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**ASSESSING THE CO-OPERATIVE'S IMPACT ON PEOPLE'S
WELL-BEING AND COMMUNITY DEVELOPMENT: THE CASE
STUDY OF COPPALJ, A CO-OPERATIVE LOCATED IN
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Abstract

After years of preconceptions about co-operatives in developing countries, scholars and international institutions have re-evaluated their role particularly in poverty reduction strategies. Crucial condition is that co-operatives are considered as genuine, authentically participatory enterprises. Here, investigating how these peculiar enterprises affect people's well-being and contribute to institutional transformation of communities emerges of crucial importance.

The paper, by showing the results of a case study, carried out in the Maranhão State through a field research, provides a methodology to evaluate the genuineness of the co-operative and its impact on people's well-being and community development. Adopted methodology entails quantitative and participatory methods and, based on the Human Development and Capability Approach (HDCA) framework, it provides a multidimensional analysis of poverty. In such a way, this methodology aims at contributing to overcoming the evaluation of co-operative performance based only on monetary indicators, enhancing the concrete contribution that co-operatives can bring to human development and poverty reduction.

Key words: *co-operatives; human development and capability approach (HDCA); propensity score matching; participatory methods; Brazil.*

JEL classification: O150; O540; P130

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1. Introduction

In last twenty years, co-operatives have been rediscovered and praised for their contribution to poverty reduction. In fact, even if literature judging as a failure the experience of co-operative movement in developing countries is not lacking (e.g. Lele, 1981; Attwood and Baviskar, 1989; Holmén, 1990; Thorp, 2002), both scholars (Sen 2000; Birchall 2003; 2004; 2006; Stiglitz 2004; Simmons and Birchall, 2008) and international institutions (e.g. UN 1992-2011¹; ILO 2002) have pointed out that, once genuinely in operation, co-operatives represent an important means for enhancing well-being of members and their families and for community development.

In reassessing the role of co-operatives in fighting poverty, investigating how concretely these peculiar enterprises affect people's well-being and contribute to institutional transformation emerges of crucial importance.

To this aim, the Human Development and Capability Approach (HDCA)² can be identified as an appropriate framework, enabling to go beyond a mere evaluation based on efficiency criteria. In fact, this framework seems to be the most suitable for the analysis of co-operatives, especially when it regards their role in poverty reduction. The main reason lies in the full recognition given by this approach to participation. For HDCA, participation in political/social/community life helps to achieve commonly valued results, but it is also a process, intrinsically valid, because as such it enlarges the real freedom enjoyed by people. On the other hand, participation is a core element of genuine co-operatives where members have the right to self-determination, working together, participating in decision-making and, finally, taking decisions in a "democratic" way. Therefore, genuine co-operatives, can play an important role in expanding people's agency and capabilities, being the latter basic capabilities, such as being adequately nourished, sheltered, educated, and so on, as well as complex ones such as participating in the community life or in household decision-making (Vicari and De Muro, 2012).

Thus, based on the HDCA, the paper proposes a methodology for impact assessment of co-operatives in low human development areas. Adopting quantitative as well as qualitative/participatory methods, it attempts to evaluate co-operatives' genuineness; its impact on people's well-being and its contribution to institutional transformation of local communities.

¹ Since 1992, the UN Secretary-General has issued the "Report on Co-operatives in Social Development". They are available at <http://www.copac.coop/publications/unpublications.html>

² Human Development is defined by Sen (1999, p.3) as the process of "expanding the real freedoms that people enjoy". Therefore, the expansion of human capabilities, not income per-capita nor GDP, is the central feature of the process of development. Notably, as stressed by Robeyns and Crocker (2009), HDCA is not a theory to explain poverty, inequality or well-being, although it provides concepts and normative frameworks within which to conceptualize, measure and evaluate these phenomena as well as the institutions and policies that affect them.

Proposed methodology was used in a field research, focused on an agricultural primary co-operative, called COPPALJ (Co-operative de Pequenos Produtores Agroextrativistas de Lago do Junco) and located in the Maranhão State, one of the poorest among Brazilian States. This co-operative, set up nearly 20 years ago as result of a common action carried out by the local population affected by socio- economic exclusion and unequal power relations in the field, was selected as a good example of genuine co-operative.

Therefore, focusing on this case study, the paper is divided in five sections. Section 2 will show applied methodology, while section 3 will deal with the context of the field work and the presentation of the sample. Here, some characteristics of co-operative member participation will be illustrated in more depth, thus, providing the justification for COPPALJ to be considered as a genuine co-operative.

Finally, section 4 will deal with data analysis. Through the application of Propensity Score Matching techniques in the analysis of data collected in the survey and the application of participatory methods, together with open interviews, there will be an assessment on to what extent, presumably, co-operative membership had an impact on members' well-being, on which dimensions of well-being, as well as on their agency and community development.

The last section is devoted to conclusions and agenda for further research.

2. Methodology for evaluating the impact of co-operative membership on members' well-being

The aim of this study is to evaluate whether being a member of a co-operative results in enjoying some valuable outcomes at an individual level (the co-operative member), involving their families and their communities, and whether these outcomes are attributable to co-operative membership. Furthermore, consistently with the adopted framework of HDCA, the mentioned outcomes for individuals should be evaluated in terms of their functionings³ and/or capabilities⁴, and agency.⁵

Both types of literature on the measurement of capabilities (e.g. Alkire 2002a, 2008; Robeyns 2003, 2005, 2006; Comim 2001, 2008) and on impact evaluation (e.g. Baker, 2000; Ravallion, 2008; Khandker *et alii*, 2010) recognise the importance in overcoming the fierce cross-discipline debate on the value of different data collection methods, namely qualitative and quantitative methods. Indeed, it is clearly recognised that, due to the complexity and multi-dimensionality of concepts such as capabilities, and the difficulty in identifying differences in individual well-being as a consequence of participation in a project (that is, being member of a co-operative in this case study), in most situations a mix of data collection tools provides a more reliable and complete picture of the phenomenon under study.

Thus, due to these considerations, the empirical work adopted in this study was both qualitative and quantitative, divided into the following sequences:

a) Drawing up the draft questionnaire, based on questions adopted in LSMS and in studies on “missing dimensions” published by Oxford Poverty Human Development Initiative⁶. The questionnaire is divided into 7 sections: section 1 and 2 regard general information on the people interviewed, education included; section 3, work and assets holding; section 4, health; section 5, participation in the co-operative and,

³ Functionings are defined as “the various things a person may value doing or being” (Sen, 1999, p. 75).

⁴ Capabilities are defined as “the various combinations of functionings (beings and doings) that the person can achieve. Capability is, thus, a set of vectors of functionings, reflecting the person’s freedom to lead one type of life or another...to choose from possible living” (Sen, 1992, p. 40).

⁵ “Agency refers to a person’s ability to pursue and realize goals that he or she values and has reason to value” (Alkire, 2005, p. 3).

⁶ In going beyond the dimensions usually included in the Human Development Index (income, longevity and education), which do not cover all the dimensions of poverty, Alkire (2007) asserts that “it is at times necessary to conduct empirical studies using individual or house-hold data level on multi-dimensional poverty”. Thus, in order to complete all the most well-known surveys, such as the World Bank Living Standards and Measurement Survey (LSMS), with the “missing dimensions”, the Oxford Poverty Human Development Initiative (OPHI), proposes numerous indicators and related questionnaires to represent them. Some of these works regard: Employment Quality (Lugo, 2007); Agency and Empowerment (Ibrahim and Alkire, 2007); Physical Safety (Diprose, 2007); The Ability to Go About Without Shame (Reyles, 2007); and Psychological and Subjective Well-being (Samman, 2007). The questionnaire has been drawn up under the supervision of the OPHI staff, mainly Dr. Sabina Alkire and Dr. Emma Samman.

generally speaking, local organisations; section 6, participation in community life; and section 7 regards individual achievements and aspirations. The chosen dimensions of poverty regarded basic capabilities, such as education, health, access to sanitation and shelter, decent work. Moreover, beyond such relative questions drawn up in line with LSMS and surveys on micro- assessment adopting CA (e.g. Pillai and Alkire, 2007) and more contextualised questions regarding participation in the co-operative and information on the local economy, some questions extracted from “missing dimensions” were added, about the quality of work (Lugo, 2007) and participation in household decision-making in the domains of health, household expenditure, children’s education and tasks at work (Ibrahim and Alkire, 2007).

