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RESILIENCE INTELLIGENCE

Financial services for resilience: how to assess the impacts?

Implementing innovative methodologies to measure resilience in Niger

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KEY MESSAGES

- Niger is a least developed country prone to recurrent drought, which affects a large share of the population and results in severe food security issues.
- Support mechanisms, including access to adequate financial resources, are important for individuals and communities to better prepare for and cope with climate extremes.
- Village savings and loan associations (VSLAs) are implemented as a means to support rural communities, address livelihood shocks and strengthen social capital.
- Two innovative research methods – financial diaries and serious games – have been carried out in Niger, to help support a better understanding of VSLAs' contribution to climate resilience.
- These innovative tools reveal behavioural changes that help complete our understanding of how VSLAs can contribute to resilience-building in dimensions that are often unexplored, including (i) gender empowerment; (ii) social trust; and (iii) natural resource management.
- This paper paves the way for further analysis of the role of VSLAs in building communities' resilience by documenting the linkages between financial inclusion and resilience to climate extremes.
- These methods, based on community participation, provide a complementary alternative to traditional monitoring and evaluation methods. They contribute to the 'monitoring–evaluation–learning' trinity by blending evaluation and learning.

1. INTRODUCTION

Niger is a landlocked country prone to droughts, floods, locust infestations and political instability.¹ In 2015, 81.3% of the population lived in rural areas and depended on agriculture and pastoral activities for their livelihoods.² The country relies on agriculture for 40% of its gross domestic product (GDP) (Yayé et al., 2013). Niger has been identified as 'one of the world's most vulnerable countries because of its exposure to climate risks and its landlocked position' (World Bank, 2013). Since 1980, seven severe droughts have resulted in enormous losses to farmers and livestock herders.³

Among the most vulnerable communities, inequalities related to gender, ethnicity and religion mean that not all households and individuals are equally equipped to deal with the impacts of climate change. Women often do not benefit from equal access to and use of information and financial services, which potentially limits their influence over adaptation decisions (Webb, 2015). Additionally, in times of crisis, women tend to end up with greater economic responsibility for their household yet often have less control over assets such as land, credit, seeds and animals, owing to structural gender inequalities (Otzelberger, 2014).

The BRACED PRESENCES project (see Box 1 for more) aims to enhance the resilience of women to shocks by strengthening their socioeconomic status. At the heart of PRESENCES's activities

are village savings and loans associations (VSLAs), which aim to play a key role in resilience-building.

This paper assesses the role of VSLAs in building resilience to climate extremes and disasters. The findings aim to inform a broader conversation on how financial inclusion can be considered a pillar of resilience programming. Two innovative approaches are implemented for a holistic exploration of the VSLAs' contribution to resilience: this paper is an interim presentation of these methods and initial results on the contribution of VSLAs to resilience. Authors hope that presenting initial findings from these complementary approaches in Niger will improve understanding of resilience-building to climate extremes through access to financial services.

To date, VSLAs have been adopted in 73 countries across Asia, Africa and Latin America and the Caribbean, and there are over 12 million active members worldwide (VSLA Associates, 2017). Many non-governmental organisations (NGOs) consider VSLAs a leading approach for women's empowerment and financial inclusion (Pettengell, 2016). However, despite their adoption worldwide, there is little evidence of their impacts in terms of resilience-building for women and rural communities more broadly (Pettengell, 2016). This paper introduces new and innovative research methods to assess the link between



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1 World Bank country overview: www.worldbank.org/en/country/niger/overview#1, consulted in May 2017.

2 WDI database: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>, consulted in May 2017.

3 CRED-EM Database, www.emdat.be/database, consulted in May 2016.

Box 1: About BRACED and PRESENCES

The programme: BRACED aims to improve the integration of disaster risk reduction and climate adaptation methods into development approaches. It is implemented by 15 consortia to build the resilience of communities in 13 countries across Africa, South and South-East Asia.

The project: As part of the BRACED programme, CARE is leading the *Projet de la Résilience face aux Chocs Environnementaux et Sociaux (Resilience to Climate and Social Shocks Project; PRESENCES)* project in Niger. It works with Tree Aid, IDEES Dubara, CARE Niger, AREN (Association pour la Redynamisation de L'Élevage au Niger), Mooribeen (Fédération des Unions de Groupements Paysans du Niger), AGRHYMET (Centre Régional d'Agro-Hydro-Météorologie) and INRAN (Institut National de la Recherche Agronomique du Niger).

PRESENCES is a three-year project working to build the resilience of approximately 450,000 climate-vulnerable people in Niger's Tillabery region. The Project works in 12 communes to:

- Increase the relevance of and access to information services on climate, planning and risk management relating to climate change adaptation and disaster risk reduction;
- Support local people to develop sustainable and climate-resilient livelihoods;
- Develop systems and governance structures that support fair, sustainable and climate-resilient natural resource management.

VSLAs and resilience-building in the Sahel.

