Measuring resilience

Training and baseline report for a new community resilience project in Gaibandha District, Bangladesh

Introduction

The concept of resilience has become an integral part of development and humanitarian efforts. It has a key role in the four major frameworks on *development* (Sustainable Development Goals), *disasters* (Sendai Framework), *climate change* (Paris Agreement), and *humanitarian efforts* (World Humanitarian Summit).[1]

In the context of increasing climate variability and frequency of extreme weather events that are amongst the manifestations of climate change, fostering communities' ability 'to anticipate, reduce the impact of, cope with, and recover from the effects of adversity […]' (IFRC 2011) is indeed a sensible objective.

Yet, resilience brings challenges for practitioners: how should it be reinforced, and how should it be measured? Without answers to these two questions, "the danger is that 'resilience' provides a new term, but no new action on the ground." (Matyas/Pelling 2015)

In the past nine months, two tools have been published that seek to assist project teams in resilience programming and measurement. The IFRC brought out the 'Road Map to Community Resilience (IFRC 2016) - a process manual that offers step-by-step guidance for Red Cross and Red Crescent Societies to assist communities towards raising resilience. The 'Road Map' includes the **resilience star** - a multi-dimensional tool that can be used as a participatory exercise (as illustrated in the photo above).[2]

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1. For an overview of resilience in the four frameworks, see *Peters et al (2016): Resilience across the post-2015 frameworks: towards coherence. London: Overseas Development Institute.*

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2. For details on the 'resilience star', see reference sheet O (p. 80f) in the road map manual, available *here.*

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Note that additional resources have been made available to course participants on the course dropbox folder.

The second instrument to measure resilience is the **resilience radar**, a survey-based tool prepared by Australian consultancy Banyaneer.[3]

In June 2017, a two-tool-test was conducted along the banks of the Jamuna river. In the context of a new resilience project in Bangladesh's north-western district of Gaibandha, Swiss Red Cross (SRC) and Bangladesh Red Crescent Society (BDRC) commissioned a baseline study that was to use the duet of the qualitative tool (the resilience star) and its quantitative sister (the radar).

This report summarizes the experience and the results from the dual application. It is structured in three sections. **Section A** provides the local and project context and summarizes the objectives of the study. **Section B** highlights the approach - reflecting on the 'measuring resilience' training course that preceded the actual baseline study, and reviewing the ways the two tools were amended to render the tools most relevant to the project context. **Section C** contains the findings of the study. It presents the outcomes and experiences of the resilience star exercises *(chapter 6)* as well as those of the resilience radar *(chapter 7)* before triangulating results in line with the dimensions of resilience and the project logframe data needs *(chapter 8)*. The section ends with concluding remarks and recommendations *(chapter 9)*.

While the report is kept in a concise format, the appendices (available online *here*) contain additional information, such as raw data and further analysis.

Before proceeding further, it is essential to highlight the people that made this baseline work out well. I would like to thank the participants of the training course for their active role and thoughtful contributions in adapting star and radar. Thanks is also due to the supervisors and enumerators of the baseline process, who did an excellent job despite sweltering heat and the hardship of working during the holy month of Ramadhan. The lively and insightful debates during the resilience star exercises are due both to the great facilitation and to the outspokenness of participating communities.

The project team of SRC and BDRCS did an outstanding job at preparing logistics and informing communities - making the field experience one of the best-prepared I have come across in my forty field research trips.

Thank you!

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3. All elements of the resilience radar (user manual, questionnaire, data analysis sheet etc) are available on the Banyaneer website at *http://banyaneer.com/resilience-radar/*

Last but not least, I would like to thank Swiss Red Cross - in particular Amitabh Sharma and Eva Syfrig - for commissioning the first-time application of the two new (and previously untested) tools. It is my great hope that their pioneer spirit has paid off - both for the new resilience project and for future users of the radar and the star. Ultimately, the two tools are a means to an end - of better supporting communities in strengthening their level of resilience.

SECTION A | **BACKGROUND**

1. Project context

Bangladesh: home to 163 million people, the country is located in the low-lying delta of major rivers (notably the Ganges and the Brahmaputra) fed by the enormous water sheds around the Himalayas. While the country has seen considerable economic progress and made numerous advances in terms of social and economic policy (such as halting population growth and improving disaster risk management), it is also one of the world's hotspots exposed to climate change.

Fig. 1 | **Map of Gaibandha District**

Densely populated (1,252 inhabitants per km[2] according to the World Bank 2016), low-lying, and largely poor, Bangladesh is already at high risk to numerous hazards.

The south of the country witnesses saline intrusion as the first messenger of sea-level rise, and is exposed to tropical cyclones. Across the country, increased variability in precipitation adds burdens on people, most of whom are dependent on natural resources. And along the main rivers, there are more frequent floods and flash floods, as well as accelerated levels of erosion.

A 45-minute flight from Dhaka and a two-hour road trip take us to the north-western district of Gaibandha *(see map)*. For many of its 2.4 million people, lives and livelihoods are shaped by the mighty Jamuna.[4] The river gives and takes: it is rich in fish and carries organic sediments, making adjacent fields fertile and productive. At the same time, its strong currents and frequent floods take away the land: fighting river bank erosion is a continuous struggle.

Nowhere is the river's role more powerful than on the chars - islands formed from the deposit of sediments. Going past fishing boats, a short boat ride takes the visitor away from dense towns and villages of the mainland to the open grassy plains of the chars. Jute fields, grazing cows, boats and fishing nets come into view in front of wide horizons - and communities of people who made the chars their home.

It is here and in nearby mainland villages along the river banks that Swiss Red Cross and Bangladesh Red Crescent Society work: from June 2013 to June 2016, the two Societies supported 24 communities in the unions Haldia (Shaghata upazila), Kamarjani and Mollar Char (both part of Gaibandha Sadar upazila). Through the DRR-WASH project, they promoted disaster preparedness and risk mitigation, sanitation and access to safe water, and invested in health centers. With this project coming to its end, the two Societies prepare for a successor.

Compared to the earlier project, the new intervention will see a broader scope - expanded in two ways: *thematically*, it widens the lens from disaster risk reduction (DRR) as well as water and sanitation (WASH) to the more holistic notion resilience. *Geographically*, the new project will focus on the 77 communities across Fulchari's seven unions while extending limited support to the 24 communities previously supported.

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4. At Gaibandha's northern district border, the Brahmaputra merges with the Tista river and is called Jamuna further downstream.

Participants of the measuring resilience training course pose for a group photo.

Overall, the new project will reach 229,600 people across 52,600 households, with support planned to be rolled out successively over the anticipated three-year period. The study described in this report forms the baseline of this new resilience project.

2. Objectives

The terms of reference (ToR) for this mission stipulate the main purpose - it "is to comprehensively carry out a baseline assessment against qualitative and quantitative variables linked to the intended objectives/outcome and outputs of the project, using 'resilience radar' and following the 'road map to community resilience'.

While the collection and analysis of baseline data are indeed the main purpose, the specific tasks[5] furthermore illustrate a second objective of capacity-building in similar baseline or endline-related processes: the overall consultancy and manuals should "allow the participants

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5. The specific tasks are listed as:
- Orientation of the team in IFRC's road map to community resilience
- Amendment of the radar survey questionnaire and analysis sheet according to the specific project needs and the road map
- Define the qualitative tools the radar needs to be complemented with in order to have a comprehensive baseline
- Prepare the sampling framework
- Prepare enumerator training manual and train enumerators
- Provide punctual support during the time of data collection. Data will be collected by the project team and appointed enumerators.
- Analyze data (also together with team)
- Compile a baseline report

to apply the knowledge in a different setting and/or to repeat the exercise for a mid-term or end-line survey without further external support."

In summary, the consultancy covered two related aspects - first, the **training** of staff, enabling staff to measure resilience independently, and second, the implementation of the actual **baseline study**.

SECTION B | **APPROACH**

3. Sampling and other initial preparations

The quality of data collected through a survey largely depends on the level of preparation - therefore, it is crucial to invest in planning and testing before venturing into the field. But with just one day available between the envisaged completion of the training course and the start of the survey process, both the course and the key elements of the survey had to be prepared prior to the consultant's arrival in Bangladesh. In particular, this included developing the sampling framework, the draft questionnaire, and logistics.

Sampling
The fact that the new project targets both previously supported ('old') communities as well as the new ones in Fulchari upazila provided an opportunity to stratify between these two groups: by effectively designing two

Fig. 2 | **Sampling framework summary**

Strata I ('old' communities supported by the previous project)   Sample size: planned 268 *(actual 273)*

Key information: Confidence level: 95% | Margin of error: 6% | Number of clusters: 4 | Sampling interval: 2,719

Code	Community	Location	Households	Sample size	Sampling interval	Teams	Date
A.2.5	Chithulia Dighor	Gaibandha Sadar (Mollar Char Union)	1,312	66	6 (three divisions*)	All teams	June 18th, 2017
A.1.6	Batikamara	Gaibandha Sadar (Kamarjani Union)	562	66	7	Blue	June 19th, 2017
B.1.3	Bera	Shaghata (Haldia Union)	677	66	8	Green	June 19th, 2017
B.1.7	Uttar Deghalkandi	Shaghata (Haldia Union)	643	66	8	Red	June 19th, 2017

Strata II (new communities previously unsupported)   Sample size: planned 384 *(actual 396)*

Key information: Confidence level: 95% | Margin of error: 5% | Number of clusters: 6 | Sampling interval: 6,963

Code	Community	Location	Households	Sample size	Sampling interval	Teams	Date
C.1.5	Modonerpara	Fulchari (Kanchipari Union)	700	64	9	Blue	June 20th, 2017
C.2.3	Kabilpur	Fulchari (Uria Union)	452	64	6	Green	June 20th, 2017
C.5.6	Parul	Fulchari (Fulchari Union)	643	64	8	Red	June 20th, 2017
C.7.10	Khatiamari	Fulchari (Fazlupur Union)	2,883	64	12 (three divisions*)	Blue	June 21st, 2017
C.6.4	Dakatia Char	Fulchari (Erendabari Union)	1,407	64	9 (two divisions*)	Green	June 21st, 2017
C.4.1	Katlamari	Fulchari (Gazaria Union)	1,732	64	11 (two divisions*)	Red	June 21st, 2017

For the full sampling framework, see *appendix C*. To prepare sampling for future surveys, use the automated template (*appendix D*).