b) Identification of population to be analysed and extracting the sample and relative control group. The population regards rural workers who live in the communities where the co-operative under study operates. They are men and women, who share the household with a partner (where at least one of them is the head of the household), whose main job is linked to co-operative activity and who hold some of the characteristics which are considered important to participate in the co-operative. A simple random sampling was adopted with a significance of 8%.

c) Discussion of selected capabilities with the local community. In line with suggestions by Robeyns (2003) and Alkire (2008), the selected capabilities were discussed with local communities through a focus group. This focus group was held in the community of Ludovico with 10 members of the co-operative participating. Participants were asked to draw a map of their values, placing themselves at the centre, surrounded by what they felt to be more important in their daily lives, while at the outer extremities what they felt to be less important or more distant from their values. This activity was used as a starting point for fostering a debate and, thus, for identifying the valued dimensions of well-being. The identified dimensions made it possible to draw up the final version of the survey questionnaire and to prepare cards used in the adopted participatory method, that is, the card game.

d) Drawing up the final version of the questionnaire and testing through a pilot survey. The final version of the questionnaire was also approved by Board Members of the COPPALJ and the personnel of local NGO ASSEMA, which support the activities of the co-operative. The questionnaire was tested through a pilot survey in the community of Ludovico. Furthermore, a staff of 6 high-school and university students (children of co-operative members) were trained to provide assistance in carrying out the field work.

e) Carrying out the survey. The survey was carried out from November to December 2008 in 6 communities of the municipality of Lago do Junco, where the co-operative operates. In total, 63 members and 84 non-members were interviewed.

f) Use of the card game. This is a participatory method used in order to explore the impact of the co-operative on valued capabilities⁷. The author was trained to use this technique in the International Workshop “Children’s Capabilities and Project Why”, held in Delhi, on 4-9 September 2008, promoted by the Human Development and Capability Association Thematic Groups, respectively on Participatory Methods and on Children’s Capabilities. The technique was used with 4 groups: two with co-operative members (one with only women, one with both women and men); one with a control group (both with women and men); and one with a comparison group (only women from the community of Riachão, a community where there are no co-operatives).

g) Interviews with key members of the co-operative. Seven co-operative members, holding (or who had held) managerial positions were interviewed through open interviews. Answers were recorded but not codified.

h) Data Analysis triangulating the survey findings obtained by elaborating the dataset through the application of Propensity Score Matching⁸, with qualitative findings obtained through the participatory technique and open interviews.

⁷ A first application of the card game in CA is found in Frediani (2007). Other interesting applications of participatory methods in the CA can be found in Alkire (2002b), Biggeri *et alii* (2006), Biggeri and Bonfanti (2009), (Biggeri and Anich, 2009).

⁸ Propensity Score Matching (Rosenbaum and Rubin, 1983; 1985) is one of the most used econometric method in impact evaluation literature for reducing selection bias (Jalan and Ravallion, 2003; Setboonsarngand Parpiev, 2008). An application of PSM to co-operatives is found in Bernard *et al.* (2007) but only for evaluating more “economic” variables, such as prices .

3. Study context and presentation of the sample

3.1 The COPPALJ and the Babaçu economic system

Even if nowadays Brazil ranks among high human development countries, the issues of inequality and poverty are still a major feature in the Brazilian socioeconomic system⁹. Particularly, once we analyse Brazilian HDI divided into regions (UNDP, 2008), we observe significant disparities, with the North-East region showing the lowest HDI (0,716)¹⁰. Among the states belonging to this region, the states of Alagoas and Maranhão show the lowest HDI, respectively 0.677 and 0.683¹¹. The situation is even worse when we look at single municipalities, since 15% of these (636 out of 5,507) are ranked with an HDI lower than 0.6 and, specifically, 21 municipalities are ranked as low human development (UNDP et alii, 2000). The HDI of the Municipality of Lago do Junco, in the Mearim region of the Maranhão state, where the co-operative under study is located, is 0.567 and it ranks 5,163th out of 5,507 Brazilian municipalities, thus representing one of the poorest municipalities in Brazil.

COPPALJ (Cooperativa de Pequenos Produtores Agro-extrativista de Lago do Junco) is an agricultural primary co-operative, set up in 1992 and active in six rural communities of the Municipality of Lago de Junco. It was set up as a spontaneous initiative of the rural population searching for a way out of poverty and to shake off the oppression of the landowners. It is owned by 136 members, who are small-scale farmers and “Babaçu breaker women”, involved in family agriculture and extractive activities¹².

The main activity of the co-operative is to buy the members’ production, that is, the nuts from the Babaçu coconuts and other products, such as rice, beans and corn. While the latter products are traded in local markets, the transformation of the Babaçu nuts and selling of the derived oil represent the co-operatives main economic activity. Moreover, the co-operative owns farmland which members can collectively cultivate, practicing agro-ecological methods, which provide a solution also for

⁹ Brazil economy ranked among the 10 most unequal countries in the world, despite its recent improvements. From 2005 to 2011 Brazilian Gini Index decreased from 0.56 to 0.51 (www.worldbank.org).

¹⁰ Brazilian HDI in 2008 was 0.8.

¹¹ Index values comparable with countries such as South Africa considered as medium human development countries

¹² Babaçu is one of the most important species of Brazilian palms, more highly concentrated in the States of Maranhão, Pará, Piauí and Tocantins. The nuts found in the Babaçu shell (the coconuts), are the most important part extracted by hand mainly by women using a traditional system practiced in a subsistence economy and thus called “Babaçu Breaker Women”. They have good market value, as well as industrial value, in fact all the local oil pressing mills which produce refined and unprocessed oil are the main receivers of the Babaçu nuts. (Amaral Filho, 1990; May, 1990). This is the only means of income for a great majority of the families not owning land, living in the region where the Babaçu grows. In fact, selling Babaçu nuts to dealers, women, on average, earn 80% of the household income, representing a fundamental component of household subsistence. Extracting the nut involves about 300,000 families, even though the census has enormously underestimated this entity (MIQCB - GERUR, 2001).

gender conflicts in the families related to production, as the men were used to destroying Babaçu palms in favour of land to cultivate and, thus, the women were forced to go longer distances to collect the Babaçu nuts. Moreover, the co-operative's commitment to agro-ecological production has enabled it to place the organic label of oil on its products, being the main output of COPPALJ.

Basically, COPPALJ has been set up by its members to overcome the monopsonistic power of the dealers who had been the only buyers of the Babaçu nuts. Thus, they have developed a productive trading model that is able to challenge the unfair low price of the Babaçu nuts previously offered by the landowners.¹³

As Ms Sebastiana Sirquiera (Dona Sebá), ex-president of Coppalj reported:

"In the town of Lago do Junco the conflict for the land was very fierce in the '80s, and it was a very hard struggle. We won. But it was only after the conflict was over, did we realise that we had achieved freedom from the landowners, even though the Babaçu production was still in their hands, as they were the only buyers and their price for the nuts was incredibly low. How could we solve our problem?, we asked ourselves. We thought about creating an association, which we called <<commercialisation>>. Then, after many discussions, we discovered it to be the co-operative form of business. This idea came from the necessity to free ourselves from the dealers. United, we formed a group, of men and women, aimed at continuing our struggle to survive".

The Babaçu related activities are organised and managed by two co-operatives, the COPPALJ – the co-operative of small agro-producers in Lago do Junco -, which is the case study under investigation, and the COPPAESP – the co-operative of small agro-producers in Esperatinópolis which produces the mesocarp flour - and, as well, an association of women, AMTR – an association of rural women workers which produces soap bars transforming the Babaçu oil produced by

¹³ The high concentration of land reached in the 1980s, together with the destruction of the Babaçu Palms and the privatisation of the forests, caused violent conflicts between landowners and small producers. The most serious problem was to define property rights, since landowners wanted to extend their property into the Babaçu forests. In the Municipality of Lago de Junco and other communities around, the long and difficult battle was initiated exactly by the Babaçu Breaker Women and their families who fought for the so-called "stolen coconut liberation". It meant that the fencing off of land for cattle breeding prevented access to the Babaçu forests and so, hindered the working of the land and the harvesting of the nuts. The only option for the workers was to give half of their harvest to the landowners and sell the other half to the self-same landowners who also decided on the price paid to the workers for the nuts. The privatisation of the larger forests also meant a decrease in the areas used for home-grown vegetable gardens and, thus, changing family subsistence patterns. In other words, some families were forced to rent the land and some rural workers had to find work in the mines, while others fought for access to the land and natural resources. The mobilisation of the Babaçu Breaker Women and their families to have the right to access the land and natural resources was carried out mainly during the 1980s, culminating, towards the end of the decade, in the expropriation of vast expanses of land, allotted to the so-called "agrarian reform settlements" (*assentamentos*). This was the result of the state's intervention in the great conflicts between the rural workers and the landowners.