The primary purpose of a VSLA is to provide simple savings and loan services in rural areas where communities do not have access to formal financial services as a result of their remote location and poor transport networks. In Niger, about 81% of the population live in remote rural areas with low or no access to formal financial services (World Bank, 2011).⁴

In Niger's Tillabery region, which is exposed to recurrent drought, rural agricultural communities are often prone to losing their harvest. As such, providing

loans to these communities is often too risky and not profitable enough for banks or insurance companies. VSLAs were launched in Niger in 1993 by CARE Norway within CARE Niger's *Matu Masa Dubara (Women on the Move)* programme to respond to the needs of communities, especially the lack of access to financial services in rural areas. PRESENCES adapted the VSLA activities to the Tillabery context. Activities have also been adapted to be integrated into resilience-building planning (see Box 2 on VSLA implementation in PRESENCES).

Combining two methodologies – 'financial diaries'⁵ (also named resilience diaries)

⁴ Also WDI database for 2016: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>, consulted in May 2017.

⁵ CARE's team has adopted a new evaluation approach that uses financial diaries to collect information on resilience, coping strategies and finance at the household level.

and 'serious games'⁶ – allows researchers to investigate the link between financial services and resilience. The serious games approach aims to improve our understanding of VSLAs' direct contribution to multiple dimensions of resilience (i.e. beyond economic capacity-building). The financial diary is a qualitative method that tracks inflows and outflows of financial resources at the household level and their interaction with coping strategies in the face of chronic climate shocks, such as droughts.

Use of these combined methodologies in Niger's Tillabery region and PRESENCES

communities enables us to carry out one of the first empirical analyses of whether VSLAs contribute to building women's resilience, particularly to climate shocks and extremes. The innovative approaches allowed researchers to consider the underlying complexities of the cultural contexts while also being participatory. This paper forms part of on-going work on the role of inclusion in financial services in resilience-building, implemented across several project sites with different communities, including pastoral, agricultural and agro-pastoralist communities. This is the first in a series of papers.

Box 2: About PRESENCES implementation of VSLAs

VSLAs are community groups made up of 10–35 members who form a self-managed and self-selected association to save money. The way VSLAs function varies within and across countries depending on the context (Pettengell, 2016). Savings can be accessed for different purposes, including starting a new business, investing in on-going activities, or covering unexpected cash needs such as hospital bills. Members of the group agree the saving cycle and can add interest to loans to members, which is then shared among contributing group members at the end of the saving cycle.

VSLAs are set up through a process that includes training and graduation, completed in eight months and through four stages: information-sharing, start-up, development and maturation.

In the first phase, information about VSLAs is shared with members and groups are

formed. The groups establish their own rules and regulations within the framework of the VSLA guidelines. Within the first month of setting up the VSLAs, group members start saving based on an agreed minimum weekly fee. A social or 'solidarity fund' is also established to support group members with unexpected shocks, such as illness. In Tillabery, where PRESENCES is implementing activities, a total of 107 (77 matured and 30 in training) VSLAs with 2,377 members (1,832 women and 545 men) have been set up.

During the second phase, the start-up, the trainer, called a 'village animator', attends group meetings every week for four months. The weekly visits include training and monitoring of group members and activities. Training covers basic financial management: accounting, note-taking, credit, fines, savings, interest.

⁶ BRACED Knowledge Manager researchers have implemented the original 'serious game' approach, which is designed as an impact evaluation tool (implemented in treatment and control groups), to reveal the behavioural changes that can be attributed to VSLA participation.

The third phase is the development phase. In PRESENCES, about 30 VSLAs are in the development phase. After the first four months of activities, training and monitoring, group members become more independent and the animator attends group meetings only every two weeks. Meanwhile, the groups continue their weekly meetings. During this stage, VSLA members take responsibility for leading group activities and the village animator attends as an observer. After eight months, additional training is offered to VSLA members on conflict management, building partnerships and negotiation skills. In the case of PRESENCES, it has been observed women often lack the means to start income generation activities, as savings are too small to make a meaningful investment. Thus, PRESENCES is providing specific additional trainings on natural resource governance and income-generating activities.

The fourth stage, maturation, occurs in the seventh and eighth months. The village animator visits just once a month to monitor group activities but the group functions independently. The group graduates after eight months once final objectives have been met. Objectives can include sharing the interest on loans or the establishment

of a group enterprise. Once the group reaches maturity in the eighth month it becomes self-sustaining. In the case of PRESENCES, groups that achieve maturity are offered additional support in the form of equipment and support to implement income-generating activities.

At maturity, VSLAs have acquired skills in financial management and natural resource management and governance, and have built partnerships with local traders. Of the 107 VSLAs set up by PRESENCES, 14 Business Groups have been formed, which promote the diversification of income-generating activities. In PRESENCES, VSLA members have received training on the advantages of non-timber forest products (NTFP) and equipment to process these products and develop new activities, such as:

- Planting, harvesting and selling NTFP products such as baobab and moringa leaves;
- Manufacturing and selling liquid soap from NTFP products such as neem seeds;
- Extracting and selling neem oil.

