Women, Social Capital and Collective Action – The Case of NERICA Rice Technology in Benin

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Abstract

Women rice farmers in Africa are often constrained in accessing resources and technologies adapted to their requirements. AfricaRice has targeted women in disseminating NERICA to consider their needs. Along with top-down strategies, also processes that strengthen women rice growers at the grassroots are essential. Farmer groups’ social relation networks and collective action might open opportunities for women.

This qualitative case study examines the interplay of technology adoption, social capital, collective action and women’s empowerment by focusing on women’s perceptions in the context of NERICA in Benin.

Findings show that social capital and collective action enhance women’s economic and social position and their personal advancement. The study indicates what kind of external support might be useful to exploit, in the best possible way, the potential of collective action as a means for promoting women’s holistic development. The results can help in the design of strategies for women’s empowerment within NERICA dissemination activities.

Keywords: Benin, women, collective action, social capital, NERICA
JEL: Q16, Q19

1 Introduction

Rice cultivation is gaining importance as food, employment and income source for many African farming households (NORMAN and KEBE, 2006; NWANZE et al., 2006). Due to the importance of rice for food security and poverty alleviation, the Africa Rice Center (AfricaRice) put research efforts in the development of improved rice varieties that are high-yielding, resistant to local stresses and adapted to smallholder farming conditions and specific needs, including those of women rice growers (WARDA, 2003). In Africa, women provide most of the labor input in rainfed rice farming and play a
vital role along the rice value-chain (LANCON and ERENSTEIN, 2002; WARDA, 2003; WORLD BANK, FAO and IFAD, 2009). One important outcome of AfricaRice’s rice-related research work was the NERICA (New Rice for Africa) innovation which was disseminated in many African countries, including Benin1.

Empirical evidence from impact assessment studies conducted in West Africa showed that the adoption of NERICA has a positive impact on productivity, income, household expenditure and poverty – with special benefits for women (ADEKAMBI et al., 2009; AGBOH-NOAMESHIE, KINKINGINHOUN-MEDAGBE and DIAGNE, 2007; KIJIMA, OTSUKA and SSERUNKUUMA, 2008; SOGBOSSI et al., 2008). Since there are positive effects on a number of development outcomes, it can be observed that the adoption of NERICA alone offers opportunities for empowering smallholder farmers, particularly women. Complementary institutional arrangements such as collective action and within-social network exchange might reinforce this empowerment process. For identifying how to promote women’s holistic development within the framework of dissemination activities of a new production technology like NERICA, it is important to know and understand the interplay of technology adoption, collective action, social capital and women’s economic, social and personal empowerment. This qualitative study aims to contribute to this objective by focusing on women’s views, experiences and opinions about NERICA and group membership and by capturing their perceptions about resulting changes (if there are any). The study refers to the case of NERICA production by farmer groups in Benin.

The remainder of the paper is structured as follows: section two describes the theoretical and conceptual dimensions of the research and outlines the research methodology used to collect and analyze data. The results are presented and discussed in section three. Finally, conclusions are summarized and recommendations are derived in section four.

2 Methods

2.1 Conceptual Framework

Collective action can be understood as a phenomenon of targeted-oriented and joint efforts of individuals for the purpose of altering current situations and circumstances (see e.g. ICRA n.d.; KUMAR and QUISUMBING, 2010; MARSHALL, 1998). The concept of collective action is closely related to the concept of social capital (see BOURDIEU,

1 Extensive measures to speed and scale up the diffusion and uptake of NERICA were taken within the framework of the African Development Bank funded Multinational NERICA Rice Dissemination Project (since 2005), which is known in Benin under the name Projet Multinational de Diffusion du Riz NERICA (PDRN) (AFDB, 2008; AFRICAN DEVELOPMENT FUND, 2003: xi).
1986), which is the “norms and social relations embedded in the social structures of society that enable people to co-ordinate action and to achieve desired goals” (NARAYAN, 1997: 50).

Another concept linked to social relations and the social process of collective action is social learning, which is the process in which the “individual learns from another by means of observational modeling; that is, one observes another person’s behavior, and then does something similar” (ROGERS, 1995: 330).

A benefit arising from social networks and social interaction is social support which is “the perception or experience that one is loved and cared for, esteemed and valued, and part of a social network of mutual assistance and obligations” (WILLS, 1991, cited in TAYLOR et al., 2004). TAYLOR et al. (2004) distinguish three forms: (i) information support (e.g. advice); (ii) instrumental support, that means the direct provision and allocation of tangible goods (e.g. credit/cash, food, medicine), services or facilities; and (iii) emotional support which is expressed, for instance, in giving recognition, approval or security to another person.

To conceptualize empowerment, KABEER (1999, 2003) discusses three interconnected elements of power2:

(1) **Resources** (pre-conditions) include material, human and social resources/assets (i.e. social capital) (KABEER, 1999). For being empowered or powerful, not only the access to but also the control over resources might be decisive (KABEER, 1999).

(2) **Agency** (process) refers to having the means or skills to define objectives and work towards them (power to) (KABEER, 1999). It comprises both action that is apparent in making choices (e.g. decision-making, protest, bargaining and negotiation) as well as the motivation (sense of agency or power within) that stimulates individuals to act (KABEER, 1999: 438; 2003: 171; MAYOUX, 2000). MAYOUX’s (2000) Framework for Women’s Empowerment defines an additional notion of power, namely power with, which means the capacity to link with others to exploit collective strength and achieve collective objectives.

(3) **Achievements** (outcomes) are shown in how far individuals are able to translate potentials into positive outcomes (e.g. improved food security, increased income) to ensure well-being (KABEER, 1999; 2003).

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2 Power is the capacity to exercise “strategic life choices” (KABEER, 1999: 171; 2003: 437).
2.2 The Conceptual Model

To guide the whole study of the interplay of NERICA adoption, collective action, social capital and women’s empowerment, a conceptual model (see Figure 1) was developed.