COPPALJ. They are all members of a local NGO, called ASSEMA¹⁴, founded in 1989 on the initiative of rural community leaders and the rural workers' unions of the Mearim Valley. One of the most important objectives achieved by "Babaçu Breaker Women" and farmers in municipalities where ASSEMA works is the adoption of the municipal law, "Babaçu Livre" (Free Babaçu), which guarantees the free access to landowners' lands for the harvesting of Babaçu nuts.

In speaking about this Local Rural System, the SEBRAE (Support Service for Micro and Small Enterprises) declared: "the model which the region is developing is a cluster, an island of specialisation and excellence in Babaçu utilisation." The organisation of the supply chain can be seen in figure 1.

COPPALJ organisational system is structured as in figure 2. Nuts are collected through the *cantina*,¹⁵ that is, a kind of shop, where members, as well as non-members, can sell their nuts and buy goods at lower prices. Clearly, members have the right to more profitable conditions, such as buying goods at a 20% lower price and receiving the member refunds at the end of the year. However, both members and non-members can sell their nuts for a price that is 50% higher than the average prices offered in the region (ASSEMA, 2008). Afterwards, nuts are sent to the COPPALJ plant transforming nuts in gross oil, which is then sold in domestic and international markets, i.e. in the USA, as well as the EU, mainly the United Kingdom (Body Shop) and Italy (*Cooperativa Mondo Solidale*)¹⁶.

The marketing strategy of COPPALJ is aimed at incorporating in the final price the benefits of the organic feature of the oil, as well as the history of the social struggle and the development of the local communities. This higher price is then converted into a higher revenue for the co-operative and, thus, a higher income distributed among its members. After almost 15 years since COPPALJ was set up, it is still financially sound with a turnover of 1,531,771 R\$ (year 2007).

¹⁴ ASSEMA (Association for agrarian reform settlements in the Maranhão State) is a non-governmental, non-profit regional organisation, which is attempting, through technical, juridical and political support, to strengthen the position of the rural workers and their families who survive thanks to agriculture and the related activities.

¹⁵ The *cantina* has an important role also concerning the co-operative's governance, since each of them works as a representative group of the co-operative. Being closer to each community, the "cantina" is the place where members of that area meet up and discuss the issues regarding co-operative management, but also regarding community problems. Every community is represented on the Board by a Board member who organises twice monthly a meeting in the "cantina", together with the manager of the local shop and the co-operative members from that community. In this way, all members are aware of all the current issues that the co-operative is facing and are able to communicate their opinions to the Board. Then, all members participate in the General Assembly, that takes place twice a year, and is the proper location where decisions are taken through the one person-one vote principle.

¹⁶ The oil is used as an ingredient in cosmetic products and detergents by enterprises committed to Corporate Social Responsibility (CSR). In particular, the inter-co-operative relationship between COPPALJ and *Mondo Solidale* has taken on an important value from the viewpoint of the role of Western co-operatives in fostering development. In fact, it represents a significant example of North/South co-operative networking promoting reciprocal opportunities for development on the basis of common values and principles (the so-called "co-development", see *Bellanca et alii, 2011*).

Fig. 1 Organisation of Babaçu supply chain

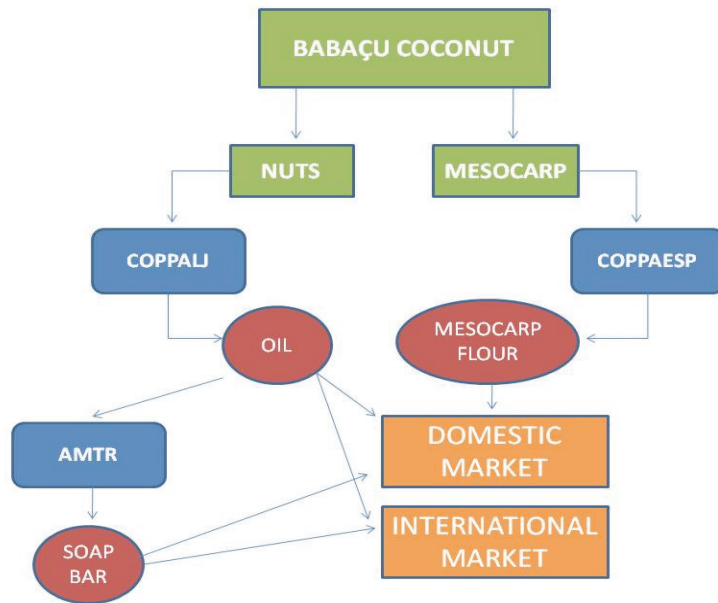


Fig. 2 Model of the co-operative's local development



3.2 *Sample description*

In the Municipality of Lago do Junco there are 9,833 inhabitants, with a male population of 5,007 units, and a female of 4,826 units. There are 2,297 households in the municipality, 80% with a man as the family head, and in 96% of these cases, the household is shared with a female partner. In the residual households led by a woman, only in 4% of cases is there also a man. It means that women mainly head the households in the absence of a man. Thus, according to this data, 78% of the households in the municipality have both partners present. (IBGE, 2000)

In the communities of the Municipality of Lago do Junco where COPPALJ is active (i.e. Ludovico, São Manoel, Centrinho de Acrisio, Centro de Aguiar, Santa Zita and Sitio Novo) there are 377 households. For the sample, we assumed that the male and female population in these communities is distributed as for the population in the municipality. Population and sample size are listed in table 1.

According to the statutes of COPPALJ, co-operative members can be small-scale farmers and “Babaçu Breaker Women”. Units of the co-operative member group were selected through a simple random sampling. Units of the control group were selected from among people living in the same communities and with the same characteristics considered important in becoming a potential co-operative member. Thus, they did not hold land or they held only up to 10 hectares; their main work was related to agriculture and/or the agro-forestry activity of the Babaçu palm; and they lived with their own partner and the couple (or one of partners) was the head of the household.

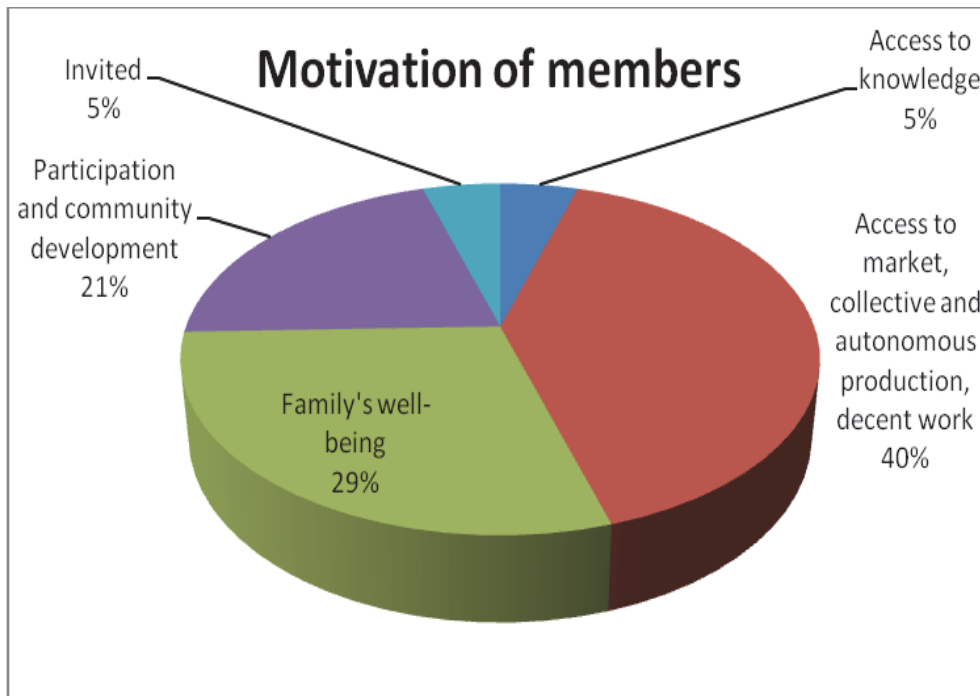
Table 1. Population and sample size

	Co-operative members group		Sample weights	Control group		Sample weights
	N	n		N	n	
Men	46	29	1.6	254	21	12.1
Women	60	34	1.8	228	63	3.6
Total	106	63		482	84	

3.3 *Some considerations about COPPALJ as a genuine co-operative*

The assumption to consider COPPALJ as a genuine co-operative is a fundamental prerequisite for the significance of the outcomes of the analysis. To achieve this, information was collected using both participatory methods and the questionnaire. From the questionnaire data, which have been confirmed by findings from the participatory methods, it emerges, first of all, that COPPALJ members are moved mainly by reciprocity, the need to produce collectively and autonomously and advance in their work. Moreover, they highly value the improvement of their families’ well-being and community development.

