



**RESILIENCE ASSESSMENT BENCHMARKING AND IMPACT
TOOLKIT (RABIT)**

**IMPLEMENTATION
HANDBOOK**

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Overview

The Resilience Assessment Benchmarking and Impact Toolkit (RABIT) handbook is designed for an audience of developing country strategists and practitioners – working on ICTs-for-development (ICT4D), climate change, disaster response, and other focal areas – interested in assessing the impact of development interventions on resilience; especially community resilience.

This handbook describes the purpose and components of RABIT, explaining how to use the toolkit during the stages of planning and design (*pre-hoc*), implementation and monitoring (*durante-hoc*), evaluation and future planning (*post-hoc*) of development interventions.

The analysis unpacks the concept of resilience and, based on the example of information and communication technology for development (ICT4D) projects, it explores the potential impact of development interventions in strengthening – and potentially weakening – the resilience of low-income communities. It also presents a set of methods and instruments for data collection that support the toolkit's implementation in development practice.

In sum, RABIT provides practitioners from the development, climate change, and ICT fields with an innovative approach to resilience building; particularly in vulnerable communities. This handbook offers practical guidance on how to integrate the notion of resilience throughout the project cycle, to identify the (anticipated or unanticipated) impacts of development interventions on resilience, and to inform the design of future initiatives in this field.

- ❖ *If you are interested in the **fundamentals of RABIT**: what it is, why to use it, when to use it, and how to use it, go to **SECTION 1**.*
- ❖ *If you are interested in the **concept of resilience** and on the **attributes** of resilient systems, go to **SECTION 2**.*
- ❖ *If you are interested in the **linkages between ICTs and resilience**, go to **SECTION 3**.*
- ❖ *If you are interested in **data-gathering instruments** that can be used to implement RABIT, go to **SECTION 4**.*

This RABIT Handbook should be read in conjunction with other resilience resources including case studies and briefing document available at: <http://www.niccd.org/resilience>

This Handbook is a work in progress that will be subject to updates and revisions. If you have suggestions for revisions and improvements, please email the RABIT Coordinators:

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Introduction

Resilience is increasingly recognised as an essential capacity of developing countries and their communities if they are to survive and thrive amid the environmental, economic and social shocks likely to arise during the 21st century. Although the definition of resilience is widely debated among different writers and fields, in narrow, 'dictionary' terms, resilience means the ability to 'bounce back'; that is, to recover to some original state following an external disturbance.

Other definitions add further abilities to the understanding of resilience. One is the ability of the system (e.g. an individual, a community, a sector or a country) to *withstand* or endure the effects of an external disturbanceⁱ. The other is the ability to *change* in the face of an external disturbance; going beyond renewal to adjusting, and occasionally transforming, to enable the survival of the systemⁱⁱ.

For developing country communities facing complex development challenges, resilience (defined in Box 1) is becoming a central factor in order to understand their ability to cope with climate change and other sources of vulnerability.

Box 1. Defining Resilience

The capacity of a system (e.g. a community) to cope with, adjust to and potentially transform amidst change and uncertainty.

The notion of resilience provides a comprehensive, long-term and system-encompassing approach that is gaining importance in the development agenda. In practice, resilience results from

“the sum of all the different *actions, strategies, investments, and anticipations* that contribute to build that specific ability to deal with shocks, and that are undertaken ex-ante and ex-post, at different levels (individual, household, community, etc.)”ⁱⁱⁱ.

But despite the emergence of considerable research on the meaning and measurement of resilience from a variety of perspectives^{iv}, development practitioners have so far lacked robust tools for baseline measurements of resilience, or for assessment of the impact on resilience of development interventions.

In response to this knowledge gap, researchers at the University of Manchester developed the Resilience Assessment Benchmarking and Impact Toolkit (RABIT).

RABIT constitutes an innovative approach to resilience building focused on developing countries. It is based on a set of resilience attributes (i.e. robustness, self-organisation, learning, redundancy, rapidity, scale, diversity, flexibility and equality) that are critical for vulnerable households, communities and nations to cope with, adjust and potentially transform amidst the impacts of short-term shocks and long-term change.

Contrary to traditional asset-based and disaster-focused approaches, RABIT is based on a broader, more in-depth understanding of the attributes required by developing country systems to build resilience. It is also a toolkit designed for practitioners and strategists, and its implementation is linked to concrete stages of the project cycle.

It is expected that RABIT will allow users to improve their understanding of the relationship between development interventions and resilience, as well as facilitate the integration of resilience into the design, implementation and assessment of development projects.

Building on research conducted at the intersection of climate change, innovation and information and communication technologies (ICTs)^v, the use of RABIT will be illustrated through the case of

ICT for development (ICT4D) interventions in vulnerable communities. However, RABIT is equally applicable to other types of development interventions: for example, relating to physical infrastructure, community empowerment, institution building, enterprise development, etc.

The role of ICTs in strengthening or weakening the resilience of low-income communities was selected because of the growing influence of ICTs in development, and because it constitutes an area where little research has been conducted to date. Thus, for example, RABIT allows development practitioners and strategists to assess ICTs' contribution to the resilience of low-income communities. It provides tools and mechanisms that seek to strengthen the design, implementation and evaluation of ICT4D interventions and future strategising. It also seeks to raise awareness of the potential and challenges associated with use of ICT tools in low-income communities that are vulnerable to stressors such as climate change.

The handbook is structured around four main sections:

Section 1 describes the fundamental aspects of RABIT: what it is, why to use it, when to use it, and how to use it, including the main stages involved in its implementation.

Section 2 provides readers with a more in-depth understanding of resilience, unpacking the concept and describing each of the foundational and enabling attributes that characterise resilient systems such as communities.

Section 3 illustrates the application of RABIT, exploring the case of ICT4D interventions from a resilience lens. The section provides concrete examples of the role of ICTs in strengthening – and in some cases, undermining – the resilience of low-income communities.

Section 4 provides practitioners and researchers with a set of practical methods and instruments for data gathering, aimed at facilitating the implementation of RABIT to benchmark or assess the resilience impact of development interventions.

SECTION 1. RABIT Fundamentals: What, Why, When and How

This section explores the questions that are at the core of RABIT's implementation, clarifying its purpose and the potential benefits that can be derived from its use in development practice.

1.1. What is RABIT?

RABIT is toolkit aimed at strengthening the resilience impact of planned or implemented interventions in developing countries.

RABIT can be used as part of the initial benchmarking of development interventions¹ to establish key areas of focus and action to build resilience (i.e. establish resilience baselines). And it can also be used to assess the impact on resilience of interventions during or after their implementation, to draw lessons learned, and to inform future programming/strategising.

1.2. Why is RABIT focused on developing countries?

Developing countries are most vulnerable to the impact of external shocks and stressors, including being on the "front line" of the impacts of climate change. While the focus of RABIT is on resilience to climate change impacts in developing country communities, the toolkit can be applied to projects that respond to a variety of stressors and at different levels of analysis (e.g. household, organisational, community, sectoral, regional, national levels).

1.3. Why use RABIT?

RABIT provides practitioners with a practical, yet in-depth mechanism to identify and score the anticipated, unanticipated, and actual impacts of development interventions on resilience.

It is designed to assist development practitioners (including those involved with climate change and with ICT interventions) to strengthen their projects in five ways:

- a) By identifying the resilience strengths that exist in a community or other development system, and that can be integrated/built upon as part of new or ongoing initiatives;
- b) By providing an indication of the weaknesses that need to be addressed as part of efforts to build resilience;
- c) By providing a 'snapshot' of issues that are perceived as priority areas for action at the local level;
- d) By facilitating the identification and assessment of factors that may undermine resilience, enabling the adoption of corrective actions; and
- e) By providing critical, evidence-based information to improve the design of future interventions.

1.4. When to use RABIT?

RABIT can be used during different stages of project cycle:

- Project design (*pre-hoc*)
- Project implementation (*durante-hoc*)
- Project assessment (*post-hoc*)

In the stage of project design, RABIT can be applied as a '*benchmarking tool*' to strengthen the planning of development interventions.

¹ The terms "development intervention" and "project" will be used roughly interchangeably in the text that follows.

In the stages of implementation and assessment, which include implementation, monitoring, evaluation and future strategising, RABIT can be applied as an “*impact assessment tool*” to strengthen the impact of development interventions on resilience.

The use of RABIT in the different stages of the project cycle is illustrated in Figure 1.

The figure starts by indicating the two main aims of RABIT usage (i.e. resilience benchmarking or impact assessment), the stage of the project’s implementation that corresponds to those aims, the potential instruments for data collection and options for data visualisation, as well as the main purposes of the data analysis. The figure also highlights the fact that, ultimately, the key expected outcome of RABIT’s implementation is to strengthen the project’s impact on the achievement of development outcomes (immediately and directly, resilience; but ultimately and indirectly, poverty reduction, improved well-being, strengthened local livelihoods, etc).

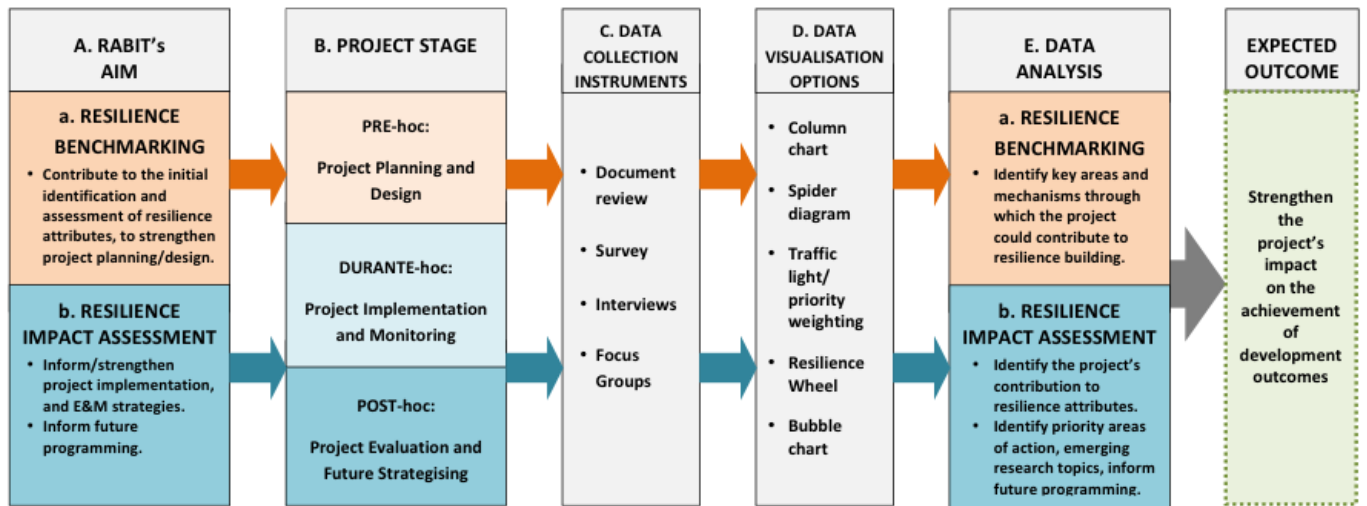


Figure 1. RABIT: Overview of implementation

This approach is consistent with an understanding of resilience as a neutral term (i.e. that can have positive or negative impacts), as opposed to a final end in itself^{vi}. Thus, the main outcome of RABIT’s implementation is to ensure that, by effectively integrating resilience and assessing its attributes from a critical, in-depth perspective, development projects can contribute more effectively to the achievement of final development outcomes.

1.5. How to use RABIT?

Building on research conducted at the University of Manchester, RABIT is based on the identification of a series of foundational (robustness, self-organisation, learning) and enabling (redundancy, rapidity, scale, diversity, flexibility, equality) attributes of resilient systems.

RABIT provides key markers for each of these attributes, as well as a scoring rank to assess and prioritise areas of impact. RABIT also provides a series of data gathering instruments (survey, interview and focus group guides) and a suggested approach for the analysis of findings, which have been tested through the implementation of pilots in [Costa Rica \(urban community\)](#) and [Uganda \(rural community\)](#).

RABIT's Conceptual Framework

The conceptual framework that serves as the basis for RABIT's implementation integrates the three main stages in the cycle of development projects: (A) project planning and design, (B) implementation and monitoring, and (C) evaluation and future strategising, as reflected in Figure 2. In this particular case, the community is the core of the development intervention but, as noted above, the central system could be any type of system: households, supply chains, districts, etc.

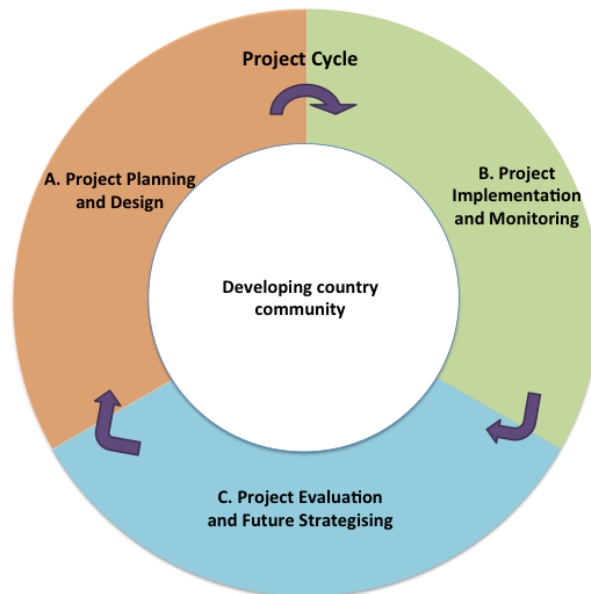


Figure 2. Stages of the project cycle.

The circular shape suggests that the project cycle is a *continuous learning process*, where the different stages of implementation are inter-related and feed into each other. At the centre of the project cycle is the development country setting where the project is/was implemented.

In order to understand *if* and *how* development projects can have an impact on resilience, it is necessary to take a more in-depth look at the unit of analysis – e.g. a community, its vulnerabilities, and at the set of stressors that exacerbate those vulnerabilities. In other words, we need to ‘unpack’ the particular development system that is being analysed.

Figure 3 takes the example of a community and represents it as a ‘system’ that is formed by components (e.g. assets and institutions)² and by properties (e.g. resilience). The model identifies a series of pre-existing vulnerabilities dimensions that exist in developing countries (e.g. related to livelihoods and finance, food security, water supply, health, socio-political conditions, habitat and migration, among others).

The impact of external stressors such as climate change³ exacerbates existing

² Drawing from the Sustainable Livelihoods Approach (SLA), assets include human, natural, financial, social and physical capital. The lack of access to these assets significantly limits the ability of a developing country community to cope with the effects of climate change and other stressors, while the more varied the asset base, the stronger the ability of the community to respond to those impacts. Institutions include sanctions, taboos, customs or codes of conduct (all of which are found within the notion of ‘culture’), as well as formal rules such as laws, property rights or government policies. DFID. (1999) *Sustainable Livelihoods Guidance Sheets*, London: Department for International Development (DFID), <http://www.eldis.org/vfile/upload/1/document/0901/section2.pdf>

³ For the purposes of RABIT's implementation, climate change encompasses both acute shocks and long-term trends. Acute shocks refer to extreme hazards that usually occur over a geographically limited area and require rapid response and relief Cannon, T. (2010) *Adapting to Climate Change: Applying Concepts in Practice. Climate Change, Disasters and Urban Poverty*. Manchester, UK: School of Environment and Development (SED), University of Manchester. They can include events such as heavy rainstorms or cyclones, which may produce effects such as landslides, flooding, disruption of transportation systems and the erosion of agricultural land, among

vulnerabilities (e.g. acute flooding can exacerbate food insecurity and health problems, sea-level rise can accelerate migration, more intense and frequent storm surges can deteriorate urban habitats and affect local livelihoods). At the same time, communities and other systems have different components and properties that can either enable or constrain their ability to respond to those external stressors.

Communities utilise available assets and institutions (system components) to respond to the impact of stressors such as climate change impacts. In turn, existing vulnerabilities can affect the availability and/or the functioning of assets and institutions. These dynamic linkages are represented in Figure 3 with a two-way arrow (linking the community's vulnerability dimensions, its assets and institutions).

Resilience is represented in the framework as a property that vulnerable communities and other systems have or that they can develop. It encompasses a series of key attributes (robustness, self-organisation, learning, redundancy, rapidity, scale, flexibility, diversity and equality) that can ultimately enable a community to better withstand, recover, adapt, and potentially transform in the face of climate change impacts and other stressors. Section 2 discusses this further.

The framework acknowledges that both the impact of those stressors and the strategies to address them can take place at various levels: at the macro (e.g. national), meso (e.g. regional), or micro (e.g. local) levels.

Development interventions (e.g. projects and strategies) can play a role in the community's ability to respond to the impact of stressors: they can both influence and be influenced by resilience, and also help to strengthen (or undermine) the availability and functioning of community assets and institutions. The framework also illustrates the ultimate goal of RABIT's implementation, which is to strengthen the project's impact on community resilience in order to contribute to the achievement of development outcomes.

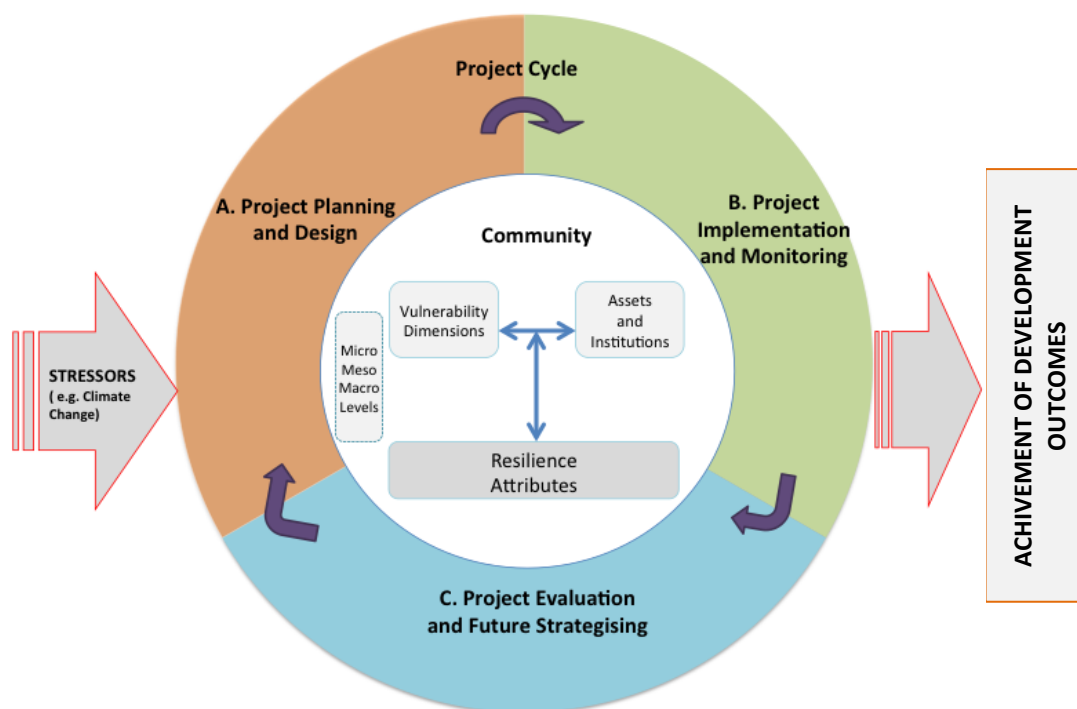


Figure 3. RABIT Conceptual Framework: Project cycle and community resilience. In summary, RABIT's conceptual framework illustrates the linkages that exist

others. Long term trends refer to subtler shifts in conditions, and can include sea level rise, melting glaciers or changing oceanic acidity due to atmospheric CO₂ uptake, which take place over long periods of time and are, therefore, harder to identify. These long-term changes also include changes in seasonality, temperature and precipitation.

between development interventions and resilience in a community or other development system vulnerable to the impact of stressors such as climate change. It integrates the key stages of the project cycle (planning and design, implementation and monitoring, evaluation and future strategising), and the characteristics of the vulnerable community where the project takes place (vulnerability dimensions, assets and institutions). It suggests that by effectively integrating resilience as part of the project cycle, development interventions can strengthen their impact on the achievement of development outcomes.