Figure 1. Conceptual model for the study of the interplay of NERICA adoption, social capital/collective action and women’s empowerment

The adoption and integration of NERICA into a farmer’s portfolio of rice varieties offers new opportunities for increased rice production and thus a rise in income. Improved income is just one factor contributing to women’s empowerment. Social networks and relations of trust and cooperation among farmers might also be essential in leading to positive outcomes for women’s empowerment. This study tends to identify how women perceive the influence of social capital and collective action on their economic and personal development as well as on their position in the family and rural farming community. Many studies (see FAO, 2011 for a review of studies) show that by strengthening women’s economic power, social status and personal well-being positive outcomes for household nutrition and health as well as children’s education can be achieved.

Following analytical frameworks for studying gender and collective action in rural development (see, MEINZEN-DICK, DI GREGORIO and MCCARTHY, 2004; PANDOLFELLI, MEINZEN-DICK and DOHRN, 2007; 2008), it is assumed that members’ motivation and group’s institutional and structural characteristics determine the conduct of/within a group (collective action), which in turn influences the performance and effectiveness (i.e. ability of groups to meet their immediate purposes) of the group.
(collective action outcome) (OLSON, 1998; OSTROM, 1990; WADE, 1987). In addition, collective action outcome might have influence on women’s perceptions and opinions about how active group membership impacts their livelihoods, well-being and personal development. This study implies that already the conduct of/within a group has a direct influence on how the individual is feeling within the group and how she assesses the benefit(s) of group membership on her personal and social condition (see Figure 2). Therefore, this study explores the characteristics of NERICA-related farmer groups and their joint action.

Figure 2. Theoretical model of the interplay of collective action and individual members’ empowerment

Note: the research focus is laid on the grey shaded areas.

Source: own depiction, derived from concepts by MEINZEN-DICK, DI GREGORIO and McCARTHY (2004); PANDOLFELLI, MEINZEN-DICK and DOHRN (2007, 2008); OLSON (1998); OSTROM (1990); WADE (1987)

2.3 Study Site

The Department of Collines was selected as the primary research site because it represents one of the most important rice growing areas in Benin with a high representation of grassroots farmer groups. ‘Collines’ is one of the twelve Departments of Benin with the six Communes of Dassa-Zoumè, Glazoué, Savalou, Banté, Ouissé and Savé. In this region, many rice farming activities are conducted by women. Regarding NERICA dissemination, this was the first region in Benin where NERICA was introduced in 1998 (WARDA, 2000).

2.4 Type of Research Design and Data Collection

A qualitative case study research approach was adopted for this study. To gain a holistic view on people’s attitudes, beliefs, values, behaviors, actions as well as their perceptions, views and experiences in the context of the research problem, various data
collection methods were used: (i) literature-based study; (ii) direct and participant observations. The observational focus was on capturing the rural village life at the research site (e.g. daily routine and habits, customs, events and ceremonies, income activities) and rice-related activities (e.g. rice growing, processing operations) as well as getting an insight into target people’s life situations and social settings. Participant observation helped, in particular, to get a richer understanding of why the people under study have developed certain views; (iii) individual (using a face-to-face method) and group interviews with a semi-structured format (i.e. use of an interview guide). A special type of individual interview was the key informant interview by using an unstructured format.

For data recording, field notes, short memos, hand-written interview notes and digital audio-taping (with digital voice recorders) were used.

2.5 Sampling Strategy

Key informant selection was based on purposeful sampling whereby selection criteria for inclusion of informants were determined: (i) the kind of responsibility they had in Benin’s rice sector; (ii) their expertise in rice and NERICA-related activities and (iii) their operation level (local, regional and national). Additional informants were selected by snowball sampling (see BIERNACKI and WALDORF, 1981: 141). Similar to the idea of theoretical saturation in Grounded Theory (see STRAUSS and COBIN, 1998), the inclusion of additional potential informants was stopped when this process led to redundancy of information and/or when the researcher was of the opinion that a wide array of views and perspectives had been considered.

To select groups for group interviewing, a two-stage purposeful sampling was applied. The first stage involved the selection of the fieldwork site based on the following criteria: (i) importance of rice production for national rice supply; (ii) long experience with NERICA and (iii) accessibility to the site in terms of travel time because of a limited research timeframe. The Department of Collines fulfilled all these criteria.

All six Communes of Collines have been considered in the second stage of sampling which involved the selection of groups in each Commune according to the following procedure:

1. Three clusters of groups were defined to obtain a diverse sample: Groups (1) within an independent farmer group association; (2) supported by the communal extension service CeCPA (Centre Communal pour la Promotion Agricole) and (3) supported by CeCPA and by the project PDRN3.

3 PDRN only operates in two Communes.
2. For each Commune and within each cluster, *two* sample units (groups) were chosen based on three pre-defined selection criteria: (i) cultivating NERICA; (ii) at least 60% women participants in the group and (iii) operating for at least three years. Meeting the selection criteria was considered important because only NERICA groups with a high share of women and which have some experience in working together can give rich information in addressing the research objectives (see 2.2). The selection of groups within each cluster for each Commune was carried out by establishing lists in cooperation with CeCPAs, a PDRN project coordinator, and the chairperson of a farmer group association. To reduce bias in the selection procedure, the groups were chosen randomly from these lists. However, due to organizational and availability issues, it was not always possible to execute the sampling plan, so that in total the study surveyed 25 groups across all three clusters and six Communes (see Table 1).

*In-depth individual interviews* with female members belonging to the interviewed NERICA farmer group were conducted after each group session. Two women group members were selected randomly from the list of participants which had been drawn up at the beginning of each group session. With respect to the 25 groups, there are 49 corresponding individual interviews with group members (see Table 1).