Figure 3 Motivation of members to join the co-operative



As possible evidence of the principle of open door, 30% of interviewed members reported to have been invited to join the co-operative while 70% decided autonomously. With reference to democratic participation, all interviewed confirmed that decisions are taken by the majority through the principle of one person-one vote. Nearly 40% of members held a decision-making position - 36% of women and 45.7% of men. However, correlation between gender and participation in decision-making positions is not significant, thus, presumably also showing the absence of significant gender bias in decision-making. Moreover, the average length of a decision-making position is no more than 4 years suggesting the existence of a real turnover. The data concerning quality of participation show that active participation involves 56.6% of co-operators, even if the absence of participation is registered only in a very few percentage of cases.

4. Data analysis through participatory and econometric methods

The implementation of the methodology highlighted the complementarity of qualitative and quantitative methods in responding to the main research question, i.e. whether and how the co-operative influenced members' well-being and community development. In particular, participatory methods helped in understanding the causal connection between co-operative membership and well-being, the local context and how the co-operative contributed in transforming it. Participants were asked whether they considered dimensions studied achieved (or not), however, these results can not be considered representative for the whole population. This was the role of the quantitative methods. The survey revealed statistically significant results regarding achieved (or not) well-being dimensions. However, since in using Propensity Score Matching we can reduce the bias on observables, but not on unobservables, by only looking at ATT outcomes, it is not enough to affirm causal connections for co-operative membership and outcomes. Therefore, using the two methods together results in being a successful methodology to understand the role that COPPALJ plays in local poverty reduction strategy.

4.1 The application of the participatory method “card game”

In the empirical work the card game was used to explore more thoroughly the dimensions of well-being that co-operative members value and the impact of COPPALJ on them. Through this method it was possible also to analyse more in depth the impact of the co-operative on members' agency as well as to evaluate the genuineness of the co-operative.

This method involves using 30 cards, previously designed according to the well-being dimensions that emerged in the focus group of 10 co-operators from the community of Ludovico. Every card represents people, places, activities and feelings familiar to members of COPPALJ and to local people, in general. In table 3, the important well-being and agency dimensions are listed, matched with respective cards and some explanations of issues usually reported by focus group participants regarding such dimensions.

The application of the card game basically involved the group's participants collectively choosing 14 cards out of the total of 30. They were asked to select those cards representing the dimensions that they considered particularly important for their life. Afterwards, they had to explain their interpretation of every card and to decide jointly whether such card represented a dimension of their life that they had achieved (or not achieved). While explaining their arguments, the participants were also asked to explain whether participating in the co-operative had had any impact on the dimensions achieved (or not achieved). The discussions that emerged during the first phase of the game, that is, when they have to unanimously choose the 14 cards, led to a deliberative debate, with participants expressing their opinions, and usually dissenting with each other. This process allows participants to think about dimensions and their historical background that has led to their current situation. At

the same time, a lot of information emerges which could be very helpful also in interpreting the quantitative findings from the survey.

Four groups participated in the game, each of them made up of an average of 10 people. The first group meeting was held in the community of Centrinho do Acrisio, with only women co-operative members participating; a second was held in the community of São Manoel, with the participation of both men and women co-operative members; a third was held in the community of Ludovico, with a control group made up of both men and women non-co-operators; and a fourth group was held with women of the community of Riachão, a community where COPPALJ does not work. This last group worked as a comparison group.

As shown in table 3, cards selected by all groups were related to youth education; gender relationships at home (particularly the violence aspect); the daily activities related to collecting and breaking Babaçu nuts; the fights for land and free access to Babaçu palms; and the church. It emerged that the most valued well-being achievements generated by the COPPALJ were related to the provision of schools in the communities where the co-operative acts; a reduced gender bias in member households, due to an increased men's sensitiveness and women's self-esteem and consciousness of their role; the enhancement of Babaçu for local economy, due to the role played by the co-operative in overcoming the monopsonistic power of dealers; access to lands and to Babaçu palms, due to co-operators' commitment also in promoting the municipal law, "Free Babaçu", that legally enforced the free access of the small farmers to the Babaçu palms, even if they were located on landowner properties. All these findings were supported by the fact that participants from the comparison group reported exactly the opposite for all of the considered well-being dimensions. Finally, the card related to the church demonstrated the origins of co-operators' common action, since during the dictatorship it was the place where they found support and were given the incentive to react and organise themselves.

Concerning the cards chosen only by groups from the communities where COPPALJ works, one card deserves a specific mention, the one showing the word "cooperativism". Here how people perceive the co-operative and being a co-operative member has been analysed, confirming also the genuineness of the COPPALJ. Co-operators stressed the significance of "being a member", that is, working in autonomy and in reciprocity; owning the enterprise; having the control over their business, even if they are not Board members, as, at any moment, they can have access to any information they require and they can actively participate in the meetings, addressing the co-operative activities; and having the opportunities to improve their knowledge and know-how, also being directly involved in managerial activities.

Table 2 Dimensions explored with the participatory method and description of related cards

WELL-BEING AND AGENCY DIMENSIONS	ASPECTS OF DAILY LIFE RELATED TO THOSE DIMENSIONS	CARDS
HEALTH	Possibility to receive health assistance in the community Use of popular natural medicine	1) Health centre in a rural area 2) Woman preparing herb infusion
EDUCATION	Possibility to have access to education in the rural communities, both in terms of public school and quality education provided by social movement (“escola familia”: family school) Possibility for adults to be educated and attending training courses	3) School in rural areas 4) School provided by social movement 5) Adults studying 6) Adults receiving training on their agricultural activities
SHELTER	Possibility to have a decent house, that according to the local standards, means not having a straw roof, and having electricity and piped water.	7) Decent house
GENDER RELATIONS AT HOME (LOVE/VIOLENCE)	Typology of relationships in the household, care feelings or male oppressive and violent behaviour.	8) Couple with child caring for each other in the family 9) A man beating a woman
ECONOMIC FREEDOM	Possibility to have free access to natural resources, as babaçu; to sell fairly their products, avoiding dealers’ power; to access fair markets also abroad and having fair relationships with other producers around the globe. Possibility to organise collectively and autonomously their productive activities, providing themselves with decent work.	10) Only the word “cooperativism”, that evokes co-operatives and related movement. 11) Woman breaking babaçu nuts, with closeby a donkey, important animal for the extractive activity 12) People borrowing money from institutions 13) COPPALJ Babaçu oil plant 14) Local shops of the COPPALJ (called cantina) where people sell their





WELL-BEING AND AGENCY DIMENSIONS	ASPECTS OF DAILY LIFE RELATED TO THOSE DIMENSIONS	CARDS
		production 15) A Babaçu Breaker Woman selling her production to the dealer 16) A globe with arrows starting from Maranhão and going around the world 17) Producers holding hands around the globe
MOBILITY	Possibility to reach the urban centre without walking for hours or waking up very early in the morning, that is the only time when public transport passes.	18) COPPALJ truck
ENVIRONMENT	Concern for the environment, especially regarding forest destruction and water pollution	19) Fires and destruction of Babaçu palms 20) Lakes in the forest
AGENCY	Collective and individual activities to claim rights regarding access to natural resources (land, babaçu palms) and relevant institutions considered in some way reference points for such claims.	21) Women leaders talking 22) Fights against landlords (fazendeiros) 23) Women claims for free access to the babaçu palms against the landlords 24) Municipality of Lago do Junco 25) State/Federal Government
LEISURE IN THE COMMUNITY	Leisure/recreation activities held in the community such as carnival festivities	26) Carnival parties held in the communities
PARTICIPATION IN COMMUNITY ORGANISATIONS	Participation in community organisations, such as the co-operative and the church Qualification of the level of participation and relationships among members	27) Co-operative General Assembly 28) Co-operative Board meeting 29) Church 30) Disunion among people

