

Seeds keepers in Argentina and Brazil: comparing experiences

ABSTRACT

Creole seeds have been used by family farmers to expand their productive autonomy and food security, to contribute to the strengthening of agroecological production. The nature of this study is qualitative, and the comparative methodology is used to discuss the data of the two unstructured interviews of the keepers in Brazil and Argentina. The objective is to discuss the strengthening of food sovereignty aiming at the importance of the seed keepers experiences in the Cities of Wanda, the State of Misiones, Argentina and Marechal Candido Rondon-PR in Brazil. It aims to answer the following question: How can seed keepers reduce food insecurity from the perspective of sustainability? It is concluded that sustainability is part of the life of seed keepers, and agroecology innovations serve to improve this process and adapt to reality, without exceeding the biophysical limits of nature. The seeds keepers in Argentina and Brazil have the same ideas of how to produce and the reasons that we should be more sustainable, cultivate with love, even with a large difference in the number of hectares.

KEYWORDS: Open innovation; seed nets; Argentina-Brazil; food sovereignty; agroecology and sustainability.

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1 INTRODUCTION

Agroecological innovations are considered as the field of scientific, practical and technological studies that seek to contain the forms of degradation and exploitation of nature that encompass productive societies, the effects of the so-called green revolution and its unending need of pesticides. They are expressed through social actions that prioritize collective issues of participatory character in the search for the implementation of systems linked to alternative agricultural crops that enhance ecological biodiversity and socio-cultural diversity. (TOLEDO, 2002; CAPORAL; COSTABEBER, 2004; ALTIERI, 2012).

These innovations lie in agroecology, which is defined as the scientific basis for alternative agriculture (ALTIERI, 2012). Agroecology presents internal ties based on knowledge, such as the agroecosystem that inspires ecological processes by recycling nutrients and conserving biodiversity inside and outside the production units (WEZEL; SOLDAT, 2009). Later, such traditional practices were applied and inserted into social agrarian agendas and social movements of resistance to capitalist modernization, especially the techno-diffusionist model of the Green Revolution (ALTIERI, 2012).

Innovation is considered here an important element mainly for rural actors in the perspective of agricultural production. In this sector, innovation appears as a virtuous spiral in the search for a more sustainable agriculture that seeks to answer questions such as food quality, the implementation of agroecological production systems, environmental protection and respect for natural resources, among others (SANTANA; DA SILVA ANDRADE; ANDRADE, 2023). In this view, the issue of conservation and reproduction of various genetic resources is observed in addition to cultural practices linked to native and Creole seeds.

According to Maronhas, Silva and Grgeren (2021), seeds are some of the most important inputs for agriculture, explaining that the seeds were selected and domesticated throughout history, so that the farmers themselves were responsible and involved in genetic improvements based on the morphological characteristics of each of them, considering a historical and deep process for the communities and the practicing families, enabling the maintenance of the so-called creole seeds.

The recent process of introduction of transgenic seeds in agriculture brought both a process of expropriation of seeds and peasant knowledge, as well as a process of acculturation in relation to the related practices and of concrete danger of the total loss of this resource. Within this line of reasoning, Maronhas, Silva and Grgeren (2021, p. 687), that "the contamination of creole seeds by transgenic seeds has been a great challenge that causes

also a delay in the adaptation of the creole seeds in that environment, in addition to a possible genetic erosion."

It is observed thusly that the processes of agroecological innovation in the rural environment do not exclude and deny the role in the production of knowledge of the seed keepers. This knowledge shared throughout history serves as a material and cognitive basis for the generation of various strategies. The Creole seeds are the link between the peasant and his or her identity, not being able to survive the field and the peasant without the seeds (MARONHAS; SILVA; GRGEREN, 2021).

In Argentina and Brazil, in response to these trends, a group of plant breeders, agricultural organizations and researchers have created initiatives for the reproduction of open source and collaborative seeds that try to address the challenges posed by a sector of oligopolistic seeds. These processes focus on the dissemination of knowledge and the development of varieties and seeds free of restrictive intellectual property, suitable for various agricultural practices, particularly small-scale agriculture and other forms of low-input agriculture at various scales.