2. APPROACHES TO MEASURING RESILIENCE: FINANCIAL DIARIES

The financial diaries approach relies on a methodology presented by Collins et al. (2009), whose research takes an in-depth look at the financial lives of the rural and urban poor population in three countries over two years. Their methodology is known for pioneering the mixed-method (i.e. quantitative and qualitative) financial diary research tool.

The diaries unveiled a surprising degree of complexity in the financial lives of the people and revealed some of the advantages and disadvantages of microcredit that had not previously been recognised (Collins et al., 2009).

For example, barriers in accessing collateralised credit do not necessarily take into account all financial behaviours and their interdependence with other household members. In fact, financial providers tend to simplify and downplay the ability of low-income clients to manage financial resources as a function of literacy. These diaries show instead a great degree of reflection from individuals when making financial decisions in their daily lives.

In a context of financial market growth and financial product diversification, the need for flexibility and appropriate services tailored to multiple needs is increasingly being recognised. Evidence from the financial diaries research suggests that, for poor people living on average, \$2 USD a day, the key challenges relates to cash flow management and building

lump sums⁷ through long-term savings and borrowing (Collins et al., 2009).

A diversified range of accessible financial services and products has proven important, especially when interlinked with reliable and flexible access to credit, savings and markets. For example, support to cereal banks within PRESENCES makes it possible to explore how the existence of facilities where farmers can stock and trade goods provides an entry point for further financial inclusion and/or market linkages. Yet additional contextual variables mean there is a need to adapt the methodology to look also at the role of VSLAs on resilience. Behavioural changes in the way VSLA members manage assets and financial resources – triggered by newly acquired skills/assets – represent a core area for validating the contribution of financial access in terms of enabling livelihood options that can lead to increased access to climate information and improved ways to manage natural resources (e.g. reduction of conflict, improved seeds).

To get an accurate and meaningful understanding of circumstances on the ground, the diaries have been adapted using insights from the PRESENCES baseline and monitoring analysis. For example, researchers considered common learning questions such as how climate shocks are affecting access to resources and how respondents address the consequences of climate shocks through VSLAs. As such, the



The diaries unveiled a surprising degree of complexity in the financial lives of the people and revealed some of the advantages and disadvantages of microcredit

7 To make payment once at a specific time, as opposed to in several smaller payments or instalments.

diaries methodology is aligned with the theory of change of PRESENCES and the BRACED programme.

The diary approach offers the opportunity to examine correlation among variables causally linked to the expected change. It aims to validate the underlining assumptions about the contribution of VSLAs towards enabling household strategies to cope with shocks. The diary tool adopted in PRESENCES constitutes an innovative approach, measuring behavioural changes in accessing and managing key resources (monetary or assets).

In addition, the methodology produces information by means of a self-reflective iterative process through continuous engagement with respondents. Regular interaction between the respondents and researcher builds trust that facilitates the generation of in-depth and high-quality information.

It is important to note that, while this research considers resilience largely from a livelihoods and assets perspective. The PRESENCES's theory of change contains a broader definition of resilience. The project theory of change addresses other dimensions, even if these are not strictly linked to financial inclusion – notably: access to relevant climate information, sustainable livelihood options, conflict management and robust environmental (ecosystem) management to support resilience-building. Choices linked to livelihood and asset management are sensitive to environmental shocks and constitute an important focus of the research based on diaries.

Timeframes are also a significant dimension considered in the approach. Diaries make it possible to look at the role of

VSLAs during climate shocks for both immediate and long-term response. For this reason, the diaries can gather longitudinal information to explore a range of coping strategies that strengthen adaptive and absorptive capacities. These insights can help determine the likely recurring trends in a context of climate change.

2.1 Implementation

Execution of the diaries approach combines a self-reflective methodology and more quantifiable findings from larger-scale cross-sectional studies and input allocations. The shift from extractive to interactive impact assessment techniques involves a significant investment of time to build trust with local communities through recurrent inquiries. The estimated time needed to tailor the tool to a specific subset of VSLA members (100), who are visited twice a month, is one year. The tool was appraised and translated into the local language after a pilot phase.

The way facilitators are now executing the roll-over phase is becoming critical in terms of spotting causalities in PRESENCES. Implementation requires the substantive engagement of participants in providing information, and previous experience shows that the scope of this iterative process is to establish trust between respondents and investigators. Towards this objective, investigation of the complexity of people's financial behaviours and their coping strategies needs to consider and review issues such as incentives to share information, language barriers, time, distances and risks during data collection.

Investigators were trained to engage with target participants through translating complex learning objectives



Diaries make it possible to look at the role of VSLAs during climate shocks for both immediate and long-term response



Analysis of the data in the diaries leads to the identification of practices in terms of managing cash flow, building savings, executing coping strategies, using credit and recognising opportunity costs

using a simplified approach of direct questions in the local language. It was important that the team of local female investigators retained trust with participants. This element is essential for implementation of the research, which is why PRESENCES continuously supports the team of investigators through tool reviews, data quality checks and refresher workshops.

