Methodological strategies of action research with family farmers’ practitioners of the slash-and-burn system in southern Brazil

Cintia Uller Gómez
Reney Dorow

Abstract: We present and discuss the action-research methodological strategies used with farmers of Biguaçu, on the coast of Santa Catarina State, southern Brazil, over eight years. These strategies have enabled access to the formal market of farmers who produce in the slash-and-burn system the added value to products from this system and, above all, the collective organization and raising their self-esteem. Cutting and burning agriculture, locally known as "roça de toco", consists of the felling and burning of a small piece of vegetation (glebe) for the implementation of annual crops for a few years. After that, the glebe is left fallow so that the forest and soil fertility regenerate, and another glebe is felled and cultivated. In Biguaçu, three main products are obtained in this system: charcoal, cassava and cassava flour. Although having recognized quality and being produced in an ecologically intelligent system, these products were marketed irregularly, with little financial return for farmers who were wrapped in a large legal and environmental insecurity. Within the framework of different projects, different strategies were used to overcome this situation. We highlight the unprecedented combination, in working with farmers, of the thematic research of Paulo Freire with the Teaching Moments, used for the transposition of Freire’s premises for the teaching of science. On that basis, the group took conscience of their problems and of the need to acquire new knowledge and new attitudes that would overcome them. To plan for overcoming the problems, the method ZOPP of participatory planning (Objectives-Oriented Project Planning) was used. The set of strategies used resulted in the development of packaging and collective marks and the constitution, in July 2013, of the Association "Valor da Roça" ("The Farm’s Value"). Collectively, we created the Association’s statutes and the Regulations laying down detailed rules for the use of packaging and the umbrella brand "Farm's Value" as well as that of the collective marks of the products Our Coal, Our Flour, and Our Cassava. Currently, farmers are independent, managing their brands and packaging autonomously and reaching new markets.

Keywords: Methodology; Pedagogical Moments; Family Farming

Resumo: Apresentamos e discutimos as estratégias metodológicas de pesquisa utilizadas com agricultores de Biguaçu, no litoral do estado de Santa Catarina, sul do Brasil, ao longo de oito anos. Essas estratégias permitiram o acesso ao mercado formal de agricultores que produzem no sistema de corte e queima, a agregação de valor de produtos oriundos desse sistema e, sobretudo, a organização coletiva e elevação de sua autoestima. A agricultura de corte e queima, localmente conhecida como roça de toco, consiste da derrubada e queima de uma pequena gleba de vegetação para a implantação de cultivos anuais por poucos anos. Depois disso, a gleba é deixada em pousio para que a floresta e a fertilidade do solo se regenerem, e outra gleba é derrubada e cultivada. Em Biguaçu, três produtos

1 Ph.D. in Human Sciences, environment analyst at Fatma. E-mail: cintiauller@fatma.sc.gov.br
2 Master in Agribusiness and researcher at Epagri. E-mail: reney@epagri.sc.gov.br
principais são obtidos nesse sistema: carvão vegetal, aipim e farinha de mandioca. Embora com qualidade reconhecida e produzidos num sistema ecologicamente inteligente, esses produtos eram comercializados de forma irregular, com pouco retorno financeiro aos agricultores que estavam envoltos em uma grande insegurança jurídica e ambiental. No âmbito de diferentes projetos foram utilizadas diferentes estratégias para superar essa situação. Destacamos a conjugação inédita dos Momentos Pedagógicos, utilizados para a transposição das premissas freirianas para o Ensino de Ciências, com métodos do planejamento participativo. Com base nisso, o grupo tomou consciência de seus problemas e da necessidade de adquirir novos conhecimentos e novas atitudes que os fizessem superá-los. Para planejar a superação dos problemas, lançou-se mão do método ZOPP de planejamento participativo (Planejamento de Projeto Orientado por Objetivos). Do conjunto de estratégias utilizadas resultou a elaboração de embalagens e marcas coletivas e a constituição, em julho de 2013, da Associação Valor da Roça. De forma coletiva, foram construídos o Estatuto da Associação e o Caderno de Normas, que estabelece as regras para o uso das embalagens e da marca guarda-chuva Valor da Roça e das marcas coletivas de produtos Nosso Carvão, Nossa Farinha e Nosso Aipim. Atualmente, os agricultores estão independentes, fazendo a gestão de suas marcas e embalagens de forma autônoma e atingindo novos mercados.