* In large communities that would have high household sampling intervals, we split teams into two or three divisions and reduced intervals.

sub-surveys (each of which is representative), we were able to create a horizontal comparison - thereby identifying any difference between 'old' (*strata I)* and new communities *(strata II)*.[6] Applying the Probability-Proportional-to-Size (PPS) technique, we sampled communities by setting the number of clusters to 4 for old and 6 for new communities. We determined the sample size by setting the confidence level to 95% and the margin of error to 6% for old and 5% for new communities.[7] This led to the selection of the ten communities listed in *fig. 2*, and an overall sample size of 648 (actually reached: 665).

Other initial preparations
While the ToR suggested sampling as part of the training course, prior sampling was unavoidable because logistical preparations depended on it.[8] Communities needed to be

informed ahead of time, boats and cars arranged. Having advance notice, logistical preparations of field research and training course were flawless.

Initial preparations also included the development of the training course modules and a first round of adapting the resilience radar questionnaire, bringing it in line with the requirements of the new resilience project.

Further adjustments of the questionnaire were made during the training course. We will describe overall adjustments in chapter 5.

4. Training course

Conducted at the SKS training center in Gaibandha, the five-day course aimed to enable graduates "to be able to prepare and conduct household surveys, and to measure community resilience." This was to include "sampling, questionnaire design, enumerator training, and data collection."[9]

The 23 participants came from Swiss Red Cross, Bangladesh Red Crescent Society (both National Headquarters and Gaibandha branch), German Red Cross,

6. It should be noted that any such difference between old and new communities is not automatically attributable to a possible role of the previous project in old communities. Since the main purpose of the survey was the acquisition of baseline data for the new project, we did not cover aspects of attribution.

7. Applying different margins of error (and number of clusters) for the two strata was based on three considerations: *first*, strata II has roughly four times as many households as strata I. *Second*, with strata II being the main focal area of the new project, and with no prior data collected, we wanted to have a greater level of precision for this strata. *Third*, given that the number of days was limited and the fact that a previous endline survey had already been conducted for strata I, we decided to limit the number of days we could spend in 'old' communities.

8. Nonetheless, we conducted several sampling exercises during the course and provided a sampling template for use in future surveys (appendix D).

9. The aspect of data analysis could not be fully covered in the five-day course. However, a 45-minute Skype session was arranged with Banyaneer's statistician, who illustrated the SPSS-based steps of converting raw data to the descriptive statistics used in the resilience radar's data analysis sheet.

and the Development Association for Self-reliance, Communication and Health (DASCOH). A pre-training online survey showed general familiarity with surveys but considerable variability in the use of tools and sampling.

The original plan was that all training graduates would subsequently support data collection - either as survey supervisors or as facilitators of the 'resilience star' exercises. In so doing, graduates would be able to consolidate classroom knowledge with field practice.

However, as it became apparent that not all graduates would be available for data collection, local Red Crescent Youth members were also invited to ensure sufficient resources for data collection. By implication, the course had to cover some basics in monitoring and evaluation - an aspect that was seen as a welcome 'refresher' by more experienced participants.

The remainder of this chapter summarizes the course content and outcomes by theme and concludes with lessons and reflections.

Introducing resilience (day 1, session 1)
Following introductions of course participants ('who's my neighbour?') and the course outline, we got a grip of the rather complex concept of community resilience.

Having discussed definitions as well as the instrumental, functional and outcome perspectives of resilience, we moved outside the classroom to demonstrate resilience, using a bicycle tyre (the community), elastic ropes (functional dimensions) and a water melon (stressor). One of the course participants prepared a video of this illustrative exercise, _accessible here_. Back in the classroom, we discussed critical questions around resilience.[10] It was pointed out that resilience is never 'zero' - in resilience programming, we should capture and build on existing capacities. In turn, this makes the assessment and measurement of resilience critical.

Monitoring (day 1, sessions 2-3)
But how to measure? Before exploring specific tools, we reviewed some of the basics of monitoring and evaluation. Under the headline 'why, what, how, when', concepts such as project cycle, logframes, (SMART[11]) indicators and their hierarchies, and theory of chain were reviewed.

10. All Power Point presentations for the training course are available on dropbox under appendix B.

11. SMART indicators are Specific, Measurable, Achievable, Relevant, and Time-bound.

As a first group exercise, teams were asked to analyze the then current logframe of the new resilience project in terms of coherence and SMARTness, and to suggest improvements. The results of this team work helped enhance the new version of the project logframe.

Discussing tools and systems, session four introduced qualitative and quantitative methods and highlighted the benefits of triangulation in mixed-method designs. With this in mind, the second team task was to develop Monitoring and Evaluation (M&E) plans for all outcome indicators.

The two modules helped create a more leveled playing field amongst participants. The link to the project logframe also provided a point of reference for the remainder of the course and the field work.

Introducing the road map to resilience (day 1, session 4)
The final session of day 1 introduced the overall concept of the road map to community resilience - highlighting its nature as an overarching process manual rather than a specific assessment tool. We discussed the context and the four main stages (1: Engage and connect, 2: understanding community risk and resilience, 3: taking action for resilience, and 4: learning for resilience), and noted the change in philosophy compared to 'conventional' programming, with the road map highlighting:

- a _holistic_ rather than _sectoral_ focus,
- a move from '_delivering_' to '_connecting_', '_accompanying_' and '_connecting_' communities,
- a _people-centered_ and _demand-driven_ approach: people define their own projects, and
- a stronger focus on _existing capacities_.

Making the reference to the project, it was noted that the initial stage of the road map had already passed, as initial framework planning for the project had been completed.[12]

12. Commendably, the 'Road Map' assumes a blank sheet in terms of planning: It describes an inductive process that starts with National Societies engaging with communities and stakeholders. While this order of events appears ideal, the humanitarian reality is usually different: it usually begins with donor calls (usually sector-focused) and proceeds with at least rudimentary planning before communities are adequately engaged. The most promising way out of this dilemma may be to keep initial planning flexible, thus giving communities the room to sketch out project priorities and outlines for _their_ context.

In the case of the new resilience project, the project team had a rough idea of capacities and needs - given its experience from the predecessor project. While we recognize that the project logframe indeed reflects suitable focal areas, it must also be understood that initial planning was not as participatory as envisaged in the 'road map' ideal.

The resilience star (day 2, sessions 1-2)
While the 'road map' serves as a process manual to operationalize IFRC's 'Framework for Community Resilience', it contains a tool that - in the course and in the field - turned out to be a star: the 'resilience star'.

As the 'road map' describes, the resilience star can be used in two ways - either (a) *as a tool to summarize information* that has been previously gathered through other means, or (b) *as a participatory assessment tool* that acts as a starting point for further in-depth assessments and planning.

Given the baseline context, we decided to use the 'star' as a participatory tool. Following the outline of the exercise, two groups tested its use and reflected on possible adaptations for field use (see chapter 5).

The resilience radar (day 2, sessions 3-4)
In the afternoon of day 2, we moved to the star's quantitative sister - the resilience radar. We discussed the logic of the radar chart, the use of ascriptors and indices, reviewed the standard questionnaire and explored indications, options and processes for amending the radar. Due to great interest in the radar and the star, the final session planned for the day was shifted to day 3.

The basics of surveying (day 3, session 1)
This short session outlined the overall process of surveys (see illustration at the top). It was noted that surveys can be very effective tools - but only if they are well prepared.

Investing time in distilling information requirements (what information do I really need?), sampling, questionnaire design, training, testing as well as proper analysis and utilization is at least as critical as the actual data collection itself.

Classroom simulation of the resilience star

Questionnaire design (day 3, sessions 1-2)
Building a good questionnaire may sound easy but is not, as the group exercises on this morning showed. Starting with a look at a project's M&E plan, one should ideally:
- run the two checks (are data unavailable, can they best be obtained through a survey?)
- compile a list of information needs (demands on the survey) and structure them according to themes,
- consider five key questions/elements (introduction, identifier, informed consent, open-ended fields, validation),
- choose the most suitable question type (e.g. text, numerical, single- or multi-select, scale),
- consider good practices (e.g. MECE - Mutually Exclusive, Collectively Exhaustive),
- make use of skip logic, and
- in light of limited time of most respondents, consider the length of the interview. Test for relevance - whether you will need to ask all questions for your purposes.

Once a draft questionnaire is ready, it should be tested in the field and possibly revised in case questions prove too difficult.

The session ended with group exercises - each of the four teams had to develop a complete questionnaire around the information needs of one of the project logframe's outcome indicators.

Sampling (day 3, sessions 3-4)
At its heart, sampling is about the effectiveness and efficiency of surveys: choosing a number of respondents (a sub-group of your target population) that is high enough for your needs to make inferences amongst your population, while being as low as possible to keep costs and resources at a minimum.

The session introduced types of sampling (probability and non-probability sampling) and general aspects to consider, and then proceeded with the explanation as to how the sampling framework for the actual baseline had been developed. Key terms such as confidence level, margin of error, sampling interval and stratification were explained in the process.

Using a sampling template for use in future surveys (see appendix D[13]), participants were asked to prepare sampling frameworks for different sets of communities until they became familiar with the overall process.

Baseline questionnaire and data collection (day 4)

The fourth training day was spent on the actual survey questionnaire that had been prepared and translated.[14] We spent the first 90 minutes going through the questionnaire to ensure that all questions were understood. Participants were then asked to interview each other. By mid-day, each participant had acted once as interviewer and once as respondent.