2.2 Emerging results

Primary data taken from an initial cluster analysis, tree maps⁸ and word clouds⁹ indicate three main topics of discussions with respondents:

- Group dynamics (how people engage in social networks and VSLAs);
- Food security (if resources are enough to minimise negative coping strategies);¹⁰ and
- The link to local markets through VSLA support (the way people use financial resources from their VSLA to engage in market-led activities).

The financial diaries provide longitudinal evidence on how decisions are taken at the individual level over a period of chronic climate shocks.

Analysis of the data in the diaries leads to the identification of practices in terms of managing cash flow, building savings, executing coping strategies, using credit and recognising opportunity costs, based on the principles of reliability, convenience and flexibility of all service providers involved through PRESENCES (e.g. VSLAs and institutional schemes).

The implementation of in-depth qualitative probes, extensive monitoring information and a solid evaluation cycle is already an achievement. The next step is to combine these different data sources to review assumptions related to the link between VSLAs and women's resilience to climate change (including those in the theory of change). The financial diaries tool actually includes questions about households' capacity to manage resources (financial, natural and capital).

There is a clear advantage to relying on a longitudinal tool that can strengthen evidence on specific causalities in the context of VSLA membership and climate change, even though this is not conducted through representative sampling. The findings should generate evidence to enable a synthesis that not only reflects the delivery model but also tests the underlying hypothesis of the programme. For example, one hypothesis would be a link between VSLA membership and resilience to climate change and extremes.

- 8 A tree map provides a hierarchical view of data and makes it easy to spot patterns.
- 9 Word clouds are images composed of words used in a particular text or on a particular subject, in which the size of each word indicates its frequency or importance.
- 10 Examples of negative coping strategies during times of food scarcity are; eating less-preferred foods; borrowing food or money from friends and relatives; limiting portions at mealtime; limiting adult intake of food; reducing the number of meals per day.

3. APPROACHES TO MEASURING RESILIENCE: SERIOUS GAMES

A second methodology designed to analyse the potential behavioural changes generated by VSLAs uses serious games.

By implementing a serious game, designed as an impact evaluation instrument, researchers aim to explore the following four hypotheses, looking at whether and how:

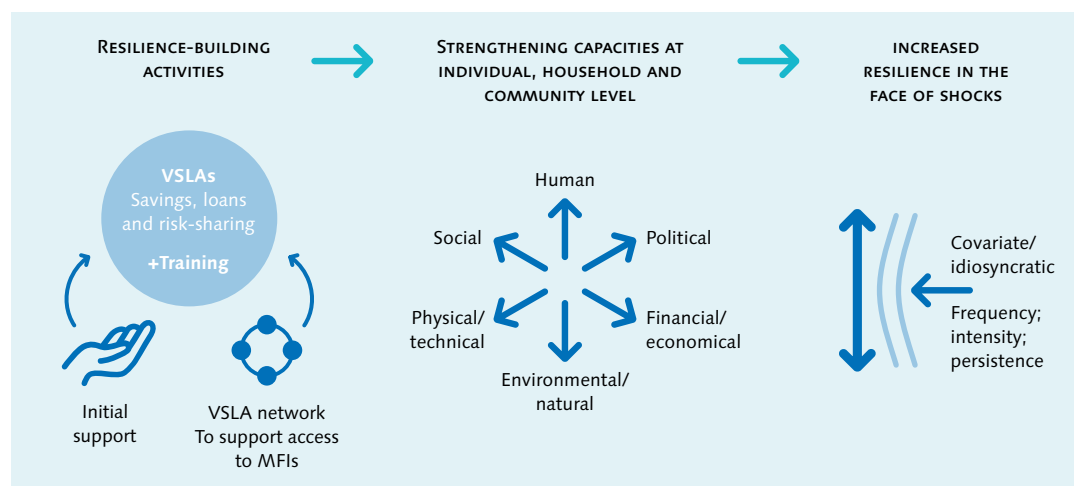
1. Participation in VSLAs enhances trust and social cohesion within the group and the community;
2. The different activities (including training) planned within these groups contribute to driving changes in behaviour such as diversification of economic activities and anticipation of deeply uncertain shocks;
3. They improve the natural resource management of members from an adaptive perspective;

4. VSLA activities focusing on women's membership empower women at the household and community level.

In PRESENCES, VSLA activities primarily target women. As such, the serious game pays particular attention to the effect of VSLA membership on women's status and role in the community. The analysis understands the contribution of VSLAs to resilience from a broad perspective, looking at different types of shocks (idiosyncratic and covariate).¹¹

The conceptual framework (Figure 1) represents how resilience-building activities undertaken by VSLAs strengthen livelihood assets and capacities at different levels that then contribute to enhancing resilience in the face of diverse shocks.

Figure 1: Conceptual framework



Source: Adapted from Weingärtner et al. (2017)

¹¹ An idiosyncratic shock is an event affecting one individual (e.g. an accident). A covariate shock is common to a group or community. Climate extremes, especially droughts, are considered covariate shocks.