RABIT's Stages of Implementation

This sub-section provides an overview of the different stages involved in RABIT's implementation. The research instruments suggested to operationalise each stage are presented in Section 4 of this handbook.

The four stages of implementation suggested for RABIT are illustrated in Figure 4 (dotted lines). These stages are linked to the key components of RABIT (explained in Section 1.4), and are interconnected and complementary.

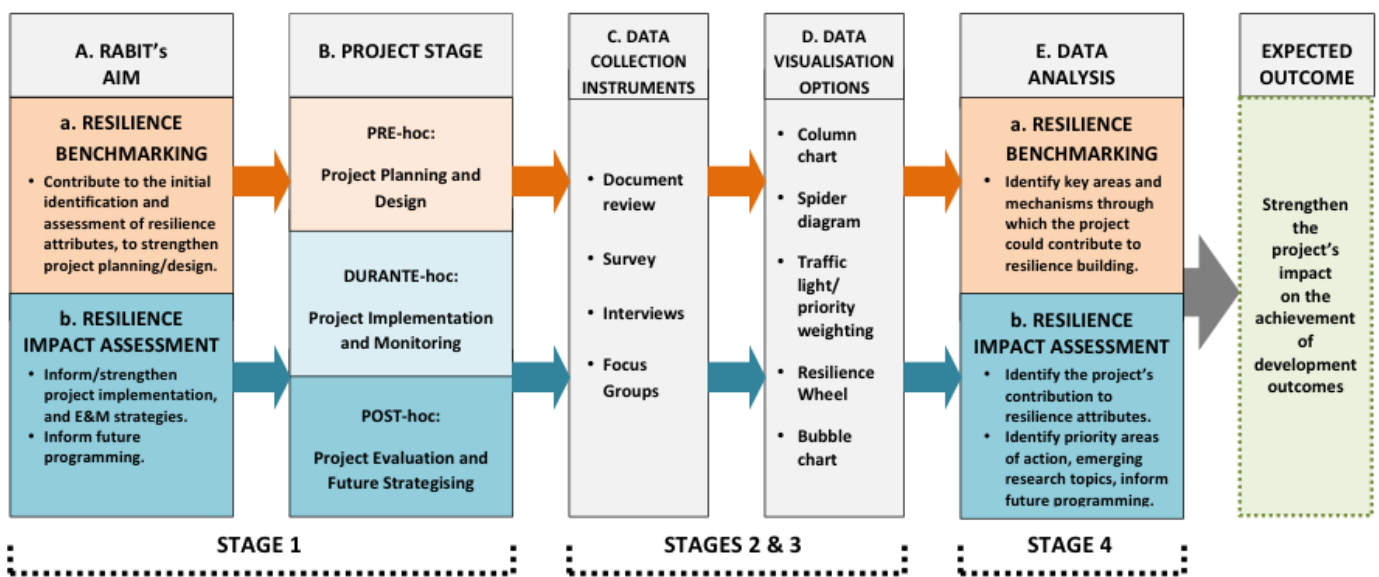


Figure 4. RABIT: Key components and stages of implementation

This section provides practitioners and strategists with guidelines to implement each of these stages. The approach suggested should be adjusted to fit the specific vision and strategy of the implementing organisation, and respond to the characteristics and priorities of the context where RABIT is applied.

• STAGE 1: Establishing RABIT's Purpose and Scope

The first stage consists of the identification of the stage(s) of the project cycle during which RABIT will be applied (i.e. project design *-pre-hoc-*, project implementation *-durante-hoc-*, and/or project assessment *-post-hoc-*). Based on that, the team must define and agree on the purpose and expected outcomes of implementing the toolkit.

- ❖ As identified in Section 1.4, if applied during the stage of project planning and design, RABIT can serve as a *'benchmarking tool'* to strengthen the planning of development interventions.
- ❖ If applied during the stages of project implementation and assessment (monitoring,

evaluation and future strategising), RABIT can serve as an '*impact assessment tool*' to strengthen the impact of development interventions on resilience.

The purpose and scope of RABIT's implementation should be identified at two levels:

(a) for the *organisation* that is implementing the project or development intervention (i.e. why and how would it be useful for the organisation), and

(b) for the *context* within which the project is being implemented (i.e. why and how would it be useful for different stakeholders).

This stage typically involves a focus group discussion with staff members of the implementing organisation, and in the case of joint implementation, with partner organisations. The process can also be informed by semi-structured interviews or by a focus group conducted with key local stakeholders, so as to ensure that the views and priorities of these stakeholders are reflected in RABIT's design from the outset. Focus group and interview guidelines are provided in Section 4.

• **STAGE 2: Establishing Resilience of *Whom to What***

The second stage of RABIT's implementation is focused on establishing the resilience of *whom* and *to what*. If dealing with resilience of community, for example, this would focus on gaining a better understanding of the community (i.e. whose resilience we seek to strengthen) and of the impact of stressors on the community (i.e. what are the stressors that we seek to build resilience to, e.g. climate change). Referring back to the RABIT conceptual framework (Figure 3), for a community, this stage involves identification of:

(a) the *stressors* that impinge upon the community (for the purposes of RABIT's case studies, the emphasis was on short- and long-term climate change impacts but these could be other environmental, economic, social, etc factors);

(b) the existing *vulnerability dimensions* that exist in the community (i.e. pre-existing vulnerabilities related to local livelihoods and finance, food security, water supply, habitat and migration, health and socio-political conditions);

(c) the key *assets and institutions* that are available in the community, and that can play a role in local responses to the impacts of stressors (e.g. to maintain the performance and functions of the community in the event of disasters, to help adjust their livelihoods to changing conditions, to access the financial resources needed to recover); and

(d) for *ongoing projects*, the specific tools and activities undertaken as part of the development intervention (e.g. in the case of ICT4D projects this would include the identification of ICT tools that are available at the local level, their usage by local stakeholders, as well as perceived benefits and challenges).

This stage involves the compilation and analysis of key documents through desk research (e.g. vulnerability assessments, reports, census data, project documents), and through semi-structured interviews with key community stakeholders (detailed in Section 4).

• **STAGE 3: Assessing Resilience**

The third stage consists of assessing the role of the development intervention on resilience. This is the central stage of RABIT's implementation, and it is based on the identification and assessment of resilience markers or the key characteristics of resilience present (or absent) in the focal system: households, community, district, etc.

In order to do this, RABIT utilises a set of resilience attributes and attribute 'markers' that are explained in Section 2.3 (Table 1). These markers can be used to assess the role of development interventions in strengthening and/or undermining resilience of the community (or other system) to stressors such as climate change impacts.

This stage involves the identification of resilience markers through a survey and key stakeholder interviews (detailed in Section 4).

• **STAGE 4: Identifying Key Areas of Action**

The fourth and final stage of RABIT's implementation involves analysis of the data gathered in order to identify priority areas of action to strengthen the project's impact on resilience.

- ❖ As reflected in Figure 4, if the aim of RABIT is *benchmarking*, the analysis should be focused on identifying the key areas and mechanisms through which the development intervention could contribute to resilience building.
- ❖ If the aim of RABIT is *impact assessment*, the analysis should be focused on identifying how the project is contributing to the different attributes of resilient systems, and what are the key areas of action for the implementing organisation to ensure a positive impact on resilience and, ultimately, on the achievement of development outcomes. It is expected that these reflections would also help to inform future programming, and to identify areas where further research could be conducted.

This stage involves the compilation and analysis of data collected throughout the toolkit's implementation (utilising the instruments described in Section 4), as well as a final learning event/workshop with key local stakeholders, in order to share, validate and/or complement the findings.

Only by understanding resilience properly can we effectively make use of it as a concept: for design of future initiatives, for implementation of current initiatives, and for evaluation of past initiatives. Having provided an overview of the stages of RABIT's implementation, the next section will explore in further depth the meaning of resilience.

SECTION 2. Resilience: Unpacking the Concept

The successful implementation of RABIT depends largely on gaining a better understanding of resilience as a property that communities or other systems (households, supply chains, districts, etc) have to a greater or lesser extent.

We can understand it as a series of nine elements or attributes. Three of these are *foundational* and basic. They are robustness, self-organisation and learning, and constitute the core attributes of resilient systems. The other six elements are *enabling* attributes, which means that they facilitate the presence of the three foundational elements in resilient systems, and complement their functions. These enabling attributes are redundancy, rapidity, scale, diversity, flexibility and equality.

These attributes are explored below. They include illustrative examples related to climate change impacts that affect low-income communities in developing countries. But we again note that RABIT is not restricted to only measuring resilience of these systems.

2.1. Foundational Attributes

Analysis and synthesis of literature sources that explore resilience as a system property^{vii} suggest that resilient systems have three core characteristics, referred to here as ‘foundational attributes’.

Robustness

Robustness relates to the ability of a system to withstand; that is, to maintain its characteristics and its performance in the face of environmental fluctuations, including climate change shocks^{viii}. Generic features of robust communities include measures that help spread the risks and the effects of any external disturbance, and help avoid the collapse of local livelihoods and institutions in the face of stressors.

In relation to climate change, examples of community robustness include physical preparations such as flood barriers, terracing on hills and resistant infrastructure, flood storage basins, green spaces and tree planting. It also includes the strengthening of institutions to avoid their collapse amidst the impact of stressors such as extreme weather events and disasters, among others.

Self-organisation

Self-organisation refers to the system’s ability to independently re-arrange its functions and processes in the face of external disturbances, without being forced by external drivers/ influences^{ix}.

Self-organisation is critical given both the uncertainty of reliance on external systems e.g. during an extreme climate event, and the potential mismatch between those external forces and the local interests of the community. Self-organisation enables the community to diagnose its own problems and assess its local priorities, as well as to mobilise resources to initiate solutions^x. It relies strongly on the capacity for collaborative decision-making and action that exists within the community; a capacity linked to local social networks^{xi}, local leadership and trust, and on psycho-social dimensions (e.g. belief, motivation, hope, perceived self-efficacy) within the community^{xii}.

In relation to climate change, examples of community self-organisation include the availability of locally-led adaptation efforts, the existence of community organisations that coordinate access to disaster prevention and response resources, community-based social networks that help create awareness and disseminate information about local climate change impacts, among others.

Learning

Learning refers to the capacity of a system to generate feedback with which to gain or create knowledge, and build the skills, attitudes and other competences required to innovate and adapt to change. Experimentation, discovery and innovation are part of learning, and contribute to a community's short-term response to shocks and longer-term transformational change^{xiii}. Learning may be enhanced by the combination of local and traditional knowledge with that sourced from outside the community^{xiv}.

In relation to climate change, examples of community learning include the availability of capacity-building programmes on adaptation options, of mechanisms to document traditional adaptation knowledge and lessons learned, access to relevant information and knowledge about local climate change impacts, among others.

2.2. Enabling Sub-Properties

Further review of conceptual literature suggests the existence of an additional set of sub-properties or attributes – redundancy, rapidity, scale, diversity, flexibility, and equality – that enable resilience, and that facilitate the operationalisation of the foundational attributes described above^{xv}.

Redundancy

Redundancy is the extent to which components (e.g. assets, institutions) within a system are substitutable; for example, in the event of disruption or degradation. It includes the diversity of assets available, as well as the ability to access assets that are 'surplus' and interchangeable. Redundancy may also involve the overlap of processes, capacities and response pathways in a community, which allows for partial failure without complete collapse^{xvi}.

In relation to climate change, examples of redundancy include the existence of collaborative efforts between community-based and external organisations, as they facilitate the availability of multiple sources of support/expertise that can help fill gaps in times of need. Examples also include the availability of multiple livelihoods or sources of income (e.g. remittances), which create a financial surplus that can be used to respond to the impacts of climatic events, among others.

Rapidity

Rapidity means how quickly assets can be accessed or mobilised by system stakeholders to achieve goals in an efficient manner^{xvii}. Rapidity is key to ensure the community's ability to identify the emergence of problems, and to decide and implement a course of action in a timely manner. This will have a particular value in responding to acute climate-related events, and will relate to a variety of assets; but especially information and finance.

In relation to climate change, examples of rapidity include the availability of early-warning systems that alert the community about imminent threats, and mobilise resources to respond to climatic events. Examples also include swift access to the information needed to take decisions, as well as the availability of savings, credit and insurance mechanisms to ensure rapid access to the financial resources required to respond to climatic events, among others.

Scale

Scale refers to the breadth of assets that a system can access in order to effectively overcome or adapt to the effects of disturbances^{xviii}. It involves, for example, access to assets, institutions and structures beyond the immediate community level, which enable access to resources that may not otherwise be available.

In relation to climate change, examples of scale include the access of community stakeholders to informal social networks (formed by members beyond the community), the community's access to extended markets (regional or international), or access to state (national or regional) organisations, which are shown to be important to pull resources and support climate responses, among others.

Diversity

Diversity refers to the availability of a variety of assets, institutions and institutional functions in the system, which enable a range of response options (e.g. in terms of diverse livelihoods, land use, adaptive infrastructure choices, etc)^{xxix}. Diversity can help reduce the vulnerability of a community to external stressors by helping to absorb their impact, spread the risk, and stimulate competitive reorganisation^{xx}. Diversity can also provide “the basis for innovation, learning and adaptation to slower, ongoing change”^{xxi}.

In relation to climate change, examples of diversity include the community's access to diverse/varied sources of knowledge and reference frames that foster innovative responses to climate change challenges, among others.

Flexibility

Closely linked to diversity and combined into a single sub-property for the purposes of what follows, flexibility refers to the ability of a system to undertake different sets of actions with the resources at its disposal. Flexibility enables a community to address problems and utilise opportunities arising from external change^{xxii}.

Flexibility partly relates to the availability of resources and institutions that can be recombined in different ways, but also to the existence of knowledge (e.g. from wider networks and sources) that can suggest to the community different courses of action. Flexibility also relates to the adaptability of decision-making processes in the community, to allow alternatives/different courses of action to be considered.

In relation to climate change, examples include the availability of flexible institutions that support alternative pathways of action to climatic impacts such as sea-level rise or migration, as well as the availability of various knowledge sources to inform adaptable decision-making at the community level, among others.

Equality

Equality is the extent to which a system affords equal access to rights, resources and opportunities to its members, given evidence that more unequal systems are less resilient and less able to adapt^{xxiii}. This includes the distribution of access to resources and institutions within a community, as well as the availability of participative and transparent decision-making.

In relation to climate change, examples of equality include the availability of programmes to improve the skills and competencies of vulnerable members of the community, the inclusion of elders, women and youth as part of participatory strategies, as well as the recognition of traditional knowledge and technologies in the design of local adaptation strategies, among others.

2.3. Resilience Markers

Based on the attributes described above, we can now summarise resilience as a series of foundational and enabling sub-properties with definitions and key ‘markers’ or characteristics, as shown in Table 1. As before, we express this in specific terms of a community but the attributes and markers can equally be applied to other types of system from households up to nations.

| Resilience Attributes | Definition | Key Markers/ Characteristics |
|--|--|--|
| FOUNDATIONAL ATTRIBUTES OF COMMUNITY RESILIENCE | | |
| Robustness | <ul style="list-style-type: none"> Ability of the community to maintain its characteristics and performance in the face of environmental shocks and fluctuations. | <ul style="list-style-type: none"> Physical Preparedness Institutional Capacity Multi-level Governance and Networking |
| Self-Organisation | <ul style="list-style-type: none"> Ability of the community to independently re-arrange its functions and processes in the face of an external disturbance, without being forced by external influences. | <ul style="list-style-type: none"> Collaboration/Consensus-building and Participation Social Networks Local Leadership and Trust |
| Learning | <ul style="list-style-type: none"> Capacity of the community to generate feedback with which to gain or create knowledge, and strengthen skills and capacities. Closely linked to the community's ability to experiment, discover and innovate. | <ul style="list-style-type: none"> Capacity Building New and Traditional Knowledge Reflective Thinking |
| ENABLING ATTRIBUTES OF COMMUNITY RESILIENCE | | |
| Redundancy | <ul style="list-style-type: none"> Extent to which community resources and institutions are substitutable; for example, in the event of disruption or degradation. | <ul style="list-style-type: none"> Resource Spareness Functional Overlaps and Interdependency Resource Substitutability |
| Rapidity | <ul style="list-style-type: none"> Speed at which assets can be accessed or mobilised by community stakeholders to achieve goals in an efficient manner. | <ul style="list-style-type: none"> Rapid Resource Access Rapid Resource Assessment/ Coordination Rapid Resource Mobilisation |
| Scale | <ul style="list-style-type: none"> Breadth of assets and structures a community can access in order to effectively overcome or bounce back from or adapt to the effects of disturbances. | <ul style="list-style-type: none"> Multi-level Networks Resource Access and (intra/inter) Partnerships Cross-level Interactions |
| Diversity and Flexibility | <ul style="list-style-type: none"> Ability of the community to undertake different courses of actions with the resources at its disposal, while enabling them to innovate and utilise the opportunities that may arise from change. | <ul style="list-style-type: none"> Different Courses of Action/Emerging Opportunities Adaptable Decision-making Innovation Backbone |
| Equality | <ul style="list-style-type: none"> Extent to which the community provides equal access to rights, resources and opportunities to its members. | <ul style="list-style-type: none"> Strengthened Competencies/ Gaps' Reduction Inclusiveness Openness and Accountability |

Table 1. Attributes of resilient communities: Summary of definitions and key markers^{xxiv}

These resilience attributes are dynamic and interrelated. They interact with the assets and institutions available in vulnerable communities, allowing them to better withstand, recover, adjust, and potentially transform in the face of stressors such as climate change.

