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# RURAL EXTENSION IN ORGANIC HONEY PRODUCTION AND INCOME GENERATION FOR WOMEN IN THE AREIAS RURAL SETTLEMENT – NIOAQUE-MS

## EXTENSÃO RURAL NA PRODUÇÃO DE MEL ORGÂNICO E GERAÇÃO DE RENDA PARA MULHERES NO ASSENTAMENTO RURAL AREIAS - NIOAQUE-MS

## EXTENSIÓN RURAL EN LA PRODUCCIÓN DE MIEL ORGÁNICA Y GENERACIÓN DE INGRESOS PARA MUJERES DEL ASENTAMIENTO RURAL AREIAS – NIOAQUE-MS

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**Abstract:** Beekeeping has emerged as a promising alternative to enhance the income of rural families in developing countries, particularly addressing challenges faced by women in such areas. This practice is seen as a potential means of female empowerment within communities. This article focuses on the role of rural extension activities in empowering women engaged in beekeeping in the Areias settlement in Nioaque-MS, Brazil. Situated along BR 419, the Areias settlement hosts an *Apis mellifera* honey bee apiary initiated with support from various projects. The project, funded by PROEC/UFGD since January 1, 2023, has entered a new phase involving three dedicated families. The initiative includes courses, participatory meetings, and theoretical discussions, providing guidance from project coordinators and field

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professionals. Despite challenges leading to a reduction in participants, the persistence of women in the households has contributed to the continuation of beekeeping. Regular visits focus on theoretical and practical aspects, covering material fabrication, swarm capture, bee management, and honey production. Notably, female family members actively lead hive management, while men support in more robust tasks. Among participating families, those persisting in beekeeping maintain 36 hives, yielding an annual honey production of approximately 940 kg. However, critical mistakes, such as lacking hive identification and management notes, hinder the apiary's full potential. While the extension activity has positively impacted income generation, challenges persist in fully realizing the economic potential of beekeeping. Women's active engagement remains crucial, but addressing identified shortcomings is imperative for the sustained success of this initiative.
**Key words:** Beekeeping, Gender Autonomy, Sustainability, Local Development

**Resumo:** A apicultura tem sido promovida como uma alternativa para melhorar a renda e como um meio de melhorar a situação desfavorável enfrentada pelas mulheres em áreas rurais. Este artigo discute a importância da atividade de extensão rural no fortalecimento e empoderamento das mulheres na atividade apícola no assentamento Areias em Nioaque-MS, Brasil. O assentamento abriga um apiário de abelhas melíferas *Apis mellifera*. O projetoé financiado pelo PROEC/UFGD. Diversas atividades, incluindo cursos, reuniões participativas e discussões teóricas, foram realizadas. As famílias receberam orientação do coordenador do projeto e conselhos de vários profissionais de campo em cada etapa da atividade apícola. As famílias que permaneceram na atividade o fizeram devido à persistência e determinação das mulheres em manter essa prática. Durante as visitas às famílias participantes do projeto, observou-se que as mulheres mostraram maior envolvimento nas atividades apícolas, demonstrando um interesse significativo em sua expansão ficando a cargo da gestão e cuidado das colmeias. Entre as famílias que perseveram na apicultura, verificou-se que são mantidas 36 colmeias, resultando em uma produção anual de aproximadamente 940 kg de mel. Essa produção proporciona uma renda adicional média anual de R$ 4.700,00 por família. Conclui-se que a atividade de extensão realizada conseguiu impulsionar a geração de renda para as famílias envolvidas na apicultura, e as mulheres desempenharam um papel significativo na continuidade das atividades apícolas. No entanto, existem obstáculos para que a atividade

atinja seu pleno potencial produtivo e econômico, e para que as mulheres se envolvam na apicultura como atividade principal.

**Palavra-chave:** Apicultura, Autonomia de gênero, Sustentabilidade, Desenvolvimento local

**Resumen:** La apicultura es una alternativa prometedora para mejorar los ingresos de las familias rurales, especialmente las mujeres. Este artículo se centra en el empoderamiento de las mujeres en la apicultura en Areias, Nioaque-MS, Brasil. El asentamiento alberga un apiario de Apis mellifera, iniciado con varios proyectos. El proyecto, financiado por PROEC/UFGD desde 2023, ha entrado en una nueva fase con tres familias. La iniciativa incluye cursos, reuniones y discusiones teóricas. A pesar de los desafíos, la persistencia de las mujeres ha mantenido la apicultura. Las visitas regulares se centran en la fabricación de materiales, la captura de enjambres, el manejo de las abejas y la producción de miel. Las mujeres lideran la gestión de las colmenas, mientras que los hombres brindan apoyo. Las familias que perseveran en la apicultura mantienen 36 colmenas, generando una producción anual de miel de aproximadamente 940 kg. Sin embargo, errores críticos obstaculizan el potencial del apiario. Aunque la actividad de extensión ha tenido un impacto positivo en los ingresos, persisten desafíos para realizar el potencial económico de la apicultura. La participación activa de las mujeres es crucial, pero es imperativo abordar las deficiencias identificadas para el éxito sostenido de esta iniciativa..