### Table 1. Sampling plan and sample realized, group members

<table>
<thead>
<tr>
<th>Group cluster</th>
<th>Sampling plan</th>
<th>Sample realized*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group (N₀)</td>
<td>Member (N₀)</td>
</tr>
<tr>
<td>(1) Groups from a farmer group association</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>(2) Groups supported by CeCPA</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>(3) Groups supported by CeCPA &amp; PDRN</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
<td><strong>56</strong></td>
</tr>
</tbody>
</table>

*Due to organizational and availability issues it was not always possible to execute the sampling plan.

b The number of 50 individual interviews could not be reached because in one Commune only one instead of two interviews was conducted.

Source: own data

To collect opinions about NERICA and group membership in general and to be able to substantiate that there is a nexus between women’s empowerment and group participation, the researcher was interested in capturing the perceptions and views of women who were *not* affiliated with a NERICA group. In each NERICA group’s focal village (i.e. a village where the researcher conducted a farmer group interview) two one-on-one interviews were planned with non-group women rice growers. However, the objective of interviewing two women in each village could, due to emerging time.
and logistical problems, not be realized in the desired depth and detail. Consequently, this non-group member individual interview category had to be stopped during the field research process. To get a holistic picture of views and perspectives in regards to NERICA and collective action, these interviews were still incorporated as short statements in this study. For selecting non-group women the researcher defined three criteria: (i) being a woman rice grower; (ii) being a non-group member of the local NERICA group, but (iii) having NERICA experience. Snowball sampling (see BIERNACKI and WALDORF, 1981) was applied to locate those respondents who met all three criteria. In total, the researcher was able to interview 16 non-group women rice farmers with NERICA experience.

Altogether, it was possible to conduct a number of 104 interviews, including 14 key informants, 25 groups and 49 group member individuals and 16 non-group member individuals.

2.6 Data Analysis

Data analysis followed a multi-step approach involving sorting, organizing and preparing (e.g. transcribing digital recordings of each interview) as well as describing, classifying and interrelating data. For the latter purpose, the core instrument was the formation of codes and categories (CRESWELL, 2007: 152). Data was reduced by assigning codes to subcategories and combining several subcategories under a broader category or theme (MERRIAM, 2009). The last step was basically a reviewing and interpretation of the code-category-relations. Data analysis was supported by the software Atlas.ti 6.2 (ATLAS.TI SCIENTIFIC SOFTWARE DEVELOPMENT GMBH, 2012).

2.7 Validation

To enhance the credibility/internal validity (see BITCH, 2005, for the concept) of the study findings, multiple strategies were applied during the entire research process (see Table 2).

To control/minimize biased answers e.g. due to dominant respondents, expectations by the participants, misunderstanding and biases caused by the “external origin” of the researcher, the following strategies were applied:

- Trust/rapport-building (e.g. proper introduction of the project without revealing too much, comfortable interview setting, showing empathy without getting too emotional)
- Careful phrasing; clear and simple wording of questions
- Constant reflecting and clarifying of answers; probing questions
- Keeping dominant respondent(s) in check; motivating all participants to contribute their views to the discussion
- Crosschecking of data (e.g. comparison of group discussions with individual interviews to identify eventual contradicting statements)

Table 2. Evaluation criterion – credibility/internal validity and validity strategies applied in this study

<table>
<thead>
<tr>
<th>Validity strategy applied</th>
<th>How it was implemented in this study?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistent observation</td>
<td>Intensive in-depth observational efforts to identify particular aspects and details of the phenomenon under study</td>
</tr>
<tr>
<td>Prolonged engagement</td>
<td>Research stay in Benin of 80 days with fieldwork of a period of 28 days</td>
</tr>
<tr>
<td>Peer briefing</td>
<td>Discussion and exchange with non-involved researchers at the CGIAR Center Africa Rice</td>
</tr>
<tr>
<td>Progressive subjectivity</td>
<td>Constant self-reflection and critical self-inquiry</td>
</tr>
</tbody>
</table>

**Triangulation:**

(a) **Method triangulation**

(b) **Data triangulation**

=> **Subtype: person triangulation**

(a) Use of a variety of data collection methods: literature research, participant & direct observation, different interview formats. Constant comparison of the results obtained through different data collection methods.

(b) Collecting data from individuals (group-members, non-group members), groups and key informants.

Source: own depiction based on BITCH (2005); POLIT and BECK (2010); CRESWELL (2009)

3 Results and Discussion

This chapter presents the findings from 104 interviews. The most informative direct quotes from the three interviews types (corresponding alphanumeric codes are assigned) are used for illustration. Although the sampling considered three different types of groups, the findings of this study are not disaggregated by group type because the content of the interview statements did not differ across the group categories.

3.1 Socio-demographic Characteristics of the Participants

*Key informants* were representatives from governmental and non-governmental institutions and operated in different areas ranging from rice research and production to resource management, support to agricultural groups, cooperatives and rural communities, nutrition and food security and agricultural commercialization.
All *farmer groups* had a minimum of 60.0% of women participants. Fifteen groups thereof had a proportion of even 80.0% or higher, including five all-women groups. In total, 291 persons participated in the group interviews across all 25 groups. Men accounted for around 15.8% of all participants. Among the total number of participants, 88.0% were married and 27.8% had received formal education (including 51 women and 30 men). The majority of the *female individuals* in the *in-depth face-to-face interviews* were of middle age (between 30 and 49 years old). For 91.8% of the women, agriculture was the primary income source. 28 women mentioned a secondary one such as processing, commerce, tailoring and stone/rock crushing. 40.8% of the respondents had received formal education. All participants were either married or already widows. Among the small sample of *non-group member individuals*, only two women were widows, the rest of them were married. One third had received formal education. The income activities of these women correspond to those of the group members.