The objective is to discuss the strengthening of food sovereignty aiming at the importance of the seed keepers experiences in the Cities of Wanda, the State of Misiones Argentina and Marechal Candido Rondon, Paraná state, in Brazil. It is aimed to answer the following question: How can seed keepers reduce food insecurity from the perspective of sustainability? This article is divided into five parts, the first being composed by the introductory aspects of the research, the second by the theoretical framework that supported the research, the third part by the methodological aspects, the fourth by the results and discussions and the fifth by the final considerations.

2 THEORETICAL FRAMEWORK

Societies are organized, each in their own way, to access natural goods and services, their distribution and conservation care so that they are continuous and permanent. Every society aims at sustainability, allowing that, with existing natural resources, it is possible to meet the human needs of the current generation and future generations, at the same time, enable nature to rest, regenerate and restore everything that has been taken from it (BOFF, 2021).

According to Capra (1999), the basic principles of ecology need to be understood, that is, people need to become ecologically literate, understand the

assumptions of organization of ecological communities and use them to build sustainable human communities, since both present the same basic principles of organization: they are structurally closed networks, but receptive to resource and energy flows.

Although an ecosystem and human communities have differences, it is possible to notice and learn from ecosystems, how to live in a sustainable way in search, cultivation and improvement of the quality of life, actions that have as main foundations the relationships and cooperative activities (CAPRA, 1999).

For Altieri (1989), the use of the term agroecology began in the 70's, but the practice and study of agroecology have the same age as agriculture. This term is commonly used to demonstrate actions and research aimed at a more sustainable world, and to show that this reconstruction, of a more rational and harmonious coexistence with ecosystems is something difficult to do and that they started before the great growth of the so-called "Green Revolution".

The Green Revolution associates chemical inputs, whether fertilizers or pesticides, mechanical inputs such as tractors and big harvesters, and biological inputs such as improved productivity plants. The Green Revolution brings with it the adoption of the "technological package", which was a set of practices and inputs, chemicals, irrigation, machinery, among others, to which the farmer

became dependent, so as to achieve high productivity vegetable varieties (SANTILLI, 2009).

It is also through the use of agroecological practices that seeks the permanence of families in the field, such as the preservation of natural resources, the sustainable management of soils and the valorization of local knowledge (MEIRELLES, 2004). To carry out the change from one agricultural model to another involves several factors, and it is necessary to understand the people involved and what effects and consequences will reach their lives and their families, by organizing and reformulating agricultural production under a socio-environmental perspective (HEDEL et al., 2016).

According to Altieri (2012) there are several reasons why the maintenance of family agriculture should be supported, because it is commonly carried out in small properties which are fundamental to the food security of the entire planet. Small properties preserve natural resources, and thus, it is more productive in relation to large monoculture properties, as well as ensuring sustainability and sustaining biodiversity free from genetically modified organisms.

Preserving seeds of Creole varieties has become a fundamental aspect to preserve biodiversity, especially with regard to those of temperate climate in

Brazil, considering that they have been little prioritized by research and development institutions. There are an expressive number of seed species that are at risk of biodiversity loss, some species have greater visibility, but there are cases, such as beans, where only 50% of genetic variability is currently preserved in germplasm banks. As examples of crops with great genetic variability and number of Creole cultivars, we find mainly Cucurbitaceae, beans and maize (BROWN et al., 1999).

In recent decades, population growth, climate change, lifestyle change, intensification of agriculture, neglect of poverty and food security, pointing out the need to modify the food system and food consumption patterns from the perspective of both people's health and food and environmental safety. (DONATI et al., 2016).