In the afternoon, we introduced electronic data collection through iSurvey/droidSurvey, a smartphone application.[15] There are several benefits of electronic data collection over the paper-based alternative - including time savings, less room for error and added functionality.[16]

For the baseline survey, we used 15 iPod touch devices (running iSurvey) as well as 12 Samsung smartphones (running droidSurvey). With the draft questionnaire already uploaded, we spent most of the afternoon on testing the use of the electronic questionnaire, familiarization with the devices and the app, and on revising the questionnaire further. The day ended with logistical arrangements for next day's field test, and uploading of the revised questionnaire.

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13. The sampling template used in during the training course was semi-automated - the current version shown in appendix D has since been refined by Md. Suman Miah of DASCOH. For further information on the sampling process using the PPS technique, see a short manual prepared by the World Health Organization - available online *here.*

14. For initial familiarization, all participants received printed versions the evening of day three.

15. For details, see *www.harvestyourdata.com* and watch a video describing the set-up *here.*

16. Time savings are mainly due to the fact that that data do not need to be converted to a digital format. Making this step redundant also reduces the room for error. Other advantages include the automatic skip logic, GPS tracking, and the possibility to add photos if needed.

Test run and review (day 5)

For the test run, we selected three locations in Kamarjani Union (which had been supported by the previous DRR-WASH project but were not selected for the actual baseline survey). We appointed three teams (Blue, Red, Green) to these locations. Each team consisted of one survey supervisor, at least five survey enumerators, and two facilitators for the resilience star exercise. During this test run, we ran separate resilience star exercises for women and men. Enumerators conducted two to three interviews each.

Upon return to the classroom, we reviewed the experiences, which showed that both tools were generally effective but needed some tweaking. With regard to the *resilience star*, facilitators needed to better highlight the holistic nature of the tool (rather than referring to disasters only), explore probing, and receive more guidance on the contextualization of the characteristics. The short facilitator's manual previously prepared was updated in response.

With regard to the *resilience radar*, it was found that the survey questionnaire was generally too long (45-60 minutes per interview), that some translations had to be amended, and that some questions proved difficult (the questionnaire was revised in response).

The training course concluded with a review and the handover of certificates by the BDRCS Gaibandha Unit Chairman.

Review of the training course

In spite of the limitations of the timing during Ramadhan, the 'measuring resilience' course proved effective - participants' reflections pointed to several underlying factors:

- a good mix between theory and practice (group exercises)
- sound preparation of course content and presentations,
- great interest in the topic of measuring resilience,
- team-led daily reviews, using quiz-show and other formats,
- the pool of experience amongst participants, and
- excellent preparation of logistics (by the project team).

Suggested improvements included:
- extending the length of the course by 1-2 days and allocating more time to the resilience star (note that this would also allow for more guidance on enumerator training, an aspect that we could only cover very briefly in the final session),

- advance sharing of presentations and reading material, and
- considering participants' experience, the module on monitoring basics may be shortened in future courses.

In summary, the course was highly appreciated by participants - with graduates feeling confident in independently measuring resilience with star and radar.

5. Amendment of tools and field application

For the application in the baseline study, we adapted both tools for a variety of reasons. Let us review the changes we made to the resilience star and to the resilience radar, and then summarize experiences from their actual application in the field.

Amendments to the resilience star

We adapted the resilience star in three ways and then applied it as a participatory tool a total of 15 times.[17]

The **first adaptation** concerns the first characteristic ("knows its risks, is healthy, can meet its basic shelter, food and water/sanitation [needs]", see fig. 3). We felt that this characteristic was overloaded with too many aspects, and that it would be unwieldy in practice. Therefore, we split this characteristic in two:
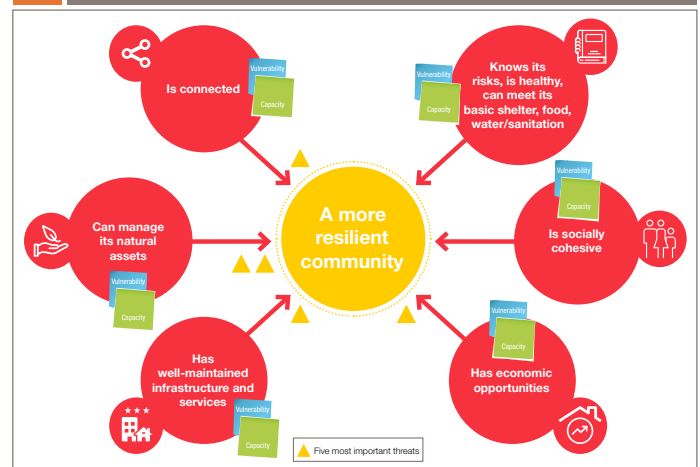
- *is healthy and can meet its water and sanitation needs*
- *knows its risks and can meet its shelter, food, and education needs*.

This brings the overall number of 'characteristics' to seven. Notably, we added 'education' as another aspect, as course participants argued that this was not covered by the original version of the star.

The **second adaptation** concerns the question over gender-disaggregated groups. While the 'Road Map' does not suggest splitting community members into two separate groups, we initially explored a gender-segregated approach (a) to see whether men and women identified different patterns of threats, capacities and vulnerabilities, and (b) to see whether it would make a difference to the level of women's participation. We maintained gender segregation over the first two days (test run in Kamarjani and in Chithulia Dighor) and then reviewed the outcomes.

Fig. 3 | **The original resilience star** (IFRC 2016)

Our analysis showed neither any significant differences in the outcomes, nor was there any indication that women's voices were suppressed in any way (rather, women appeared to be the more outspoken group).

We therefore decided to continue with mixed-gender groups throughout the remainder of the study. Nonetheless, for future application in areas with a different cultural setting, it may be worth considering separate group exercises, then compare and collate results before moving into joint planning.

The **third adaptation** concern timing and follow-up. In the context of working during Ramadhan, we felt that we could not work with communities for more than 150 minutes. Therefore, we did not utilize the star exercise for community-based planning. This presented no problem for the baseline context.

However, where time is not a major issue, one could build on the initial findings and ask further: 'considering these threats, capacities and vulnerabilities, what can be done to build on capacities and reduce vulnerabilities and/or threats? We suggest that this aspect be explored in all project communities, and that results form the starting point for community-based planning.

Amendments to the resilience radar

By comparison, the star's sister tool underwent far greater adaptations to render it more relevant to the project's context - these concerned four types of changes:
(a) we needed to **add questions** to assess the values related to logframe indicators,
(b) we needed to **replace** or **change questions** to make them relevant to the local context,

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17. During the test run, each of the three teams applied the tool twice (once with women, once with men). In Chithulia Dighor, each of the three teams was in charge of one third of the village, applying two separate exercises with men and women. In each of the nine remaining villages, mixed star exercises were conducted (only one per village).

(c) in light of added questions (see point a), the duration of interviews became too long, requiring us to **delete questions**, and

(d) in some cases, we needed to **adjust ascriptors** or revise the formulas underpinning the radar, making the resulting radar charts more reflective of the situation on the ground.

All changes to the original resilience radar are listed in *figure 4*.

Lessons from the field

With the described adaptations, both tools proved effective in the field. Most of the resilience star exercises turned out to be major events: they included lively and sometimes strong debates, yielded great insights (see chapter 7), and were often attended by village or union leaders.

The key lesson from the experience is that facilitators need to be well-prepared and should ideally work in teams of three (one facilitating the discussion, another writing and placing cards on the star, another one documenting the discussion).

We have prepared a two-page guidance note for facilitators that should complement the more elaborate guideline presented in the 'Road Map to Community Resilience'.

In terms of the resilience radar, interviews progressed well and became shorter over time: as enumerators became more experienced, the average interview duration decreased form 55 to 35 minutes. With the benefit of hindsight, another day should have been allocated for enumerator training (including another test run).

While the general logic is not called into question (the initial 'measuring resilience' training course producing graduates who could then train and supervise enumerators), more time for enumerator training may have reduced initial problems.

Figure 4 | **Overview of changes to the original resilience radar**	
Changes	**Reason**
O | Background	
Questions 0.0, 0.1, 0.2 adapted to context	Identifier questions
A | Community capacity	
All questions remain the same - in the electronic version, answer options were displayed as 'sliders' with smiley icons (this also applies to all questions with the same logic - parts B, C.1-4, D.1-3, E.1-7	Showing the slider to the respondent made answering the questions easier and faster than reading out the five answer options.
B | Social capital	
Question B.6a added and incorporated into RR calculation	Added to measure conflict sensitivity and solving (project team suggestion)
Part C | Inclusiveness	
No changes	
Part D | Linkages	
Questions D.4a, D.5a, D.6a, D.6a added	Suggested by the project team, these questions concern involvement in ward shavas and open budget sessions.
Part E | Disaster preparedness	
• Questions E.7a-e added but not counted for radar • Question E.13 - now referring to floods (not storms) • Question E.14a added on evacuation behaviour	• E.7a-e required by project team • E.13 - floods are the main hazard • E.14a required by project team
Part F | Safe shelter	
• Questions F.3-4 deleted • Safe shelter awareness taken out of radar calculation • Question F.8 and F10 deleted • Question F.9 changed • Question F.11a added	• F.3-4: limited relevance to project • Safe shelter awareness: limited relevance • F.8/F10: limited relevance to project • F.9: adjusted to plinth-raising • F.11a (house distance from embankment) added due to particular relevance
Part G | Resilient livelihoods	
• Question G.1a: option 5 (NTFP) deleted • Question G.1b: option 6 reads now 'cash for work or food for work' (the latter being new) • Questions G.7a-f added but not counted in formula • Question G.9 option 3 re-worded	• G.1a: NTFP not relevant • G.1b: food for work common and thus added • G.7a-f: requested by project team • G.9 change requested by project team
Part H | Natural resources	
• Questions H.3-4 deleted	• Not relevant to the project
Part I | Health	
• Questions I.3-4 (health knowledge) and I.5-6 (health practice) deleted - formulas adjusted • Question I.11: option 4 adjusted (poor service or absence of staff), option 88 (other) added	• Limited relevance and need to downsize questionnaire • Question I.11: absence of health center staff is a common issue in the area
Part J | Water & sanitation	
• Questions J.1a (arsenic) and J.3a (distance well-house) were added • Question J.4: options 2,5,8 deleted • Question J.8 (full latrine pit) added • Formula correction	• J.1a and J.3a added after project team input • J.4: deleted options not relevant • J.8 (added after project team input but not taken into account in underpinning formula • Formula correction

For additional information, see the final version of the questionnaire **(appendix E)** and the data analysis sheet **(appendix G)**.