In other words, these attributes enable the community's resilience to short-term shocks and long-term uncertainty, and contribute to the community's ability to achieve development outcomes (e.g. higher income, better quality of life).

Table 2 provides some examples of what these resilience markers can look like in developing practice, and their role in either strengthening or weakening a community's resilience. Most examples relate to the resilience of vulnerable communities affected by climate change impacts.

The examples are not meant to be exclusive, but to illustrate the type of markers to be identified during the process of data collection (explained in Section 4).

| RESILIENCE ATTRIBUTES | RESILIENCE MARKERS | EXAMPLES OF MARKERS THAT STRENGTHEN COMMUNITY RESILIENCE | EXAMPLES OF MARKERS THAT WEAKEN COMMUNITY RESILIENCE |
|-----------------------|---|--|--|
| ROBUSTNESS | <ul style="list-style-type: none"> • Physical Preparedness • Institutional Capacity • Multi-level Governance and Networking | <p>+ The community has measures in place to strengthen its physical capacity to cope with extreme weather events (e.g. flood protection measures, earthen embankments, raised roads and floodwalls, sluice gates, pumping stations, sandbagging).</p> <p>+ The community has measures in place to improve its physical preparedness against food shortages (e.g. locally-grown produce using micro-gardens, more resistant seed varieties).</p> <p>+ Community-based institutions have the capacity to undertake actions in the event of climatic disruptions, have land-use regulations, and institutional programmes in place to protect environmentally-critical areas.</p> | <p>- Physical defences to weather-related events within the community are absent or of poor quality.</p> <p>- There is poor planning of flood interventions in the community, increasing the impact of external stressors (e.g. to plan of action in case of a flood or landslide).</p> <p>- Local institutions are absent or ineffective and do not have the capacity to assist with external shocks.</p> |
| SELF-ORGANISATION | <ul style="list-style-type: none"> • Collaboration/Consensus-building and Participation • Social Networks • Local Leadership and Trust | <p>+ Community members have formed social networks, building trust and collaboration within the community (e.g. networks among migrant populations, community-based cooperatives, volunteers' associations).</p> | <p>- Initiatives within the community are absent or are dependent on external funding and intervention; thus increasing the external dependencies of the community.</p> |
| LEARNING | <ul style="list-style-type: none"> • Capacity Building • New and Traditional Knowledge • Reflective Thinking | <p>+ Community members have access to training and educational resources related to climate change, fostering information exchange, the confidence and self-perception of community members.</p> <p>+ There are programmes in place to raise awareness about climatic impacts (e.g. the climate causes of flooding, the nature of flooding, and the impacts of flooding in the community).</p> | <p>- Training and capacity building resources focused solely on external, top-down knowledge, weakening the traditional knowledge that exists in the community (e.g. knowledge about traditional adaptation practices, elders' oral traditions).</p> |

| | | | |
|----------------------------------|--|--|--|
| REDUNDANCY | <ul style="list-style-type: none"> • Resource Spareness • Functional Overlaps and Interdependency • Resource Substitutability | <p>+ There is availability of alternative mechanisms in the community to cope with the effects of flooding.</p> <p>+ Community members can develop spare financial resources (e.g. through semi-commercial home gardens and livelihood diversification) and have unused land.</p> | <p>- Community members have no savings that could be used in the event of an emergency.</p> <p>- Pursuing additional livelihood options has reduced the potential for spare labour needed to respond to climatic events.</p> |
| RAPIDITY | <ul style="list-style-type: none"> • Rapid Resource Access • Rapid Resource Assessment/Coordination • Rapid Resource Mobilisation | <p>+ The community has in place mechanisms for rapid resource mobilisation to prevent or mitigate the impacts of flooding (e.g. evacuation mechanisms to reduce loss of life).</p> <p>+ The community has early warning systems in place, evacuation systems, and emergency distribution of food/aid for recovery.</p> | <p>- Decision-making processes relating to the community are slow and bureaucratised.</p> <p>- There are no early warning systems in place to identify incoming climate events.</p> |
| SCALE | <ul style="list-style-type: none"> • Multi-level Networks • Resource Access and (intra/inter) Partnerships • Cross-level Interactions | <p>+ Community members are linked externally to public institutions, academic organisations and international stakeholders (e.g. with higher-level institutions from the NGO and public sectors, and integrated into broader systems of resource access).</p> | <p>- In terms of social capital, the community relies heavily on its internal bonding capital and has little bridging or linking capital.</p> |
| DIVERSITY AND FLEXIBILITY | <ul style="list-style-type: none"> • Different Courses of Action/Emerging Opportunities • Adaptable Decision-making • Innovation Backbone | <p>+ There is diversity of land use within the community.</p> <p>+ There are diverse opportunities for income generation.</p> <p>+ There is innovative use / reconversion of urban/rural areas (e.g. upgrading of infrastructure to adapt to higher water tables, salt-water infiltration, wind-resistant roofing, etc).</p> | <p>- There is little generation of new ideas either within or into the community.</p> <p>- Community-based management interventions have reduced the diversity of decision/action pathways.</p> |
| EQUALITY | <ul style="list-style-type: none"> • Strengthened Competencies/ Gaps' Reduction • Inclusiveness • Openness and Accountability | <p>+ Availability of programmes that build the capacities of marginalised groups within and between communities (e.g. women, youth and elders).</p> | <p>- Programmes focused on certain groups may have deepened social tensions / existing divides within the community (e.g. information access, power and/or gender issues).</p> |

Table 2. Examples of resilience markers.

2.4. Updated Resilience Markers

As noted above, RABIT was put into practice in two communities in Costa Rica and Uganda. On the basis of this, a number of problems were identified with the originally-selected markers: problems with overlaps e.g. around the notions of multi-level connections; problems with rapidity that it did not sufficiently encompass the idea of detecting and reacting to external stressors; problems with equality that it focused only on equality of competencies and not on other assets; problems with misallocation of trust with leadership and of interdependency with robustness; and problems with over-broad combinations that needed simplification. With that in mind, a revised set of markers was developed, as shown in Table 3.

| Resilience Attribute | Markers |
|------------------------------------|--|
| FOUNDATIONAL ATTRIBUTES | |
| Robustness | <ul style="list-style-type: none"> • Physical Preparedness • Institutional Capacity • Loose Functional Coupling |
| Self-Organisation | <ul style="list-style-type: none"> • Collaboration and Consensus-Building • Social Networks and Trust • Local Leadership |
| Learning | <ul style="list-style-type: none"> • Capacity Building • New and Traditional Knowledge • Reflective Thinking |
| ENABLING ATTRIBUTES | |
| Redundancy | <ul style="list-style-type: none"> • Resource Spareness • Resource Substitutability • Functional Overlaps |
| Rapidity | <ul style="list-style-type: none"> • Rapid Issue Detection • Rapid Issue Assessment • Rapid Issue Response (Resource Mobilisation) |
| Scale | <ul style="list-style-type: none"> • Scale of Resource Access • Multi-Level Networks • Intra-Level Networks |
| Diversity & Flexibility | <ul style="list-style-type: none"> • Variety of Courses of Action • Adaptable Decision-Making • Innovation Mechanism |
| Equality | <ul style="list-style-type: none"> • Equality of Distribution of Assets • Inclusiveness and Participation • Openness and Accountability |

Table 3. Revised resilience markers.

Given that in this handbook RABIT is applied to ICT4D interventions, the following section will explore the linkages that exist between ICTs and resilience attributes.

SECTION 3. Analysing ICT Interventions through a Resilience Lens

This section explores the linkages that exist between ICTs and the resilience of low-income communities. The analysis explores how these tools can strengthen – and potentially undermine – the resilience of vulnerable communities, based on the resilience attributes presented in Section 2.

3.1. ICTs Strengthening Foundational Sub-Properties

ICTs and Robustness

ICTs can help strengthen the physical preparedness of communities by helping optimise the location of physical defences. For example, in a number of cities, geographic information systems (GIS) have been used to plot flood plains and watercourses, enabling the improved planning of maintenance and installation of storm drains^{xxv}.

ICTs can also strengthen institutions needed for the system to withstand the occurrence of climatic events. This can take place by developing the capacity of individual institutions: for example of local government to deliver services or to make good decisions^{xxvi}, or by drawing institutions together into networks and partnerships that expand governance capacity.

ICTs and Self-Organisation

Self-organisation of low-income communities requires that they have internal, independent capacity to take decisions and actions. ICTs can support community self-organisation processes by enabling local stakeholders to create information, make informed decisions, and take action.

ICTs have a key role in the provision of appropriate data and information for decision-making by facilitating access to digital information about climate events that originates from outside the community^{xxvii}, as well as by enabling the generation of data within communities themselves; an option which is increasing with greater availability of mobile phones. These have been used to report on-the-ground data during disasters or in relation to WaSH (water, sanitation, and hygiene) services, though as with all ICT systems there is still a reliance on external sources for hardware, software and telecommunications^{xxviii}.

Digital tools such as public participatory GIS (in some cases with linked decision support systems) are increasingly used to help communities make decisions^{xxix}. This support for self-organisation via ICTs increases dramatically if we extend the scope of ‘self’ to also cover local government. Although lagging behind the extent of use in the global North, use of ICTs in local governments in Latin America, Africa and Asia is expanding fast, and assisting with data gathering, processing and decision making of relevance to climate change.

Mobile phones also strengthen social networks, enhancing communities’ ability to self-organise responses to external disturbances. They do this by enhancing communication, and thus helping to build trust and social capital within the individual bonds of the network^{xxx}. ICTs have also been highly effective in strengthening the capacities of community leaders^{xxxi}.

ICTs and Learning

Use of ICTs enhances direct acquisition of new ICT- and information-related skills but strengthening this resilience sub-property can be related to more specific climate-oriented learning. The increasing mediation of learning via ICTs means that low-income communities will increasingly be building their base of information, skills and knowledge through digital technologies^{xxxii}. The opportunities for learning are expanding as more online educational resources around climate change continue to develop.

Digital tools such as Web 2.0/social media applications support processes of collective learning, particularly among institutions working in or with low-income communities^{xxxiii}. Examples of ICTs' support for learning cycles include the intensive use of ICTs in the Learning and Action Alliances that have supported reflection and built collective knowledge around flood risk management^{xxxiv}.

3.2. ICTs Strengthening Enabling Sub-Properties

ICTs and Redundancy

Redundancy refers to the potential of ICTs to increase availability of resources to such an extent that there is some spare, excess or possible substitutability of assets. One key way in which ICTs can contribute to redundancy is by supporting access to additional financial capital. ICTs – mobile phones especially – have been associated with an outflow of financial remittances from urban to rural areas, but they also enable inflows from richer urban and overseas diaspora social contacts into low-income communities in urban as well as rural areas^{xxxv}.

Although difficult to characterise this as creating 'spare' income, it does move communities in the direction of redundancy in terms of both financial capital and other assets purchased with the money. ICTs – e.g. mobile systems – also offer a channel for income flows that substitute for income that can no longer be produced locally during periods of acute shock, for example reversing standard urban-to-rural flows when urban areas suffer a climate event^{xxxvi}.

Just as asset redundancy can improve the resilience of communities, so does redundancy in institutions and organisations (e.g. markets), which allows a community to continue to operate even in the event of partial failure of some of its components. One example is the broadening of job market channels through use of ICTs such as the Babajob system for informal sector employment in India^{xxxvii} (providing a substitutable, redundant channel for job market operation). Another example is m-commerce – such as the CellBazaar system in Bangladesh – which provides redundancy in retail channels for urban communities^{xxxviii}.

ICTs and Rapidity

A core functionality of ICTs is the increasing speed with which they process and communicate data. They are thus strongly associated with increases in systemic rapidity within communities for all information flows, transactions and services that they handle. For example, ICTs enable greater rapidity of access to, and mobilisation of, financial assets via m-finance applications^{xxxix}. This, in turn, enables greater rapidity of mobilisation of the assets and services purchased with this money.

Similarly, ICTs can speed up the accessibility of information needed for decision-making and action. For instance, mobile-based disaster management systems enable more rapid disaster early warning, response and recovery including coordinative decisions and actions^{xl}.

ICTs and Scale

By connecting low-income communities to distant and/or higher-level institutions, ICTs can improve the scale of assets and structures to which these communities have access. Telemedicine can provide access to the information, knowledge and other capabilities of the wider health system^{xli}. Weather forecasting and early warning systems similarly provide connections to wider capitals (informational, human, social, etc) and systems^{xlii}.

ICTs can also improve the breadth of access to economic structures: tapping small-scale producers into wider markets (see the CellBazaar example mentioned above), or into regional and global supply chains^{xliii}. Most directly, this can improve scale of access to financial assets. ICTs can also assist by enabling community organisations and enterprises to scale, and by facilitating cross-community interactions and partnerships^{xliiv}.

ICTs, Diversity and Flexibility

ICTs typically supplement pre-existing sub-systems of data processing, communication, transactions and services. As such, they increase the diversity of any system such as a rural or an urban community. But they also significantly increase the potential for diversity of decision-making and action within the community, because they increase the diversity of information flows into the decision-making process^{xlv}. This would include providing information on a more diverse range of actions than might otherwise be known.

Recent ICTs are very flexible: not only incorporating an ever-wider range of functionalities but also more-readily enabling users to themselves use the technology for different purposes. This means that ICTs can facilitate greater flexibility within social and economic development components of low-income communities^{xlvi}. They can also form the foundation for new, collaborative forms of innovation, particularly social innovations^{xlvii}.

ICTs and Equality

The 21st century's "mobile revolution" has brought almost all members of low-income communities within reach of digital communications, with the majority of the population owning a mobile and with access to mobile telephony being close to ubiquitous^{xlviii}. This has been a significant equaliser and its impact on equality will continue to expand as an increasing range of services becomes available via mobile phone. Alongside examples already cited around use of m-money, this extends to the development of skills via m-learning and to the political sphere.

The spread of ICTs has seen improvements in access to government services provided online via PC and mobile^{xlix}, but the impact of ICTs has gone beyond this to foster greater inclusion in political processes. For example, in Uganda, mobile phones and social media (e.g. Facebook and Twitter) have been widely used for campaigning and civil activism that can draw low-income groups into political activity^l. ICTs can also open up governance by improving "transparency and accountability in the delivery of social services"^{li} by allowing citizens to monitor public processes, and supporting the participation of citizens in community planning decisions, for example through use of PPGIS (public participation geographic information systems)^{lii}. In this way, ICTs help level the playing field of political power, shifting power somewhat from traditional institutions to the community.

3.3. ICTs Weakening Resilience

It is, therefore, possible to identify many ways in which ICTs are strengthening resilience in low-income communities. However, the ever-greater penetration of ICTs into the lives of low-income urban communities should not be read simply as positive in resilience terms, since ICTs may also weaken resilience sub-properties. We give two brief illustrations here.

ICTs form a global digital infrastructure which encourages and enables local communities to become part of global digital networks in economic, political, social and cultural spheres. This can weaken community resilience if local capacities and systems are negatively affected in the face of external connections. For example, ICTs can support global supply chains at the expense of local ones^{liii}. This can create a dependency on wider connectivity that can undermine the ability to organise and act locally and independently.

ICTs can also perpetuate existent inequalities, with those with initially-higher resource endowments making faster, better use of new technologies thus increasing the endowment gap to those with initially-lower endowments^{liv}. Divides can take the form of a divide in access to information, to an emerging gap of skills for effective use of ICTs, and from a divide of older-generation technologies to an emerging gap of newer-generation technologies^{lv}.

Having explored the linkages between ICTs and resilience sub-properties, the following section presents the research instruments suggested to operationalise RABIT in development practice.

SECTION 4. Methods and Instruments

This section presents methods and instruments that gather data for benchmarking resilience, and for assessing the impact of development interventions on resilience. It uses examples related specifically to community resilience and to “e-resilience”: use of ICTs to support resilience.

The implementation of RABIT is based on a mixed methods approach. Both qualitative and quantitative methods can help to better understand and explain the linkages and dynamic qualities of the social world in which development interventions occur.

For the purposes of illustrating RABIT’s approach, multiple methods are used to explore the interactions between ICTs and resilience attributes in low-income communities, and to identify the factors that enable or constrain the role of ICTs in their resilience to climate change, and the achievement of development outcomes.

This approach is consistent with the systemic nature of the concept of resilience (Section 1), as it can offer further insights into the mechanisms, the motivations and the social factors that interact within complex developing country communities.

The implementation of RABIT involves the use of several methods (i.e. desk research, survey, interviews, focus group,) in order to provide a richer, more rigorous approach to the assessment of resilience impacts by triangulating data via multiple methods and from multiple actors/scales and sources, thus helping to strengthen the validity of findings^{vi}.

The instruments of data collection suggested for RABIT are summarised below according to the stage of project implementation and purpose of RABIT’s usage (Table 4). Further details about each of these methods are explained throughout the section.

| RABIT Methods Summary Card | | |
|---|--|---|
| <i>When</i> | <i>What For</i> | <i>How</i> |
| 1. <u>Pre-Hoc</u>: Project Planning and Design | Benchmarking the project’s role in community resilience | <ul style="list-style-type: none"> • Document Review • Focus Groups • Interviews • Survey |
| 2. <u>Durante-Hoc</u>: Project Implementation and Monitoring | Assessing the impact of the project in community resilience | <ul style="list-style-type: none"> • Document Review • Focus Groups • Interviews • Survey |
| 3. <u>Post-Hoc</u>: Project Evaluation and Future Strategising | Assessing the Impact of the project in community resilience | <ul style="list-style-type: none"> • Document Review • Focus Groups • Survey • Interviews |

Table 4. RABIT methods summary card.

Most of the methods and instruments that are included in this handbook were designed and tested through two RABIT pilot experiences: one conducted with a vulnerable urban community in [Costa Rica](#), and one conducted with a vulnerable rural community in [Uganda](#). The methods for RABIT data collection at different levels (micro, meso and macro), and according to different objectives, are summarised in Table 5.

| RABIT Data Collection Methods: Summary Overview | | | | | | |
|--|--------------------------|-------------------------------------|-------------------------|-------------------------------------|--------------------------|-------------------------------------|
| Stakeholders: | Micro-level Stakeholders | | Meso-level Stakeholders | | Macro-level Stakeholders | |
| Objectives: | Benchmarking Resilience | Assessment ICT Impact on Resilience | Benchmarking Resilience | Assessment ICT Impact on Resilience | Benchmarking Resilience | Assessment ICT Impact on Resilience |
| Methods: | Benchmarking Resilience | Assessment ICT Impact on Resilience | Benchmarking Resilience | Assessment ICT Impact on Resilience | Benchmarking Resilience | Assessment ICT Impact on Resilience |
| Desk Review | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Focus Groups | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Short Interview | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Long Interview | ✓ | ✓ | ✓ | ✓ | N/A | N/A |
| Short Survey | ✓ | ✓ | ✓ | ✓ | N/A | N/A |
| Long Survey | ✓ | ✓ | ✓ | ✓ | N/A | N/A |

Table 5. RABIT data collection methods: Summary overview.