While welfare-based outcome indicators – especially those related to income – have been analysed more frequently, social, human and political outcomes are harder to capture with more traditional monitoring and evaluation (M&E) frameworks and methodologies. There is a need to explore the contribution of VSLA activities towards building a broader range of capacities required to strengthen resilience. Moreover, a better understanding of the role of social assets and processes may shed light on the dynamic role of financial arrangements in building resilience against idiosyncratic or covariate shocks (Balgah and Buchenrieder, 2010).

Game-based methods help us understand people's perceptions of risks, and their attitudes, behaviours and social interactions (see Box 3). The game in this research simulates a six-year period with different

seasons and varying weather conditions in an agro-pastoralist context. In addition, it features idiosyncratic and covariate shocks such as sickness, social events, long dry periods or floods. The game also allows for collaboration between participants through common storage and community water storage. Playing the game with different group compositions – women VSLA members, women non-members, men, women VSLA members and their husbands – provides insight into the dynamics of decision-making and gender relations. The game further returns information about investment and diversification, coping strategies and decisions on natural resource management.

The game is designed to be implemented as an impact evaluation tool – that is, at baseline and end line. The second round should be implemented using

Box 3: Serious games approach

From a learning tool ...

Game-based methods are particularly effective approaches to imparting information in a way that makes it relevant to and more readily retained by participants. Evidence is mounting of their utility as a tool for promoting dialogue and learning about development and humanitarian problems faced in the world today (Mendler de Suarez et al., 2012). Participatory approaches to community-level risk management can significantly improve the use of climate information, for instance (Patt et al., 2005). As such, games provide a way of exploring and practising complex thinking, such as the concepts of uncertainty. Such techniques are of benefit in relation to issues of development, climate change, disasters and social norms (McGonigal, 2011; Suarez et al., 2014;

CDKN, 2015). Games are uniquely suited to work through and explore real-world problems from a detached perspective.

... to a research instrument

Games can be a rich mine of potential data for understanding the causal mechanism of a wide range of human action (Mendler de Suarez et al., 2012; Juhola et al., 2013). However, there is limited published evidence and thorough analysis of studies using game-based methods (Mendler de Suarez et al., 2012; CDKN, 2015). The Horn of Africa Risk Transfer for Adaptation (HARITA) project is an example where game-based methods and subsequent analysis have been used to understand the decision-making process and behaviours of local communities related to a range of financial services (IRI, 2010; Patt et al., 2010; Norton et al., 2011).

the same composition of participants as the first. The game outcomes depend on the personalities involved. Playing with the same people on multiple occasions is the only viable way to test change over time, controlling for individual non-observable characteristics that may affect the game results.

Despite anecdotal evidence of the benefits and effectiveness of game-based approaches, there is a lack of systematic assessment of such methods. And yet game initiatives are growing in popularity and are in great demand. More evidence is needed to see whether serious gameplay leads to improved thinking and activities. This research aims also to contribute to analyses of the role of games as an evaluation and research tool.

3.1 Implementation

The implementation of the serious game was piloted in December 2016 in four different sites around Niamey: Zoribangou, Yetey Izé Koirra, Kobio and Magou.

The combination of the experimental game with research tools, both qualitative (participant observation, unstructured interviews) and quantitative (systematic data collection during the game), allowed for the triangulation of information and an overview of social dynamics within communities and VSLAs.

So as to be able to answer the research questions, the methodology incorporated a gender analysis. A gender perspective helps in studying the linkages between access to banking services and resilience and whether people's social identity influences their ability to access, use and control services, and the benefits generated. Such an analysis also encourages social diversity among participants: as many men as women, of different age and status, were consulted and invited to participate in the game. To assess the data according to gender, as well as membership in a VSLA group, four groups were selected at random in each of the four sites (see Table 1).

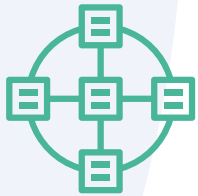
Facilitators were trained to implement the game in the exact same way to avoid any bias. A guide supported the implementation to ensure consistent phrasing and to limit the potential influence of the facilitator on the game. Moreover, to control for facilitation characteristics, each facilitator was allocated the same sampling group in each village. For instance, the same facilitator implemented all games with women's groups so the differences between all the groups of participants could not be attributed to potential differences arising from the facilitation. During the game, researchers observed behaviours among game players, whereas



Despite anecdotal evidence of the benefits and effectiveness of game-based approaches, there is a lack of systematic assessment of such methods

Table 1: Sampling strategy

| VILLAGE | WOMEN, VSLA MEMBERS | WOMEN, NON-VSLA | MEN | MIXED GROUP |
|------------------|---------------------|-----------------|-----------|-------------|
| Zoribangou | 8 | 8 | 8 | 8 |
| Yetey Izé Koirra | 8 | 8 | 8 | 8 |
| Kobio | 8 | 8 | 8 | 8 |
| Magou | 8 | 8 | 8 | 8 |
| TOTAL | 24 | 24 | 24 | 24 |



The game is a tool to be integrated into the research analysis

investigators collected information on the decisions participants made.

