpinning.

**Resilience index thresholds, or measures that define a household as resilient or not resilient, should be avoided unless there is a specific rationale or meaning for the threshold; KPI 4 guidance should be revised.**

Resilience is a dynamic state that is hazard-specific, and this is even more important considering the evolving nature of climate change and what that means for exposure to shocks of different magnitudes. Creating a fixed threshold that distinguishes someone as resilient or not resilient is therefore problematic, unless resilience is defined in relation to a specific hazard of a specific magnitude and return period. A level of resilience that is sufficient for today's hazards (however that level is defined) may not be sufficient for intensified and/or new hazards that will occur in the foreseeable (and perhaps very near) future as a result of climate change. If adequate levels of resilience can be defined for existing hazards, attention needs to be paid to how required levels of resilience may change in the future.

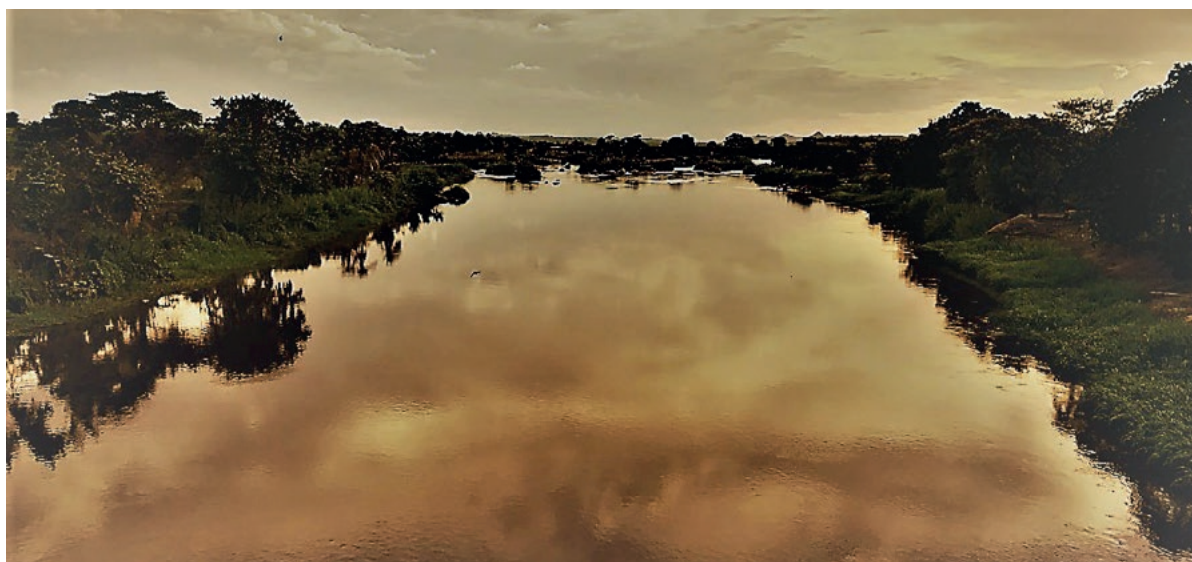
As discussed above, PROSPER resilience indices classified households as resilient if they achieved a given minimum score, but the score had no clear meaning with respect to resilience. To be meaningful, such thresholds need to be based on empirical evidence that can generate insights into how the resilience indicators used to construct the index relate to real-world outcomes. Without a detailed analysis of how indicators relate to such outcomes, how they relate to each other (in terms of independence, covariance, reinforcement/amplification, and appropriate combinations and weightings), such thresholds are likely to be rather meaningless, and may be dangerous if they give the impression that resilience has been achieved.

Current KPI 4 guidance recommends the use of a threshold classifying households as resilient when using a resilience index approach for KPI reporting. However, for the reasons described above, this approach risks failing to identifying meaningful changes in resilience, or undercounting households that have achieved significant improvements in resilience, but failed to cross the threshold. It is recommended that KPI 4 guidance be revised to allow for other approaches to identifying improved resilience based on resilience index scores, while maintaining the emphasis that the criteria for improvement be developed based on strong empirical or theoretical evidence.

## **Data collection and research is required to provide the empirical basis for resilience measurement.**

Many of the previous recommendations require a foundation of research and/or data before they can be implemented. Building realistic theories of change specific to hazard type and magnitude, welfare outcome and different population groups require a strong understanding of the different causal mechanisms related to resilience for each combination of shock, outcome and group. Understanding the relationship between resilience indicators and the implications of aggregating them requires data that can be used for assessing those relationships.

As a result, in order for programmes to successfully improve their resilience measurement and evaluation approaches, they will need to be supported by, and include dedicated funding for, high-quality research that provides an empirical basis for more detailed programme theory and better resilience measurement tools and approaches.





# LITERATURE

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