Table 3 Cards selected by groups

CARDS	GROUP1 Women Co-operative Members	GROUP 2 Mixed Co-operative Members	GROUP 3 Control group (mixed)	GROUP 4 Comparison group (women)
1) Health centre in a rural area				-
2) Woman preparing herb infusion				
3) Schools in rural areas	+	+	+	-
4) School provided by social movement	+	+	+	-
5) Adults studying 6) Adults receiving training in their agricultural activities	+	+		
7) Decent house			-	-
8) Couple with child caring for each other in the family			+	
9) A man beating a woman	-/+	-/+	+/-	+
10) Only the word: "cooperativism", that evokes co-operatives and related movement.	+	+	+/-	
11) Woman breaking babaçu nuts, with nearby a donkey, important animal for the extractive activity	+	+	+	+
12) People borrowing money from institutions			+	+
13) COPPALJ Babaçu oil plant	+	+		
14) Local shops of the COPPALJ (called cantina) where people sell their production	+		+	-

15) A Babaçu Breaker Woman selling her production to the dealer				
16) A globe with arrows starting from Maranhão and going around the world				
17) Producers holding hands around the globe	+			
18) COPPALJ truck	+	+	+	
19) Firesand destruction of Babaçu palms			+	+
20) Lakes in the forest		+		-
21) Women leaders talking				
22) Fights against landlords 23) Women claims for free access to the Babaçu Palms	+	+	+	-
24) Municipality of Lago do Junco		+		
25) State/Federal Government	-/+	-/+	-/+	
26) Carnival parties held in the communities				
27) Co-operative General Assembly		+		-
28) Co-operative Board meeting				
29) Church	+	+	+	+
30) Disunion among people	+			

Legend

	Cards selected by all groups	+	Dimension of well-being considered achieved by participants
	Cards selected by members and control group	-	Dimension of well-being considered not achieved by participants
	Cards selected only by co-operative members	+/-	The majority of participants considered that dimension achieved
	Cards selected only by control and comparison group	-/+	The majority of participants considered that dimension not achieved

4.2 The application of Propensity Score Matching to this case study

By using the Propensity Score Matching technique, we can reduce the bias in the estimation of treatment effects with observational data sets. An attempt was made, adopting this technique to estimate how participating in COPPALJ could have had an impact on members' capabilities. Co-operative members were considered as the treatment group, while non-treated units were obviously the control group units.

Matching methods contribute to developing a counter-factual or control group that is as similar to the member group as possible in terms of observed characteristics. Thus, the Propensity Score Matching builds a statistical comparison group by modelling the probability of participating in the co-operative on the basis of observed characteristics unaffected by the participation. Co-operative members are then matched on the basis of this probability, or propensity score, to non-participants. The average treatment effect of participation in the co-operative is then calculated as the mean difference in outcomes across these two groups.

Therefore, this technique "corrects" the estimation of the treatment effects checking for the existence of confounding factors, based on the idea that the bias is reduced when the comparison of outcomes is performed using treated and control units who are as similar as possible. To this aim, this method proposes to summarise pre-treatment characteristics of each unit into a single-index variable, that is, the propensity score, which renders the matching feasible.

To apply Propensity Score Matching we need to select some variables that influence a treatment group but not the control group. In our case we selected co-variables that could have influenced participation in the co-operative but not the outcome variables. The co-variables we selected were: community in which respondent lives; gender; age; civil status and main occupation.

As required by theory, after calculating the Propensity Score (using a logit model), the Balancing Hypothesis had to be checked to ascertain that it was satisfied, a condition implying that observations with same propensity score must have the same distribution of observable characteristics, independently of treatment status.

Therefore, once each treated unit has been matched with a control unit with the closest propensity score, the difference between the outcome of treated units and the outcome of the matched control units is calculated. The ATT is then obtained by averaging these differences. Thus, by calculating the ATT¹⁷ for every variable of interest, the impact that participating in COPPALJ could have on selected outcomes was estimated.

Chosen variables tested by this econometric method concern the following dimensions of well-being: nutrition, education, health, shelter and sanitation, decent work, access to land, participation in household decision-making, participation in community life.

¹⁷ ATT estimations computed with Nearest Neighbour Matching method and bootstrapped standard error.

Table 4 Logit regression

VARIABLE	COEFF	STAND. ERROR
Community2	- 0.681	0.654
Community3	0.436	0.693
Community4	- 0.466	0.639
Community5	- 1.093**	0.766
Community6	- 2.565***	0.976
Sex	0.333	0.952
Age	0.168*	0.092
Age2	- 0.001	0.001
Civil Status	- 0.635	0.477
Main occupation	- 0.590	0.927
Constant	- 3.496*	1.998
n	142	
Pseudo R ²	0.2403	

Note: *** p-value<0.01; ** p-value<0.05; * p-value<0.1

Table 5 Table of the balancing property

INFERIOR OF BLOCK PSCORE	NON-MEMBER	MEMBER	TOTAL
0.04	20	5	25
0.2	34	12	46
0.4	11	10	21
0.6	9	3	12
0.7	1	12	13
0.8	0	17	17
TOTAL	75	59	134

Table 6 Estimation results - Outcome Nutrition

Variable		n. treat	n. control g	ATT	Std. Err.	t
Times eating meat/fish		59	29	1.059	0.607	1.746*
Times eating meat/fish (women)		34	19	0.618	0.803	0.770
<i>Not computable for men</i>						
Times eating fruits/vegetables		59	29	1.119	0.776	1.442
Times eating fruits/vegetables (women)		34	19	2.132	0.871	2.448**
<i>Not computable for men</i>						

*p-value<0.1; **p-value<0.05; ***p-value<0.01

Table 7 Estimation results – Outcome Education

Variable		n. treat	n. control g	ATT	Std. Err.	t
Being literate		59	29	0.102	0.219	0.464
Being literate (women)		34	19	0.382	0.217	1.765*
Being literate (men)		24	6	- 0.125	0.305	- 0.409
Education		59	29	0.085	0.206	0.411
Education (women)		34	19	0.412	0.192	2.149**
Education (men)		24	6	- 0.208	0.271	-0.770
Education/years of schooling		59	29	0.525	1.600	0.328
Education/years of schooling (women)		34	19	1.676	2.165	0.774
Education/years of schooling (men)		24	6	-0.208	1.883	-0.111

*p-value<0.1; **p-value<0.05; ***p-value<0.01

Table 8 Estimation results: Outcome Health

Variable	n. treat	n. control g	ATT	Std. Err.	t
Serious health problems in the last year	59	29	- 0.161	0.214	- 0.753
Serious health problems in the last year (women)	34	19	0.250	0.197	1.270
<i>Not computable for men</i>					
Access health care	59	29	0.027	0.161	0.167
Access health care (women)	34	19	-0.059	0.195	-0.302
<i>Not computable for men</i>					

Table 9 Estimation results: Outcome Shelter and Sanitation

Variable	n. treat	n. control g	ATT	Std. Err.	t
Shelter	59	29	-0.008	0.191	-0.044
Shelter (women)	34	19	0.324	0.186	1.742*
<i>Not computable for men</i>					
Toilet facilities	59	29	0.059	0.155	0.382
Toilet facilities (women)	34	19	0.471	0.186	2.525**
<i>Not computable for men</i>					
Water	59	28	-0.212	0.183	-1.155
Water (women)	34	19	0.147	0.144	1.019
<i>Not computable for men</i>					

*p-value<0.1; **p-value<0.05; ***p-value<0.01

Table 10 Estimation results: Outcome Access to land

Variable	n. treat	n. control g	ATT	Std. Err.	t
Access to land	59	24	0.566	0.198	2.980***
Access to land (women)	34	13	0.578	0.208	2.781***
<i>Not computable for men</i>					

*p-value<0.1; **p-value<0.05; ***p-value<0.01

Table 11 Estimation results: outcome Participation in Community Life

Variable	n. treat	n. control g	ATT	Std. Err.	t
Voluntary activity for the community	59	29	0.466	0.219	2.127**
Voluntary activity for the community (women)	34	19	0.206	0.226	0.913
<i>Not computable for men</i>					

*p-value<0.1; **p-value<0.05; ***p-value<0.01

Table 12a Estimation results – Outcome Decent Work (security)