**Palavras-chave:** Metodologia; Momentos Pedagógicos; Agricultura Familiar

**Introduction**

In this text we present action research procedures used with family farmers of the village of Three Rivers, in the municipality of Biguaçu, coast of Santa Catarina, Brazil. Through them there was the collective construction of strategies that helped make the formal market accessible for agriculture products of cutting and burning, the added value of these products and, above all, the collective organization and raising the self-esteem of farmers. These advancements are results of a series of inter-institutional and interdisciplinary projects that have been developed since 2006. Taking into account the limits of space, we delve in the methodological procedures used during the period from 2012 to 2014, under the Project "Valor da Roça" (ULLER-GÓMEZ, 2011).

The discussion presented here includes a broader theme that relates to the form of action of rural extension services to rural communities and the need for rescue and revaluation of traditional systems of land use, featured here as the slash-and-burn agriculture³.

³ Other terms are also used in literature to refer to this type of traditional land use system, as "itinerant agriculture", "fallow ground agriculture", "fallow fields of play" and "slash-and-burn". Although there are variations, the essential characteristics of the system are similar throughout the tropics. The vegetation of a small area of forest is felled and burned to prepare and fertilize the soil for cultivation of agricultural species for a short period of time, usually one to three years; after harvest, the area is left
Rural extension services originated in Brazil in the late 1940 in Minas Gerais with the purpose of promoting the improvement of the living conditions of the rural population and support the process of modernization of agriculture. In Santa Catarina, they began in 1956 with the creation of the Santa Catarina Association of Credit and Rural Assistance (Acaresc). These services were included in the country's industrialization policy, which would require the modernization of agriculture with the intention of increasing agricultural productivity, replacing imports, generating raw material, and freeing labour force for the industry. This process, based on extreme value of technical and scientific knowledge and on the devaluation of the knowledge of farmers, led to the production and dissemination of agricultural technologies. From that point on it became known as "modern technological standard", widespread in central countries in the 1920's and 1930's, and in peripheral countries from 1960's, through what is called "green revolution" (MULLER, 2001).

In Brazil, the construction of vision about how agriculture and rural extension should be contributed to the bias against slash-and-burn agriculture, which has often been considered old-fashioned and degrading. However, in the Atlantic forest Biome, the system, which has existed since the pre-Columbian era (DEAN, 1997), is still present in many traditional communities (ADAMS et al., 2013). Biguaçu is an example of where this type of agriculture resisted in most of the rural establishments that have inclined areas (ULLER-GÓMEZ and GARTNER, 2008).

Contradicting the prejudice, recent approaches on this type of agriculture point out their environmental benefits, including biodiversity conservation, landscape heterogeneity and food safety (VAN-VLIET et al., 2012; ADAMS et al., 2013). In Biguaçu, however, farmers until recently acted in a clandestine manner by a number of factors: environmental laws are very restrictive and do not contemplate the traditional use of the forest that uses extended periods of fallow, and the official extension technicians were not allowed to address, along with the population, native forest-related matters or to the production of coal. These two factors fostered

Fallow for a long period, which usually ranges from ten to twenty years. Few characteristics of the system of slash-and-burn, according to Padoch and Pinedo-Vasquez (2010), fall into a category of sustainable management. The cutting and burning of the vegetation, the weeding, the relatively low productivity and the apparent abandonment of fields after two or three years of cultivation are considered primitive and destructive characteristics. Because of this, these authors point out that this system has been condemned and criminalized, and the efforts to eliminate the "roça de toco" are common in conservation and development programs. As a result, the "roça de toco" is disappearing or being replaced by other land uses in recent decades (VAN-VLIET et al., 2012).
ignorance with respect to some possibilities of legislation (such as the settlement of coal kilns and authorization of the practice of fallow up to ten years) and the elimination of rural extension services. These factors, allied to an ageing population, favored replacing of the traditional system of slash-and-burn by planting exotic trees in many rural establishments (BAUER, 2012).

In summary, the problem was complex: the production system was very interesting ecologically and quality products were obtained. Coal, for example, was sold in irregular packaging, and farmers had little economic return although consumers recognized its quality (CARRIERI et al. 2014). The irregular situation left the population in a condition of great social fragility. This situation was highlighted for the first time by Uller-Gómez and Gartner (2008). After this initial work, a series of action-research projects has been developed since 2009 by different research institutions, and it managed to advance in many aspects, especially in social organization, in marketing and in the re-empowerment. This article aims to present and analyze the methods of research-action which allowed those advances, a combination of methods originated in science education with participatory planning methods. We believe that this analysis can help improve the use of the methods themselves, representing important breakthrough for the methodological possibilities of research projects with rural communities, as well as bringing to light their potential for action research processes in other fields of knowledge.