In the questionnaire, any modifications from the original radar questionnaire are printed in orange font. Similarly, the data analysis sheet highlights new/altered questions in orange shading.

SECTION C | **FINDINGS**

6. Resilience radar results

When discussing the resilience radar results, we should begin with a look at the sample sizes. As shown in fig. 5, we exceeded the target samples for both strata and remained in 45-55% frame of gender balance for both strata.

For the data analysis, we prepared three radar charts (each with respective Excel sheets in the data analysis sheet, see appendix G).

First, we generated the actual project baseline pattern for all communities (see fig. 7a overleaf). *Second*, we plotted the two patterns 'old' and 'new' communities (strata I versus strata II) on a single radar chart (see figure 6 on the right).

This is not so much a baseline but rather a horizontal comparison between previously supported (target) and unsupported (control) groups.

Looking at figure 6, one can easily grasp that 'old' communities have generally higher values - indicating (but not necessarily confirming)[18] that the former DRR-WASH project had an impact towards increased resilience.

Third, we compared the results of female and male respondents (see fig. 7b). Here, the differences are very minor and indeed significantly smaller than between old and new communities.

....
18. A difference does not necessarily confirm impact, since other factors may have played a role too. In the endline survey, we will thus need to add questions of attribution.

Figure 5	**Actual versus target sample sizes**			
Strata	**Target**	**Actual**	**male**	**female**
Strata I ('old' communities)	268	273	50.5%	49.5%
Strata II ('new' communities)	384	396	45.2%	54.8%
Total	**648**	**665**	**47.4%**	**52.6%**

Let us have a closer look at the individual dimensions, and consider four values for each of them:
(a) the **baseline value** for all communities
(b) **old communities**' value
(c) **new communities**' value, and
(d) **the difference** between old and new communities.

In the remainder of this chapter, we will highlight areas of differences as well as possible implications for the project.

Figure 6 | **Resilience radar: comparing 'old' and 'new' communities**

0.514	'old' phase I project communities
0.571	'new' phase II project communities
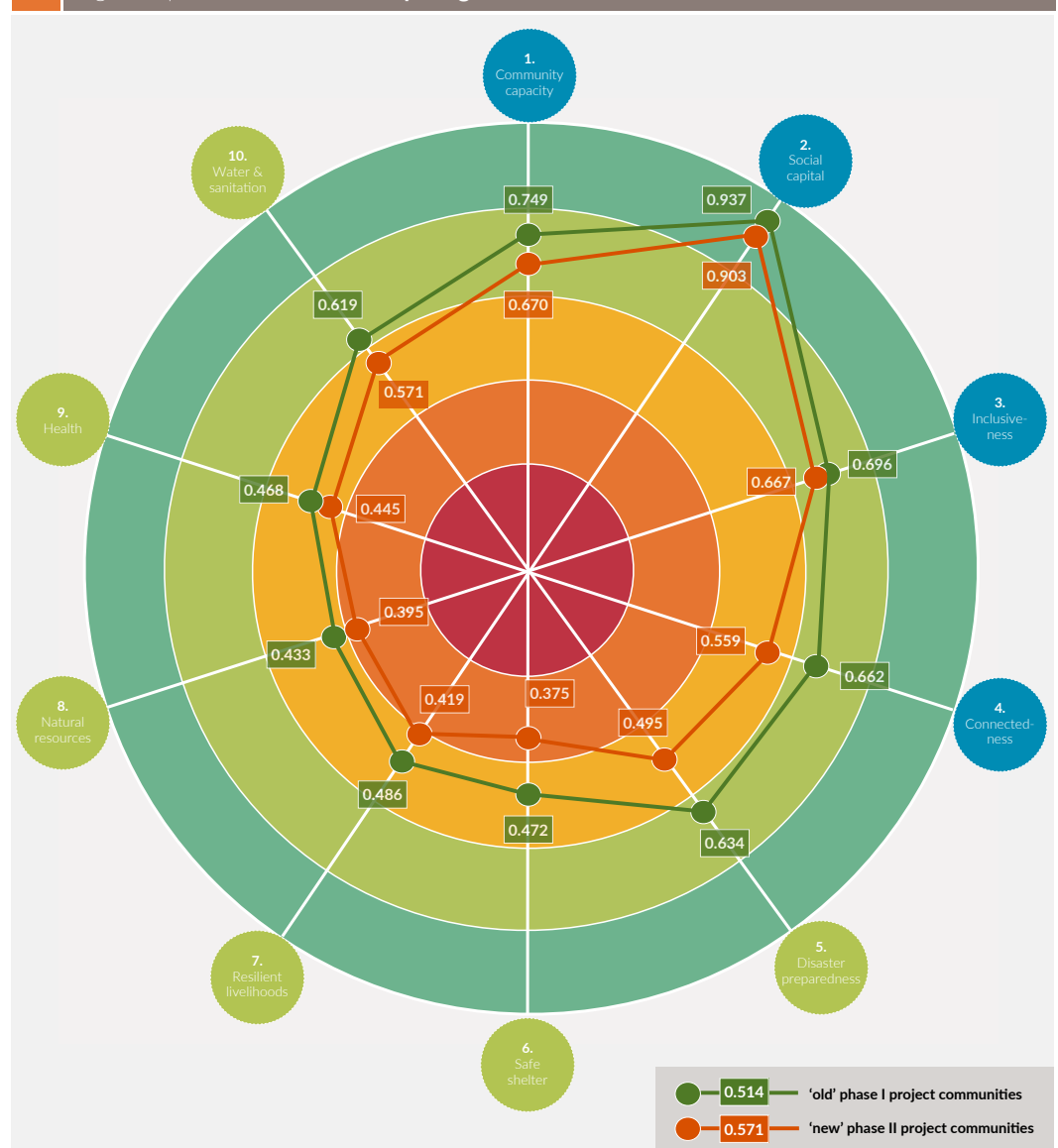
Figure 7 | **Resilience radar: comparing 'old' and 'new' communities**

Fig. 7a | **Baseline**

all project communities 0.414

Fig. 7b | **Women** versus **men**

0.514 Male respondents (N=317)
0.571 Female respondents (N=352)

Community capacity

low	medium	high	very high
	Baseline value **0.702**		
Strata I (old)		0.749	
Strata II (new)	0.670	**0.079** Difference	
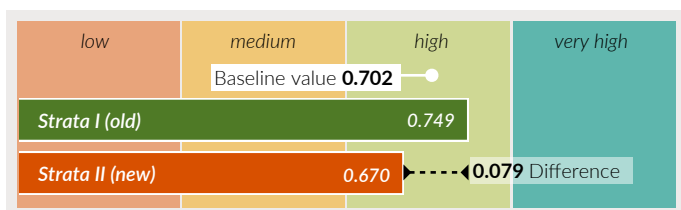
Both strata perceive their community capacity as high - with project-supported communities having an advantage of 0.079 points. This is due to **five key factors** - family support programs (A.3), general service provision (A.4), problem-solving (A.5), reflection and adaptiveness (A.8) and trust in public officials (A.13). In all of these elements, old communities outperform new ones by at least 0.08 points.

The generally high rating indicates a good basis for community involvement in planning, and can be considered as a favorable factor in terms of sustainability.

Social capital

low	medium	high	very high
		Baseline value **0.915**	
Strata I (old)			0.937
Strata II (new)			0.903
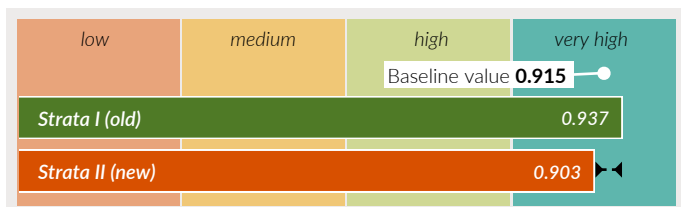
In terms of social capital, both strata see themselves in the 'very high' area - and there are neither any significant differences between old and new communities, nor between women and men.

The fact that respondents feel well-embedded and have a strong sense of belonging, that they have a high willingness to collective action, mutual support and conflict resolution is extremely favorable to community and group-based activities for the project.

Inclusiveness

low	medium	high	very high
	Baseline value **0.683**		
Strata I (old)		0.696	
Strata II (new)	0.667	**0.029** Difference	
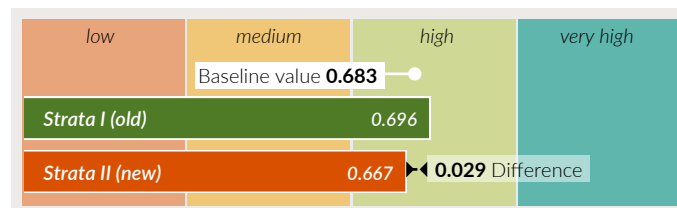
In terms of general and disability inclusiveness, there are no significant differences on either axis (old/new, male/female).