Because of the limited scope of these pilots and their focus on community stakeholders, not all data collection instruments for every level were developed and tested (instruments that are not available are identified with 'N/A' in the table).

It is expected that RABIT's methodology will continue to be refined and complemented through future applications of the toolkit in development practice.

4.1. Document Review

As part of the foundational steps for RABIT's implementation, it is suggested that the implementing organisation undertakes document review, through desk research, aimed at identifying the key characteristics of the community within which the development intervention is taking place. This review will serve as a foundation for RABIT's implementation.

In the case of resilience to climate change impacts, the document review should incorporate the following key tasks:

- (a) Identify the general **vulnerability dimensions** of the community with respect to livelihoods and finance, food security, water supply, habitat and migration, socio-political conditions and health.
- (b) Identify the **climate change impacts** that affect the community (e.g. past climate change-related events, current manifestations, future trends/projections for the area), and establish if those impacts are exacerbating existing vulnerabilities.
- (c) Determine the **role of the project/development intervention** (e.g. ICT project) in regards to the identified vulnerability dimensions (e.g. areas of impact, vulnerabilities that are tackled through project activities).

This review will contribute to a more comprehensive, system-wide understanding of the community (i.e. *resilience of what*), to situate the role of climate change stressors (i.e. *resilience to what*), and to identify the factors that influence the ability of local stakeholders to cope with, recover from and adapt to climatic impacts.

This initial review can also help the implementing organisation to reflect about the role and the unforeseen contributions of their project to local climate change responses, an area that may not have been considered or explored before.

A more detailed list of issues recommended for inclusion in the document review is provided in Box 2. This is a non-exclusive list that should be adapted to reflect the characteristics and priorities of the local context where RABIT is used, considering the following:

- ❖ In cases in which RABIT is used for **benchmarking** at the onset of the project cycle (before implementation and/or during the stages of design/planning), this process can require more in-depth research and consultation with local sources.
- ❖ In cases in which RABIT is used to **assess the impact** of projects that are already under implementation, this information can be gathered from existing project documents, reports, and vulnerability assessments conducted during the stage of project planning and design.

Box 2. Issues to consider in the document review

Community vulnerability dimensions

- a) **General Facts** (e.g. demographics, location, income level, transportation, connectivity)
- b) **Climate change impacts** at the community level
 - What are the local impacts of climate change? (short-term shocks and long-term trends)
 - Past climatic events, current manifestations, future trends and projections for the area.
- c) **Livelihoods and Finance**
 - What are the main livelihood sources of the community?
 - How is climate change impacting those livelihoods?
- d) **Socio-Political Conditions**
 - What are the socio-political conditions that characterise the community? (e.g. social and political instability, inequality, access to resources, violence, etc)
 - How is climate change impacting local socio-political conditions?
- e) **Health**
 - What is the health situation in the community? (e.g. health conditions, provision and access)
 - How is climate change impacting the health conditions of the community?
- f) **Habitat and Migration**
 - What are the characteristics of habitat and migration in the community?
 - How is climate change impacting the local habitat and the patterns of migration in the community?
- g) **Food Security**
 - What is the food security situation of the community? (e.g. access to food, nutrition)
 - How is climate change impacting local food security?
- h) **Water Supply**
 - What are the conditions of water supply and access at the local level?
 - How is climate change impacting water supply and access?

If more detail or depth is required for the vulnerability benchmarking review then the sources in Box 3 can be referred to.

Box 3. Vulnerability benchmarking: Selected references

- USAID and OECS (2007) “Vulnerability Benchmarking Tool”, Organization of Eastern Caribbean States, St Lucia, <http://www.oecs.org/esdu-documents/vulnerability-benchmarking-tool-btool/80-vulnerability-benchmarking-tool-booklet/file>
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<http://www.sde.nus.edu.sg/csac/r7.html>
- Pelling, M (2006) “Measuring urban vulnerability to natural disaster risk: Benchmarks for sustainability” Open House International, Vol 31, no. 1, pp. 125- 132.

The findings of the document review process will provide the general context for RABIT’s implementation, and can be used to help interpret, complement and/or triangulate data gathered through other methods (e.g. focus groups, interviews, survey).

Example of Data Visualisation: Force Field Diagram

The adapted version of the ‘force field’ diagram (Figure 5) provides an example of how to visualise the (desk research) findings on the climate change impacts that impact upon a community’s vulnerability dimensions, and the role of a development intervention (e.g. an ICT for development project).

Based on the results of the desk research, the diagram is built following the following steps:

1. Identify the main **vulnerability dimensions** of the community.
2. Identify the main **climate change impacts** that exacerbate local vulnerability.
3. In the case of an ICT for **development project**, identify the ICT applications that are used as part of local responses to climatic stressors and/or in response to vulnerability dimensions exacerbated by those stressors.
4. **Rank each factor** using a 0-5 score (0 meaning no impact, 1 minimum impact, 2 low impact, 3 moderate impact, 4 considerable impact, and 5 high impact), and adjust the size of the arrows to reflect the scores.
5. Reflect on the **linkages** between climate change impacts, local vulnerability dimensions, and the role of the development intervention (e.g. ICTs). Identify the key areas where the development intervention is playing a role, as well as the gaps and opportunities.

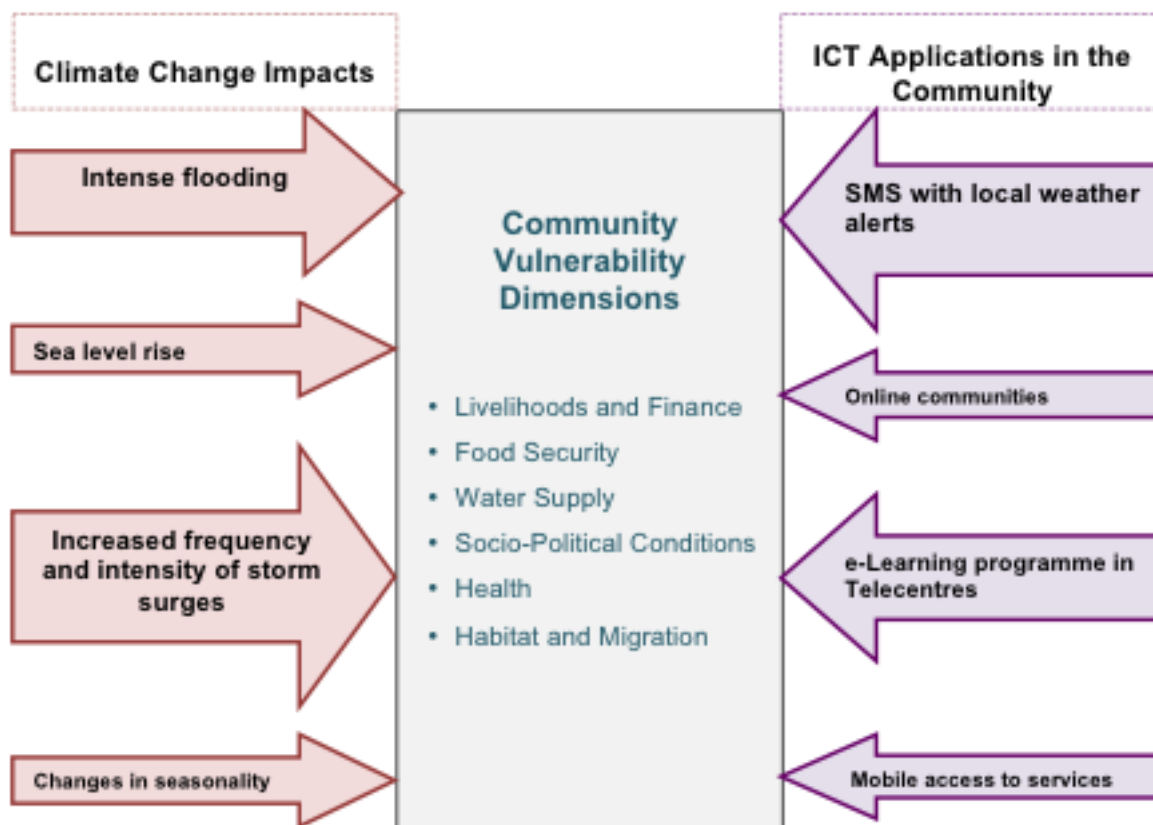


Figure 5. Example of force field diagram: Climate change impacts and the role of ICTs in a vulnerable community.

The results of this exercise can help inform the identification of future areas of action and research to improve the impact of development interventions on community resilience to climate change, as well as to provide context and help inform the next steps of RABIT’s implementation.

4.2. Focus Groups

Focus groups are collective discussions aimed at “gaining insights into the personal experiences, beliefs, attitudes or feelings that underlie behaviour”^{ivii}, and are useful tools to gather diverse opinions and attitudes simultaneously. They provide an opportunity to identify group dynamics and unanticipated issues that can help to better understand and assess the impact of development interventions on community resilience.

It is suggested to conduct a minimum of two focus groups as part of RABIT’s implementation. Each of the proposed focus groups is explained below.

a. Initial Focus Group with the implementing team and institutional partners

The implementation of an initial focus group with members of the implementing organisation(s) is suggested in order to set up the foundations needed for the successful rollout of the toolkit, as well as to consolidate the organisational capacity and the partnerships needed to achieve RABIT’s goals.

This focus group discussion aims at addressing the notion of resilience, the objectives, methodology and expected outcomes of RABIT, and the roles and responsibilities of the staff (from the implementing and partner organisations) that will be involved in the toolkit’s implementation. Participants will also be consulted on key aspects related to the toolkit’s rollout in the field (e.g.

opportunities, challenges and personal expectations), and a consensus reach on the short-, medium- and long-terms goals of implementing the toolkit.

If RABIT is going to be implemented in partnership or in collaboration with other organisations (e.g. donor organisation, local government representatives/municipality, partner NGOs), they should be invited to join this initial activity as a way of strengthening the basis for collaboration.

The moderator's guide (Box 4) contains suggested topics of discussion for the initial focus group. As per the focus group's methodology, it is suggested that the moderator appoints a note-taker for the session, and that flip charts/boards are also used to document emerging ideas and opinions throughout the discussion. The notes from the session should be systematised and distributed among participants, asking them to complement or clarify the points raised during the discussion.

Box 4. RABIT Initial Focus Group - Moderator's Guide

Participants: Staff of the implementing organisation and institutional partners (*in case of joint implementation)

1) INTRODUCTION:

- Explain the purpose of the focus group: To discuss the scope, objectives and expected results of RABIT, its significance and implications for the organisation(s) involved in the implementation, and for the community.
- To discuss the roles and responsibilities of the staff that will be involved in RABIT's implementation.
- To clarify any questions or concerns in regards to the implementation process.
- Explain how the results of the focus group will be used.

2) RESEARCH GOALS:

- To define roles and responsibilities for RABIT's implementation.
- To ensure organisational engagement/buy-in at various levels (e.g. researchers, field officers, managers).
- To adjust/adapt the toolkit in order to reflect local and organisational priorities, strengths and limitations, and other context-specific aspects.

3) GROUND RULES OF THE FOCUS GROUP:

- Participants have the right to leave at any time.
- Respect for each other's opinion. Participants should not be shunned in any way for having opinions that are different from the rest of the group.
- Use of proper language not to offend the other participants.
- Do not speak while others are speaking; avoid simultaneous discussions.
- Encourage expression of different opinions.
- Efforts will be made to protect the confidentiality of the participants' comments. However, due to the group setting, participants should be aware of the disclosure of any sensitive information.

4) GROUP DISCUSSION: MAIN ISSUES

The following constitute the main research topics to be addressed during the focus group discussion. The moderator will pose additional questions at different stages (according to the group's dynamic) in order to animate the discussion and ensure that the focus group's objectives are met.

4.1. Introductory Stage: Context

- Identification of RABIT's objectives and expected outcomes (*a staff member can be asked to provide a brief overview of the project, as the basis for discussion: 10 minutes).
- What are your expectations of RABIT? How can it benefit you/your work in the field?
- Identification of the meaning and significance of resilience (e.g. what do you understand by resilience? why is this notion relevant for vulnerable communities)?
- Is resilience a relevant term for your organisation's programming/strategy? In which way?
- In your view, how can ICTs help to strengthen resilience in the community? Could they also undermine it?

4.2. What is RABIT About?

- Overview of the project in which RABIT will be applied (e.g. objectives, timeline, current state of implementation) (*a staff member can be asked to provide a brief overview of the project: 10 minutes)
- In your view, what are the advantages of using RABIT in this project?
- Are there any challenges? How can these challenges be addressed?
- Identification and discussion of RABIT's stages of implementation (e.g. what to expect, what could be adjusted, are the expected outcomes and the timelines achievable, etc)

- Identification of roles and responsibilities of each participant in the process of RABIT's implementation.

4.3. What's Next?

- Discuss RABIT's timetable, including short-, medium- and long-term outcomes.
- Clarification of questions, concerns.
- Additional suggestions, including how the organisation and the community could benefit from RABIT's implementation (e.g. participants encouraged to 'think outside the box': about future research, possibilities of training, new funding opportunities etc).

5) SUMMARISE KEY POINTS THAT EMERGE IN THE DISCUSSION (**throughout the session, write key points as they emerge on a flip chart, including drawings for participants to visualise the discussion*)

6) THANKS AND CLOSING REMARKS

b) Focus Group(s) with community stakeholders

Focus group discussions with community stakeholders constitute a very valuable method to gather data on key aspects that are at the core of RABIT's implementation. As in the case of other methods included in this handbook, the implementing organisation can implement as many focus groups as they consider necessary (taking into account RABIT's objectives, community access, the time and resources available, among others).

The specific objectives of the focus group discussions with community stakeholders include:

- ❖ To identify and learn from the community's experience in regards to climate change manifestations and impacts on their local livelihood.
- ❖ To identify the community's experience with the development intervention (e.g. in the case of ICT4D projects, this would refer to use of ICTs, including the opportunities and challenges of using these tools).
- ❖ To raise local awareness about RABIT (i.e. issues/themes), and validate its potential contribution and local relevance.

Guidelines for focus group facilitators are available in Box 5. It is suggested that the methodology involves participatory techniques (e.g. participatory mapping) so as to provide a voice to all the participants in the identification of local climate change manifestations, vulnerability dimensions, and perceptions of the development intervention towards resilience.

Box 5. Focus Group with Community Members - Moderator's Guide

Participants: Community members (15-20), including women, youth +18, elders.

Setting of the chairs: Circle

To start: Each participant introduces him/herself. Ice-breaker activity.

Time management: One hour of discussion + half hour of clarifications/wrap-up

Note taking: If possible, arrange for a research assistant to take detailed notes during the session, and help with time management.

1) INTRODUCTION:

Explain the purpose of the focus group:

- To LEARN from the experience of participants.
- To GATHER and UNDERSTAND their opinion about the weather events/climatic changes affecting their livelihood.
- To IDENTIFY local perceptions in regards to the development intervention that is being planned/assessed (e.g. in the case of an ICT4D project, this would involve the identification of local usage of mobile phones and Internet, including the opportunities and the challenges of using these tools).

2) GROUND RULES OF THE FOCUS GROUP:

- The role of the facilitator is to animate and moderate the discussion.
- Participants have the right to leave at any time.
- Respect for each other's opinion. Participants should not be shunned in any way for having opinions that are different from the rest of the group.
- Use of proper language not to offend the other participants.
- Do not speak while others are speaking; avoid simultaneous discussions.
- Encourage the expression of different opinions.
- Efforts will be made to protect the confidentiality of the participants' comments. However, due to the group setting, participants should be aware of the disclosure of any sensitive information.
- The information that they provide will remain anonymous – no names will be associated with the opinions shared.

3) GROUP DISCUSSION: MAIN ISSUES TO ADDRESS (to generate participant feedback)

The following are the main research topics to be addressed during the focus group discussion. The moderator will pose additional questions at different stages (according to the group's dynamic) in order to animate the discussion and ensure that the focus group's objectives are met.

3.1. THEME ONE: Introductory Stage: Context

- What are the main strengths or positive qualities of the community? [could be physical characteristics, economic or social aspects, knowledge etc]
- What are the main problems or development challenges faced by the community? [could be for example economic problems, infrastructure, natural resources, livelihood etc]

3.2. THEME TWO: Climate change impacts at the local level

- Have you noticed or experienced changes in the climate? [e.g. **MANIFESTATIONS:** more frequent/intense rainfall, changes in the seasons, more extreme/prolonged drought]
- Have you experienced more extreme weather events?
- Can you share with the group your experience?
- How have those changes affected your livelihood? / What have been the effects of climatic changes on your livelihood? E.g. on your livelihood practices/sources of income? [e.g. **IMPACTS]**

3.3. THEME THREE: [Based on the example an ICT4D project. To be adapted to the particular development intervention] Use of new technologies: mobile phones and Internet

- How many of you have a mobile phone? [raise your hand]
- How many do you have? [ask individual participants]
- What do you use it for? [give examples]
- Has your quality of life improved or worsen since you have access to the mobile phone?
- How has it improved/worsen? Can you give us examples?
- What is the main usage of the mobile phone in your livelihood? [i.e. for livelihood purposes]
- Do you have access to the Internet? Where do you access the Internet?
- What are the main challenges that you face to use the mobile phone and the Internet? [e.g. cost, connectivity, literacy]
- What are the main areas of potential of these technologies? How could they help improve local livelihoods?
- How could these technologies help overcome some of the challenges that we were discussing at the beginning of the session? [e.g. mention challenges, climate change impacts].

4) SUMMARISE KEY POINTS THAT EMERGE IN THE DISCUSSION (**throughout the session, write the key points as they emerge on a flip chart, including drawings/icons for participants to visualise the discussion points*)

5) THANKS AND CLOSING REMARKS

REMEMBER:

DOCUMENT ALL THE IDEAS SHARED BY THE PARTICIPANTS THROUGHOUT THE DISCUSSION. BE AS ACCURATE AS POSSIBLE WHEN CAPTURING THE IDEAS.

Once systematised, focus group results can be used to triangulate data captured through other methods of data collection, as well as to complement and strengthen the analysis of findings.