3.2 Incentive Structure and Characteristics of Farmer Groups involved in NERICA Production

3.2.1 Collective Motivation

The farmer groups in this study were self-organized, which means created and sustained by the members themselves. The process of self-initiated group formation was often spurred by active and strong individuals within the farming community, who were able to mobilize other farmers in the villages for collective objectives. In some cases, the impulse for group formation was given by external agents such as local NGOs, pastors, community workers and/or district heads. However, the ultimate process of group formation still remained in the hands of the members.

The primary motivation of the farmers to organize themselves was to be more productive in their rice farming, improve their income situation and thus the living conditions and well-being of their families and village community. The respondents experienced that a lone-working farmer is limited in his/her ability to cope with production-related problems and stresses (e.g. pest control, hiring of machines) and often does not have the same opportunities as a group, for example, in terms of access to inputs (e.g. (improved) seed, fertilizer, equipment), information (e.g. about new technologies such as NERICA), services (e.g. credit, training), markets and external support (e.g. by government agencies such as SONAPRA⁴, NGOs, microfinance institutions). Furthermore, a sense of social responsibility/solidarity as well as a concern for their families and children were important in their motivation to join together as a collective:

⁴ Benin’s parastatal marketing board in charge of promoting and commercializing Benin’s agricultural production.
Together we united to support our husbands so that the household develops. That we can help them with the contributions for the children’s support, for example, with the expenses for school stationery. Or if the children get sick, we do not have to wait for our husbands to have the money to take our children to hospital (GG08).

One day one of our friends had lost her mother. During the funeral we decided to create a group to pool money to support each other. Everybody had to pay 500FCFA \(\approx 0.75\€\) every two weeks. So, we started the group with a tontine\(^6\). In order to have more money in the group fund, we decided to cultivate a field together (GG5).

3.2.2 Structure and Gender

The groups were membership-based organizations with democratic governance structures (e.g. assemblies, elections and vote). The core of all groups was the administrative board with an executive bureau (president, the treasurer and the secretary). Some groups had, in addition, deputies (e.g. vice-president, adjunct secretary) or even a supervisory body. The bureau was responsible for the current activities of the group, meaning, for example, group fund\(^7\) management, calling of meetings and representing the group with regard to third parties. The bodies of the group were in charge of enforcing rules within the group and were supposed to enhance a smooth and harmonious functioning of the collective. All representatives of the groups were elected and accountable to the membership. Whether and to what extend elite capture or elite control\(^8\) played a role within the groups could not be identified through the interviews that were conducted.

The majority of groups studied were mixed groups (male and female members) which had, however, once started as women’s groups and only later evolved into mixed producer groups. Men’s motivation to engage in rice-oriented collective action was based on economic incentives and practical reasons. Economic reasons were crop diversification and the profitability potential that rice farming currently offers in Benin. So, men recognized that rice is not only a tasty food, but it becomes more and more of a lucrative product:

\(^5\) 1\€ \(\approx 656\) CFA Franc (FCFA) or 100 CFA Franc (FCFA) \(\approx 0.15\€\) (Mai 4, 2012).
\(^6\) Tontine is a joint financial arrangement among individuals. Each member of a tontine group pays a stipulated amount at regular intervals into the tontine to financially support an individual of the group who is in difficulties.
\(^7\) The sources of the fund were e.g. membership fees, regular contributions by the members, fines, harvest “levies”, contributions for special occasions, income from extra activities (e.g. commerce).
\(^8\) Elite capture is understood in this study when dominant and/or better-off members (e.g. higher-status, better educated, better networked) capture the benefits of collective action (e.g. misuse of group fund). Elite control is the control of decision-making processes within a group by dominant and/or better-off members (e.g. higher-status, better educated, better networked).
Rice is selling like cotton. It is a crop that needs to be pursued (GG08).

We entered into rice cultivation because we have seen that there is money in it (GG08).

Practical reasons were providing physical support to the women in the laborious and physically exhausting activities of crop cultivation (e.g. land clearing or plowing) and also contributing to the food supply and well-being of the family. Women from one group in Dassa stressed as to how they needed the help of their male counterparts:

It was [we] women who arranged [ourselves] together to form the group, but women alone do not manage to perform all the tasks that are part of their activity, for example, there are works which require physical strength, and so the contribution of the men is needed. Therefore [we] asked the men to join [us] so that [we] can succeed with our activity (GG08).

The men also considered their support to the women as important:

As regards women, they do not have the physical power and strength to cultivate a large amount of land […]. In some sense, this constitutes a loss of production for the women. Now, with men among them, the area of land under cultivation can be augmented. So when [we] are in the group, the output can be higher (GG07).

Within the group, each sex often assumed specific roles/tasks. Men were responsible for hard physical work in land preparation, transport of the produce, purchase of inputs and hunting of rodents. In many cases, men also assumed tasks that required reading and writing skills such as the role of secretary, probably because many women within the groups were illiterate. Women did the bulk of the often labor-intensive rice farming tasks, such as planting, harvesting and processing, and often took leadership positions like group president. Consequently, a gender division of labor within the groups could be identified which, according to them, was important for the group viability and development.

3.2.3 Institutions / “rules-in-use”

An established formal structure and institutions (“rules-in-use” (OSTROM, 1999: 187)) enabled the coordination and management of members’ interactions. The institutions were specific entry procedures, financial contribution regulations, working rules, rules of conduct, social norms (e.g. solidarity, reciprocity, trust) and sanctions. The interviews revealed the importance of such rules and regulations for the functioning and sustainability of the groups and their collective action because they helped to reduce internal conflicts, ensured discipline, and guaranteed that each member did not only benefit from the efforts of the others, but also made his/her expected contribution to the stability and working of the group.
3.2.4 Activities