In terms of **gender** however, the picture differs: in old communities, women are significantly more likely to speak during meetings (+0.141) - yet, this does not (yet) translate into a discernible difference in terms of decision-making power. While participation in meetings is rather

Fig. 8 | **Gender roles in the community**

Regarding community meetings, who in your community... (questions C.5-C.8, all communities)

- only men
- mostly men
- equal shares
- mostly women
- only women

	only men	mostly men	equal shares	
takes part	13.9	19.9	51.1	
speaks	18.5	29.2	39.7	
influences	32.1	33.8	27.2	
makes devisions	37.3	33.7	25.0	
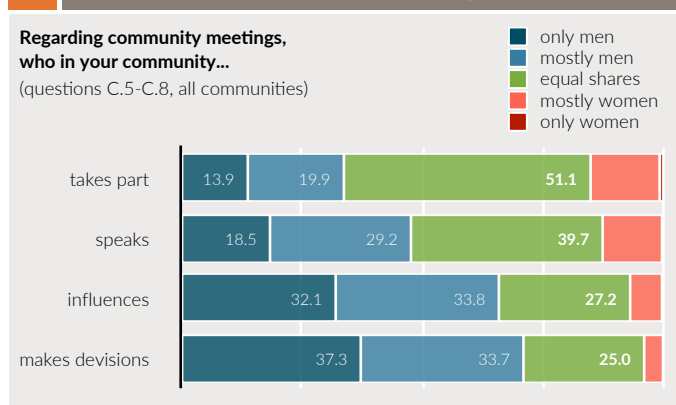
balanced, actual decision-making largely remains a mainly male domain (see figure 8). In terms of inclusiveness, the new project may thus seek to further advance **gender mainstreaming** and women's empowerment - for instance through targeted capacity-building and gender-based group formation.

Connectedness

low	medium	high	very high
	Baseline value **0.602**		
Strata I (old)	0.662		
Strata II (new)	0.559	**0.103** Difference	

The level of communities' connectedness is medium (new communities) to high (old communities). With regard to all three original aspects of the radar (collaboration with external actors, proactive seeking of support, and responsiveness of external actors to these approaches), there is a significant advantage of old communities (meanwhile, there is no notable difference between women and men).

The questions added to the radar furthermore show that the level of participation in ward shavas and open budget sessions (which are opportunities to raise issues and express needs) is significantly higher amongst old communities: here, 34.1% of respondents (22.2% in new communities) say they participated in a ward shava over the past twelve months, while almost a quarter (23.4%, compared to 7.8%) took part in an open budget sessions.

As it is highly likely that this pronounced difference is a result of the DRR-WASH project, the new project should strive to promote linkages to government agencies. Stronger linkages enable external support for general development and times of crises, and may ultimately help to sustain project outcomes.

Disaster preparedness

low	medium	high	very high
		0.540 Baseline value	
Strata I (old)		0.634	
Strata II	0.495	**0.139** Difference	
	0.813		COMMUNITY PREPARED-NESS
	0.647		
0.455			HOUSEHOLD PREPARED-NESS
0.344			
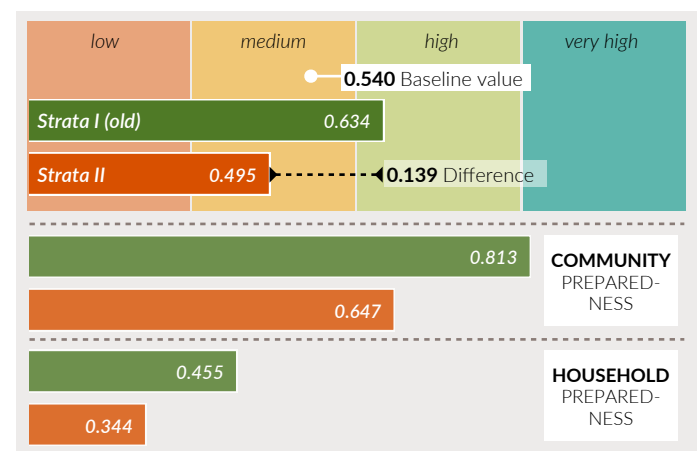
Compared to the four process dimensions discussed above, most index scores on the outcome dimensions are generally lower.

One exception is disaster preparedness, where old communities score in the 'high' (0.634) and new ones in the 'medium' range (0.495; overall baseline value 0.540). Disaster preparedness sees the highest observed 'advantage' of old communities over new ones - something that may come as little surprise given the focus of the DRR-WASH project.

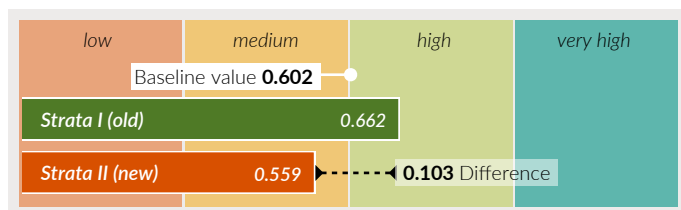We make three observations in this regard: *first*, there is a significant advantage of old over new communities for every single question in the preparedness dimension - it thus appears that all major elements of preparedness have been addressed by the DRR-WASH project.

Second, preparedness at the community level is much higher than amongst households. By implication - *third* - disaster risk management efforts in future programming should consider extending disaster preparedness to the household level (while continuing to pursue advances in community-level preparedness).

Areas of particular action could include more frequent disaster drills, family contingency plans and household preparedness kits, first aid training, and measures to evacuate or secure assets ahead of hazard events.

Promoting household preparedness could include neighborhood groups - another level that serves as an extension of village disaster preparedness teams, providing a broader reach into the community. Similar approaches have been used with great success in India and Sri Lanka.

Safe shelter
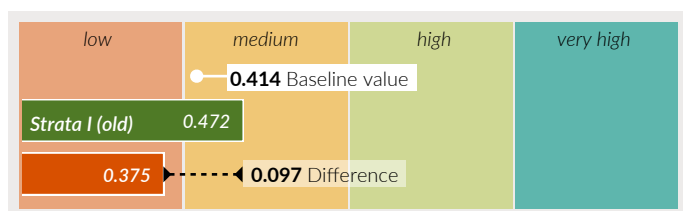
With regard to safe shelter, we disregarded the safe shelter awareness component and focussed on safe shelter practice. While 'old' communities have again a clear advantage over new ones, there is considerable room for improvement - an aspect that is related to the limited household preparedness mentioned earlier.

Further investing in plinth-raising (less than a quarter of households is raised to a level that would prevent major floods), trimming of trees around houses (reducing storm damage) and retrofitting roof structures are activities that should be promoted more broadly.

Resilient livelihoods
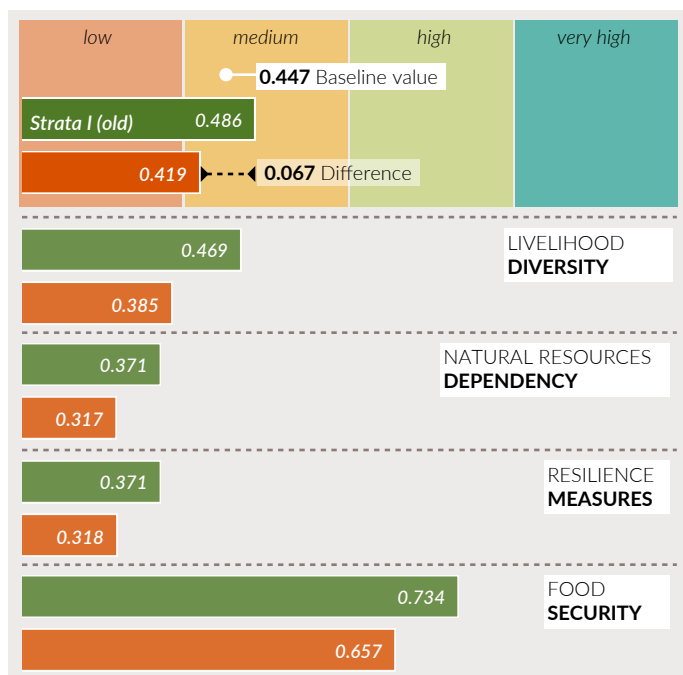
The resilience of livelihoods was neither a focus of the previous project, nor is it one of its successor. This helps to explain the very little difference observed between old and new communities (both score in the 'medium' range).

Looking at the sub-indices, we see food security as rather high, but observe low scores in terms of natural resource dependency (implying a high level of exposure to extreme weather events) and the adoption of resilience measures. Given the portfolio of BDRCS and SRC, it may be rather

difficult to work on diversification and reduction of exposure (also considering the context - in particular on the chars). Arguably the most promising avenue to increase livelihood resilience is the promotion of buffers - through savings groups and the promotion of micro-insurance.

Natural resource management
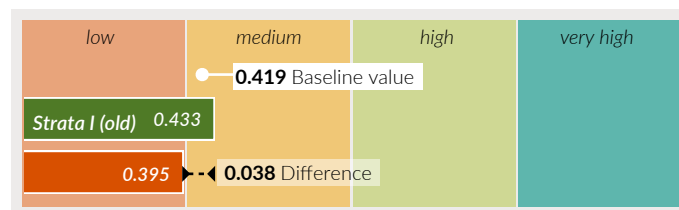
Natural resource management (NRM) should be an area of concern - particularly in the more densely populated mainland communities (e.g. use of pesticides). Both old and new communities have rather low scores in this respect; there is very little management that would help sustain natural resources for future generations. The project team may consider mainstreaming NRM aspects into the 'portfolio' of village disaster management teams or committees.

Health
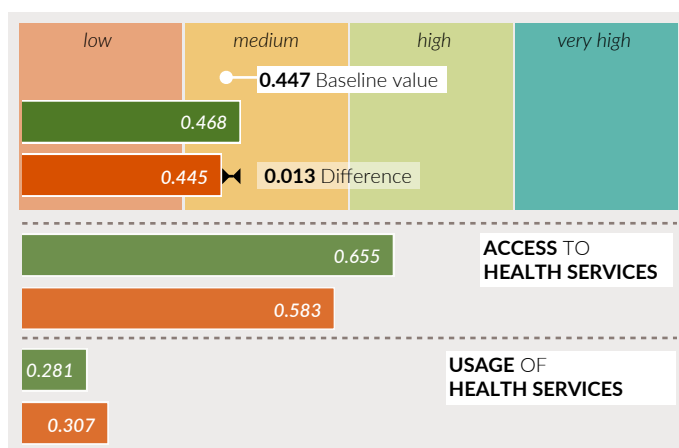
In principle, both old and new communities generally have access to health services - an aspect that his higher amongst old communities (notably, there have been investments into community clinics). However, usage remains very limited (largely confined to health emergencies). Distance, price and long wait times are cited as the main barriers to a more frequent use of health services.