4.3. Semi-structured Interviews

The objective of the semi-structured interviews is to gather data on the key components of RABIT's conceptual framework, gaining a system-wide understanding of the linkages between the development interventions and resilience in the community.

Interviewing is one of the main tools used to collect qualitative data, and to understand the perceptions and meaning that participants attribute to certain phenomena and events^{lviii}. Semi-structured interviews refer to interviews that utilise open-ended and flexible questions, aimed at capturing the participants' views and experiences in their own language, and at leaving room for the interviewee to explore in greater depth emerging topics and probe beyond the initial questions^{lix}.

Key objectives of RABIT interviews include:

- ❖ Understand the local context (*i.e. whose resilience?*): identify the strengths and weaknesses of the community.
- ❖ Identify the key development stressors that affect the community, and to which the community must build resilience (*i.e. resilience to what?*).
- ❖ Identify the climate change impacts, and the local responses to climatic stressors.
- ❖ Identify the significance/need for resilience building in the community (*i.e. resilience for what?*)
- ❖ Identify the existing and emergent roles of the development intervention (e.g. ICT usage) within the community (roles than can be project- and/or non-project-related).
- ❖ Identify factors that enable and constrain the project's contribution (e.g. ICTs' role) at the community level (e.g. challenges to ICT adoption).

- ❖ Identify the linkages between the project and community resilience based on the resilience attributes and markers (Table 1/Table 3 revised).

In line with the conceptual framework presented in Section 1 (Figure 3), semi-structured interviews can be conducted with key stakeholders identified at the micro, meso and macro levels. Examples (non-exclusive) of these stakeholders are reflected in Table 6.

| |
|--|
| <p>Micro level: individuals (community members), local committees and associations, community-based organisations.</p> |
| <p>Meso level: representatives from NGOs or private sector companies working at the local or regional level, municipalities/local government representatives, cooperatives.</p> |
| <p>Macro level: representatives from government ministries and/or national public sector organisations, international donors, and other relevant organisations working at the national level.</p> |

Table 6. Examples of stakeholders at micro, meso and macro levels.

Examples of potential interviewees include:

- Community leaders.
- Selected community stakeholders/representatives of community organisations.
- Local government representatives.
- NGO representatives.
- Representatives of relevant initiatives (e.g. related to climate change and/or ICTs).
- Donor organisations with projects in the community.

The interview guide should be revised and adjusted to fit the local context and the profile of the interviewees, and reflect considerations such as the local language and the level of education/technical skills of the respondents, among others. The proposed questions also have to be customised to reflect the focus of the development intervention.

Semi-structured interviews can integrate different stages and purposes. In the case of RABIT's use for the resilience assessment of ICT interventions, these stages/purposes include:

- Introduction/ice-breaking.
- Gaining a better understanding of the context where the project is being implemented.
- Identifying the climate change impacts and local responses to climatic stressors.
- Identifying the role of ICTs and the challenges to their use, particularly in regards to climate change responses.
- Identifying the linkages that exist between ICTs and resilience, by exploring the contribution of these tools to (strengthen or undermine) the resilience markers (Table 1/Table 3 revised).

A guide of potential issues and questions to address each of these stages is presented in Box 6.

| Box 6. Resilience Benchmarking and ICT Assessment: Short interview guidelines |
|--|
| Semi-structured interviews: Guiding Issues |
| Micro-level Stakeholders |
| <p>A. Introduction/Ice-breaker: -Short background/life story (e.g. <i>ice-breaker</i>: how long have you been living in the community).</p> <p>B. Understanding the context: -Identification of the main characteristics and strengths of the community. -Identification of the main development problems faced by the community.</p> <p>C. Identifying climate change impacts and local response: -Identification of critical incident(s) related to climate variability or climate change. -How did it affect the respondent and what did they do, why did they do it, who helped, and what are they doing to prevent that from happening again.</p> <p>D. Identifying the role of ICTs: -ICT ownership and usage: what are the prevalent applications and uses of ICTs in their lives? (including issues of ICT access, training and appropriation). What challenges do they encounter in regards to ICT access and use? -Perceptions of ICTs' impact/potential: In which way do ICTs contribute to climate change responses? What is their role?</p> <p>E. Establishing linkages between ICT usage and resilience: -Use relevant probing questions of ICT's role based on the markers of resilience sub-properties (Table 1/Table 3 revised).</p> |
| Meso-level Stakeholders |
| <p>A. Introduction/Ice-breaker: -Short background (e.g. <i>ice breaker</i>: overview of personal experience in the field).</p> <p>B. Understanding the context: -Identification of the main characteristics and strengths of the community. -Identification of the main development problems faced by the community.</p> <p>C. Identifying climate change impacts and local response: -Identification of critical incident(s) related to climate variability or climate change in the community. How did it affect the community, and what actions have been taken in response to those impacts (including stakeholders involved, and what is being done to prevent that from happening again).</p> <p>D. Identifying the role of ICTs: -ICT ownership and usage: what are the prevalent uses and applications of ICTs in the community (including issues of local access, training and appropriation)? What challenges do they encounter in regards to ICT access and use? -Perceptions of ICTs' impact/potential: In which way do ICTs help respond to climate change challenges? What is their role?</p> <p>E. Establishing linkages between ICT usage and resilience: -Is resilience part of the mandate of their organisation? What do they understand by resilience? -How do and could ICTs contribute to resilience? Use relevant probing questions of ICTs' role based on the markers of resilience sub-properties (Table 1/Table 3 revised).</p> |
| Macro-level Stakeholders |
| <p>A. Introduction/Ice-breaker: - Short background (<i>ice breaker</i>: overview of personal experience in the field, work of the organisation).</p> <p>B. Understanding the context: -Identification of the main characteristics and strengths of communities. -Identification of the main development problems faced by communities.</p> <p>C. Identifying climate change impacts and local response: -Identification of national trends and priorities in climate change adaptation. How do those trends affect vulnerable communities? What actions have being taken in response to those impacts?</p> <p>D. Identifying the role of ICTs: -ICT ownership and usage: what are the prevalent uses and applications of ICTs in vulnerable communities (including issues of local access, training and appropriation)? -Perceptions of ICTs' impact/potential: in what way do these technologies help reduce the vulnerability of communities to climate change? What challenges do they encounter in regards to ICT access and use?</p> <p>E. Establishing linkages between ICT usage and resilience: -Is resilience part of the mandate of their organisation? What do they understand by resilience? -How do and could ICTs contribute to resilience? Use relevant probing questions of ICT's role based on the markers of resilience sub-properties (Table 1/Table 3 revised).</p> |

In order to ensure the appropriateness and relevance of the guiding questions, it is suggested to conduct a series of 'pilot' interviews to assess the following issues:

- (a) the formulation of the questions and the language used in order to ensure that they are appropriate for the intended respondents (e.g. identify any terms or words that are unfamiliar to the interviewees or inappropriate for the local context),
- (b) the structure and flow of the guiding questions, in order to ensure that key areas of interest to the research are incorporated (i.e. characteristics of the community, climate change impacts and local responses, project's focus (e.g. role of ICTs), and linkages between the main development intervention (ICT usage) and resilience attributes,
- (c) the length of the interview, in order to ensure a reasonable implementation time (depending on the context of implementation, e.g. 30 minutes),
- (d) the use of probing questions to confirm the responses, and
- (e) the appropriateness of requesting the interviewee to score the resilience attribute (see Interview score card: Resilience attributes of the community).

Interview guidelines should be adjusted reflecting the results of the pilot interviews. Other important considerations include:

- ❖ It is suggested that, when possible and based on the interviewees' consent, the interviews are recorded and transcribed.
- ❖ In order to ensure consistency with RABIT's conceptual framework, it is suggested that interview transcriptions/notes are analysed through a coding process based on the resilience attributes and markers (Table 1/Table 3 revised).
- ❖ Field notes and photographs taken during the field visits can be used to complement the data gathered through interviews, and to contextualise the analysis of findings.
- ❖ Interview data can be triangulated with data gathered from surveys and focus groups, contributing to the validity and reliability of RABIT's outputs.

The following are samples of (long) interview guidelines that can be used (a) for resilience benchmarking and (b) for resilience impact assessment with micro- and meso-level stakeholders (the format can be adjusted for macro-level interviewees).

a) Interview Sample: Resilience benchmarking (long interview guidelines)

| Interview Guidelines: MICRO-/ MESO-Level Stakeholders Resilience Benchmarking | | | |
|--|------|---------|--------|
| A. Local context | | | |
| What are the positive characteristics/strengths of the community? | | | |
| What are the problems faced by the community? And what are the <u>external problems</u> , that do not originate in the community, but that affect it? | | | |
| In the time that you have lived in this community, what have been the situations of emergency or risk that you have had to face? For example, moments of crisis or disasters that needed to be overcome? | | | |
| B. Role of climate change impacts and local response | | | |
| In your experience, has there been any incident related to climate change that has affected the community? | | | |
| What was the response to that incident? What did you do, why, and who helped you? | | | |
| Are there any measures that have been taken to prevent or mitigate those impacts in the future? | | | |
| C. Community resilience attributes <i>How would you rate the following attributes in the community:</i> | | | |
| <u>Robustness</u> | WEAK | AVERAGE | STRONG |
| Community preparedness to respond to disasters or climatic events/emergencies | | | |
| Availability of physical infrastructure/physical measures that have been adopted in the community to prevent damage in case of climatic emergencies | | | |
| Contact and coordination between members of the community and institutions that operate in this area (e.g. committees, authorities) | | | |
| Preparedness of the community's infrastructure/housing to the impact of climatic emergencies or events | | | |
| Availability of laws or policies that help to reduce the risk of the community to climatic events | | | |
| <u>Self-organisation</u> | WEAK | AVERAGE | STRONG |
| Capacity of the community members to organise among themselves, in case of crisis or problems | | | |
| Degree of trust among members of the community | | | |
| Social networks or networks of collaboration operating in the community | | | |

| | | | |
|--|-------------|----------------|---------------|
| Membership of local groups or associations | | | |
| <u>Learning</u> | WEAK | AVERAGE | STRONG |
| Ability of the community to learn from past experiences, for example in the case of natural disasters or climatic events | | | |
| Knowledge sharing among members of the community | | | |
| Access to training/awareness-raising activities about climate change | | | |
| Use /acknowledgement of traditional knowledge/ indigenous adaptation practices | | | |
| <u>Redundancy</u> | WEAK | AVERAGE | STRONG |
| Ability of community members to diversity their income sources (e.g. selling different products) | | | |
| Availability of several institutions/organisations that work on the same issues? (for example, multiple cooperatives or NGOs working on climate change issues) | | | |
| Ability to access support from family, friends and neighbours in times of emergency | | | |
| Custom of saving money that can be used in the case of disasters or emergencies | | | |
| <u>Rapidity</u> | WEAK | AVERAGE | STRONG |
| Capacity of the community to respond and act rapidly in case of emergency or climatic events | | | |
| Ability of community members to access resources swiftly, for example, immediate support from friends/institutions/insurance, in case of need | | | |
| Local availability of early warning systems | | | |
| <u>Scale</u> | WEAK | AVERAGE | STRONG |
| Contact among members of the community and institutions/organisations that are not based in this area (e.g. that operate at the regional or national level) | | | |
| Capacity of the community to receive support from institutions or groups that are not part of the community, in situations of emergency or crisis | | | |
| Examples of associations or collaborative work between the community, the private sector, NGOs | | | |

| | | | |
|--|-------------|----------------|---------------|
| and/or local/national authorities | | | |
| <u>Diversity and Flexibility</u> | WEAK | AVERAGE | STRONG |
| Ability of the community to adapt well to change (e.g. to changes in the economic, political or environmental situation) | | | |
| Ability of community members to identify options to do things differently from the past (e.g. in cases of emergencies, look for different options/solutions) | | | |
| Access of community members to different sources of information | | | |
| Ability of the community to implement innovative practices | | | |
| Ability of the community to see change as an opportunity, rather than as a threat | | | |
| <u>Equality</u> | WEAK | AVERAGE | STRONG |
| Ability of community groups/associations to take decisions that affect the community in a participative manner | | | |
| Existence of gaps between different community groups, for example between seniors and youth, or among people with higher and lower income | | | |
| Extent to which needs and opinions of all community members (including seniors, youth, women-headed households, disabled, etc) are being heard and considered (for example as part of community projects/initiatives, local organisations) | | | |
| D. Conclusion | | | |
| Any final comments? | | | |
| THANK YOU | | | |

b) Interview Sample: Resilience impact assessment (long interview guidelines)

| Interview Guidelines: MICRO-/ MESO-Level Stakeholders Resilience Impact Assessment | |
|---|--|
| Example: Assessment of ICTs' role in community resilience | |
| A. Local context | |
| <ul style="list-style-type: none"> • What are the positive characteristics/strengths of the community? • What are the problems faced by the community? And what are the <u>external problems</u> that do not originate in the community, but that affect it? • In the time that you have lived in/worked with this community, what have been the situations of emergency or risk that you have had to face? For example, moments of crisis or disasters that needed to be overcome? | |
| B. Role of climate change impacts and local response | |
| <ul style="list-style-type: none"> • In your experience, has there been any incident related to climate change that has affected the community? • What was the response to those incidents? What did you do, why, and who helped you? • Are there any measures that have been taken to prevent or mitigate those impacts in the future? | |
| C. Community resilience attributes | |
| Robustness | |
| <ul style="list-style-type: none"> • In your opinion, is the community prepared to respond to disasters or climatic events/emergencies? • Are there any physical infrastructure/physical measures that have been adopted in the community to prevent damage in case of climatic emergencies? • Are members of the community in contact with the institutions that operate in this area? (e.g. committees, authorities)? Do they coordinate actions with those institutions? • How vulnerable is the community's infrastructure and housing to the impact of climatic emergencies or events? • Do you know of any laws, policies that help to reduce the risk of the community to climatic events? | |
| Self-organisation | |
| <ul style="list-style-type: none"> • What can you tell me about the capacity of the community members to organise among themselves, in case of crisis or problems? • Is there a high or a low degree of trust among members of the community? • Are there social networks or networks of collaboration operating in the community? How strong are those networks? • Are you a member of local groups or associations? | |
| Learning | |
| <ul style="list-style-type: none"> • Do you think that the community has learned from past experiences, for example in the case of natural disasters or climatic events? If yes, how did that learning took place? (for example, with the help of which tools or which groups) • Is it common for people in the community to share their experiences and their knowledge with each other? Or are they rather guarded with their knowledge? • Has any training/awareness-raising activity about climate change taken place in this community? Do you know if those issues are taught to youth at school? • Do you think that traditional knowledge/indigenous practices are being taken into account, or are being lost? | |
| Redundancy | |
| <ul style="list-style-type: none"> • Do community members generally depend on a single income source, or do they have access to multiple sources? (e.g. do they sell different products, receive remittances) • In this community, are there several institutions/organisations that work on the same issues? (for example, multiple cooperatives, multiple NGOs) | |

| |
|--|
| <ul style="list-style-type: none"> • If you were not able to access support from family and neighbours in times of emergency, who would you go to for help? • Do community members have the custom of saving money? In case of disasters or emergencies, do they have contingent financial resources that they can use? |
| Rapidity |
| <ul style="list-style-type: none"> • Do you consider that, in case of emergency or climatic events, the community responds and acts rapidly? • Do you consider that community members can access resources swiftly? For example, immediate support from friends/institutions/insurance, in case of need? • Do you know of any early warning system operating in this area? |
| Scale |
| <ul style="list-style-type: none"> • In your opinion, are members of the community in contact with institutions/organisations that are not based in this area? For example, with institutions that operate at the regional or national level? Which institutions? For what purpose are they in contact? • In situations of emergency or crisis, have community members received support from institutions or groups that are not part of the community? • Do you know of any examples of associations or collaborative work between the community, the private sector, NGOs and/or local/national authorities? |
| Diversity and Flexibility |
| <ul style="list-style-type: none"> • Do you consider that the community adapts well to change? For example, to changes in the economic, political or environmental situation. • In your opinion, do community members identify options to do things differently from the past? For example, in cases of emergencies or disasters, do they look for options, or apply the same measures that they have always used? • What are the main sources of information for community members? Where do they access information? • Do you think that the community implements innovative practices? Can you give any examples? • Do you consider that community members see change as a threat or as an opportunity? |
| Equality |
| <ul style="list-style-type: none"> • In your opinion, are the decisions that affect the community taken in a participative manner? • Are there gaps among different community groups, for example between seniors and youth, or among people with higher and lower income? • Do you consider that the needs and opinions of all community members (including seniors, youth, women-headed households, the disabled, etc) are being heard and considered? (for example as part of community projects/initiatives, local organisations) |
| D. Role of ICTs (<i>*to be adapted to the particular development intervention</i>) |
| <ul style="list-style-type: none"> • In your opinion, what is the rate of usage or adoption of mobile phones in the community? And of the Internet? • What have been the main benefits of using ICTs in the community? Has anything improved or changed for better, from the way it was in the past? • Has anything worsened? • What are the main challenges that exist locally to access and use the mobile phone? And the Internet? For example, do you face any difficulties when using these tools? • When there has been climatic emergencies or events [such as the ones you mentioned before...] have ICTs been used? • For what purpose? What role did they play as part of the community's response to those impacts? |
| E. ICTs and Resilience Attributes (<i>*to be adapted to the particular development intervention</i>) |
| <p>How would you mark the contribution of ICT tools to the following resilience attributes of the community? (Weak/Average/Strong)</p> |

| Interview Score Card: ICTs Towards Resilience Attributes | | | |
|--|------|---------|--------|
| RESILIENCE ATTRIBUTES | WEAK | AVERAGE | STRONG |
| 1. Robustness | | | |
| 1.1. Physical preparedness | | | |
| 1.2. Institutional capacity | | | |
| 1.3. Multi-level governance | | | |
| 2. Self-organisation | | | |
| 2.1. Collaboration and participation | | | |
| 2.2. Social networks | | | |
| 2.3. Local leadership and trust | | | |
| 3. Learning | | | |
| 3.1. Capacity building | | | |
| 3.2. New and traditional knowledge | | | |
| 3.3. Reflective thinking | | | |
| 4. Redundancy | | | |
| 4.1. Resource spareness | | | |
| 4.2. Functional overlaps/interdependency | | | |
| 4.3. Resource substitutability | | | |
| 5. Rapidity | | | |
| 5.1. Rapid resource access | | | |
| 5.2. Rapid resource mobilisation | | | |
| 5.3. Rapid resource assessment/coordination | | | |
| 6. Scale | | | |
| 6.1. Multi-level networks | | | |
| 6.2. Intra/inter-scale partnerships | | | |
| 6.3. Cross-level interactions | | | |
| 7. Diversity and Flexibility | | | |
| 7.1. Different courses of action/opportunity | | | |
| 7.2. Adaptable decision-making | | | |
| 7.3. Innovation backbone | | | |
| 8. Equality | | | |
| 8.1. Gaps reduction | | | |
| 8.2. Inclusiveness | | | |
| 8.3. Openness and accountability | | | |

F. Conclusion
Any final comments?
THANK YOU

Interview Data Visualisation

The visualisation of interview findings is based on the resilience attributes identified through discourse analysis conducted on interview transcripts: by quantifying the number of times that issues related to the resilience attributes (Table 1 (but see also Table 3 revision)) were mentioned during the interviews.