Background – understanding the context

Hired by the official organ of extension of the State of Santa Catarina, the first work carried out in the communities, from 2006 to 2007 (ULLER-GÓMEZ and GARTNER, 2008), was based on the procedures of the "Thematic Research" (FREIRE, 1975) to understand the reasons for the lack of participation by the community in the activities that the extension staff proposed. The work concluded that the lack of participation was motivated by not treating, by the rural extension team, some themes of interest to the population, according to the same survey, which were: Food Security; Pesticides and Soil Management; Technical Assistance; and Permanent Preservation Areas and Forests (including coal production with native wood).

These themes have continued not being dealt with by the rural extension, but prompted an inter-institutional group of researchers, that since 2009, has been
meeting with the community to address the issue openly across three research projects and research-action chained together and often go hand in hand. The work carried out in 2009 to 2011 were generating a plethora of information about the use of the forest, social organization and forms of commercialization, as well as facilitate environmental and agrarian regularization of a group of farmers (approximately 10 families). In dialogue with the community the particularity of the system of slash-and-burn was evident, and it provided the maturation of consciousness of farmers and researchers around the singularity of their traditional practice.

From 2011, the need for formal inclusion of products on the market and of its differentiation becomes clearer, ensuring that the set of researches developed would roll back in benefits for the community. To do so, it would be necessary to overcome other challenges: find product differentiation strategies and achieve group organization for trade, which used to be done informally and individually. This way, the "Valor da Roça" project was designed (ULLER-GOMEZ, 2011), structured precisely to find strategies for recovery of stump farm products, whose methodological approach is discussed below.

The methods – what was planned

The proposal of intervention within the framework of the project "Valor da Roça" has always been based on the understanding that, as pointed out by Thiollent (2008, p. 24), "research-action is not constituted only by action or by participation. It is necessary to produce knowledge, gain experience, contribute to the discussion or to advance the debate about the issues raised ".

The works were targeted, in the long run, by the dynamic proposed in Teaching Moments (DELIZOICOV, 1991): Initial questioning, organization of knowledge and application of knowledge. With the progress of the project, the method was combined with the participative planning method known as ZOPP (Goal-Oriented Project Planning) (BROSE, 2001; HELMING & GÖBEL, 1997). The integration of these methods will be described properly in another section of this text.

The Teaching Moments originated in the area of Science Education, of Brazil, and were designed for the transposition of the premises set by Paulo Freire for formal education, and have been analyzed in various initiatives (DELIZOICOV, 1991; DELIZOICOC et al., 2002; FERRARI et al., 2009; LINDEMANN, 2010; MUENCHEN e DELIZOICOV, 2010; SILVA, 2004). The possibility of use of Teaching Moments,
however, is far beyond of structuring the dialogue for appropriation of knowledge in classroom activities. It can be used in the organization of teacher training, in structuring the curriculum, in the organization of meetings, the elaboration of disciplines, in distance learning and in the organization of work with farmers (PERNAMBUCO, 1993; LINDEMANN, 2010; FERRARI et al., 2009; SILVA, 2004; ULLER-GÓMEZ et al. 2014).

Delizoicov (1991) distinguishes the three teaching moments and their distinct functions: a) Initial Questioning: the present situation in discussion as a problem that needs to be faced. The goal is to "sharpen the contradictory explanations and locate possible limitations and gaps of knowledge that is being expressed" (DELIZOICOV et al., 2002a: p. 201). The culmination of this moment is to make people feel the need of acquiring knowledge that they still do not have; b) Organization of knowledge: it is the moment in which the knowledge necessary for understanding the situation presented in the earlier time is studied systematically; c) application of knowledge: "is intended, in particular, to address systematically the knowledge that has been built to analyze and interpret both the initial situations that determined their study and other situations which, although not directly linked to the initial motive, can be understood by the same knowledge" (DELIZOICOV et al., 2002a: p.202). It is important to highlight that the Teaching Moments are fractals, i.e., within each of the above Moments there will be three other Moments.

So, initially the project was formulated with the following structure:

**First Moment: Recognizing products, processes and actors** – When the researchers should exchange information on ongoing projects in the community to subsidize the elaboration of strategies of differentiation. It aimed to provoke in the community the need to participate more actively in the search for alternative and differentiated markets.

**Second Moment: Organizing and reflecting with the community and with the public managers about the knowledge generated** – It involves actions intended for the collective study of the possibilities raised in the earlier time as regards the possibilities of product differentiation.

**Third Moment: Dissemination of the results and referrals** – It involves activities to spread the results to different audiences, synthesizing the strategies identified. Methodologically, it could mean the beginning of a new process in which
public managers and community would interact more in search of market for products with differentiated quality.