**Palabras clave:** Apicultura, Autonomía de Género, Sostenibilidad, Desarrollo Local

## INTRODUCTION

Beekeeping is the activity responsible for the breeding of bees of the genus *Apis mellifera* and the production of honey, wax, propolis, and other products derived from hives. This practice not only provides economic benefits, but also plays a crucial role in plant pollination, contributing to the maintenance of biodiversity and food production from plants.

In addition to the environmental benefits, beekeeping plays a significant socioeconomic role by ensuring income generation, especially when it comes to activity on small properties, as it does not require large investments and is considered less laborious compared to other animal and plant production systems (GRIFFITHS, 2004; POCOL,

MCDONOUGH, 2015). Beekeeping has been promoted as an alternative to improve the income of rural families in developing countries (SCHOUTEN, 2020) and as a means of improving the unfavorable situation that women face in rural areas of these countries (AHMAD et al., 2007). For this reason, beekeeping has been cited as a potential activity generating female empowerment and allowing the participation of women in the communities where they are inserted (BRADBEAR et al., 2002; BHUSAL, THAPA, 2005).

Historically, Brazilian society has had a patriarchal culture towards women, viewing them as individuals incapable of performing tasks outside the home. There is a normalization in the distribution of tasks in rural areas, with women being responsible for domestic and reproductive activities and men for financial and productive activities. There is an exclusion of women in the knowledge of agricultural technologies and their participation in decisions, which are attributed to the husband, in addition to the devaluation of their work, which is considered as a "help" without the right to remuneration (SILIPRANDI, 2015).

Even though there were rebellions by women at certain times, it was not sufficient to bring about the emancipation of this system (DIAS et al., 2017). In the face of this ongoing social scenario, it is necessary to implement public policies focused on gender equality to empower social groups that face inequalities in various forms (SOUSA; MOURA, 2013).

To better understand the term empowerment, it is necessary to comprehend its levels: personal, organizational, and structural. On a personal level, an individual's self-confidence is strongly influenced by their relationship with the community. Empowerment, as studied by Kleba and Wendausen (2009), is a process that manifests through constant interactions, underscoring the importance of interconnectedness to create opportunities for learning and recognition among group members. In the second level, the focus shifts to the group or organizational sphere, targeting community entities or mediating structures such as associations. These play a crucial role as connectors between the individual and the social context, providing tools for enhancing the quality of life in the community. Finally, structural or political empowerment emphasizes that individuals should not confine the expression of their opinions to local contexts; instead, it is vital for them to amplify their voices in broader forums, such as unions, political parties, and social movements Kleba and Wendausen (2009).

In this context, the current research aims to substantiate the hypothesis that individual and community empowerment plays a crucial role in the lives of female beekeepers in the

Rural Settlement Areias. These women have turned beekeeping into not only a source of income but also a significant avenue for active participation in the community. Therefore, the aim of this article is to discuss the importance of rural extension activity in strengthening and empowering women in beekeeping activity in the Areias settlement in Nioaque-MS, Brazil.

## MATERIALS AND METHODS

The Areias settlement, located in the municipality of Nioaque, located along BR 419 at kilometer 49 at the entrance to the South Pantanal, is home to an apiary of *Apis mellifera* honey bees. This apiary is nestled within a 400 ha reserve of secondary forest intended for collective use. Adjacent to the reserve, there is a stream called "Corrego das Areias," bordered by riparian vegetation that is undergoing the process of restoring its original vegetation or transitioning to a cerrado state. The site was selected for its abundant flora, which provides a diverse and favorable environment for beekeeping and honey production.

The establishment of beekeeping in the Areias settlement is a result of university extension projects run by the Federal University of Grande Dourados. Presently, the beekeeping activity is financially backed by the National Council for Scientific and Technological Development (CNPq) through the Technological Vocational Center Project in Agroecology and Organic Production in Mato Grosso do Sul and PROEC / UFGD.

It should be noted that this action is a result of a previous project developed in that community, from 2013 to 2015, during the activities of the Postgraduate course (specialization level), entitled Agrarian Residence: Agroecology Production and Rural Extension, offered by UFGD, in partnership with MDA/INCRA/PRONERA, for people from rural settlements and ATER technicians from Mato Grosso do Sul and also from actions of the Agroecology and Organic Animal and Vegetable Production Center, implemented at UFGD, in partnership with CNPq. Among the students who were part of the aforementioned specialization course, one of them comes from that community, and during the course expressed the desire to expand knowledge in relation to beekeeping.