The game is designed to reveal differences in decisions, choices and behaviours between groups of participants and between individuals. Researchers aim to reveal if any systematic differences between groups appear in decision-making processes, risk-sharing, trust and social cohesion. The game aims to test the four hypotheses mentioned previously. A 10-month process of repeated design and testing helps improve the game, calibrate it to the group size and adapt it to the context (see Box 4).

The game's dependence on facilitation and the potential for individual personalities

to drive its processes and outcomes are two limitations to the approach. To address these issues, key informant interviews were held with project staff, as well as with game participants. Interviews and discussions served also to triangulate findings and to generate complementary contextual information.

The game is a tool to be integrated into the research analysis. Thus, the research will both explore the contribution of VSLA activities to resilience and analyse the relevance of the game approach in an M&E process to capture resilience-building and behavioural changes. As noted above, the game implemented in December 2016 was designed to be implemented twice: at the

Box 4: Game design process

The first step of the game design process was to conduct formative research on how the game could create an environment where these questions could be tested. The bulk of this research consisted of a literature review of VSLA programmes and informal interviews with partners.

It was determined that a simulation of day-to-day life in rural Niger (farming, tending livestock, making decisions about when to plant and harvest) would best suit the parameters of the game design.

Next, the team modelled different shock types, including drought, floods, pestilence and strong winds. The key shock identified by experts was drought, so this became the focus of design. To simulate the effects of drought, a game system was built so that the primary in-game economy revolved around rainfall. Players needed to make decisions based on forecasts (i.e. rainy or dry) and received a return

on their investment only if it rained. A drought was modelled as a longer-than-average period of no rain where investments did not 'pay out' and players had to consume stored goods. Initial tests demonstrated that this system worked reliably and engaged players.

Two saving mechanisms (common storage and water storage) were integrated so that players could plan for shocks. Playtests of these mechanisms demonstrated that they allowed researchers to measure if players were able to anticipate and prepare for the shocks in the game.

To assess the strengths of social networks, a game mechanic was introduced whereby players had to collaborate and negotiate to access saving mechanisms. Players could not withdraw from common storage or water storage without consensus from all other players. This ensured teamwork among players, which greatly increased

efficiency in the game. The game design allows groups that trust each other to accumulate a greater number of resources by the end of the game. Additionally, observers can record the behaviour of women and men who play the game and specific actions taken by players broken down by gender.

Finally, the success of the game was ultimately dependent on BRACED partners

proxy testing it with players in Niger and contributing greatly to both the design of the game system and its content. All in all, the game went through roughly 30 iterations of design, playing, analysis, refinement and repeating.

The sampling strategy is also fully part of the game design as it provides discriminatory observations on gender and VSLA membership.

beginning of the project and later, one to two years after project implementation. We share here preliminary findings based on the baseline game. This first round does not allow for controlling for individual characteristics of the participants, which undermines the robustness of these preliminary results.

3.2 Preliminary results

At this time, data analysis is still under way, as the second round of the game has not been implemented. Moreover, the relatively small sample involved in implementation of the game means we need to take the following initial results with caution.

Role of VSLAs in resilience

Beyond the financial component, social capital¹² is a key area of VSLA impact. The game and interviews suggest VSLAs amplify pre-existing structures. Thus, we find differences between the villages where we implemented the game. These differences in trust and social cohesion between villages are amplified when focusing on VSLA members. VSLAs may also contribute

to bonding social capital by deepening relationships and reciprocities among members. We did not see the creation of trust in zones where social cohesion was already weak – that is, the VSLAs seem to amplify social cohesion but not create it.

In one community, social tensions affected the overall population. These conflicts occurred across all groups in the community in which the game was implemented (including VSLA members). Observations suggested that in fact some community members identified participation and issues in the VSLA as being a cause of conflict. Several members felt the origin of the conflict was bad management of VSLA funds and related tensions to this and the exclusion of members.

The game was not able to reveal that VSLAs had had a significant impact in terms of supporting women's empowerment. We did not find significant differences in individual and common storage management between groups by VSLA membership. The group of mixed gender players systematically

¹² Defined as 'social networks and the norms of reciprocity and trustworthiness that arise from them' (Putnam, 2000).

performed worse than the other groups (less accumulation of beans in common storage and personal storage, more players failing before the end of the game). The absence of significant impact may owe to spill-over effects of the VSLA within the community (so no differences can be highlighted within the community) or to the absence of effects of the VSLA to date on this aspect. These results must be cross-checked with other sources of information, given the relatively small size of the game's implementation. The second round of the game's implementation should also help confirm or invalidate this result.

Beyond economic empowerment, women use VSLAs as a discussion platform. VSLA membership appears to influence intra-household relationships, decreasing women's dependence on their spouse's income (interviewees said they were more able to discuss the use of the money provided through VSLA loans). Unlike with women VSLA members, who mentioned this aspect frequently in interviews, we did not find any differences in intra-couple bargaining behaviour with regard to the mixed group: husbands remained the primary decision-makers in the couple (results confirmed during interviews) and any joint decisions were overruled and not followed by the husband if male players' conversations contradicted it during the game, whereas women did not interact together but only with their husband to take decisions.