(Re)look on the process

Initially, we point out that we agree with Delizoicov and Zanetic (1993, p. 9) when they claim that for the "historical and instrumental seizure that was built it is necessary to consider the process-product indivisibility". Thus, although the intent is to present and discuss the methods, we cannot avoid presenting the process and, minimally, the results which were made possible through its use.

Analyzing the dynamic process occurred, it is possible to identify that changes were made in relation to what had been proposed initially for two primary reasons: the) researchers who were the main performers of the process in the community were also in training period and were adding to the project new capacities and knowledge acquired; b) the results achieved (such as the preparation of packages, which we will see below) demanded that other methods were used, in this case the Zopp method, which was the instrument to which we resorted in order to punctuate properly objectives, targets and actions to farmers, so that collective action was successful.

The reader will notice that the process was so dynamic that we managed to deploy the strategies outlined with farmers and not just define them or elaborate them, as was the initial idea. However, the organization around the Teaching Moments has always been the guiding North of the task: First Moment – Which is the current perception of technicians and farmers of the situation? What do you know and what else do you need to know? How to make the Group understand the need to know more about it? Second Moment – How to organize our knowledge about what's on the agenda? How to learn more? Third Moment – How to deploy the knowledge we have acquired to improve our situation? What other issues are viewed now that, in turn, require a new quest for knowledge?

Watching now the process performed, we can say that the intervention in the community in the period from 2012 to 2014 was based on three main sets of actions, observing the Teaching Moments. But they are better referred to as follows: 1. (RE) KNOWLEDGE of the SLASH-AND-BURN; 2. COLLECTIVE MANAGEMENT ORGANIZATION; and 3. IMPROVEMENT of COLLECTIVE MANAGEMENT – each
of which, in turn, also structured internally with the dynamics of the three Teaching Moments (see Table 1 below).

Table 1. Structuring the Design "Valor da Roça", on the basis of the three Teaching Moments (DEIZIOICOV, 1991)

<table>
<thead>
<tr>
<th>THREE PEDAGOGICAL MOMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Questioning</strong> (IQ)</td>
</tr>
<tr>
<td>(Re)knowledge of the production system</td>
</tr>
<tr>
<td>- Discussion on product quality; Decision on collective strategies of adding value;</td>
</tr>
<tr>
<td>IQ:</td>
</tr>
<tr>
<td>- Preparation of packaging and collective marks;</td>
</tr>
<tr>
<td>IQ:</td>
</tr>
<tr>
<td>- Discussion on how to make the management of collective strategies of adding value found.</td>
</tr>
</tbody>
</table>

In the set of meetings that constituted the (RE)KNOWLEDGE OF THE "ROÇA DE TOCO" PROJECT, initially we discussed (Initial Questioning) the characteristics and qualities of the products from the "roças de toco". Once these elements were identified and organized, the Group decided that differentiated packaging would be made and that they should refer to the common identity of the origin of the products – the "roça de toco" system, including cassava, cassava flour and charcoal. The second moment (Knowledge Organization) was the preparation itself of the packaging in a participative manner. This way the discussion stage of packaging was finalized, and we began the last moment of the great educational block, the "recognition of the 'roça de toco'". Thus began the Application of Knowledge, reflecting on the need to establish rules for the collective use of this packaging. At that time we the second major set of actions, which we called COLLECTIVE MANAGEMENT ORGANIZATION. The reader will notice that this set of actions is also subdivided into the Three Teaching Moments.

In this second set of actions, the initial questioning was intended to promote reflection on the group's way of life to put in evidence the commonality of these families' lives and arouse the desire to know more about the possibilities to manage
the production of packaging collectively. These packages presented themselves as a feature until then never accessed by them, and represented an important step for the improvement of marketing. The Initial Questioning of this second set of actions was developed in several meetings, allowing farmers to recognize that their activities feature common trajectories and challenges, such as the use of the same production system, the concern with environmental surveillance, and illegal marketing. To this end, we used the brainstorming technique, which enabled the collective building of Denomination, Vision and Mission of the group of farmers. This set of highlighted words underwent a frequency analysis, in which those most repeated were taken to the group, which adopted as the symbol of the group. And these words were: quality, work, organization, group, union, and cooperation. Based on this discussion, the Group decided to refer to itself as Slash-and-Burn Family Farmers Group of Biguaçu, SC.

In addition, we structured a SWOT matrix, whereby the group identified the strengths (S) and weaknesses (W) internal to the group, as well as found opportunities (O) and threats (T) relating to its external environment. This exercise made it possible to structure the next step, based on the ZOPP\(^4\) method, which consisted in the conversion of internal and external elements identified in the SWOT matrix into structured problems, and these, in turn, into objectives, a total of four, which dismembered into a set of ten specific actions.