Variable	n. treat	n. control g	ATT	Std. Err.	t
Retirement pension	59	29	0.153	0.150	1.014
Retirement pension (women)	34	19	-0.088	0.158	-0.558
Retirement pension (men)	24	6	-0.125	0.344	-0.364
Retirement pension in the future	59	29	-0.169	0.168	-1.008
Retirement pension in the future (women)	34	17	-0.073	0.174	-0.420
Retirement pension in the future (men)	24	6	0.169	0.230	0.733
Access to credit	59	29	0.356	0.167	2.135**
Access to credit (women)	34	19	0.250	0.186	1.343
Access to credit (men)	24	6	0.500	0.355	1.408

*p-value<0.1; **p-value<0.05; ***p-value<0.01

Table 12b Estimation results – Outcome Decent Work (protection in the workplace)

Variable	n. treat	n. control g	ATT	Std. Err.	t
Chemical	59	29	0.051	0.107	0.477
Chemical (women)	34	19	0.000	0.098	0.000
<i>Not computable for men</i>					
Uncomfortable work posture	63	29	0.053	0.122	0.435
Uncomfortable work posture (women)	34	19	0.118	0.143	0.824
Uncomfortable work posture (men)	24	6	0.083	0.327	0.255
Intimidations	59	29	0.119	0.159	0.748
Intimidations (women)	34	19	0.162	0.159	1.019
Intimidations (men)	24	6	0.083	0.279	0.298

Table 12c Estimation results: Outcome Decent Work (psychological well-being)

Variable	n. treat	n. control g	ATT	Std. Err.	t
Opportunity to express potentiality and to improve	59	29	0.390	0.222	1.758*
Opportunity to express potentiality and to improve (women)	34	19	0.191	0.185	1.033
<i>Not computable for men</i>					
Treated with respect	59	29	-0.157	0.187	-0.840
Treated with respect (women)	34	19	-0.231	0.186	-1.243
<i>Not computable for men</i>					

*p-value<0.1; **p-value<0.05; ***p-value<0.01

Table 13 Estimation results: Outcome Participation in Household decision-making – Domain Household Expenditures

Variable	n. treat	n. control g	ATT	Std. Err.	t
Functioning DM Household expenditures	59	29	-0.119	0.172	-0.688
Functioning DM Household expenditures (women)	34	19	0.176	0.212	0.831
<i>Not computable for men</i>					
Capability DM Household expenditures	59	28	0.598	0.233	2.562**
Capability DM Household expenditures (women)	34	9	-0.119	0.203	-0.586
<i>Not computable for men</i>					

*p-value<0.1; **p-value<0.05; ***p-value<0.01

Table 14 Estimation results: Outcome Participation in Household decision-making – Domain Tasks at work

Variable	n. treat	n. control g	ATT	Std. Err.	t
Functioning DM Tasks at work	59	29	0.237	0.132	1.802*
Functioning DM Tasks at work (women)	34	19	0.147	0.166	0.886
<i>Not computable for men</i>					
Capability DM Tasks at work	59	12	0.057	0.144	0.393
Capability DM Tasks at work (women)	34	7	-0.062	0.202	-0.310
<i>Not computable for men</i>					

*p-value<0.1; **p-value<0.05; ***p-value<0.01

Table 15 Estimation results: Outcome Participation in Household decision-making – Domain Health

Variable	n. treat	n. control g	ATT	Std. Err.	t
Functioning DM Health	59	24	0.154	0.201	0.766
Functioning DM Health (women)	34	13	0.094	0.209	0.452
<i>Not computable for men</i>					
Capability DM Health	59	29	0.331	0.207	1.595
Capability DM Health (women)	34	19	0.221	0.214	1.032
<i>Not computable for men</i>					

4.3 Conclusions on the case study

By merging the results obtained through adopted methods, it follows that COPPALJ had presumably had the following impacts:

a) Education

Concerning education, it seems that participation in the co-operative contributed to expanding this members' capability. On the one hand, only co-operators participating in the focus groups selected cards showing adult education and training, reporting on the importance of the co-operative's commitment, together with the NGO ASSEMA, in providing them with training opportunities and adult courses to attain a higher qualification (e.g. PRONERA). On the other hand, PSM results showed better performance in terms of education, particularly among women co-operators, who have a statistically significant higher probability to be literate and to attend schools.

In fact, in a rural area where access to education was very difficult among small-scale farmers, and even more difficult in the case of women, interviewed co-operators pointed out that participating in the management of the co-operative constituted a significant "learning by doing" opportunity for practicing and improving their educational skills, especially for illiterate members, thus, representing a daily school in itself.

Women's findings are particularly important, due to the widely recognised key role that education plays as a basic capability for both personal human development and also for the well-being of families and children. Participatory methods particularly revealed the importance of member participation in the co-operative regarding their children's education, a dimension that was not thoroughly explored in the survey. Through the use of the card game, the importance of the co-operative in having schools provided in every community was revealed. This was carried out by co-operative members pressuring public authorities, stressing the right

for their children to have the opportunity to be educated without being forced to move to urban areas. However, since it is broadly recognised that accessing education is not synonymous with accessing quality education, COPPALJ contributed actively in establishing a school, namely the “Escola Familia”, (which was also written up in the English newspaper “The Guardian”, 27th October 2007), recognised by the public authority, and inspired by agro-ecology and co-operative principles. In referring to the “Escola Familia”, people participating in the card game underlined its fundamental role in providing a high quality education for young people and in creating the future leaders of the co-operative. Interestingly, as emerged from the card game, all these contributions in terms of youth education involved not only member households, but also those of non-members, who could also send their children to the “Escola familia”. This underlined the significant role of the co-operative in the development of the community as a whole.

b) Nutrition

The co-operative’s commitment to food security clearly arose from the focus groups and interviews. With reference to the FAO definition of food security (1996)¹⁸, we could say that COPPALJ has a significant role both in making more food available, selling member production in community shops (*cantinas*), and in improving member purchasing power through income distribution. Furthermore, fostering organic production, has increased food safety and promoted training in nutrition, educating member in diet diversification.

These results found their confirmation in the quantitative findings, showing the higher propensity of members in the consumption meat/fish and vegetables/fruit. Notably, this last domain was statistically significant only with reference to women. In fact, on the one hand, the result regarding the meat/fish consumption could represent a proxy of household income, since, usually, such food is bought and, probably, a higher income enables members to buy and, thus, consume this food more frequently. On the other hand, the increased consumption of vegetables/fruit could suggest the role of the co-operative in raising women members’ awareness of the importance of a diversified diet, as well as, of a diversified agricultural production contributing to household food security, as emerged in the group debates and open interviews. Interestingly, these findings also underline the crucial role of women in household food security.

c) Health

Health care in the region is not sufficiently developed, as pointed out by all those interviewed, who complained about the absence of decent public health assistance providers in rural areas, as well as, in urban areas. In fact, they widely agreed that, for serious health problems, the best option was a private hospital, since public assistance was not effective. However, even if the co-operative is not directly involved in healthcare assistance, members interviewed reported that it supports them through lending money when they cannot immediately afford the health costs for private hospitals. Nevertheless, quantitative methods do not show statistically

¹⁸ “Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO, 1996).

significant differences between co-operators and non-co-operators concerning severe diseases reported in the last year and access to decent healthcare, leading to the conclusion that health is one of the well-being dimensions not yet adequately achieved and, however, the co-operative has not particularly contributed to expanding this capability.

d) Shelter and sanitation

The importance in having access to decent housing and related facilities was reported by all those interviewed, showing a difference between co-operators and non-co-operators. In fact, during the card game, both the control group and the comparison group selected the card showing decent housing, identifying the need for a decent shelter as one of their most important priorities. This card, instead, was not selected by members, even though, during discussions they expressed satisfaction in their homes, recounting how they had been able to build them, especially thanks to the member refund from the co-operative at the end of every year. Quantitative findings confirm such differences between co-operators and non-co-operator outcomes regarding women, showing that women co-operators have a higher probability to access decent housing and also toilet facilities. No significant findings emerged for access to water.

Therefore, the co-operative role in this well-being dimension could be seen, considering the fact that one of the priority areas where members invest their annual co-operative member refund is, in fact, in their home. This confirms the important role of the co-operative in shelter achievement, not directly, but indirectly through monetary benefits. The fact that the quantitative findings revealed a statistically significant difference for women could confirm this income-related explanation, since women co-operators, being involved in the Babaçu activity, usually receive the highest amount of member refunds, being proportional to the amount of Babaçu nuts sold to the co-operative in the year.

e) Decent work

During the participatory methods, all groups belonging to the communities where COPPALJ works chose the card showing the word *cooperativismo*. Co-operators immediately explained their idea and their experience of what being a member has meant, outlining their feelings about being autonomous, and, thus, not being exploited by the landowners; being able to address their business activity and to control management information, but, moreover, being able to improve their work. Specifically for women, as they reported, participation in COPPALJ has meant, first of all, the opportunity to enhance their identity as women, agricultural producer and “Babaçu breakers”, without shame or feelings of being useless and invisible. In fact, many women reported that, before setting up the COPPALJ, they had denied their work activity and had not been aware of their fundamental contribution to the household economy, attributing value only to the men’s work.