The groups pursued rice production, chiefly NERICA, as their main income-generating activity. They had a so-called collective rice field where the group members gathered together once or twice a week to perform the necessary cultivation duties. There are two categories of collective fields: (i) Type I: One unified group field which is cultivated collectively; and (ii) Type II: One unified group terrain which is divided into individual plots (en bloc), so-called casiers de riz or piquets (usually a size of 20 x 20 m). The decision in favor of a group terrain instead of a group field was applied by the majority of groups to promote working morale and discipline and increase productivity. This suggests that by transferring responsibility to the individual, transparency and accountability within the group is assured. The single member cannot ‘hide behind the group’, but is subject to group and peer pressure, which challenges and motivates him/her to do his/her best for individual as well as collective success. A certain degree of individual responsibility within collective action is viable and sound with respect to free-riding (OSTROM, 1990) avoidance. One group in Glazoué raised this issue of efficiency and free-rider avoidance as grounds for subdividing the field: “[…] so that the work advances quickly and everyone really contributes to the activities of the group” (SAG01). Another group in Glazoué reported:

At the beginning, the group had one group field and all members worked for the group. But in the long run [we] realized that this didn’t work, that’s why the group decided to subdivide this field into units and each member has his/her portion. This means, the ground is common, everybody goes to the terrain, but each member has his plot, his cashiers to work in. And what you produce there, it benefits you. Now, when you produce, you will give a contribution for sustaining the group (GG06).

Contribution or ‘levies’ for the group fund9, that the individual member had to pay on his/her output, were either paid in kind (a ration of rice) or in cash and varied across the groups. Collective marketing of members’ produce was applied by the majority of groups.

3.2.5 Intra-group Support

With respect to the economic sphere, the group supported the individual in his/her rice cultivation activities within the collective in the following ways: access to inputs (e.g. improved seeds) and equipment (e.g. tractor, work tools like hoes), provision of labor (reciprocal support in doing the field work within the group terrain) and information (ideas and advice exchange on farming practices). Furthermore, the group as a collective also plays a role in the social life of its members by providing social support (see Table 3).

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9 The group fund is used for multiple purposes e.g. group administration, production input/equipment financing, long-term production/storage investments, social support.
Table 3. Social support provided by the groups to their members

<table>
<thead>
<tr>
<th>Types of support</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Informational and emotional</strong></td>
<td>(a) “[We] have a teacher in [our] group who helps [us] to learn how to read and write” (GG08).</td>
</tr>
<tr>
<td></td>
<td>(b) “When we women are together, we debate among ourselves […]. If one of us has a problem with her husband, we discuss. If she is doing something wrong, we tell her to stop it. And so there will be happiness and no more problems at home with the husband” (GG08); “In our group we give each other advice how to educate our children at home” (OG01).</td>
</tr>
<tr>
<td>Instrumental</td>
<td>(c) “For example, last time her father died […] and everyone contributed maize, money, wood, water and [we] helped her to prepare and organize the funeral” (GG02).</td>
</tr>
<tr>
<td></td>
<td>(d) “The group helps us, for example, in the case of illness of our children. We take credit from the group to take the child to hospital […] And later [usually after harvest], you repay the credit” (BG01).</td>
</tr>
<tr>
<td></td>
<td>(e) “If the child or the person herself/himself is ill and in hospital, the group helps this person by making a financial gesture” (SG03).</td>
</tr>
<tr>
<td></td>
<td>(f) “If someone among us is ill, the group lifts up and fixes one day, apart from the group day, to go and help this member in his/her field” (BG02).</td>
</tr>
</tbody>
</table>

Source: own data

Through intra-group support in production and daily life, the social network ‘group’ helped the individual member to reduce, mitigate and cope with production-related and social risks like pests, input and equipment failure, lack of information, illness and ageing etc.

3.3 Women’s Individual Experiences of Group Participation and Perceived Resulting Changes

3.3.1 Women’s Motivation to Engage in Collective Action

Based on the individual interviews, the main motivation of the women to participate in a group was to progress in their agricultural work and thus improve their living conditions through (facilitated) access to productive resources, technology, learning and support of various kinds, for instance, technical, financial and social support. This finding accords with CHEN et al. (2005: 75) who argue that “women consistently seek to create and join groups that will provide them with critical economic and social benefits”. The female members decided to join the group to obtain information and gain experiences - both important aspects for advancing their rice farming:
When you are in a group, you are informed, you have information about agricultural activities. So, \( I \) decided to join the group (GIM13).

You alone, if you develop alone, you cannot know everything. You have to be in a group for exchanging ideas with others (SIM03).

For some women it was the rice-growing cultivation itself, including its benefits such as provision of food for the family and income, and/or NERICA which motivated them to do farming within a group:

When \( I \) came to the village, they told me that there was a group which produced rice and if \( I \) produced rice with them, \( I \) would have rice for nourishing the children. And \( I \) would also get some food for the children if \( my \) husband wasn’t able to give \( me \) money (DIM09).

I already cultivated rice. As they said that there was NERICA seed available, I joined the group (BIM05).

Several women also stressed that they joined a group because they had observed the change in other people’s lives as a result of group membership:

I saw how the others, who took part in a group, had developed. I admired it and I also wanted to become a part of this group to see how I would develop myself” (GIM05).

[…] \( I \) realized that for those who were in the group, there was a change in their life; there was progress in all what they did. It was this aspect which caused \( me \) to belong to the group (DIM08).

Shared entertainment through group singing and dancing, which allows for diversion and recreation, attracted women in the village: “The group helps you to distract yourself and it is a way to free yourself sometimes. That’s why I decided to take part” (SIM01).

3.3.2 Economic Empowerment

This section explores how women perceived the influence of group membership on their income situation. To be better able to evaluate women’s perceptions, the researcher was interested to get an insight into women's sources and decision-making power of self-generated income. For this purpose, it was asked one question about the women's income generating activities and another question about who decided over their generated income.