Soon, the Organization of knowledge of the second great set of actions started, and it was characterized by the implementation of actions aimed at fulfilling the objectives: capacity on collective forms of work (associations, cooperatives); formation of thematic groups of discussion; formation of the self-control Group that

---

\(^4\) According to Brose (2001), briefly, the Zopp presents the following steps: 1) Diagnosis: an analysis of the actors involved, of the problems and of objectives is made. In this step it is intended that the group can build a joint vision of the future that makes the commitment to the implementation of actions. 2) Choice: a reference mark is designed (time horizon, partner institutions, and resources available for a project are defined) and an analysis of the alternatives (definition of objectives and basic intervention strategies). 3) Strategy planning: it makes a logical framework for the project. Initially, the planner is defined, because only the one who plans who will also perform after. Then a hierarchy of objectives is set; this hierarchy defines the strategy: a) the higher objective - describes the desired situation; b) project objective – specifies the beneficiary group and the specific situation; c) results – represent innovative products and services that will be offered to the public beneficiary under the project. For each outcome the required activities for success are described. There is still an analysis of risks that threaten the achievement of the goals and the definition of indicators for measuring, monitoring and evaluating. In the project analyzed here, the first step had already been carried out within the framework of the work leading up to the design "Valor da Roça".
performs periodic inspections in establishments, with the purpose of providing participatory certification of the production system and of marketing forms practiced by farmers of the Group; preparation of a book of rules for use of collective certification mark consisting of them and named "Valor da Roça"; establishment of rules for the correct use of the collective marks and packages developed for the products from this system of land use ("Roça de Toco"), in particular for charcoal.

After this intense collective construction, we came to the understanding that the tools developed should be underpinned by a formal collective organization. Thus was initiated the application of knowledge, which resulted in the founding of the Association "Valor da Roça" – the Association of Roça de Toco Family Farmers in Biguaçu, SC – which went on to hold the property rights concerning the certification mark, collective marks, packaging and product standards.

Once certain standards for collective marketing were determined, and the Association was formed, the third set of actions started – IMPROVEMENT OF COLLECTIVE MANAGEMENT. This third set of actions is based on a new survey of Generating Themes, this time pertaining to this specific group of farmers that reveal knowledge to be seized for their strengthening and autonomy: Collective Organization and Productive System. The development of these two themes, still in progress, led the group to deepen their knowledge about municipal authorities for acting on the formal market through a seminar for associates. The following meetings were prepared to deepen management aspects of the Association and have contributed to progress in challenging issues for the Group of farmers, as the collective purchase of packaging, negotiating with suppliers, the Organization for the collective sales and, among others, the institutional markets.

A brief reflection on the potential of the methods used

We believe that the method used promoted a healthy restlessness, allowing technicians and farmers to look at the world as an object of knowledge. Thiollent (2008, p. 20) notes that one of the peculiarities of the action-research is the relationship of two types of purpose – the practical and the knowledge. At the time of drafting the research the distinction between these two types of goal was not made. However, once the experiences were systematized, it should be noted that they were followed throughout the process. Practical objectives related to facilitating farmers' access to their market and to adding value to products. The objectives of knowledge
related to the construction of strategies to facilitate such access and aggregation of value. And these strategies were in themselves a major challenge, especially because it is a group of people so disjointed that practiced a system of land use devalued although ecologically intelligent.

In 2004 Brazil promulgated the National Policy of Technical Assistance and Rural Extension (BRAZIL, 2004) – the new Pnater. It emphasizes the need for professionals who deal well with the popular culture and dialogue between different kinds of knowledge so that it exceeds the vision that the technician is the absolute owner of knowledge. However, few effective changes are perceived in the performance of the technicians towards the rural populations. Modern critics believe that the enactment of this policy represents possibilities of change and construction of autonomy for farmers. We believe that the analysis presented here contributes concretely to the development of the possibilities identified with the advent of Pnater. The fact that we foresee the achievement of two goals (knowledge and practical) encourages us to assert that the combination of methods presented here could be used as methods of work in rural extension. Practical objectives impose on the technicians their responsibility to promote improvements in (and with) the community. The goal of knowledge makes you realize the need to learn more and to be a constant researcher.

In simultaneous pursuit of practical objectives and knowledge throughout the process, there were numerous theoretical and technical challenges that were presented to the technical team as "live encodings" (FREIRE, 1975). And they also needed to be properly raised with farmers. The results of decoding which was processed in conjunction with the community are evident in the speech of farmers: "Today we are treated like a human being!".

References