The first visualisation – example shown in Figure 6 – indicates the total number of times an attribute-related issue was mentioned. This provides an indicator for the relative salience of resilience attributes among interview respondents.

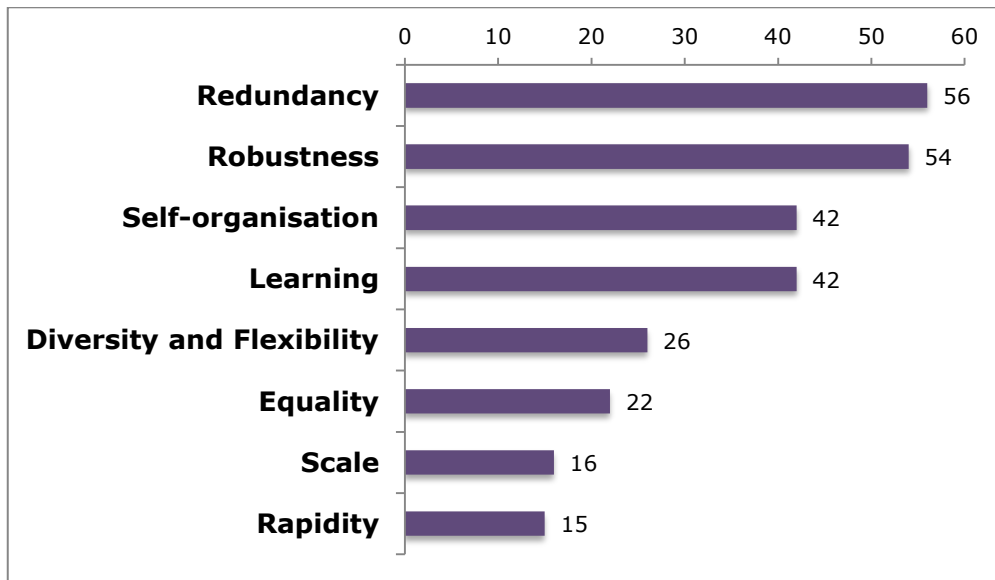


Figure 6. Relative salience of resilience attributes.

Data can also be shown as the breakdown of overall mentions into those related to resilience attribute strength and those related to resilience attribute weakness (example in Figure 7).

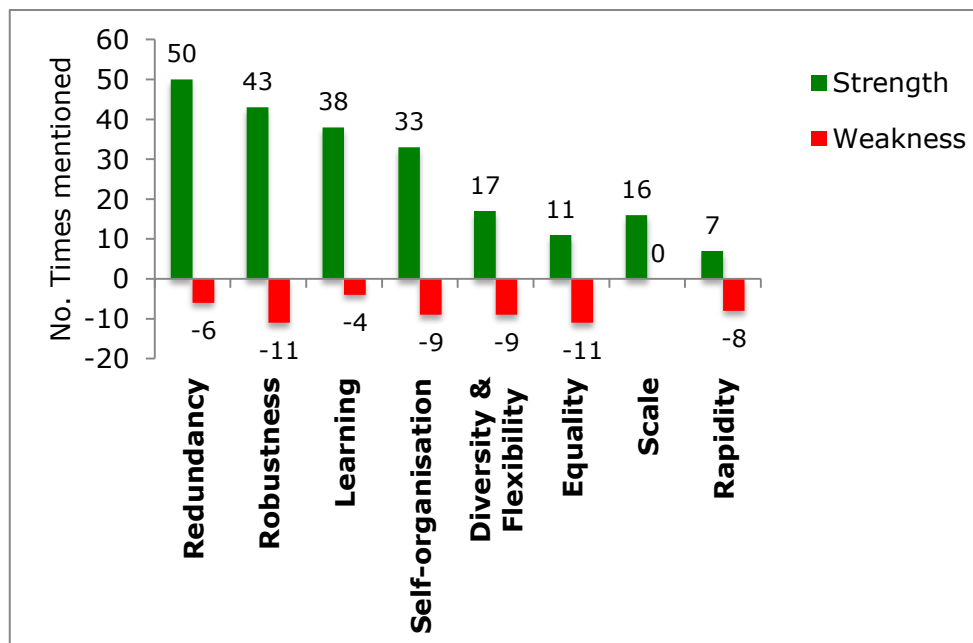


Figure 7. Overview of resilience attribute strength/weakness.

Another way of visualising interview data on the salience of resilience attributes is an Arrow Diagram (similar to a force field diagram), as shown in Figure 8. This diagram is based on the codification of interview transcripts. The numbers indicate the number of times that resilience attribute strengths or weaknesses were mentioned by respondents. The different arrow sizes help to visualise the relative weight of those responses.

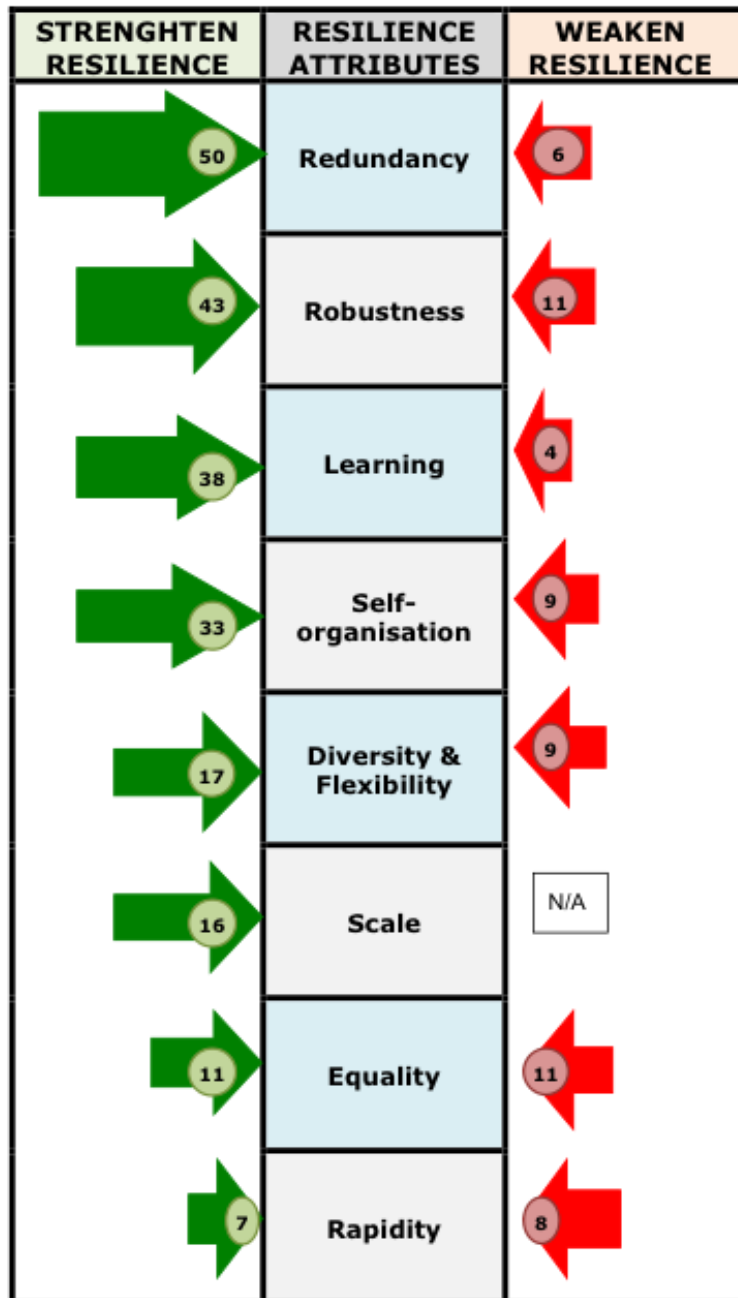


Figure 8. Arrow Diagram: Resilience attribute strength/weakness.

4.4. Survey: Assessing ICT's Impact on Community Resilience

A survey is a research method for data collection from a selected group of people, using standardised questionnaires or interviews^{ix}. Surveys are useful data gathering tools because they can represent the views of individuals who do not participate or who are underrepresented in other methods of data collection^{xi}. Surveys may provide a statistically representative snapshot of public opinion, and can be used to collect a broad range of data (e.g. opinions, beliefs, values, attitudes, factual, among others). They can be administered through different means (e.g. online, mail, email, in person or by telephone) and can prove more cost-effective and easy to implement than other methods of data collection^{xii}.

In the case of RABIT's implementation, a survey is suggested to gather data on the perceptions of community members on the development intervention's role in their community's resilience.

A sample survey questionnaire is provided below.

Given that the use of RABIT is illustrated using the case of an ICT4D intervention, the survey questionnaire focuses on assessing ICTs' impact on the resilience attributes of the community (i.e. robustness, self-organisation, learning, redundancy, rapidity, scale, diversity, flexibility, and equality).

The survey questions are based on the community's resilience characteristics or 'markers', as identified in Section 2 (Table 1 (see also Table 3 revision)). As with the case of the interview guidelines presented above, the survey questions should be customised to reflect the focus of the development intervention for which RABIT is used.

Because the survey seeks to reflect the perceptions of community members, it is suggested that the questionnaire is administered in person (i.e. structured interview), by staff of the implementing organisation/local partner working in the community. This modality of implementation would allow the surveyor to build trust/credibility with local respondents, strengthen their knowledge of the community, and provide any clarifications that may be required by the respondents.

A representative sample must be selected considering the size of the community.

Because the goal of RABIT is to assess the resilience impact of development interventions in vulnerable communities, criteria to select the survey respondents include:

- ❖ That the respondent resides in the community (so as to ensure their knowledge of the local context), and
- ❖ that the respondent is part of the target population of the development intervention, involved or directly affected by project activities (e.g. users of the services provided through the intervention, participants in the training activities provided as part of the intervention).

These respondents would be the most knowledgeable about the outcomes/impacts of the development intervention at the local level, and have the most relevant input for improvement. For example, in the case of ICT4D interventions, survey respondents would include community members that have used the ICT applications provided by the intervention (e.g. e-learning, Internet-based information, early warning systems, mobile-based services) or that have participated in local ICT training sessions/workshops (e.g. training in local telecentres or cyber cafes), among others.

Examples of relevant markers relating to climate change are provided in Section 2 (Table 2), while examples related to ICTs can be seen within the discussions in Section 3.

The survey's implementation involves five main stages:

- (a) **Initial design stage**, through which a first version of the questionnaire is developed, adapting the methodological guidelines provided in this handbook to the local context, type of development intervention, and objectives for RABIT implementation.
- (b) **Pilot stage**, through which the instrument is tested among a limited number of respondents in the area of implementation. The number of test surveys depends on the sample size. The pilot should allow the adjustment of the following aspects:
 - the formulation of the questions and the language used, to ensure that they are clear and appropriate for the intended survey respondents,
 - if the survey is to be translated into local language(s), the formulation of the questions should be simple, to allow for an accurate translation,
 - the key areas of interest to the research should be integrated into the questionnaire (i.e. questions about ICT usage and resilience attributes/markers),
 - the length of the survey, in order to limit the disruption of the respondents' daily activities (depending on the context of implementation, e.g. 15 minutes), and
 - the survey's format/layout has to respond to the level of literacy/education of the target respondents (e.g. yes/no and/or multiple choice answers), and consider the delivery format (e.g. face-to-face, using a smartphone interface).

The pilot stage is crucial to identify problems and adjust the survey to the local context, including issues of repetitive questions, confusing language, unclear response options, the length of the questionnaire, and the flow of the questions, among others.

- (c) **Adjustment stage**, through which the survey questionnaire is revised and adjusted based on the feedback received from the test's participants and surveyors.
- (d) **Roll-out stage**, through which the revised questionnaire is implemented in the field.
- (e) **Data systematisation and analysis**: survey data can be systematised and analysed using various specialist software packages or more generic products like MS Excel in order to generate descriptive statistics (e.g. frequencies, graphs and charts).

The following is a sample survey questionnaire, focused on assessing the impact of an ICT intervention on the resilience to climate change of a low-income community.

The survey is structured around three main sections: (a) general characteristics of the respondent, (b) access and perception of ICTs, and (c) linkages between ICTs and resilience attributes.

Note: like the examples that precede and that follow this sub-section, the survey questionnaire is provided solely as an illustration of the type of structure and questions that RABIT data gathering instruments can integrate. The specific language used, the formulation of the questions, and the length of the questionnaire, among others, should be adapted, in each case, to the specific context of implementation.

| RABIT SURVEY: ICTs and Climate Change Resilience | | |
|--|--|--------------------------------------|
| <p>This survey is part of a collaborative project between <i>ORGANISATION A</i> and <i>ORGANISATION B</i>. We would like to know your opinion about the use of new technologies (Internet and mobile phones), and how these technologies could impact the resilience of [<i>NAME OF THE COMMUNITY</i>]. Your participation in this survey is anonymous, and the results will be used solely for the purposes of the research project [<i>ADD</i>]. The results of this survey will be shared with the participants through [<i>PLANNED DISSEMINATION OF FINDINGS</i>].</p> | | |
| PART I Characteristics of the Interviewee | | |
| 1. Gender | 2. Age range | 3. Occupation |
| <input type="radio"/> A. Female | <input type="radio"/> A. 15 to 25 years old | <input type="radio"/> A. Student |
| <input type="radio"/> B. Male | <input type="radio"/> B. 26 to 35 years old | <input type="radio"/> B. Employed |
| | <input type="radio"/> C. 36 to 45 years old | <input type="radio"/> C. Retired |
| | <input type="radio"/> D. More than 46 | <input type="radio"/> D. Unemployed |
| | | <input type="radio"/> E. Other |
| PART II ICTs (access and perception) | | |
| 4. Do you own a mobile? | 4.1 If yes, how many mobiles do you own? | |
| <input type="radio"/> A. Yes | <input type="radio"/> A. 1 | <input type="radio"/> A. 3 |
| <input type="radio"/> B. No | <input type="radio"/> B. 2 | <input type="radio"/> B. More than 3 |
| 4.2 What do you use the mobile for? | 4.3 In your opinion, what are the main benefits of using a mobile phone? | |
| <input type="radio"/> A. Make and receive calls | | |
| <input type="radio"/> B. Send/receive text messages | | |
| <input type="radio"/> C. Games | | |
| <input type="radio"/> D. Internet | | |
| <input type="radio"/> E. Other | | |
| 4.4 In your opinion, what are the main disadvantages or problems of using a mobile phone? | | |
| | | |
| 5. Do you have access to a computer with Internet? | 5.1 If yes, where do you access it? | |
| <input type="radio"/> A. Yes | <input type="radio"/> A. Home | |
| <input type="radio"/> B. No | <input type="radio"/> B. Internet Café/Telecentre | |
| | <input type="radio"/> C. Public Library | |
| | <input type="radio"/> D. At family or friends' | |
| | <input type="radio"/> E. Other | |
| 5.2 What do you use the Internet for? | 5.3 In your opinion, what are the main benefits of using the Internet? | |
| <input type="radio"/> A. E-mail | | |
| <input type="radio"/> B. Social networking | | |
| <input type="radio"/> C. Work-related research | | |
| <input type="radio"/> D. School homework | | |
| <input type="radio"/> E. Others | | |
| 5.4 In your opinion, what are the main disadvantages or problems of using the Internet? | | |
| | | |

| PART III Resilience Attributes | | |
|--|---|------------------------|
| ROBUSTNESS | | |
| 6. Do you access more or less information about the weather since you use the mobile phone or the Internet? | | |
| Ⓐ More | | |
| Ⓑ Doesn't know / No answer | | |
| Ⓒ Less | | |
| 6.1 I use the mobile/Internet to access information that helps me prepare better for emergencies | | |
| Ⓐ Agrees | | |
| Ⓑ Doesn't know / No answer | | |
| Ⓒ Disagrees | | |
| 6.2. I use the Internet and the mobile to report problems and emergencies to the institutions/authorities | 6.3 If the answer is yes, to which institutions? | |
| Ⓐ Agrees | | |
| Ⓑ Doesn't know / No answer | | |
| Ⓒ Disagrees | | |
| SELF-ORGANISATION | | |
| 7. The Internet and the mobile have made easier or more difficult to organise and participate in community activities? | | |
| Ⓐ Easier | | |
| Ⓑ Doesn't know / No answer | | |
| Ⓒ More difficult | | |
| 8. Which social networks do you use and for what purpose? | | |
| Social Network | Usage (YES/NO) | YES: For what purpose? |
| Facebook | | |
| Twitter | | |
| Instagram | | |
| Other: | | |
| 8.1 Technologies are helping to build trust among people | | |
| Ⓐ Agrees | | |
| Ⓑ Doesn't know / No answer | | |
| Ⓒ Disagrees | | |
| LEARNING | | |
| 9.1 I have received training through the Internet (e.g. online courses) | 9.1 If yes, which online training have you received? | |
| Ⓐ Agrees | | |
| Ⓑ Doesn't know / No answer | | |
| Ⓒ Disagrees | | |
| 9.2 Since you have access to the mobile or the Internet, do you share more or less than before experiences about climate change impacts o emergencies in the community? | 9.3 Could you mention some examples? | |
| Ⓐ More | | |
| Ⓑ Doesn't know / No answer | | |
| Ⓒ Less | | |
| 9.4 Through the mobile phone or the Internet I identify ideas to make improvements in my community | | |