Building upon this initiative, at that moment, UFGD professors initiated university extension work in the Areias settlement with a group of eight families, totaling 10 individuals, who were inclined towards beekeeping. Initially, 15 beehives were set up, and for the group's

initial tasks, the course and center coordinations provided a complete carpentry kit. This allowed the settlers to produce their necessary equipment, including boxes and frames of beeswax honeycomb. Bricks were also supplied for the construction of a shed, serving as a structure for honey extraction work. Additionally, funds were allocated for the purchase of ten beehives containing selected queens. The initiative began in 2014, utilizing bait hives for swarm capture. These Langstroth model boxes consisted of 15 standardized frames strategically positioned to attract and capture native swarms during the swarming phase. Each bait hive was designed to allow bee swarms to voluntarily choose to occupy and establish themselves during their initial phase. To enhance the appeal of the new location and stimulate the interest and enthusiasm of scout bees, aromatic plant substances like lemongrass (*Cymbopogon citratus*) were applied to the inner walls of the bait hives (EMBRAPA, 2009) .

The group, initially comprising 10 members, was supplied with ten bee swarms with selected queens, courtesy of projects initiated by institutions. These institutions also provided bricks for the construction of a warehouse for beekeepers, which would serve as a storage and preparation area for work materials. A comprehensive carpentry toolkit, along with recyclable wood, was also provided. This enabled future beekeepers to manufacture and produce their own beehives, honey supers, and other essential beekeeping equipment, thereby eliminating the market costs associated with their purchase..

This project, which began on January 1, 2023 and continues to the present, is funded by PROEC/UFGD. It has entered a new phase involving three families who have remained in beekeeping. A variety of activities, including courses, participatory meetings, and theoretical discussions, have been conducted for planning and development. The settlers have received guidance from the project coordinator and advice from several field professionals at each stage of the beekeeping activity. Regular visits are made every 30 days, each lasting eight hours and providing theoretical and practical explanations. These meetings cover topics such as material fabrication, swarm capture, bee management, and honey production.

Moreover, the settlers' experiences, activity planning notes, accounting records, changes, and queries were gathered, and practical tasks were established through collective discussions that were addressed during subsequent visits. Individual interviews and participatory meetings were conducted with the group of producers from the Areias settlement, with the aim of collecting both quantitative and qualitative data. The primary

aspects evaluated included bee management, local income generation, and the transformations that took place on the properties following the implementation of the organic beekeeping system.

## RESULTS AND DISCUSSION

The meetings began in the morning and lasted all day, covering various aspects. The first moment was marked by a delicious breakfast, with the aroma of farm coffee and the smell of homemade cakes and sweets, creating a conducive environment for the activities planned for that day. This was accompanied by casual conversations about the weather, production, and what was being planned for that day's lunch. These dialogues demonstrated the empathy established between the outsiders (university) and the insiders (settlers), indicating that both felt "at home". This is essential in university extension, as it is crucial that the people involved in the action (whether they are teachers, students, or community members) recognize and see themselves in it, so that fruitful dialogues can take place and, at the end of the action, a broad result is obtained, extrapolating the productive dimension, as recommended by the references of university extension. According to Menegat et al. (2019), throughout the actions, a crucial factor has been the organization into groups of settlers, forming collectives to implement activities. This strengthens social bonds within the community, fostering sociability and solidarity, thereby gathering energy and resources to operate on various scales of work and camaraderie among group participants. This methodology enables the extension of dialogues with institutions outside the Areias Settlement, as exemplified by the partnership with professors from UFGD, in a collaborative effort facilitating the expansion of extension activities.

After this initial moment, routine inspections were carried out in the apiaries (figure 01). During these inspections, we observed technical and productive aspects of the hives, as well as the next steps to be followed in each hive. For this reason, the identification of each hive is of utmost importance. It is important to highlight that this work offered both the teachers and students of UFGD, as well as the small-scale farmers, a learning opportunity for the development of their activities in the rural area. This process involved everyone in a relationship between theory and practice, resulting in a practical experience in the field.



**Figure 01 -** Departure of the team and beekeepers to visit the apiary for inspection and management of the hives.
Fonte: Autoral

The reduction in the number of participants in beekeeping activities can be attributed to various factors, such as the departure of members from the settlement, the advanced age of some participants, and the transition to other activities of interest. It is important to note that the settlement also receives support from university extension in other projects, such as the organic production of tomatoes and lemons. However, it's crucial to emphasize that the families who stayed in the activity did so due to the persistence and determination of the women in the household to maintain this practice. This is due to the fact that often the men, responsible for supplementing income, need to seek temporary jobs with daily remuneration on large nearby properties.