The new project should therefore focus on advocating for improving service quality, reducing costs, and consider other instruments to increase usage of health services for non-emergency/ preventative incidents.

Water & sanitation

low	medium	high	very high

0.603 Baseline value

Strata I (old) — 0.619

Strata II (new) — 0.571 ◄--◄ **0.048** Difference

0.773	**ACCESS** TO **SAFE WATER**
0.744	
0.605	**HAND-WASHING** PRACTICES
0.550	
0.480	**LATRINE USAGE**
0.419	
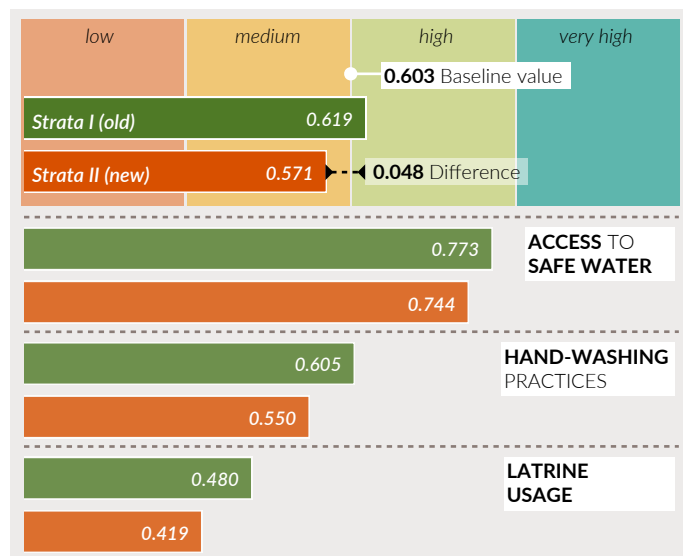
The water and sanitation dimension is the second-highest scoring outcome aspect of the resilience radar (after disaster preparedness). However, the difference between old and new communities is much smaller.

Water as such is of little concern; most respondents say they have water in sufficient quantity throughout the year

and in close proximity. While almost all people treat the water prior to consumption, most do not know about the arsenic content in the ground water (56.0% in old and 82.5% in new communities).

Hand-washing practices are generally good - promoting the use of soap and washing hands before feeding children, after cleaning babies' bottoms and handling animals would address key gaps.

In terms of **latrines**, coverage is significantly higher in old communities in old communities (74.4%) than in new ones (56.1%) - cleaning and maintaining latrines can be further improved in both settings. It should be noted that the survey did not ask for hygienic latrines - which are much more common in 'old' communities due to the interventions of the previous project.

7. Resilience star results

Analyzing qualitative information is inherently more difficult than the quantitative data gathered for the resilience radar; the respective stars illustrate patterns for each visited village (rather than the overall project area). As such, the ten 'stars' (see appendix H) are valuable for

Women listen carefully during the resilience star exercise in Khatiamari. *PHOTO: P. BOLTE, BANYANEER*

community-based planning and as well as overall programming. In terms of *measuring* resilience, they need to be read with caution for several reasons: *first*, the selection of participants is not necessarily representative of the wider community. *Second*, the role of the facilitators and his/her line of questioning inevitably influences the results.[19] *Third*, the number of cards for vulnerabilities and capacities is neither necessarily exhaustive, nor are the items on each card of equal importance for making the community (more) resilient.

In sum, it is uncertain that a repetition of the exercise would lead to the same outcomes - the value of the resilience star as a tool for the actual **baseline purpose** (enabling longitudinal comparisons and the eventual attribution of project impact) must be seen as limited (its strength lies in participatory assessment and planning).

....
19. One lesson from this first application of the resilience radar is that facilitators need to be better briefed in terms of the contextualization of the seven 'characteristics' as well as the overall line of questioning - both the 'road map' and the facilitator manual prepared for this study have gaps in this area. Greater consistency between facilitators would reduce but arguably not overcome the problem of replicable results.

Having made these limitations explicit, let us distill the broad trends that emerged from the exercises across ten communities.

Old communities fare better

On all seven characteristics, 'old' communities fare better than new communities: counting the share of 'capacity cards' of all cards, old communities have a consistent advantage - particularly pronounced in health, economic opportunities as well as infrastructure/services. See the numerical summary in appendix H for details. The charts at the bottom of this page and the next illustrate the difference between one of the most resilient communities (*this page*, project-supported Batikamari) and arguably the least resilient (*next page*, the 'new' community of Katlamari). This observation is in line with that of the radar.

Threat patterns

Floods and erosion are the main external threats and feature amongst the 'top five' threats of all communities (other natural hazards (droughts, cyclones) play a role in some villages). Most other threats fall into two categories - **poor service provision** in terms of health (generally

Batikamari (A.1.6) Resilience star

Assessed by Md. Golam Mostafa, Teresa Pereira
Date 19.06.2017
Duration: 75 minutes
Participants: 11 women, 13 men

...IS CONNECTED.

CAPACITIES	VULNERABILITIES
• Agencies (FWA and HA) visit the community • Good communication with government agencies of upazila and LGIs • UP chairman comes to the village when needed • We work with NGOs	• Lack of government facilities in the village • Upazila level service providers are not available in the char area

...KNOWS ITS RISKS AND CAN MEET ITS BASIC SHELTER, FOOD AND EDUCATION NEEDS.

CAPACITIES	VULNERABILITIES
• Most HHs have raised plinths • The few low-lying HHs set up bamboo khats • We make boats (vela) out of banana trees • Good crop production • Vast and fertile land • We have a school (primary & secondary)	• No flood shelter • Food crises during flood period • Lack of good roads • No facilities for higher education • No madrasha

...CAN MANAGE ITS NATURAL ASSETS.

CAPACITIES	VULNERABILITIES
• We have fertile and cultivable land • Forestry • Fish resources • Use of organic fertilisers • We have bamboo gardens	• Riverbank erosion

...IS HEALTHY AND CAN MEET ITS WATER & SANITATION NEEDS.

CAPACITIES	VULNERABILITIES
• There is no open defecation • Good hand-washing practices • 90% of tube wells on platform • Access to safe water • Arsenic-free water	• No clinic • Not a single doctor in the village • Lack of boats for emergencies

...HAS WELL-MAINTAINED INFRASTRUCTURE AND SERVICES.

CAPACITIES	VULNERABILITIES
• Most of the houses are on raised plinths. • Strong house structures • Good structure of the school • Good structures of latrines and tube wells	• No elevated 'resilience' road

...IS SOCIALLY COHESIVE.

CAPACITIES	VULNERABILITIES
• Helping each other in times of crisis • No violence against women • No early marriage • No dowry practice • Any festivities are enjoyed by all • No conflicts in the community • We raise our voice on social issues • We have allocated land for the school	(None)

...HAS ECONOMIC OPPORTUNITIES.

CAPACITIES	VULNERABILITIES
• Most make a living from farming • Livestock rearing • Daily labour • We have a market • Multiple crops produced • Low production cost, good prices for products	• Limited access to capital (micro-credits) • Incidences of robberies

Threats (center): Lack of higher education · Floods · Poor health services · Erosion · Bad roads · BATIKAMARI

preventive care, maternal and child health (MCH), emergency care), education and transport - as well as **economic issues** (lack of employment, cattle thefts, cattle diseases).

Key vulnerabilities

Communities are most vulnerable in situations where the three threat categories compound each other: during floods periods, most households have neither enough food nor employment nor services.

While water-borne diseases are most widespread during these times, the limited health services are unavailable when they are needed the most. Villages on chars are particularly vulnerable under these conditions. The resilience star was useful at illustrating these differences between flood and normal times - the pattern of seasonal food insecurity is much clearer than the radar results suggest.

Lack of veterinary services (to prevent and deal with livestock diseases), emergency health as well as MCH, and difficulties in accessing markets, employment and overall