| | |
|---|--|
| <input type="radio"/> (A) Agrees | |
| <input type="radio"/> (B) Doesn't know / No answer | |
| <input type="radio"/> (C) Disagrees | |
| REDUNDANCY | |
| 10. I use the mobile or the Internet to generate some additional money to my normal income (e.g. receive remittances, do business) | 10.1 I use the mobile or the Internet to obtain or provide help to my neighbours when there are problems or emergencies in the community. |
| <input type="radio"/> (A) Agrees | <input type="radio"/> (A) Agrees |
| <input type="radio"/> (B) Doesn't know / No answer | <input type="radio"/> (B) Doesn't know / No answer |
| <input type="radio"/> (C) Disagrees | <input type="radio"/> (C) Disagrees |
| 10.2 I use the mobile or the Internet to access resources in cases of emergency (e.g. government aid, donations) | |
| <input type="radio"/> (A) Agrees | |
| <input type="radio"/> (B) Doesn't know / No answer | |
| <input type="radio"/> (C) Disagrees | |
| RAPIDITY | |
| 11. Has having mobile or Internet access made it faster or slower accessing help in cases of emergency? | 11.1 I have access to early warning systems though the mobile or the Internet |
| <input type="radio"/> (A) Faster | <input type="radio"/> (A) Agrees |
| <input type="radio"/> (B) Doesn't know / No answer | <input type="radio"/> (B) Doesn't know / No answer |
| <input type="radio"/> (C) Slower | <input type="radio"/> (C) Disagrees |
| 11.2 The mobile allows me to organise support in case of a climatic event or an emergency in my community (e.g. organise support from neighbours, family, friends, institutions) faster than before. | |
| <input type="radio"/> (A) Agrees | |
| <input type="radio"/> (B) Doesn't know / No answer | |
| <input type="radio"/> (C) Disagrees | |
| SCALE | |
| 12. Mobile/Internet access has allowed me to work with new groups or organisations from outside the community | 12.1 If yes, could you mention an example? |
| <input type="radio"/> (A) Agrees | |
| <input type="radio"/> (B) Doesn't know / No answer | |
| <input type="radio"/> (C) Disagrees | |
| 12.2 The mobile and the Internet have allowed me to get involved in projects related to climate change | 12.3 If yes, which projects/groups? |
| <input type="radio"/> (A) Agrees | |
| <input type="radio"/> (B) Doesn't know / No answer | |
| <input type="radio"/> (C) Disagrees | |
| 12.4 With access to the mobile/Internet you interact/are in contact more or less than before with representatives of institutions? (e.g. cooperatives, ONGs, Committees, donors) | |
| <input type="radio"/> (A) More than before | |
| <input type="radio"/> (B) Doesn't know / No answer | |
| <input type="radio"/> (C) Less than before | |

| DIVERSITY AND FLEXIBILITY | |
|--|---|
| 13. The mobile and the Internet allow me to get to know options and opportunities to improve my quality of life | 13.1 I use the mobile and the Internet to access innovative ideas that I can apply to improve my livelihood |
| (A) Agrees | (A) Agrees |
| (B) Doesn't know / No answer | (B) Doesn't know / No answer |
| (C) Disagrees | (C) Disagrees |
| 13.2 Access to the mobile/Internet has helped me to understand better different points of view about important issues | |
| (A) Agrees | |
| (B) Doesn't know / No answer | |
| (C) Disagrees | |
| 13.3 I use information that I obtain from the mobile/Internet to inform my decisions, more or less than before | |
| (A) More than before | |
| (B) Doesn't know / No answer | |
| (C) Less than before | |
| EQUITY | |
| 14. Mobile/Internet access has helped the poorer people in the community catch-up with the richer ones. Can you give me an example? | 14.1 Has mobile/Internet access strengthened or weakened your sense of belonging to the community? Can you give me an example? |
| (A) Agrees | (A) Strengthened it |
| (B) Doesn't know / No answer | (B) Doesn't know / No answer |
| (C) Disagrees | (C) Weakened it |
| 14.2. I use the Internet to inform myself about activities/projects that are taking place in my community. | |
| (A) Agrees | |
| (B) Doesn't know / No answer | |
| (C) Disagrees | |
| THANK YOU! | |

If implementation of the survey in the field is not possible (e.g. due to time or budget constraints), the questionnaire could also be filled out by the implementing organisation via desk research or self-assessment, and used to compare internal project perceptions with those of community members.

The examples provided below present additional formatting options for the survey, including rating scores that could be used to gather data on both the positive and the negative impact of development interventions (e.g. ICT4D projects) on community resilience.

RABIT Survey: Assessing ICTs' Impact on Community Resilience

| Resilience Attributes | Resilience Markers | <u>RATING</u> |
|---|--|---|
| This survey seeks to assess the perceptions of community stakeholders on ICTs' role in local resilience. It focuses on ICTs' impact on resilience attributes & markers. | <p align="center">Question: What impact are ICTs having in your community's...</p> | <p>3= High positive impact 2= Moderate positive impact 1= Low positive impact 0= No impact -1= Low negative impact -2= Moderate negative impact -3= High negative impact</p> |
| Robustness: Ability of the community to maintain its characteristics and performance in the face of environmental shocks and fluctuations. | <ul style="list-style-type: none"> Physical Preparedness of the Community | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Institutional Capacity | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Multi-level Governance and Networking | ☒ -3 -2 -1 0 1 2 3 ☺ |
| Self-organisation: Ability of the community to independently re-arrange its functions and processes in the face of an external disturbance. | <ul style="list-style-type: none"> Collaboration/Consensus-building and Participation | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Social Networks | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Local Leadership and Trust | ☒ -3 -2 -1 0 1 2 3 ☺ |
| Learning: Capacity of the community to gain or create knowledge, and strengthen local skills and capacities. Ability to experiment, discover and innovate. | <ul style="list-style-type: none"> Capacity Building | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Dissemination of New and Traditional Knowledge | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Reflective Thinking | ☒ -3 -2 -1 0 1 2 3 ☺ |
| Redundancy: Extent to which the community's assets and institutions are substitutable; for example, in the event of disruption or degradation. | <ul style="list-style-type: none"> Resource Spareness | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Overlaps and Interdependency of Resources and Institutions | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Resource Substitutability | ☒ -3 -2 -1 0 1 2 3 ☺ |
| Rapidity: Speed at which assets can be accessed or mobilised to achieve goals in an efficient manner | <ul style="list-style-type: none"> Rapid Resource Access | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Rapid Resource Assessment/ Coordination | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Rapid Resource Mobilisation | ☒ -3 -2 -1 0 1 2 3 ☺ |
| Scale: Breadth of assets and structures a community can access in order to effectively overcome or bounce back from or adapt to the effects of disturbances. | <ul style="list-style-type: none"> Multi-level Networks | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Resource Access and (intra/inter) Partnerships | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Cross-level Interactions | ☒ -3 -2 -1 0 1 2 3 ☺ |
| Diversity & Flexibility: Ability of the community to undertake different courses of actions with the resources at its disposal, ability to innovate and utilise the opportunities that may arise from change. | <ul style="list-style-type: none"> Different Courses of Action/Emerging Opportunities | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Adaptable Decision-making | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Innovation | ☒ -3 -2 -1 0 1 2 3 ☺ |
| Equality: Extent to which the system provides equal access to rights, resources and opportunities to its members. | <ul style="list-style-type: none"> Strengthened Competencies/ Gaps' Reduction | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Inclusiveness | ☒ -3 -2 -1 0 1 2 3 ☺ |
| | <ul style="list-style-type: none"> Openness and Accountability | ☒ -3 -2 -1 0 1 2 3 ☺ |

| RABIT Survey: Assessing ICTs' Impact on Community Resilience | | | | | |
|--|--------------|------------|----------------------------------|----------------|--|
| Question | Score | | | | Information Source & Comments (e.g. Survey, self-assessment, interviews, desk review) |
| | 0=Not at all | 1=Somewhat | 2=Yes, but could use improvement | 3=Consistently | |
| 1. ROBUSTNESS | | | | | |
| 1.1. Are ICTs used to strengthen the physical preparedness of the community to withstand the impact of climate change-related events? (e.g. GIS and remote sensing as part of climate modelling, in contingency planning, to identify areas of risk/vulnerability in case of flooding, or sea level rise) | 0 | 1 | 2 | 3 | |
| 1.2. Are ICTs used to strengthen the capacity of local institutions to manage crisis? (e.g. to inform institutional planning and strategies to minimize vulnerabilities, early warning systems, to enforce regulatory systems) | 0 | 1 | 2 | 3 | |
| 1.3. Are ICTs used to reduce barriers to communication among community members, and to consolidate networks ? | 0 | 1 | 2 | 3 | |
| SUB-TOTAL: | | | | | |
| 2. SELF-ORGANISATION | | | | | |
| 2.1. Are ICTs used to strengthen the ability of community stakeholders to self-organise and collaborate amongst themselves, independently of outside control? (e.g. to gather members of community organisations, build consensus among community members, support the work of local cooperatives) | 0 | 1 | 2 | 3 | |
| 2.2. Are ICTs used to facilitate social networking among community stakeholders? | 0 | 1 | 2 | 3 | |
| 2.3. Are ICTs used in support of community engagement/leadership , and for trust building among community stakeholders? (e.g. increase communication among community stakeholders, strengthening the sense of community and belonging) | 0 | 1 | 2 | 3 | |
| SUB-TOTAL: | | | | | |
| 3. LEARNING | | | | | |
| 3.1. Are ICTs used in support of training and capacity building in the community? (e.g. training in telecentres, e-learning) | 0 | 1 | 2 | 3 | |
| 3.2. Are ICTs used to produce or disseminate new and traditional knowledge in the community? (e.g. to identify, document and disseminate information on local climate change impacts, to disseminate traditional adaptation practices and community values) | 0 | 1 | 2 | 3 | |
| 3.3. Are ICTs used to provide spaces for deliberation, discussion and reflection about | 0 | 1 | 2 | 3 | |

| | | | | | |
|--|----------|----------|----------|----------|--|
| issues that concern the community? (e.g. online discussion forums, e-mail exchange about climate change impacts, social media to raise awareness about climatic impacts) | | | | | |
| SUB-TOTAL: | | | | | |
| 4. REDUNDANCY | | | | | |
| 4.1. Are ICTs used to generate spare resources ? (e.g. diversify income sources, transfer/access remittances, access new markets, improve local income level) | 0 | 1 | 2 | 3 | |
| 4.2. Are ICTs used to facilitate the community's access to additional resources that can be drawn upon at critical times (functional overlaps/interdependency)? (e.g. fostering social networks among migrants and the local community, among local researchers/experts or volunteers, supporting collaboration among external and local organisations) | 0 | 1 | 2 | 3 | |
| 4.3. Are ICTs used to increase collaboration among institutions working in similar areas or with similar responsibilities? (i.e. allowing for their functions to be substituted in case of climatic emergencies) (e.g. in support of decentralised decision-making) | 0 | 1 | 2 | 3 | |
| SUB-TOTAL: | | | | | |
| 5. RAPIDITY | | | | | |
| 5.1. Are ICTs used to quickly identify and access resources outside the community (e.g. funding sources, expertise) in support of local responses to climate change? (e.g. facilitate access to financial resources and international donors for disaster response and recovery, access insurance mechanisms, access credit) | 0 | 1 | 2 | 3 | |
| 5.2. Are ICTs used as part of crisis response systems, or to assess/coordinate responses in the event of climatic events? (e.g. social networking/Web 2.0 tools used in the distribution of aid in disaster areas, to coordinate volunteers, to connect supply and local demand) | 0 | 1 | 2 | 3 | |
| 5.3. Are ICTs used to rapidly assess and/or disseminate data on hazards/risks affecting the community, in order to mobilise resources ? (e.g. mobiles used for real-time reporting of the location of climate refugees, information about the distribution of aid/online donation mechanisms) | 0 | 1 | 2 | 3 | |
| SUB-TOTAL: | | | | | |
| 6. SCALE | | | | | |
| 6.1. Are ICTs used to support networking and exchange among community members and stakeholders at the meso and macro levels ? (e.g. of community members with government representatives, donors, NGOs operating at the national level, migrants) | 0 | 1 | 2 | 3 | |
| 6.2. Are ICTs used to facilitate partnerships between community organisations and the private, public or NGO/academic sectors? | 0 | 1 | 2 | 3 | |
| 6.3. Are ICTs used to facilitate the interactions between community stakeholders and (non-community) stakeholders operating at the regional and national levels ? | 0 | 1 | 2 | 3 | |

| | | | | | |
|---|----------|----------|----------|----------|--|
| | | | | | |
| SUB-TOTAL: | | | | | |
| 7. DIVERSITY AND FLEXIBILITY | | | | | |
| 7.1. Are ICTs used to identify alternative actions or emerging possibilities ? (e.g. new business ideas, new employment opportunities that may emerge with new changing climatic conditions, alternative livelihoods). | 0 | 1 | 2 | 3 | |
| 7.2. Are ICTs used to inform local decision-making processes , facilitating the response to climate change impacts? (e.g. access to weather forecasts and projections to inform decisions, facilitate access to different types of knowledge/sources related to climate change) | 0 | 1 | 2 | 3 | |
| 7.3. Are ICTs used as a source of innovation / innovative thinking ? (e.g. through access to new knowledge and ideas, in the design and experimentation of novel solutions to respond to climate related change) | 0 | 1 | 2 | 3 | |
| SUB-TOTAL: | | | | | |
| 8. EQUALITY | | | | | |
| 8.1. Are ICTs used to create skills/ strengthen the capacities of the most vulnerable members of the community? (e.g. ICT training for women, elders and youth etc, e-learning in remote areas) | 0 | 1 | 2 | 3 | |
| 8.2. Are ICTs used to support the inclusion and participation of community members in decision-making processes? (e.g. participatory hazard-mapping, e-voting / online consultation on community adaptation priorities, localisation of climatic information) | 0 | 1 | 2 | 3 | |
| 8.3. Are ICTs used to strengthen the openness and transparency of local processes? (e.g. by facilitating access to relevant information about local projects, enabling citizen-based monitoring, to assess the efficacy of interventions/ public accountability, to facilitate/implement entitlements and rights). | 0 | 1 | 2 | 3 | |
| SUB-TOTAL: | | | | | |

Data visualisation: Traffic Light Summary Score

| | Red Zone | Caution Zone | Going Well |
|----------------------------------|----------------------|---------------------------|--------------------------|
| Overall Score | 25% (0-3) | (26-75%) (4-7) | 76-100% (8-9) |
| Resilience Attribute | | | |
| Robustness | | | |
| Self-Organisation | | | |
| Learning | | | |
| Redundancy | | | |
| Rapidity | | | |
| Scale | | | |
| Diversity and Flexibility | | | |
| Equality | | | |

Survey Data Visualisation: Radar Chart

After all the survey questionnaires are received, the results need to be tabulated. If the number of respondents is manageable, the results may be hand-tallied and the responses to each category for every question are counted.

The radar chart constitutes one option for visualising survey results, as the examples in Figures 9 (focused on resilience attributes) and 10 (disaggregating resilience attributes into specific resilience markers) illustrate. The percentage figures for each attribute or marker can be calculated directly from an average ranking such as that produced by a 0-100% rating scale for each item, or calculated by conversion to a percentage figure of an ordinal rating system such as the 0-3 system used in the survey shown just above. Alternatively it can be calculated from the percentage of respondents who agree that ICTs (or other development intervention) has strengthened resilience (potentially first subtracting those who disagree and/or feel ICTs have weakened resilience) on the particular attribute or marker.

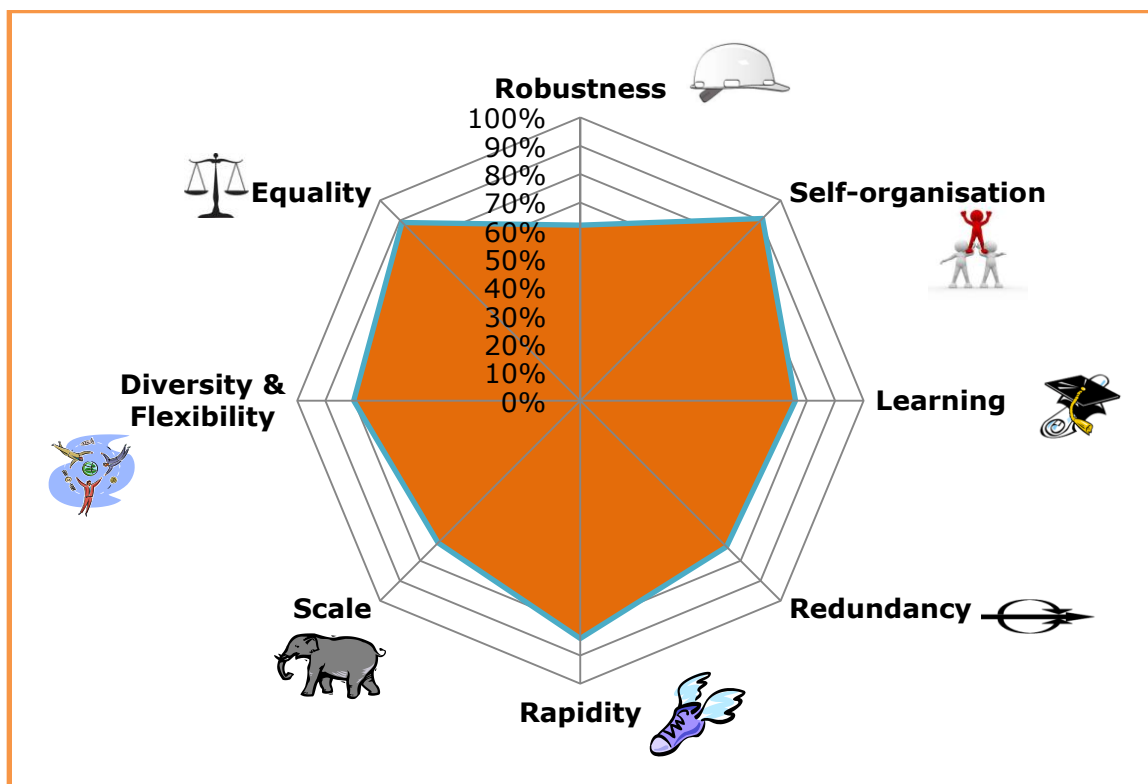


Figure 9. Contribution of ICTs to resilience attributes.