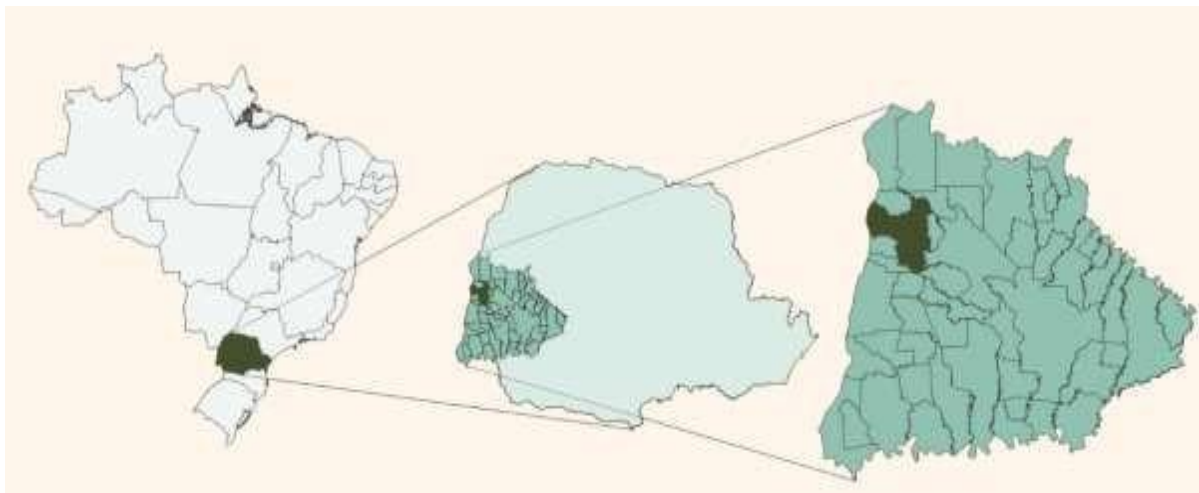
3 MATERIAL AND METHODS

In this section, it is presented the characterization of the studied areas and the methodological instruments used in the research. This section has the function of setting the reader on the conditions that the study was carried out.

3.1 Characterization of territories, Marechal Cândido Rondon and Wanda

The present article was developed in two municipalities, in Brazil in Marechal Cândido Rondon, western region of the state of Paraná, with the following coordinates: 24° 33' 24" south latitude and 54° 3' 24" west longitude, at a distance of approximately 580 km from the state capital (CIDADES BRASIL, 2021). Figure 1, presents the geographical location map of Marechal Cândido Rondon.

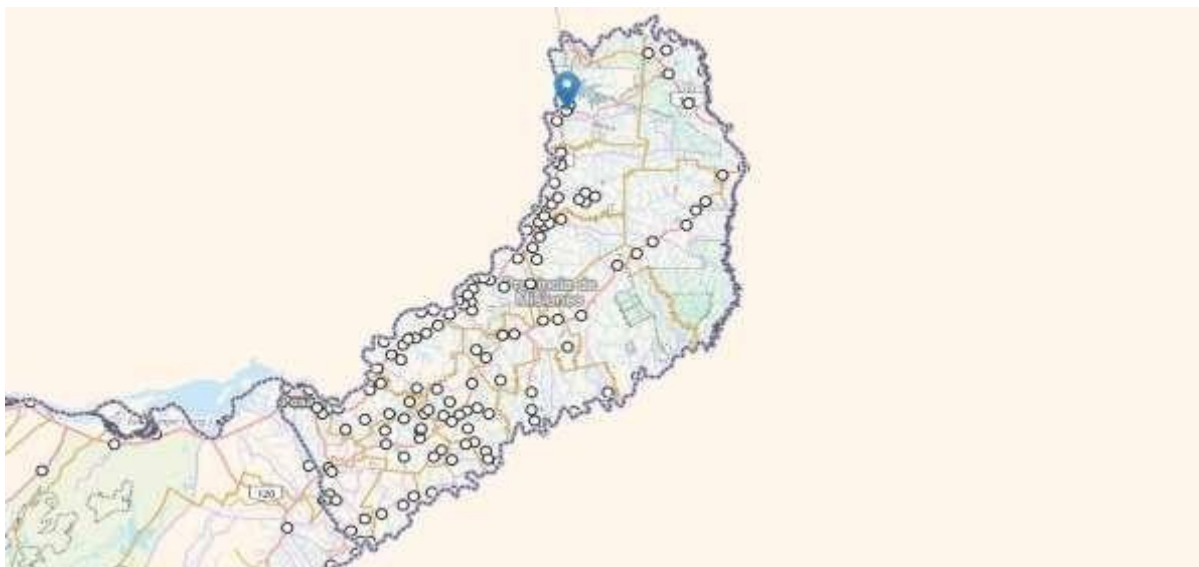
Figure 1 – Map of location of the West of Paraná with indication for the municipality of Marechal Cândido Rondon