This result was confirmed in the quantitative data analysis, where there was a statistically significant difference between members and non-members with reference to psychological well-being at work, specifically with regard to the opportunity to express their own potential and to improve.

Concerning protection at work, at different moments during group activities and individual interviews, members underlined that participating in the co-operative contributed to improving their way of working, increasing their knowledge regarding agro-ecology principles, trying to produce without using pesticides and burning off fields. However, PSM shows that there is not a significant difference between members' and non-members' concerns regarding the possibility of being exposed to chemicals, with the majority of those interviewed declaring not to be concerned. Nevertheless, in discussing the topic in the focus groups, it clearly emerged that using chemicals is the norm in local agricultural production, while organic production has been promoted only by the co-operative, though, with many difficulties.

No improvements resulting from co-operative membership regard comfort of work posture. In fact, even if the co-operative members have found a way to trade their products fairly, to transform them increasing their added value and to manage autonomously and commonly their business, it does not mean that their daily work, cultivating the land, and collecting and breaking the Babaçu coconuts, is not physically exhausting. As members, especially women members, reported, technologies at least for alleviating difficulties of breaking coconuts with axes have been tried, but up to now appropriate technologies which allow them to fully exploit the coconuts have not been discovered. Moreover, women evaluated very carefully such new technologies since in the majority of cases, they are not developed for improving their work, but for supporting industrial activities which look at the Babaçu coconuts as input for iron and bio-diesel production, ignoring the socio-economic context where Babaçu palms grow. Quantitative findings confirm this result, showing no significant difference between members and non-members regarding comfort of work posture, with the majority of respondents declaring its uncomfortableness.

With reference to the risk of exposure to intimidation or physical and verbal abuse, co-operators reported that COPPALJ activities for the last 20 years, together with other social movements, have contributed in improving social relations in the field, especially with the landowners, eliminating the probability to be abused. Nevertheless, they declared that much has still to be done, demanding respect for the law, especially regarding free access to the Babaçu forests. Moreover, there have been signals of deterioration in relations over the last years, as a landowner, against whom members had fought fiercely 20 years ago, has been elected mayor of the municipality of Lago do Junco. This situation is consistent with quantitative outcomes, showing no statistically significant difference between members and non-members for this indicator, and with descriptive statistics showing the majority of respondents declaring not to have been subjected to intimidation, but still with about 20% of respondents affirming the opposite.

Finally, some considerations concerning decent work in the dimension of security are necessary. From the quantitative data there emerges that there is not a significant impact of membership on access to retirement pensions. This aspect did not emerge during the focus group discussions, but, it should be underlined that even if the co-operative pays the trade union fee on behalf of its members, access to a

pension depends on the trade unions and there is not a close relation, in fact, with co-operative membership.

To complete the analysis concerning findings on decent work, an interesting variable investigated both by participatory methods and quantitative methods is access to credit. It was investigated in the survey through a variable expressing the fact that people have borrowed money for last three years. Descriptive statistics show that a higher percentage of members than non-members borrowed money in the last three years and the PSM showed the difference to be statistically significant, highlighting that, in fact, co-operators show a higher probability to having accessed credit than non-co-operators. Still descriptive statistics showed that the majority of members used the loan for production, while non-members for covering health expenses (it is interesting also to observe that 8% of members used the loan for education while non-members did not). Moreover, regarding the source of lending, family and friends represent the most significant source for non-members, while it is the bank for members, followed by the co-operative. It could be concluded that co-operative membership presumably expands member opportunities in accessing credit, on the one hand, itself providing members with small loans and, on the other hand, facilitating the access to official sources, but only indirectly, increasing their access to owned land, an important condition required by banks.

f) Access to land

Concerning owned land, the data showed that members have a statistically significant higher probability of holding such property, either as private individual entitlement or as a consequence of land distribution through the Agrarian Reform. In this case, direct causality between co-operative membership and access to land cannot be taken into account because, as the qualitative results showed, the majority of co-operative members participated in the fight for land, well before the co-operative had been set up and it was only after they took over the land, that the co-operative came into being. Nevertheless, one of the most important challenges underlined in the literature is that, access to land does not only mean legal entitlement to that land, but also the possibility to remain in rural areas and to cultivate the land over time, accessing the market and other important services for production and household livelihoods. Thus, in this regard, members strongly asserted the role of COPPALJ, not only in continuing the struggle for land access but also after, when the co-operative was set-up, and above all, enabling members to continue holding their land and cultivating it. As well, it also provided them with technical assistance and access to local, domestic and international markets.

g) Participation in household decision-making

In a region deeply affected by gender bias, where women are mainly considered for their reproductive role, it was interesting to analyse whether and how the co-operative influenced this aspect. Participatory methods clearly reported that co-operative membership has significantly increased the members' attitude to participating in the decision-making process, at work and, as well as, in the household. This was shown to be particularly evident for women. In the card game, all groups selected the card showing a man beating a woman, explaining that the problem does not necessarily concern physical violence, but an unbalanced

relationship, with women not being allowed to participate and decide autonomously. In fact, co-operators stated that this was the case before the co-operative was set up, and that, even if there was still much to be done, the situation had considerably improved. In fact, it clearly emerged that by working on gender equality issues in the co-operative, women empowered themselves, growing in self-confidence and awareness concerning their rights, thus, taking on important decision-making and managerial positions and asserting themselves in decisions made in the household. On the other hand, experimenting with gender equality behaviour in the co-operative constitutes an important education for men, who have carried over some changes in this regard into their family life. However, it should be noted that even if some changes have been observed in decision-making in such domains, working tasks included, women members still complain about the unequal distribution of tasks among partners in the household.

h) Participation in community life

The research question regarding this dimension was to understand whether members were able to spread the bonding social capital created in the co-operative, to the communities where they lived, thus, creating that bridging social capital so important for the sustainability of a development process. Participatory methods highlighted a high level of member participation, specifically in the co-operative, but also in other organisations existing in the area. Members reported how they always felt committed to improving the well-being of their community, and not only their own, specifically attracting and/or conquering the public services for community well-being (such as public schools; Babaçu Free Law) or providing, themselves, services for the benefit of their communities as a whole (such as transportation, local shops). However, beyond this important spill-over offered by the co-operative to the community, it was important to understand, if, by actually participating in the co-operative enabled members to increase their individual commitment to the community, through providing voluntary work. Consequently, this dimension was analysed in the survey. Here, the PSM revealed that there is a statistically significant difference between co-operators and non-co-operators. However, even if the PSM shows a high percentage of probability for members to be committed to community voluntary work, this is one of the variables where unobservable factors can have a strong interference and, therefore, it is necessary to be very careful in affirming the causality direction. Indeed, the co-operative has played a very important role in community development and also in developing members' sense of agency. Participating in the co-operative does not only generate a stronger social capital among members but it also fosters their sense of agency, thus, spreading the opportunity for community development, in general. This attitude to promote not only the bonding social capital inside the co-operative, but also, the bridging social capital, connecting the co-operative to the communities, as well as, to groups belonging to other communities and relevant institutions, represents a winning strategy in fighting poverty and enabling a sustainable development over time. However, it is also important to take into consideration that the people most committed to improving the community, were those who fought for land and access to natural resources, and were also the people who were most probably motivated to

participate in the co-operative. However, this is a circular self-reinforcing process, and, presumably, participation in the co-operative could have increased the participation in the community of members who had not been used to it before becoming members.

4.5 The role of the conversion factors and other institutional aspects

All results outlined above pointed out which well-being dimensions have been presumably most affected by participating in the co-operative, and which dimensions were not. At this stage, it is important to wonder whether there were any specific conversion factors¹⁹, which facilitated/impeded that participation in co-operative that could be transformed into expanding member well-being.