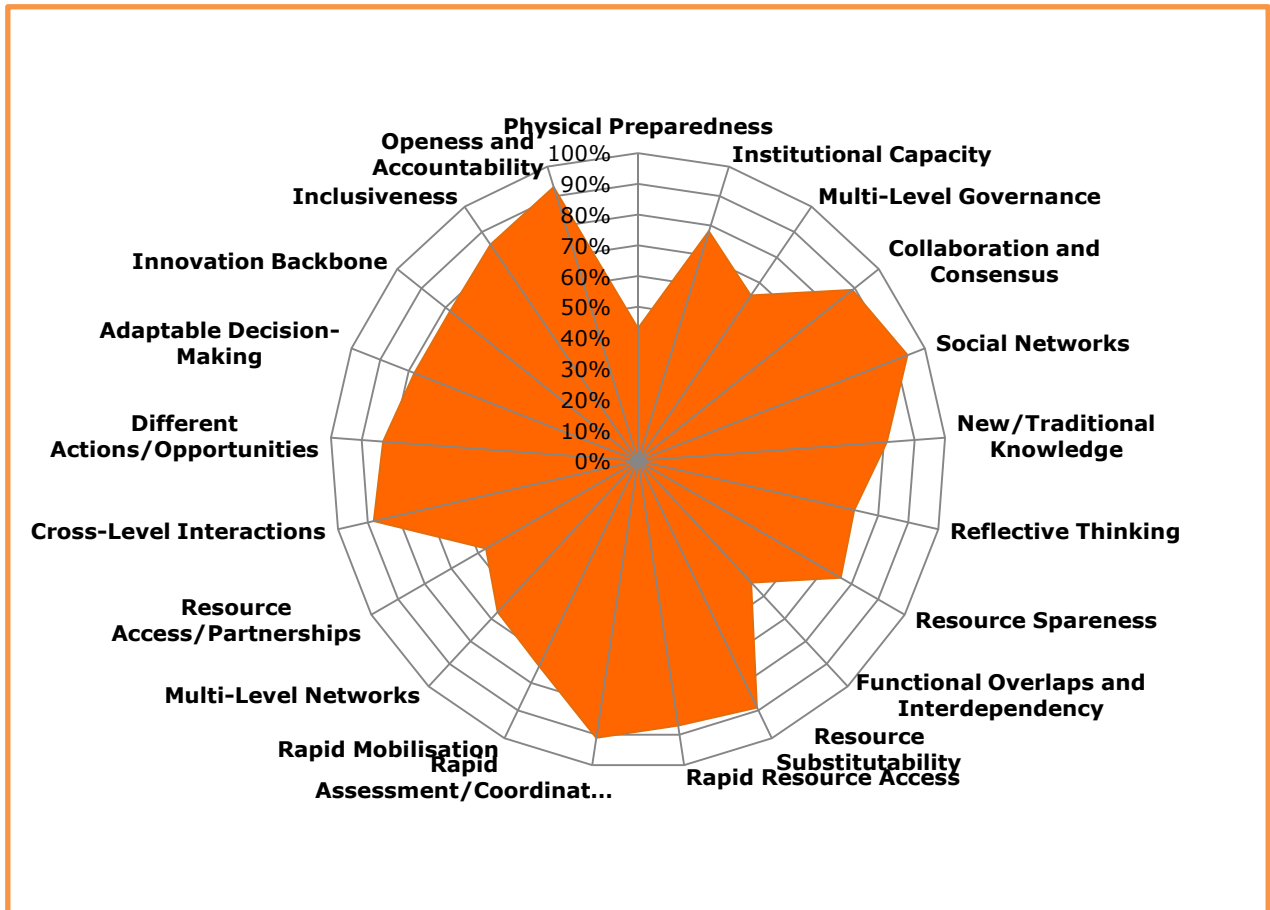


Figure 10. Contribution of ICTs to resilience markers

Survey Data Visualisation: Traffic Light

Survey findings can also be visualised through a simple “traffic light” approach to understanding priorities for action seeking to enhance resilience (Figure 11). The traffic light system is based on a score of the resilience attributes identified through the survey questions.

In the case of an ICT4D project, the survey questions can be used to determine the percentage of ICT usage towards each of the resilience markers. Percentages are aggregated according to each of the resilience attributes, as suggested in Table 1 (see also Table 3 revision). For example:

- Resilience attributes scoring **0-60%** ICT aggregate use are rated red, and are high priorities for future ICT-related intervention.
- Resilience attributes scoring **61-80%** ICT aggregate use are rated yellow, and are medium priorities for future ICT-related intervention.
- Resilience attributes scoring **81-100%** ICT aggregate use are rated green, and are low priorities for future ICT-related intervention.



Figure 11. “Traffic light” prioritisation of areas for action (based on an ICT4D project).

A similar approach can be used for the individual markers, but adding blue for those ‘n/a’ items that require further investigation (Table 7).

| Action Priority | Resilience Marker |
|------------------------------|--|
| HIGH | 1. Physical Preparedness 2. Functional Overlaps and Interdependency 3. Resource Access and Partnerships |
| MEDIUM | 4. Multi-Level Governance 5. Multi-Level Networks 6. Reflective Thinking 7. Rapid Resource Mobilisation 8. Resource Spareness 9. Institutional Capacity 10. Adaptable Decision-Making 11. Innovation Backbone |
| LOW | 12. New and Traditional Knowledge 13. Different Actions/Opportunities 14. Inclusiveness 15. Rapid Resource Access 16. Collaboration and Consensus 17. Resource Substitutability 18. Cross-Level Interactions 19. Rapid Resource Assessment/Coordination 20. Openness and Accountability 21. Social Networks |
| Further Investigation | 22. Local Leadership and Trust 23. Capacity Building 24. Competency Gap Reduction |

Table 7. Priority e-resilience markers for future action

Survey Data Visualisation: Bubble Chart

Survey findings can also be presented visually in the form of a 'Bubble chart', as shown in Figure 12.

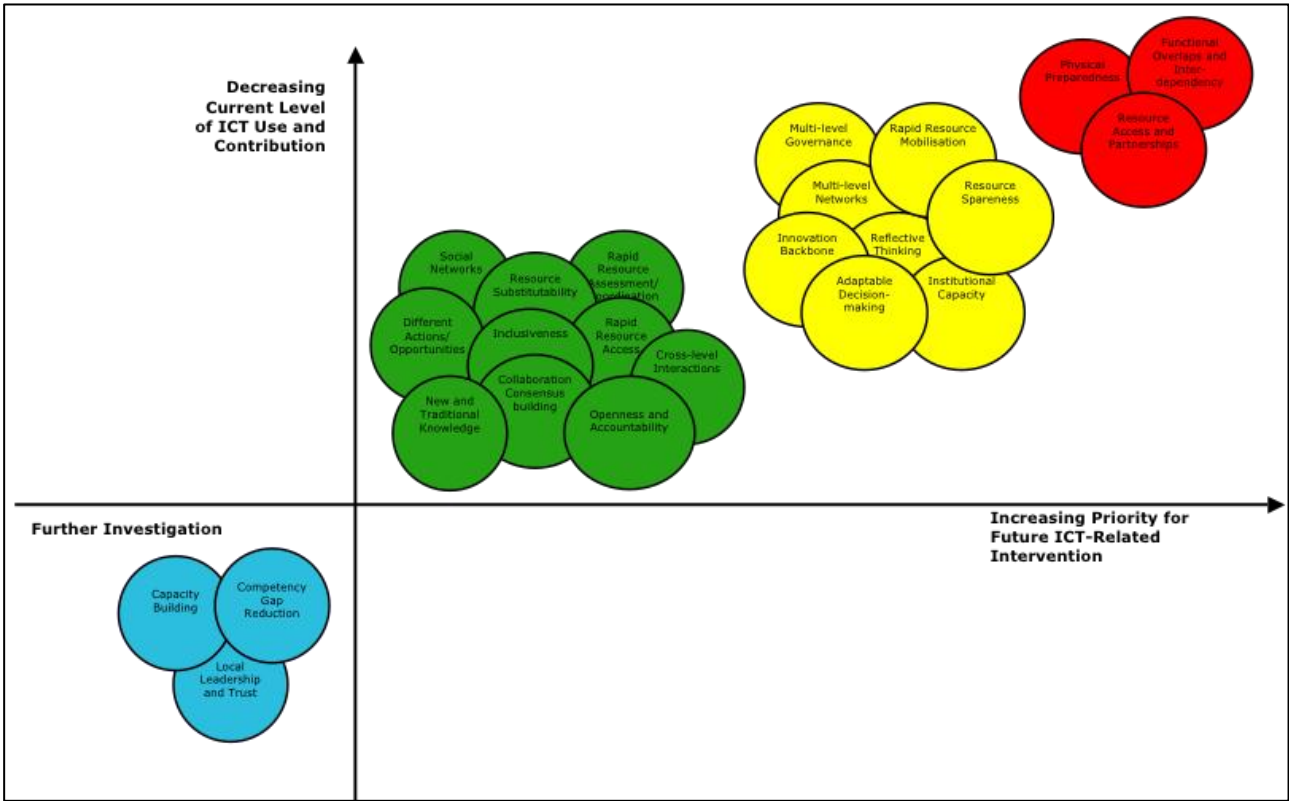


Figure 12. Bubble visualisation of priority e-resilience markers for future action.

Survey Data Visualisation: Resilience Wheel

The resilience wheel is a form of visualisation of resilience attributes that also uses the traffic light system to show the impact of a development intervention in the community (e.g. level of ICT usage), and to indicate areas of priority action to strengthen resilience/inform future interventions.

The ranking should be adjusted to the specific case of implementation. In the example illustrated below (ICT usage towards the resilience to climate change of Ugandan coffee producers) a **red** ranking (resilience attributes scoring 0-60%: low level of usage) indicates high priority for future ICT-related intervention, **yellow** (resilience attributes scoring 61%-80%: medium level of usage) indicates medium priority for future ICT-related intervention, and **green** (resilience attributes scoring 81%-100%: high level of ICT usage) shows low priority for future ICT-related intervention.

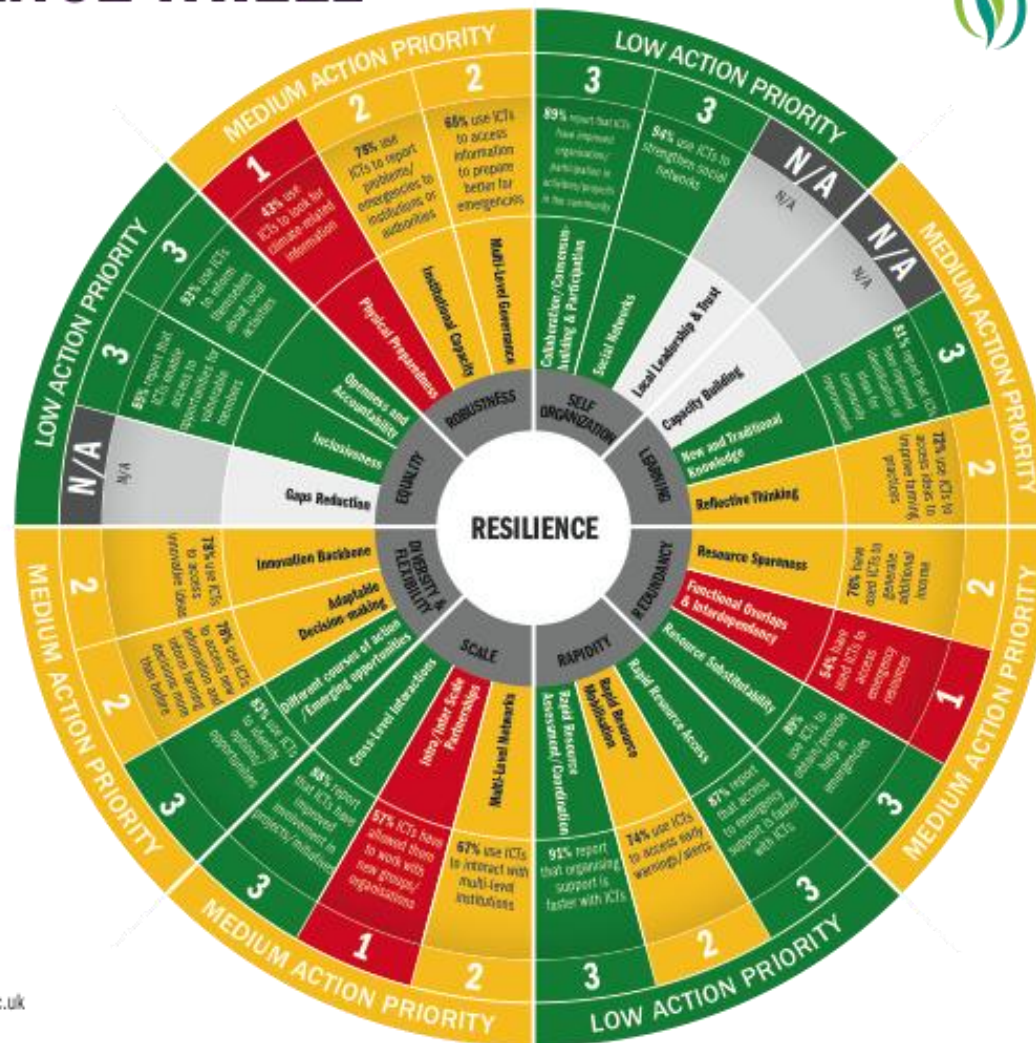
This form of visualisation is able to incorporate all the resilience attributes and markers, the nature of the survey data, as well as overview ratings for both markers and overall attributes. It therefore brings together in one place a number of the visualisations provided earlier.

The resilience wheel – like the other forms of visualisation suggested – is an attempt to provide practitioners and decision makers with a practical tool that can be easily implemented and understood, and that provides an overall ‘snapshot’ of the development impact’s contribution to resilience at the local level.

In the example shown in Figure 13, the wheel visualises the linkages between ICTs and resilience attributes clearly and holistically, thus helping to evaluate current initiatives or to inform the design of future actions on resilience and climate change. It also facilitates the identification of resilience markers for which no data is available (marked as ‘N/A’) and, therefore, where further research needs to be conducted.

RESILIENCE WHEEL

RABIT Project
Resilience
Assessment
Benchmarking &
Impact
Toolkit



Level of ICT Usage Towards Resilience Attributes / Priority of Action (RABIT Survey Data)

0-60% = 1 Low Usage/
High Priority

61-80% = 2 Medium Usage/
Medium Priority

81-100% = 3 High Usage/
Low Priority

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Figure 13: Resilience Wheel – Example of Mount Elgon coffee farmers, Uganda

4.5. Data Analysis

Once the process of data gathering has taken place (and ideally, *while* it is taking place), the next stage corresponds to the analysis of the data, and the identification of future areas of action to strengthen the project's impact on community resilience.

This phase integrates various mechanisms for the validation of the fieldwork findings (i.e. triangulation) to contribute to the validity and reliability of the data collected. Triangulation of findings consists in comparing and verifying the data obtained through different methods of data collection (e.g. by comparing findings obtained from focus groups, semi-structured interviews, document analysis and surveys).

It is suggested that the data gathered through RABIT's implementation is systematised according to the main components of the conceptual framework presented in Figure 3 (i.e. climate change stressors, vulnerability dimensions, community assets/institutions/structures, ICTs, e-resilience sub-properties).

Once the data has been gathered and the results analysed, the organisation will be in a position to identify potential areas of action to improve the impact of the development (ICT) intervention on community resilience. Towards this end, the analysis can focus, for example:

- ❖ On the *stages of the project cycle*, identifying activities that could be strengthened, in order to foster ICTs' impact on resilience (e.g. related to the project's design, implementation, monitoring or evaluation).
- ❖ On the *components of the community system*, identifying factors that enable or that constraint the role of ICTs towards resilience (e.g. assets, institutions and structures).
- ❖ On the *linkages between ICTs and resilience sub-properties*, identifying actions to improve ICTs' contribution to the resilience markers of each sub-property (or of those that are most relevant to the local context).

It is suggested that the key areas for action identified are complemented with the feedback gathered through the final RABIT workshop/learning activity (explained below).

4.6. Final Learning Activity

Once the process of data gathering and analysis has been completed, it is suggested to organise a final learning activity that can take the form of a workshop or a focus group.

The aim of this final activity is to conduct a collective reflection on the implementation of RABIT, on the main findings, and on the next steps/follow-up on the key action areas identified to strengthen the project's impact on community resilience.

This activity targets the key stakeholders that participated in RABIT's implementation, including community members and other actors involved in the implementation of the development intervention (e.g. donors, partners from the local government, staff from the implementing organisation). A sample structure for this final event is provided in Box 7.

Box 7. Final RABIT Learning Activity - Workshop Guide

Participants: RABIT stakeholders

INTRODUCTION: Explain the purpose of the workshop:

- To reflect on the results obtained from the implementation of RABIT.
- To obtain participants' feedback on what is missing, what should be clarified, what is interesting, what is unexpected, among others.
- To gather input from participants on the key areas of action needed to foster the impact of the project on the community's resilience.
- To discuss how the results can be used in practice.

2) RESEARCH GOALS:

- To confirm/validate and complement the research findings.
- To obtain stakeholders' feedback about future actions, in order to strengthen the project's impact on community resilience.

3) MAIN ISSUES TO ADDRESS:

3.1. Introductions:

- Presentation of the notion of resilience, and of RABIT's conceptual approach.

3.2. General findings

- Presentation of RABIT's findings using data visualisation.

3.3. Reflecting about the findings/gathering feedback

- What surprised participants, what is missing, what 'jumps out', what could be clarified/complemented?
- Has the implementation of RABIT helped to clarify/complement the understanding of resilience, and to raise awareness about the importance of community resilience?
- Can the resilience markers tell us something new about the role of the development intervention on local resilience?

3.4. What's Next?

- What are the key areas of action for the project/intervention to help build resilience in the community?
- What areas were identified through RABIT's implementation? What areas are missing?
- What is required to effectively implement these actions?
- What are the next steps?
- Identify participants' commitments/contributions to strengthen community resilience.

4) SUMMARISE KEY POINTS THAT EMERGED IN THE DISCUSSION

5) THANKS AND CLOSING REMARKS

4.7. Reflection on Methods and Instruments

Pilot application of the methods and instruments above led to the following learning points:

a) Boundary Setting: it was challenging to understand where to set the system boundary; i.e. to work out which institutions lay within the community and which lay outside. For example, was the local police station part of the community or an external institution? Asking community members themselves was one way to resolve this.

b) Focus for e-Resilience Questions: the survey questions on ICTs and resilience were a mix of items about extent to which ICTs were being used for a particular resilience attribute-related purpose, and items about the perceived utility of ICTs vis-a-vis particular resilience attributes. It may be more appropriate to pick one type or the other but not both. Further, it may be more appropriate still to ask about actual impact – positive or negative – on resilience. For example, selecting a seven-point scale:

- 1 – A lot better
- 2 – Somewhat better
- 3 – A little better
- 4 – The same
- 5 – A little worse
- 6 – Somewhat worse
- 7 – A lot worse

And then asking better/worse questions related to each of the attribute markers e.g. “How much better/worse is early warning of emergencies, thanks to ICTs?” or “How much better/worse are partnerships between your community and external organisations, thanks to ICTs?”

Related to this, the questions could appear to be a mix of the personal and the community level. It might be better to ensure the respondents were answering specifically in relation to the community overall.

c) Revision of Markers: as noted in Section 2.4, the pilots suggested some revisions to the markers of resilience. They also suggested an alternative approach to identification of markers. Rather than doing this top-down, from outside the community, they could have been done bottom-up, getting community members to identify the indicators of resilience attributes that were specifically appropriate to their context.

d) Questionnaire Length: respondents would give at most 10-15 minutes to answer survey questions. This meant it was not possible to ask questions about all three markers for all resilience attributes, and the questionnaire thus had to be foreshortened. One possible solution would be to have two different versions of the questionnaire which – together – would cover all markers but which – for any individual respondent – would only ask about a sub-set of markers.

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