The women in the study had self-generated income either from their own economic activities outside the group and/or from agricultural activities within the group (see Table 4). Economic activities outside the group included crop cultivation on private plots, commerce with food crops or other non-food items and/or activities such as tailoring and rock crushing.
According to Table 4, 46.9% of the interviewed women had decision-making power over their self-generated income. 18.4% had a bounded decision-making power because of an information or consultation duty towards their husbands. Joint decision-making was reported by 20.4% of the women. Only 10.2% voiced that their husbands had the decision-making authority and 4.1% did not provide any answer. When considering together those women with large and bounded decision-making power, it was shown that around two thirds of the women in this study disposed of a certain degree of economic ability.\textsuperscript{10}

\textsuperscript{10} These findings reflect the results of a demographic and health survey conducted in 2006 by Benin's Office of National Statistics (INSAE) which investigated the income control of 15 to 49 year old women living in a union and earning money (INSAE, 2007). In Collines, it was in 64.7% of the cases principally the woman who decided about the use of her self-generated income. Nationwide, the value accounted for 83.6% of women living in rural areas and for 95.6% of women living in Cotonou. The same study learned that in 26.7% of the cases in Collines, the partner and the women together jointly decided about the use of the woman’s generated income, while in only 7.6% of the cases the partner principally decided alone.
Female group members perceived the impact of participation in the group on their financial situation as consistently positive. By participating in collective action, additional financial means could be acquired which gave them a certain economic power within the household, family and community. They were better able to support their husbands and children and could satisfy more easily personal needs and wishes:

Before [I] did not have [financial] means to help [my] husband in the household, but with the group and NERICA production there is an improvement with respect to this situation (DIM05).

For me personally, it is a very good independence. With the group I am proud and I speak boldly in order to tell what I think because I know I have food, money somewhere and this is because of the rice (SG01).

Before [I] had debts, now, there are no more debts because of the group (GG07). […] the fact that [I] find money today and that [I] can help my husband. He does not have to cover the expenses alone anymore. [I] take a part and my husband, too. So there is more harmony in the house (DIM08).

We are now able to pay the schooling of the children without problems (BG01).

The opportunity to have access to financial resources from the group in the case of personal financial bottlenecks (instrumental social support) also strengthened the women:

Now, when I need money, and I do not have it, I can go to the group, and they will help me (GIM10).

Since [I] joined the group, [I] find peace in [my] household. When [I] was ill, the group supported [me] financially with money three times. The third time was a credit which [I] paid back later, without interest (GIM06).

Last year [I] lost a family member and during this time [I] had many expenses […]. The group collected money [cotisation] to support [me] in my difficulties, in [my] expenses. […] The group members are always behind [me] (GIM14).

In addition to offering a possibility of earning (additional) income, group membership also strengthens the women economically by providing them with access to other productive resources such as inputs, information, credit and training.

3.3.3 Social and Personal Empowerment

The women in this study experienced a positive change in their lives through group membership. They described that they felt comfortable in the group and were happy and satisfied. They found peace and harmony and gathered strength through the social cohesion within the group. The internal satisfaction of the women is certainly also a result of improved food security and increased prosperity:
For me personally, it is a very good independence. With the group I am proud and I speak boldly in order to tell what I think because I know I have food, money somewhere and this is because of the rice (SG01).

The female members praised the collective for providing them with an opportunity to exchange ideas and obtain important information regarding not only their production activities but also their private/family life:

The group provides [us] with advice regarding [our] households, how to take care of [our] husbands, how to spend [our] money […]. [I] realize that these advices are good and [I] take them into consideration (DIM06).

They were glad that they had a contact point, a kind of an informal social safety net, from where they got social support in the form of advice, work assistance or financial help (donation, credit):

If there is a problem and [I] am not able to resolve it, the group will assist [me]. Or if [I] need something and [I] do not have it but the other does, [I] can exchange with her (SIM06).

Last year [I] lost a family member and during this time [I] had many expenses […]. The group collected money [cotisation] to support [me] in my difficulties, in [my] expenses. […] The group members are always behind [me] (GIM14).

Several women appreciated the social backing of the group and explained that they felt secure and protected within the group: “The group helped [me] to feel more comfortable, it provides [me] assistance. It is the group who is like [my] big family for [me] now” (GIM16). Some women noted that a group is a great way for making new contacts and socializing with friends.

Moreover, participating in a collective was positively perceived by the women since it also effected a change in their personality, behavior, personal awareness and in their social environment. One of the most important changes was the expansion of their knowledge. They felt more enlightened and experienced through group activities. Many female members explained that group participation influenced their working morale and their way of working. They were more motivated to do farming and, in particular, they became more disciplined in every activity. Important reasons for the improved work attitude were group rules, peer pressure, internal competition, mutual monitoring and social learning through observation and imitation. Members reported on that as follows:

When you are alone and you work, you don’t care seriously about the work. But when you are in an association, you acquire experiences and you are forced to work in the same rhythm as the others and even more than the others [….] Working in a group is more efficient (GIM14).
If you are in a group, if the members of the group are doing something, you also want to do it, you have to do it. It becomes an obligation for you to follow (SIM04).

Many respondents admitted that they corrected their behavior in a positive way due to binding group codes and the working together with others. They were proud that they had developed personally and that they could assume responsibility within the group, in other words, responsibility for the other as well as responsibility in terms of occupying an important position such as chairperson of the group, secretary or treasurer:

If you are in a group, you see other things, you hear other things […]. If you have a behavior which is not good, you’ll change. To be a in a group, you must have a certain behavior (BIM05)

They have nominated me secretary of the group. That has given me more respect within the group (DIM09).

A positive effect on self-esteem and self-worth was experienced by the women. They paid more attention to their outer appearance, became more open and courageous and felt a certain internal pride:

Before, [I] did not manage to express [myself]. But now, as everyone in the group has to give his opinion, [I] [am] also able to express [myself] (SIM03).

This raised self-esteem is probably also rooted in the fact that they received respect and recognition from their social environment because they are now able to support their family and have developed personally. As the women reported:

Since [I] have joined the group, [I] feel happy. [I] [am] respected by [my] family and also [my] husband appreciates [me] (SIM04).