To this aim, a first group of dimensions could be grouped being linked to state welfare as one of the conversion factors. They are: education, health, water, shelter and sanitation and retirement (i.e. security at work). None of these well-being dimensions are the main mutual aim of the co-operative, i.e. the reason why members decided to set up the co-operative. In fact, the objective for this co-operative was and is market access for their production, where these services were found to be lacking from the state. Nevertheless, as seen, the area where the co-operative is located cannot rely on state effectiveness in the automatic achievement of these well-being dimensions. The low HDI of the municipality of Lago do Junco is a confirmation of this. In this situation, the co-operative, being interested in the general well-being of their members and communities, decided to play a role, basically, in three ways: a) providing directly the needed service; b) demanding from public institutions to receive the services required; c) cooperating with other organisations which can provide such services. However, among the above dimensions investigated, it seems that education is the one that can be expanded through co-operative membership independently of the institutional context. In fact, “learning by doing” is inherent in all co-operatives where member participation is high, enabling members to expand their knowledge and skills despite their educational level. The more the institutional context lacks in providing this opportunity, the more the co-operative contribution will be appreciated.

Another conversion factor to be taken into account is the economic and legal framework. It is a fundamental conversion factor to examine in order to properly evaluate the co-operative impact on dimensions such as access to markets and natural resources, access to credit, decent work (here meant mainly as a fair income, safe working conditions, but also as psychological well-being), and also to one of the most important market and natural resources related dimensions, that is, nutrition. The economic framework is closely linked to geographical factors, as it is in remote rural areas that the pre-conditions for the monopsonistic power of landowners are

¹⁹ Conversion factors can be defined as elements which can facilitate/impede the achievement of such capabilities through participation in co-operatives. These conversion factors can be personal, environmental or social ones. In this study, social conversion factors are particularly relevant and could gather social norms, the role of the state (including the legislation framework), the economic framework and participation in networking (Vicari and De Muro, 2012).

created. Landowners were able to exploit the small-scale farmers and rural workers taking advantage of the difficult access to communities, as well as the distance from the markets and urban areas. The legal framework providing incentives to large properties, and impeding small rural workers from accessing natural resources, such as land and the Babaçu palms, strengthened a situation of inequality and land exploitation. In this situation, prior to the setting up of the co-operative, people were extremely deprived in terms of well-being and freedom to improve their lives. They also lived under a fear factor as landowners used to engage violent armed people to impede to access to their land.

In this context, the co-operative, being a form of enterprise able to foster collective agency, has played a fundamental role in changing power relations, enabling members to autonomously manage their production, accessing productive factors, natural resources and markets, also international ones, which often represent a driver for local development, as happened in this case study.

In fact, this aspect recalls another important conversion factor, which is the social and economic network, and where, in this case, it strengthened the ability of the co-operative to impact on the above-studied dimensions. Participating in national and international fairs is an important opportunity for co-operatives in remote contexts, enabling them, not only to access markets, but also to create powerful relations and alliances with other co-operatives, organisations, and institutions, from developed countries, as well as in the national context. This happened to COPPALJ, which over 20 years has been able to create an impressive network, improving their access to markets and attracting important development projects.

From these conversion factors, two seem to be fundamentally important, as prerequisites of cooperative action: the state position regarding the autonomy of co-operatives and social norms that can favour or impede democratic participatory processes. In Brazil, co-operative law recognises the autonomy of co-operatives, thus, resulting in the development of an important co-operative movement. The acknowledgment of co-operatives in poverty reduction strategies mainly concerns the federal government, and COPPALJ has benefited, in part, from this attention, for instance, by participating in many international fairs thanks to support from the Ministry of Agricultural Development.

In referring to social conversion factors, in the case of COPPALJ, the unequal relations that dominated the region and the effort of the local population to defend their livelihoods played an important role as powerful source of social capital among workers, underlying the common action that fostered the setting up of the co-operative. It is also important to outline that in the communities where COPPALJ was set up, there were also close and collaborative relations, at least, among some groups of people and such factors played an important role in creating the 'glue' among members which guaranteed its success. However, this bonding social capital must be continuously renewed by members, and not taken for granted, since it can always be threatened by new external and internal factors. Internal democratic debate represents an important tool for this aim. Moreover, the presence of bonding social capital does not necessarily imply an equally developed bridging social capital. The co-operative can represent an enclave in the communities, or a source of development for all. It

depends on the relations which members establish with others in the communities where the co-operative works. Personal attitude and social norms in the community can influence both people's choice to become members, and member participation in community life. As already mentioned in the previous point, both aspects were important in this case study.

Finally, another social conversion factor to be taken into account regards gender relations in the field. In fact, male domination could have reduced the impact of the co-operative on the women's well-being by impeding the women to participate or under-valuing the role they could play. However, as shown, in the COPPALJ experience, the gender issue was deeply worked into the co-operative in order to raise the awareness of the men and to foster the women's self-esteem.

5 Conclusions and agenda for further research

The paper had a double focus: on the one hand, it focused on a joint implementation of qualitative and quantitative methodologies for the analysis of human development and the application of the capability approach; on the other hand, it focused on providing an empirical analysis, verifying how participation in a co-operative located in a low human development municipality in Brazil could have affected the well-being of member and their families, their agency and community development.

Despite the literature asserting that co-operatives do not benefit the poor, the case study showed that the co-operative COPPALJ worked successfully in improving members' well-being, examined in its multi-dimensionality, thus, enabling disadvantaged people, from a socio-economic point of view, to fully take part in socio-economic life, and moreover, in fostering transformative development in communities where it operates. Dimensions of well-being presumably mostly affected by the co-operative membership regard basic capabilities, such as women's education; nutrition; access to markets and land; shelter and sanitation; decent work (mainly in its dimension of psychological well-being and access to credit); and complex ones, such as participation in community life and participation in household decision-making (at least, in some domains).

All outcomes were obtained both through quantitative methods (survey data elaborated with Propensity Score Matching) and qualitative ones (participatory method, i.e. the card game and open interviews). Such methods hold a complementary role and triangulating them represented a crucial methodology in investigating how the co-operative influenced member well-being. In particular, participatory methods helped in understanding the genuineness of the co-operative, the local context and causal connection between co-operative membership and well-being. However, these results could not be considered representative of the whole population. In fact, this was the role of the quantitative methods. By analysing data collected through the survey, statistically significant results were found regarding achieved (or not) well-being dimensions.

This case study showed that, although the co-operative is first of all an enterprise whose aim regards the meeting of members' needs, its democratic and participatory nature enabled to foster both income related capabilities and participation related capabilities, becoming a powerful means in community development strategy.

In fact, beyond the meeting of members' need, that is founding a market for members' production, (and doing so it enlarged also other economic freedoms, such as access to land and credit) it significantly contributed in expanding members' agency and well-being and transforming their community. Contributions in terms of gender equality represented a particularly valued outcome, as well as the improved psychological well-being of members.

Referring to community development, a crucial role was played by the increased members' agency, which was addressed to attracting public infrastructures and services (for instance, schools, electricity, transport) for the benefit of the

community as a whole. Youth education received particular attention, being considered also a crucial factor for transferring co-operative values.

Results in terms of improved well-being seems to have played a significant role also in the sustainability of the co-operative over time, linking the success of the co-operative to members' satisfaction and motivation.

However, conversion factors play an important role in understanding the reason why this co-operative was presumably successful in expanding member capabilities, while others have failed. An analysis of the economic and legal framework where the co-operative operates was very important in understanding the existing power relations that the co-operative had to face and its possibility of the co-operative to work as a genuine democratic enterprise. Investigating the level of public welfare provision is important in evaluating the effort of the co-operative in expanding basic capabilities, considering that, in this case study, they are not the mutual aim of the co-operative. In fact, here it is possible to identify three ways of co-operative action: a) providing the needed service directly; b) demanding public institutions provide the services required; c) cooperating with other organisations which can provide these services.

The social norms also represented a fundamental conversion factor to be taken into account. In fact, the economic and power inequality which dominated in the field in the '80s and the consequent battles to access natural resources was an important catalyst in generating a strong bonding social capital among members, a crucial factor for the success of this co-operative. Moreover, the ability of co-operators to work on gender aspects and to expand bridging social capital, including the co-operative in national and international networks, enabled the positive impact of the co-operative on member well-being, avoiding the possible limitations represented by the traditional social norms and geographical isolation, which could have resulted in social inequalities within the co-operative.

However, despite the interesting results revealed by this case study, it would be useful to carry on other empirical studies on this topic, providing useful insights for policy-makers and practitioners. Verifying, in other contexts, which well-being dimensions are more (or less) affected by participation in a co-operative, and which conversion factors seem to be more influent in expanding people's agency and well-being and promoting community development could be crucial to implement sound policies and to learn from good practices.

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