In this context, concerning the diversification of work as an additional production alternative and its potential impact on improving the quality of life for the groups involved, it aligns with the findings of researchers Farias et al. (2022). They assert that various products, including honey, gain greater value in civil society, social movements such as the Landless Rural Workers' Movement (MST), the Peasant Women's Movement (MMC), Via Campesina, and others, as well as various research sectors and institutions, when produced organically. There is a general interest in the quality of life, which consequently implies access to fundamental rights, including dignified food from the perspective of food security. This involves food free from biological and chemical interference, with a low level of artificial inputs, and, in the case of animals, produced considering ethical principles and animal

welfare. It is worth noting that studies conducted by Oliveira et al. (2022), focusing on products transitioning to organic, detected a 14.55% increase in technology with a positive socio-environmental and ecological impact for producers using technologies introduced during the transition to organic milk production. This underscores the importance of procedures implemented for product improvements for human consumption, directly impacting people's quality of life.

During each visit made to the families participating in the project, it was noted that the female members of the family showed greater engagement in beekeeping activities, demonstrating a significant interest in its expansion. Additionally, the women actively considered the prospect of diversifying bee products as a potential strategy to increase family income, especially due to the fact that the region is located in the Upper Pantanal, an area that boasts a high level of preserved biodiversity, ensuring a pesticide-free zone. Diversification through value-added products increases income for beekeepers' families (POCOL; McDONOUGH, 2015).

It is noteworthy that the management and care of the hives are in charge of the women who lead the family nucleus, while the men play a supporting role, especially in more robust tasks, such as transporting the full honeycombs during the honey extraction process. According to Silva et al. (2020), when developing work directed at beekeeping techniques for honey production, and that were appropriate for implementation in settlements, it was concluded that honey production is an activity suitable for the union among people, incurring few costs, showing itself as a good option for income generation in the countryside, where the merit of the activity lies in the way everything was structured, with broad participation of beekeepers, well-organized group, and supporting institutions.

Among the families that persevere in beekeeping, it was found that 36 hives are maintained, resulting in an annual production of approximately 940 kg of honey. This production provides an average additional annual income of R$ 4700.00 per family. However, it is imperative to highlight that this production is below the productive potential of the region, as beekeepers make fundamental mistakes that compromise the performance of the apiary. Among these failures, the following stand out:

1. Lack of Hive Identification: The absence of proper hive identification results in a zootechnical loss of production control. This deficiency adversely impacts subsequent

activities between visits, resulting in the loss of essential information for the selection of more productive queens.

2. Lack of Management Notes: The absence of systematic records of zootechnical activities prevents the generation of indices and indicators related to production, compromising the ability to evaluate and optimize management. As well as planning when to feed, when to add wax, or even the peak of flowering. The monitoring conducted by the extension project aims to guide beekeeping activities based on the reality observed during visits to the apiaries and to suggest possible solutions.

3. Lack of wax replacement: Neglecting to replace old frames with new ones containing beeswax leads to a decrease in production and can even interfere with the size of the bees that emerge in these old hives. Another factor is that these frames are disregarded by bees for honey storage, making them susceptible to moth infestation, resulting in an effective loss of productive efficiency and potential negative effects on the bees' retention in the hives.

Through the identification of inadequacies in management, training was conducted in collaboration with a technician specialized in operations, as evidenced in Figure 02. In this context, the group of woman beekeepers participated in a specific training on the assembly of frames with honeycomb wax. Throughout the training, the relevance of using quality honeycomb wax, the positive impacts on productivity, and the correct technique for fixing the wax to the frame were emphasized to the beekeepers.



**Figure 02 -** Training group of woman beekeepers of frames with new honeycomb wax.
Fonte: Imagem Autoral

The training provided can help overcome the problems encountered, but it is worth noting that beekeepers have reported a lack of time for the proper performance of the activity. This fact may be related to gender roles. Jemase and Chesikaw (2021) identified that one of the obstacles for women to participate in beekeeping is gender roles, as they have historically been burdened with childcare and domestic tasks.

Another point raised by the women in the group is the low market value of the product, despite the honey originating from a region free of agricultural pesticides. There is a need for continuous training for market access (POCOL, McDONOUGH, 2015; BELETE; SHUMETA; DEMMISE, 2017) to work on product certification, differentiation through marketing strategies to add value to the product.

## CONCLUSION

Given the presented information, it is concluded that the extension activity carried out was able to boost income generation for the families involved in beekeeping, and women played a significant role in the continuation of beekeeping activities. However, there are still obstacles for the activity to reach its full productive and economic potential, and for women to engage in beekeeping as their primary activity.

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