Source: Elaborated by the authors, 2021.

The city of Marechal Cândido Rondon has a territorial area of 745.243 km², with a population of approximately 52,944 inhabitants. According to the 2010 demographic census, the municipality had 46,819 inhabitants, where 83.61% lived in urban area and 16.39% lived in rural areas (IBGE, 2010). The geographical location of the city of Wanda, in Misiones Argentina, is presented in figure 2.

Figure 2 - Geographical location of the city of Wanda, Misiones Argentina



Source: Geographic Military Institute, the Republic of Argentina, 2021.

The city of Wanda, Argentina, is located in the north of the state of Misiones, with the following coordinate's 25°58'9.49" south latitude, 54°34'10.89" west longitude. This city has 15,529 inhabitants (INDEC, 2010).

3.2 Methodological approach and instruments

The approach of this article has two sides; the first one is based on the exploration of available bibliographies to understand the functioning of experiences of diffusion and exchange of seeds and the studies carried out on them. The second point will have a qualitative approach, made from open interviews, in Brazil, in the city of Marechal Cândido Rondon, in the state of Paraná and Argentina, in the city of Wanda, in the state of Misiones, to understand from the perspective of the actors, the theme and how the actions are developed. This research is classified as qualitative research and aims to generate knowledge for practical application directed to solving specific problems (GIL, 2008).

For Prodanov and Freitas (2013), scientific research aims to scientifically know one or more aspects of a particular subject contributing to the advancement of the human knowledge. This study is characterized by the comparative method in two territories of Latin America that will start with non-structured interviews¹, starting with VII questions. Interviews are used as a research tool to collect data in November 2021.

The comparative method was chosen because it provides greater security in research that aims to investigate the experiences of two producers, because the comparative method is used both for comparisons of groups in the present, in the past, or between the existing ones and those of the past, as for societies of equal or different stages of development (MARCONI; LAKATOS, 2003, page 107). Table 1 is presented in Brazilian Portuguese and Table 2 in Spanish from Argentina, with the questions asked in the interviews.

Table 1 – Questions of the interview in Brazil

1 – O que levou o sr. e sua família a adotar um sistema de produção agroecológico há mais de 20 anos?
2 – Qual o significado de Ana Primavesi para o sr.? O que aprendeu com ela? O que mudou no planejamento da propriedade depois do contato com seus ensinamentos?
3 – Qual a importância das sementes crioulas para seu sistema produtivo? Quantas variedades de semente o sr. guarda?
4 – O sr. desenvolveu uma variedade de milho crioulo? Como o sr. fez? Contou com orientação? O que essa variedade representa para o senhor?
5 – É difícil ser um guardião de sementes? O que precisa para ser um guardião?
6 – O que é fácil e o que é difícil num sistema de produção agroecológico?
7 – Como o sr. vê a questão da sucessão rural agroecológica na propriedade?

Source: The authors, 2021.

For the case of the interview in Argentina, an adequacy of the first two questions was made in order to maintain consistency in the questions asked in Spanish in Table 2.

¹ Due to the sanitary restrictions proper to the world pandemic caused by SARS-COVID19, the interviews were conducted remotely.