[I] now have a good standing in the family because after the sale, [I] give a bit of money to [my] close relatives […]. [My] husband has also seen that [I] changed [my] behavior and there is now more harmony (GIM14).

All the positive developments impact their family life through more harmony, peace and understanding within the family.

To sum up, the identified women’s views and perceptions suggest that group participation strengthened the women’s role in the family and in the community by (i) offering the opportunity to link with other people and build up social capital; (ii) enabling the women with their self-generated income to (better) support their husband with family expenses or help other family members financially and (iii) providing a chance to assume responsibility and leadership positions within the social network ‘group’. Furthermore, women experienced personal development and increased self-esteem and self-confidence because group membership brought about a positive change in personal characteristics and offered an opportunity for capacity-building.
3.3.4 Perceptions of Non-group Members

The views, opinions and experiences of the 16 non-group members revealed that women who do not participate in a group face much more difficulties in getting access to markets, production resources, external support, knowledge and information because alone-standing they cannot benefit from the advantages of collective action such as experience/advice exchange, skills sharing/mutual learning, economies of scale, getting a voice. So, the majority of the non-group women could think of joining a producer group to benefit from collective action for improved agricultural production and livelihoods. One woman appreciated that in a group there is mutual learning and exchange of good practices, which helps to acquire skills in rice farming:

If [you] enter into the group, [you] will understand, they will show [you] how to sow the rice, how to maintain it, how to sell it. All these things. They will give [you] advice (GIN05).

Another woman mentioned the aspect that as group member, you can benefit from certain opportunities that were only available to groups and not to individuals:

[I] want to join the group because if you are alone, you cannot find financial help, you cannot find help from the state, from NGOs or other projects. When you are alone, you have no strength. But if you are in a group, you will find it [support] quickly (BIN01).

Group membership also allows learning more about new innovations such as NERICA:

When [I] see the rice these people are cultivating, I like it. It is good. That’s why [I] want to enter into the group next year. The people who are doing this [NERICA cultivation] over there...[I] went and [I] tasted it. It is sweet. They prepared it and [I] tasted it. Next year [I] want to join the group to see how it works (GIN06).

3.4 The Interplay of NERICA Adaption, Rice Cultivation, Collective Action and Women’s Empowerment

During the interviews with the groups and individuals it emerged that in this case study it is ultimately the interplay of three components that strengthened women rice farmers’ ability to assume a more active and productive role in life, which, in turn, contributed to the improvement of the living conditions of themselves and their families: (i) the adoption of a new technology, namely NERICA; (ii) the advantages of collective action and social network support and (iii) the production of a staple food, namely rice (see Figure 3). A number of distinctive appraisals are given by female group members:
NERICA brings [me] much benefit. After harvest, we sell it together and the money comes in bulk. With this money [I] can realize many good things in my life. And when [my] children are ill, [I] have money to take them to hospital (DIM08).

NERICA allows [me] to be happier with my family and in my life. [I] do not have to buy rice anymore, [I] consume my own production and [I] also sell it (GIM15).

I feel good in the group. It gives me a lot. I find money to eat, to buy what I like. And I eat with my children. We are in good health with NERICA (GIM09).

First of all, the rice [NERICA] grows well. It brings [me] enough profit. And [I] feel proud to belong to a group. It allows [me] to have money to support the children, the family” (SIM04).

If you sow NERICA, it grows well. It brings a good yield. And if you prepare it, it is good to eat. If [we] sell it, [we] get money […]. [I] can satisfy the needs of [my] children, [I] can prepare the rice and the children will eat (SIM06).

3.5 Challenges for NERICA Producer Groups

To improve the interplay of the three components shown in Fig. 3, it is important to identify challenges in this mesh and respond to them with appropriate strategies and measure. In this study, the following challenges could be observed:

3.5.1 Challenges in Rice Production

Challenges which hampered the groups' rice production activities and which could only be managed to a limited extent by collective action included (i) land preparation due to lack of appropriate equipment and external labor; (ii) weed and other pest management due to lack of effective herbicides and/or pest/rodent control products (e.g. traps and bird netting); (iii) fertilizer application due to lack of funds to buy
fertilizer, no on-time availability or poor fertilizer quality; (iv) proper post-harvest handling due to lack of appropriate storage facilities and (v) marketing due to an insufficiently organized market for selling their farm produce in bulk. Commercialization of their locally produced rice was mainly ensured through the intervention of SONAPRA\textsuperscript{11}, which is often not guaranteed, and/or through direct-marketing to local retailers or in local markets, mostly at price that did not satisfy the farmers:

If you take it \textit{the production} to the market, it is the merchant \textit{e.g. saleswomen/ bonnes dames} who fixes the price […]. \textit{We} do not gain by selling in local markets (GG06).

The lack of a guaranteed bulk purchaser requires the group to sell their rice in the form of small quantities at local markets, which is more complex and, in their eyes, does not always provide a satisfactory profit.

If you produce a lot of rice, you do not find a place where you can sell it. Even in the market of Gobé \textit{a town in Savè}, the people only buy a little bit, a little bit (SAG03).

An extension agent explained why the buying up by SONAPRA is not guaranteed:

It \textit{buying up} is not always guaranteed. This year, for example, the farmers still have rice at hand because PUASA said that the fund reserved for buying rice is already finished because PUASA supports the rice and maize sector at the same time (K01).

The core problem, as stressed by the groups, was the lack of adequate financial resources for the development of their rice farming activities. The contributions rendered by each group member are often not sufficient to address the production constraints. Previous support in the form of input credits provided by CeCPA was stopped. One extension agent explained,

PUASA provided CeCPA with fertilizer. We authorized the producers, according to their cultivated area, to purchase this fertilizer on credit. After the harvest, when they have sold the rice, they pay it back […]. However, it was noted that, of the producers who had taken fertilizer at CeCPA, not all had paid back the credit […]. Since the people did not reimburse the credit amount at 100%, input credit can no longer be made available by PUASA (K01).