Age appears a key discriminatory factor within the group: older women often lead the game process. This aspect needs to be correlated in the second phase of the analysis with the marital status of the women. Key informants mentioned the status of wives as an important criterion of the effectiveness of VSLAs. For the most part, the youngest, and usually first, wife

is not able to take membership in the VSLA as they are considered responsible for household tasks and the children. They mostly remain at home, whereas the oldest (higher-ranking) women can go out of the house, visit the market and take part in economic activities, and thus benefit from participation in VSLAs.

Natural capital is captured through water storage management. Interviews confirmed that lack of access to water and forests represent the main limitations to people's livelihoods. The trainings provided through the VSLAs help people grapple with these issues but most natural resource management behaviours seem highly related to the socioeconomic and natural resources of the community. Playing the game, these preconditions appear as a main driver of the natural resource management differences between communities. Indeed, the main differences in water management (numbers of participants paying for water storage and its uptake, management of water) are not significant between one group and another, or by age, gender or VSLA membership, but rather present themselves between villages. In Kobia, where well water was not available, its management was significantly different from that in other villages. Few people participated in the water storage investment and the water was used very cautiously to save productive assets such as livestock, but not to save crops. The other villages managed water and access to water sources by following the rules applied in their locality (regarding age, activities, socioeconomic status, vulnerabilities) but used it for either crops or livestock.

In most cases, common storage was used to maintain natural resources (such as water). This suggests that VSLAs

formalised some informal mechanisms already in place in the community (with both VSLA members and non-members acting in the same way). It does not appear that the VSLAs created a new way of perceiving natural resources or changed their management within the community or at individual level. This preliminary finding should be taken with caution, though, and needs further exploration. First, it is possible that water storage does not correspond with the natural resource management techniques the community implements.¹³ Moreover, the game does not model other kind of natural resource management, such as of forests or pastures, which may be managed differently.

Implementation of the game demonstrated the use of VSLAs as a buffer against shocks. In the case of covariate shocks, the groups used the common storage as a buffer pot, following principles of social protection – that is, the community supported the most vulnerable people, regardless of their contribution to the common storage. In most cases, the vulnerability was proxied by the number of beans in the individual storage. Some men's groups also used age as a discriminatory variable in using the common storage, i.e. the youngest players had priority in using to the common storage when there were not sufficient amounts of beans for everybody. This reflects one aspect of the VSLAs' objectives in particular: social protection.

The game generated preliminary findings on the diversification process and risk management, which will need to be triangulated through further investigations. The VSLA implementers mentioned several

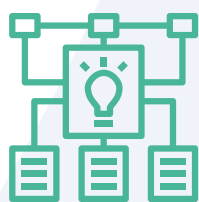
times the existence of loans between members for 'small business and trade development' but this aspect was not raised during the game. The game also did not reveal investment in productive assets as a result of VSLA funds, suggesting a way to improve the project. This lack of use of funds for 'diversification' or 'transformative investments' may owe to lack of training supporting behaviour change or an absence of opportunities for such investment, given the low amount of saving by communities. This finding needs further investigation and robustness checking during the second round of the game if it is to generate useful recommendations to improve the project.

Game approach

The game approach and this research methodology were implemented in a similar context to test the contribution of self-help group activities implemented by Tear Fund in Ethiopia (Weingärtner et al., 2017). This section relies on lessons based on these two research studies in Ethiopian and Niger contexts.

There are unresolved questions and issues with the use of games in research, such as a question as to what extent a game, a simplified version of a complex problem, reflects the reality in which planners make decisions. A game will never reflect the countless complexities present in the real world, yet it must be rooted in reality.

In Ethiopia, the game was regarded as a positive experience by most member and non-member participants, who emphasised its learning aspect and the close relationship it had to the realities of their lives. VSLA members highlighted that it reflected their activities and revitalised their work. In addition,



A game will never reflect the countless complexities present in the real world, yet it must be rooted in reality

¹³ This observation was made during the implementation of the game in the Ethiopian context. For more information, see Weingärtner et al. (2017).

they emphasised that the game had helped them better understand the savings process, VSLA works and climate shocks (Weingärtner et al., 2017).

To integrate the game as a learning tool in VSLA-related work in the future, and to implement the second phase of the project, attention needs to be paid to: training game facilitators, to consistent implementation across games and to retaining the underlying structure of the game while allowing for context-specific adjustments, for example about how the water storage is framed and introduced (Simonet and Le Masson, forthcoming).

When the game is played as a single snapshot in time, it is difficult to generalise findings about coordination and social cohesion because it is too easy for a single participant to drive game decision-making. If it is played at different points in time with the same participants, it is possible to control for personality variations and to observe how decision-making processes and collaboration have changed over time as a result of VSLA membership. Ideally, playing the game towards the beginning of a new activity and again after the activity

has been established will provide a useful basis for understanding what kinds of social change VSLAs have (or have not) helped achieve.