services are other vulnerabilities. In terms of approaching governments and expressing their needs, there is a clear 'advantage' of old communities, who are more likely to participate in government-related planning than 'new' communities.
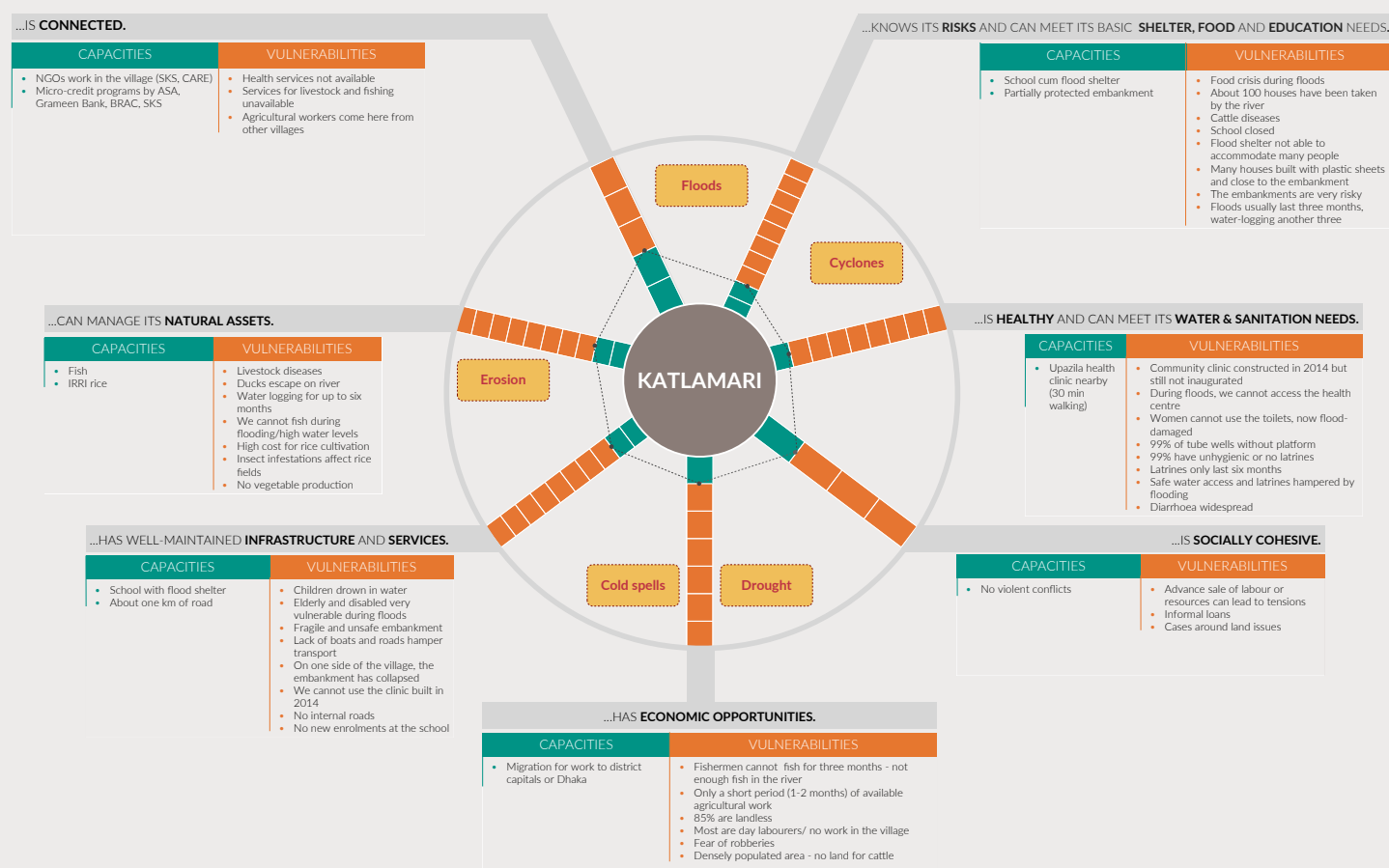
Key capacities

Aspects of **social capital** stand out as a key capacity - mutual support and collective action (e.g. community guard system to prevent cattle thefts). Communities also highlight the **natural** and **human resources**, saying however that they cannot use them to the full potential.

Old communities do not mention disaster management teams, however, some communities list **coping mechanisms** (seasonal migration, building rafts) as capacities. Elevated roads as well as houses and buildings on raised plinths (where they exist) are frequently listed, along with availability of water (particularly those tube wells set on elevated platforms).

As the patterns differ for each community, we recommend to study appendix H for more detailed information.

Katlamari (C.4.1) Resilience star

Assessed by Reazul Karin
Shariful Islam
Date 21.06.2017
Duration: 120 minutes
Participants: 25 women, 20 men

...IS CONNECTED.

CAPACITIES	VULNERABILITIES
• NGOs work in the village (SKS, CARE) • Micro-credit programs by ASA, Grameen Bank, BRAC, SKS	• Health services not available • Services for livestock and fishing unavailable • Agricultural workers come here from other villages

...KNOWS ITS RISKS AND CAN MEET ITS BASIC SHELTER, FOOD AND EDUCATION NEEDS.

CAPACITIES	VULNERABILITIES
• School cum flood shelter • Partially protected embankment	• Food crisis during floods • About 100 houses have been taken by the river • Cattle diseases • School closed • Flood shelter not able to accommodate many people • Many houses built with plastic sheets and close to the embankment • The embankments are very risky • Floods usually last three months, water-logging another three

...CAN MANAGE ITS NATURAL ASSETS.

CAPACITIES	VULNERABILITIES
• Fish • IRRI rice	• Livestock diseases • Ducks escape on river • Water logging for up to six months • We cannot fish during flooding/high water levels • High cost for rice cultivation • Insect infestations affect rice fields • No vegetable production

...IS HEALTHY AND CAN MEET ITS WATER & SANITATION NEEDS.

CAPACITIES	VULNERABILITIES
• Upazila health clinic nearby (30 min walking)	• Community clinic constructed in 2014 but still not inaugurated • During floods, we cannot access the health centre • Women cannot use the toilets, now flood-damaged • 99% of tube wells without platform • 99% have unhygienic or no latrines • Latrines only last six months • Safe water access and latrines hampered by flooding • Diarrhoea widespread

...HAS WELL-MAINTAINED INFRASTRUCTURE AND SERVICES.

CAPACITIES	VULNERABILITIES
• School with flood shelter • About one km of road	• Children drown in water • Elderly and disabled very vulnerable during floods • Fragile and unsafe embankment • Lack of boats and roads hamper transport • On one side of the village, the embankment has collapsed • We cannot use the clinic built in 2014 • No internal roads • No new enrolments at the school

...IS SOCIALLY COHESIVE.

CAPACITIES	VULNERABILITIES
• No violent conflicts	• Advance sale of labour or resources can lead to tensions • Informal loans • Cases around land issues

...HAS ECONOMIC OPPORTUNITIES.

CAPACITIES	VULNERABILITIES
• Migration for work to district capitals or Dhaka	• Fishermen cannot fish for three months - not enough fish in the river • Only a short period (1-2 months) of available agricultural work • 85% are landless • Most are day labourers/ no work in the village • Fear of robberies • Densely populated area - no land for cattle

KATLAMARI

Floods　Cyclones　Erosion　Cold spells　Drought

8. Triangulation and logframe data

Bringing the results of the resilience star and the radar together helps describing the 'baseline' picture and inform programming priorities. In this chapter, we highlight priority aspects for programming - those that are likely to make the greatest difference in terms of reinforcing resilience. The table overleaf (see fig. 10) also provides the baseline data for those logframe indicators that could be sensibly assessed through resilience radar and star.

We identified ten priority areas for the resilience project and list them below by rank, starting with the most important aspect.

1   Develop or strengthen village groups with comprehensive 'mandates'.

Dimensions
Community capacity, cross-cutting

The creation of village disaster response teams in the previous project is a sensible measure to enhance disaster preparedness at the community level. These groups should be replicated in new communities. However, their scope should be expanded in two ways.

First, they should become the interlocutor between neighbourhood sub-groups on the one hand, and key government departments at union, upazila and district levels on the other - making them key bodies to distill interests of the wider community, and advocating the interests to government agencies.

Second, their mandate should be expanded to cover greater promotion of household-level preparedness, natural resource management, and aspects of resilient livelihoods.

Given high levels in community capacity and social capital, there is arguably greater potential in group-based problem-solving.

2   Strengthen connections further and focus on advocacy.

Dimensions
Connectedness, cross-cutting, services

'Old' communities are better connected to external players than new ones - indicating an effect of the previous project. Yet, with service provision being severely limited (e.g. proxy teachers in schools, limited availability of health staff) and infrastructure curtailed (infrequent boat services, bad roads, little investment in riverbank protection), communities should demand better services and infrastructure. Participation in ward shavas and open budget sessions should be further promoted.

3   Develop neighbourhood-based savings and household preparedness groups.

Dimensions
Community capacity, disaster preparedness, resilient livelihoods

Neighbourhood-based sub-groups can be an effective way to reach the broader community: Having 30-40 households meet regularly and finding ways to improve and maintain their part of the village, to guard animals against theft, and to support each other in improving their houses would build on the high levels of mutual support, embeddedness and propensity to collective action that the survey identified.

These sub-groups would also help create the critical mass and peer pressure to generate effective and sustainable behaviour change (e.g. evacuation practices, hand-washing, creation of buffers).

Given the high levels of trust, these groups could also assume the role of saving funds - increasing both savings for times of crises and improving access to credit.

4   Assess and address gender power dynamics.

Dimensions
Inclusiveness, cross-cutting

While many women in the project area take part in group meetings and raise their concerns, eventual decision-making remains a male-dominated domain. Women are disproportionally affected by poor health services (with lack or limitations of delivery services, ante- and post-natal care) and by limitations in employment.

Targeted approaches are therefore recommended to improve the living conditions of women and to address power imbalances. This could include the formation of women groups and promotion/facilitation of employment opportunities (e.g. handicraft production), which would raise earning power and also make households more resilient (having more sources of income).

5   Enhance health services at community clinics.

Dimensions
Health

Lack or limitations of health services are listed as one of the key threats by five of the ten assessed communities, and features amongst the vulnerabilities amongst all of them. While community clinics exist in many places (in fact, the previous project provided some of them), staff is often absent and offers limited services when present.