All groups expressed the wish for external support, particularly in the area of mechanization, marketing, work equipment, inputs, storage facilities, and financial aid.

\textsuperscript{11} Société Nationale pour la Promotion Agricole (National Society for Agricultural Promotion) – This parastatal marketing board is engaged in national seed distribution (various rice varieties) and in the collection, processing and commercialization of paddy rice (various rice varieties). Financial means were provided by PUASA i.e. the Food Security Emergency Support Program (Programme d’Urgence d’Appui à la Sécurité Alimentaire).
3.5.2 Challenges with NERICA

Three groups and their members complained about the poor performance of NERICA. During the discussions it then turned out that the low yield of NERICA was due to lack of fertilizer, recycled seed and wrong handling. Due to inexperience, one group in Glazoué recycled the NERICA seed too many times (it is possible to recycle it up to 3 times) until they discovered too many impurities in the field. Instead of sowing upland NERICA in upland fields, another group sowed it in lowland plots where too much water inhibited the proper development of the plant. These statements showed that the problems were not inherent in NERICA itself, but rather arose due to inexperience in its management.

4 Study Limitations and Future Research

With a purposeful sampling method and a small sample size, the findings of this study are not representative of all NERICA related farmer groups and women NERICA rice growers. Also, the use of a case study method limits the generalization of findings to other settings. However, the purpose of selecting the case study method was to provide an in-depth understanding of a phenomenon rather than aiming at representativeness. Since the study only involved qualitative cross-sectional data and no baseline data (i.e. data related to women’s economic, social and personal empowerment before they joined the NERICA groups), it was difficult to measure change over time, to confirm any “statistical” causation between group participation and empowerment as well as to ascertain the magnitude of empowerment effect through collective action. However, the aim of this study was to analyze the interplay of NERICA adoption, collective action/social capital and women's empowerment by looking at women’s views, experiences and opinions about group membership and by capturing their perceptions about resulting changes. It is recommended that further research (in particular of quantitative nature) will be undertaken to confirm the study findings, address the limitations of this study and gain additional insights into the dynamics of (NERICA) technology adoption, collective action and women's empowerment.

5 Conclusion

The results of analyzing the interplay between NERICA adoption, collective action, social capital and women’s empowerment based on women’s views and perceptions indicate that through the adoption of a “women-friendly” improved rice technology like NERICA and by organizing in groups and acting collectively, the women rice growers experienced improvements in their economic, social and personal lives.
In particular, the findings suggest that groups and their social networks and collective action empower women through addressing three dimensions:

(i) Through group membership, women gain an (additional) income opportunity as well as access to important resources and social support ("power to"\textsuperscript{12}). Thus, they are able to generate own (additional income), expand own skills and knowledge and contribute financially to family support.

(ii) Within groups, women have the opportunity of participating actively in decision-making processes, assuming responsibility and pursuing their own objectives (gaining of agency, "power within").

(iii) Within groups, women can link and exchange with each other to pursue common objectives from which personal benefits can be derived ("power with").

The study findings imply that through the direct benefits of NERICA group participation the women are finally able to obtain the following achievements for themselves and their families: economic prosperity, food security and wealth, improved social standing in the family and community, personal development and enhanced psychological well-being (see Figure 4).

Figure 4. Individual group member’s empowerment process

Source: own depiction based on concepts from KABEER (1999, 2003) and MAYOUX (2000)

\textsuperscript{12} See MAYOUX (2000) for the concept.
However, despite the benefits of joint behavior, the case of the NERICA farmer groups also showed that these grassroots organizations still faced problems which, even through their collective action, could not be tackled such as specific production, market and financial constraints. In the light of these problems and given the critical function of collective action in strengthening women’s capacities and capabilities, it seems, therefore, a need for further external support and guidance to ensure a best use of the potentials of farmers’ joint and coordinated behavior. Regarding the NERICA farmer groups of this study, it is recommended that the stakeholders in Beninese agricultural sector such as extension services, non-governmental organizations and policymakers reinforce their efforts to further advance the development and improvement of these grassroots farmer institutions, for example, by (i) intensifying capacity building and training activities with the groups in the areas of business and financial administration and marketing and the establishment of a focal point e.g. within the extension service which would only be responsible for supporting the groups in commercialization, marketing and price negotiation, cost accounting and budgeting; (ii) supporting groups in their self-help activities, i.e. internal saving and lending through cooperation with micro-finance institutes or NGOs; (iii) establishing market linkages to large buyers, for example, through contract farming or cooperatives; (iv) enhancing their ability to improve market access and/or exploit new market opportunities through further training in post-harvest handling and processing to improve product quality and add value to the produce (value chain inclusion); (v) improving their access to improved manual (hand tools) as well as mechanized farming equipment (e.g. tractor for ploughing and weeding), for example, through the establishment of small private-sector enterprises which are specializing in providing farming equipment on leasing and rental basis and which finance their start-up costs through promotional loans (long-term, low-interest); (vi) improving and securing land use rights through legal means (e.g. land-use grant contract, lease contract) and (vii) re-introducing input credits but only in combination with offering financial planning training.

To sum up, the study wants to draw attention to the interface between the adoption of a new agricultural technology, in this case NERICA, social capital, collective action and women's empowerment. The findings which are based on women's perceptions and descriptions reveal the positive effect of cultivating a new technology like NERICA and engaging in collective action and mutual support at the grassroots level on many aspects of women's life. From this study follows that for further promoting NERICA in Benin, as well as in other Sub-Saharan Africa countries, while making sure that women benefit in a holistic way from it, it seems to be worth to consider the strengthening of farmers’ joint action and social interaction in the design and implementation of technology dissemination activities.
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