The game, to be used as a methodological complement to standard M&E tools, requires extensive training of enumerators and facilitators (as comparison relies mostly on a common approach and rigorous and consistent implementation and data collection). The game data needs to be triangulated with additional focus on group discussions and interviews. If played at multiple points in time, the game could be used as an innovative way of supporting evaluation. This will also reduce the training cost and entry cost for enumerators and facilitators.

'Learning' is often the most ambiguous element of the 'monitoring–evaluation–learning' trinity, but the game proved to be a learning experience for everyone involved – project staff, participants and the research team. Whether the game is played only once or multiple times, the process instigates a learning journey that can inform project design, improve understanding of savings dynamics and raise awareness.

4. CONCLUSION

Implementation of innovative methods can reveal behavioural changes to help complete our understanding of how VSLAs can contribute to resilience-building in the often unexplored dimensions of (i) gender empowerment; (ii) social trust; and (iii) natural resource management. Carried out with the same population of beneficiaries, the tools open up reflection on the multi-dimensionality of resilience and the limitations of using a single methodology to capture the effects of an activity on households' and communities' resilience. Moreover, enabling such a comparison shows the respective advantages and limitations of each method. Traditional surveys are recognised as altering interviewees' behaviours (Crossley et al., 2017) or present some limitations (especially on the cost of implementation) that qualitative approaches can more easily tackle. These tools cannot replace quantitative surveys but can complement them or support cross-referencing with survey findings by focusing on broader aspects of resilience-building.

Financial diaries complement the cross-sectionality of the serious game by gathering data over time from a sample of VSLA members. In addition, the diaries highlight the issue of use of resources and climate change, and it can be considered an equally transformative tool in relation to self-reflection on resilient behaviours. The two approaches provide a solid foundation to further investigate the role of financial inclusion in climate change resilience by engaging participants in different ways, away from the more traditional survey approach.

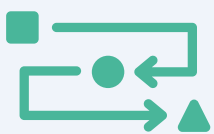
To date, observed changes reported are minimal, especially on gender

empowerment and natural resource management. Moreover, the game and interviews suggest VSLAs amplify pre-existing structures in terms of social networks. Further investigation based on additional data collection through the diaries and the second round of the game should confirm or invalidate the few changes observed. Sampling in the implementation of the innovative tools is limited, so results need to be taken with caution.

The methods highlight the importance of assessing resilience using innovative approaches and the role that such methods can have in learning. They also bring more depth to the dimension of meaningful interaction with data collection tools, in recognising the importance of behavioural changes that arise as a result of an activity/project, while collecting data for assessment.

This paper aims to stimulate the debate on new methodological trends to establish a relationship between financial inclusion and resilience-building. The current research provides an incomplete overview of the contribution of VSLAs to resilience to climate extremes in relation to the broad concept used in resilience programmes' theory of change. In addition, the complexity involved in the definition of resilience limits the use of traditional M&E tools to assess the contribution of financial service activities to resilience-building in a context of climatic shocks and stresses.

Financial diaries and the game partially fill this gap because they are sensitive to behavioural changes and focus on respondents' shifts, either by building



The methods highlight the importance of assessing resilience using innovative approaches and the role that such methods can have in learning



Image 1: Focus group discussion following the game implementation, Niger

relationships with them longitudinally or by actively recreating role-plays that open up a cognitive space for unfiltered self-expression. Despite some limitations and the need for improvements in their implementation, the preliminary findings of the tools stimulate a renewal of methods for practitioners and M&E specialists to capture results at the household level.

The initial findings show a way in which data can be collected when testing hypotheses that remain hard to validate in numerical terms. Some definitions used in resilience frameworks do not translate directly into a simple question but rather require innovative ways to track behavioural changes and boost experiential knowledge of real-world problems that are typically confined to the remit of academic debates. With the BRACED Knowledge Manager, PRESENCES is sharing the findings emerging from the use of these two tools as a way to enable better understanding of how to further conduct effective action research on the key variables and triggers for resilience-building in the context of VSLA membership. This preliminary reflection also demonstrates the need to restrict impact assessment and monitoring to certain dimensions of resilience, as the understanding of the concept in its entirety is complex.

These results may be echoed in the spheres of resilience practitioners, encouraged by the need to clarify and delimit more systematically the effect of their activities on resilience-building (which kind of resilience dimensions are strengthened by implementing a specific activity?). Current trends pushing for a holistic approach reduce the visibility of resilience-building programmes by diluting the causality and attribution of its activities. These tools help highlight the question of attribution and the contribution of a package of activities to a broad concept such as resilience. More needs to be done in breaking down resilience-building into specific aspects and defining precisely the causality of activities on the key characteristics (capacities) of resilience.

Finally, by boosting qualitative methods to help us understand climate change and the role of VSLA membership in mitigating its consequences, there is a stronger case for designing the actual delivery of activities in alignment with a grassroots understanding of how these two components are linked. These two tools represent a decisive way forward to influence M&E, starting from learning about participants' roles in defining and recognising the issues, before making assumptions on what can bring about the greatest impact.

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