There is no easy fix to this challenge - but a promising solution may be two-pronged: *First*, communities need to be more empowered to demand good service quality. The

Fig. 10 | Baseline values for selected logframe indicators

Logic	Indicator	Baseline
Impact: Strengthened resilience of vulnerable communities is sustained through support from NS and sub-national DRM system	IM 4 **Index values of at least five of the 10 resilience radar dimensions have increased by 40%** *[The list below shows the ten dimensions with baseline values and the target values, assuming the 40% increase]*	
	Community capacity index **0.702** *(0.982)*	
	Social capital **0.915** *(1.000)*	
	Inclusiveness **0.683** *(0.956)*	
	Connectedness **0.602** *(0.843)*	
	Disaster preparedness **0.430** *(0.564)*	
	Safe shelter **0.414** *(0.579)*	
	Resilient livelihoods **0.447** *(0.626)*	
	Natural resource management **0.419** *(0.589)*	
	Health **0.454** *(0.636)*	
	Water & sanitation **0.603** *(0.844)*	
Outcome 1: VDMCs/ communities are mobilized with organisation, information, skill and resources to be better protected and prepared against climate, natural hazard and health risks	OC1.1 **% of communities at risk with a functional disaster management committee**	'Functional' needs to be defined. The existence of teams then needs to be assessed by the project team.
	OC1.2 **% of houses that do not get inundated by the highest flood level experienced in the past ten years** [survey question F.9]	Respondents selected **20.3%** 'applied fully', **45.0%** 'applied partially' (**34.8%** 'not applied')
	OC1.3 **% population with access to basic health care services at all times (normal &during emergencies)**	**59.8%** say that there is a functional health centre within 30 min walking distance [I.8]. However, almost all communities say that clinics are only open on some days of the week, and some are not functional during flood periods.
	OC1.4 **% HHs who use and maintain hygienic latrines**	**63.5%** say they have latrines, but there is no distinction between hygienic and unhygienic. Of those who have a latrine, usage and maintenance is high - **69.9%** say they clean them at least weekly.
	OC1.5 **% HHs with access to safe water at all times including emergencies**	**82.3%** say they have access to sufficient amounts of drinking water throughout the year. Practices to make drinking water safe (e.g boiling) are common - the index for question J.2 is **0.851**.
	OC1.6 **% population washing hand at all critical times**	Question J.4 shows the following hand-washing pattern (index: 0.553): **88.8%** after defecating **74.9%** before eating **63.2%** before food preparation **37.2%** before feeding children **28.3%** after handling animals **26.6%** after cleaning babies' bottoms
Output 1.1 Risk reduction action plans are developed and implemented	OP1.1a **% of HHs familiar with RRAP and seeing it as beneficial to them**	Familiarity with RRAPs (E.7b): **3.9%** very familiar **24.2%** somewhat familiar **71.9%** not familiar It was not checked whether RRAPs were seen as beneficial. The index value is 0.160
Output 1.2 Improved access to water, sanitation, hygiene and basic health care services	OP1.2a **Number of HHs with hygienic latrines**	**63.5%** say they have latrines, but no distinction was made between hygienic and unhygienic latrines.
	OP1.2b **Number of disaster-resilient water points installed and sustainably managed**	Check project documents for numbers. All visited disaster-resilient water points were functioning.
	OP1.2c **Average health knowledge index increased**	The health knowledge index is **0.581** *('high', compare with radar chart)*
	OP1.2d **Number of community groups and community support groups working effectively**	Number of groups has to be assessed by project team (as well as whether they work 'effectively'). Related to VDRTs, **8.4%** are very familiar and **24.0%** somewhat familiar with these teams (E.7a)
	OP1.2e **All built CCs provide focussed ANC, PNC, FP methods and nutrition as mandated**	The resilience star exercises suggest that none of the CCs provide mandated services sufficiently.
Output 1.3 Disaster response plans are effective and practiced by community and LGIs	OP1.3a **% of communities with a contingency plan that is tested through drills at least twice a year**	Regarding **contingency plans**, **5.3%** of respondents feel 'very familiar' and **22.4%** 'somewhat familiar'. Regarding **drills**, **18.4%** have participated in drills in the past twelve months.
	OP1.3c **% of communities with trained emergency response teams (ERT) in FA and SAR skills**	To be assessed by project team
Output 1.4 Early warning systems established and functioning	OP1.4a **% of communities with functioning and effective EWS**	**68.1%** say their communities would be warned of an impending flood ahead of time.
Output 2.2 Social safety net programmes and development schemes implemented in a transparent and accountable setting	OP2.2a **% of population participating in ward shavas and open budget sessions**	In the past twelve months, **27.1%** have participated in a ward shava. **14.2%** participated in an open budget session.
	OP2.2c **% extreme poor/disadvantaged people covered through social protection schemes**	**16.2%** registered as officially poor **23.5%** receive maternity benefits **7.1%** enrolled in an employment guarantee program **7.9%** benefitting from a cash for work program **5.3%** benefitting from a food for work program **8.1%** enrolled in a vulnerable group development program

project team should assist in advocacy while ensuring that communities know their rights and avenues to complain about poor services and demand improvements.

The *second* component concerns local resources: recruitment and training of community health volunteers (CHV) may improve health promotion and emergency care (first aid volunteers, auxiliary midwives). Given that health services are usually unavailable during flood periods - when the prevalence of water-borne diseases spikes, local trained resources are an indispensable element to attain one of the project's targets (of having access to basic health care services during normal times and emergencies - OC1.3, see table 10).

6 Address the food insecurity during flood periods through creation of buffers.

Dimensions
Resilient livelihoods

The majority of survey respondents (60.3%) say that there are times of the year when people do not have enough to eat.The star exercises indicates that this refers to the flood periods.

Creating buffers for these times is therefore essential - promoting savings, food banks and food conservation techniques could be ways to overcome this shortfall.

7 Conduct emergency evacuation drills and enhance early warning and evacuation regimes.

Dimensions
Disaster preparedness

Over the past twelve months, only 18.4% of respondents have taken part in evacuation drills (28.3% in 'old' communities) - there is thus much room for improving and consolidating evacuation practices.

Many communities have flood shelters, but cannot accommodate all flood-affected families - improving facilities should therefore be part of programming.

8 Enhance household preparedness and safe shelter.

Dimensions
Disaster preparedness,
safe shelter

At the community-level, there are several resources to deal with disasters. 'Old' communities have a clear advantage over 'new' ones, and engagement in these community-level activities should be replicated.

Regarding household-level preparedness however, there is more to be done in both old and new communities. While 82.6% of survey respondents say they feel prepared or very prepared for disasters, neither **knowledge** of possible

preparedness actions (index question E.10: a very low 0.185) nor actual **practice** in terms of adopting concrete preparedness measures (93.9% say they have not taken concrete measures to become better prepared) is in line with this perception.

While there have been advances in plinth-raising around houses, only 20.3% are confident that their houses will not be inundated by 10-year flood-highs. Further promotion of support to plinth-raising would thus be sensible.

Trimming of trees around houses as well as safe storage of assets and the promotion of go-bags are further examples of improving household preparedness and safe shelter.

9 Explore ways to provide basic veterinary services to target communities.

Dimensions
Resilient livelihoods

More than half of all households are engaged in livestock production (53.3%), and cattle represents one of their most valuable asset. Losing cattle due to theft and diseases is therefore a major concern that featured prominently in the resilience star exercises.

While communities already take collective action to prevent theft, they are rather helpless when it comes to preventing diseases: with no veterinary services available in most areas (particularly on chars), there is little they can do to save sick cattle.

With problems in maintaining cold chains for vaccines, there is no easy solution to this challenge - but any successful measures are likely to be cost-effective (in terms of benefit-cost ratios), given the high value of livestock.

Solutions may include a combination of regular vaccination rounds by mainland-based vets, training of auxiliary vets in the communities, and the provision of refrigerators in selected locations (to store the vaccines). Developing such systems will require further analysis in the willingness to pay amongst cattle farmers and general feasibility.

10 Expand construction of flood-resilient tube wells and latrines, and continue with hygiene promotion.

Dimensions
Water and sanitation

While the availability of water as such is a minor concern, most tube wells in new communities are not raised by a platform and thus can be easily contaminated or become useless during floods. Construction/upgrades of tube-wells should thus be expanded to new communities.

The same applies to hygienic latrines - although the survey did not specifically ask about types of latrines, the qualitative assessment showed that further promotion and support to the construction of hygienic and flood-resilient latrines remains highly relevant.

In order to reduce the risk of diseases, the promotion of hygiene and hand-washing in particular should be continued and expanded.

9. Conclusion

The application of two new tools to measure resilience proved effective: **first**, participants of the initial training course developed the capacity to use the resilience radar and resilience star without external support. Those participants who joined the baseline as survey supervisors or facilitators were able to consolidate classroom knowledge in practice. **Second**, the baseline itself generated the reference point with which eventual endline data will be compared - enabling the attribution of the impact of the new resilience project in Bangladesh's Gaibandha District.

Testing the two new tools was not without challenges, and the process led to numerous adaptions and improvements. As far as the resilience radar is concerned, a revised toolkit is on Banyaneer's agenda - making the tool more user-friendly. It is our hope that the reflections on the resilience star will be similarly utilized in future versions of IFRC's 'road map to community resilience'.

Aside from producing a reference point for the longitudinal comparison, the baseline study proved also valuable for the course and scope of the new project itself: the ten suggestions in the previous chapter highlight the need to move beyond the modus operandi of the previous DRR-WASH project.

Expanding activities such as plinth-raising and tube construction to the new project areas in Fulchari, and adding activities towards greater household preparedness, are within the 'portfolio' of the SRC and BDRCS project team. For other aspects - those related to food security, gender, cattle diseases, and livelihood more generally - new expertise may be required through targeted recruitment and/or partnerships with relevant NGOs.

This task will add complexity to an already ambitious project: the expansion from 24 to 93 communities makes a larger project team and different structuring inevitable.

We have prepared a suggestion for a possible team set-up - see appendix J for details. The suggested project pyramid would allow for adequate frequencies in terms of project support to communities (on average, at least fortnightly visits).

In essence, reinforcing the resilience of the communities will come down to enhancing the capacity to connect, reflect, adapt and problem-solve. With high levels of social cohesion, trust and experience in collective action, there is a sound foundation for group-based action.

Using this foundation and adding further knowledge, resources and - crucially - helping to advocate for better services will be the key. It is our hope that the results of this study will be a basis for participatory refinement and operationalization of project plans, and for helping to render communities in Gaibandha more resilient.

Abbreviations

ANC	Ante-natal care
BDT	Bangladesh Taka
BDRCS	Bangladesh Red Crescent Society
CC	Community clinic
CLP	Char Livelihood project (CARE)
DASCOH	Development Association for Self-reliance, Communication and Health
DRR	Disaster risk reduction
ERT	Emergency Response Team
EWS	Early warning system
FA	First Aid
FbF	Forecast-based Financing
HH	Household
IFRC	International Federation of Red Cross and Red Crescent Societies
MCH	Maternal and Child Health
PNC	Post-natal care
PPS	Probability Proportional to Size
RRAP	Risk Reduction Action Plan
SAR	Search and Rescue
SRC	Swiss Red Cross
TB	Tuberculosis
ToR	Terms of reference
UP	Union Parishad