Table 2 – Questions of the interview in Argentina

1 – ¿Qué lleva a usted y a su familia a adoptar un sistema de producción agroecológico?
2 – ¿Posee alguna persona que sea referente en agroecología? ¿Qué aprendiste de ella? ¿Qué ha cambiado en la planificación del patrimonio después de entrar en contacto con sus enseñanzas?
3 – ¿Cuál es la importancia de las semillas nativas para su sistema de producción? ¿Cuántas variedades de semillas conservas?
4 – ¿Se a desarrollado/recuperada alguna variedad criolla? ¿Cómo lo hiciste? ¿Tuviste orientación? ¿Qué representa esta variedad para ti?
5 – ¿Es difícil ser un guardián de semillas? ¿Qué se necesita para ser un tutor?
6 – ¿Qué es fácil y qué es difícil en un sistema de producción agroecológico?
7 – ¿Cómo ve el tema de la sucesión rural agroecológica en la propiedad?

Source: The authors, 2021.

4 DISCUSSIONS AND RESULTS

Upon pointing out the main characteristics that involve the properties of the study, it is necessary to bring the speeches of the interviewees of the two colonies. The first, called Wanda Colony - Argentina and the second, Perikito Colony in Marechal Cândido Rondon - Brazil, each with its history that deserves an important and unique highlight for this study. In Table 3, therefore, the characteristics of the colonies will be presented, in particular the products (Creole seeds) and the stories pointed out by the interviewees who are part of their life experiences.

Table 3 - The historical characteristics of the Creole seeds keepers

Colonies - Countries	Colony – Wanda/ Argentina	Perikito Colony - Marechal Cândido Rondon/ Brazil
Histories of the seeds keepers	Relevance of family (mother) and of extensionists of INTA to carry out agroecological activity. Transmission of ancestral knowledge and practices	First, everything started in 1997, “We began 20 years ago, the organic production” According to the influence of Ana Primavesi, mainly in July of 2001
Production surface	2 ha	24 ha
Varieties of seeds/crops	Beans (11 types), Watermelon, Melon, Cucumber, Pumpkins (3 types), Maize (4 Types), Arugula, Carrot, Radish, Cabbage, kale, lettuce (3 types), Mustard, Turnip, Spinach, Onion Rings, Parsley, Cassava (3 types), Potato (3 Types), dried rice.	Mazes, beans, tomatoes, peppers, beets, coffee, Peanut a great diversity of Creole seeds, I have dozens of seed variety that I do not know, I can't count (HEDEL, 2021).

Source: Interviews data, 2021.

From the information in Table 3, it is perceived the importance of the historical context, the motivations of each of the Creole seeds keepers. When it comes to seeds, the challenge for traditional producers and keepers is increasing before companies that use technologies, in the perspective of forcing farmers to buy seeds as transgenic or modified at high prices, according to Capra (2002). The solution is an ecological production of seeds, an exchange between farmers, especially in underdeveloped countries and those with little resources to make purchases.

At this point, the story was combined with the Creole seeds keepers, Luiz Valter Hedel (2021), who began his trajectory in 1997, out of curiosity and need to produce a sustainable diet, balancing nature with an organic and healthy production, thus beginning his history.

We started 20 years ago, at that time the production was organic, first because I did a lot of reading books and magazines, we talked a lot about it, also had a little organic product, from conventional planting we already did some things of organic practices at that time, then, received a visit from an agronomist and as we always had the fair (Producers Fair).

here in Marechal, what we produced, we already had a place of sale, so it was what made it easier at that time to have a place to sell, so it happened and it happened like that overnight. From today on we will not use any chemicals. (HEDEL, 2021).

In this speech, it was clear the producer's willingness to follow with his decision to have a way of life that is within the limits of caring s about the surroundings, where everyone wins. Taking into account, for example, the ideas of caring for nature, no longer use chemicals to avoid negative impacts on the environment and take care of the health of all who involve the biophysical limits of nature, consumers for receiving a high quality product and, finally, for the health of his own family, which consumes the products of his property. It is realized the role of the seed keeper aiming his influence with the work that he does and that he dedicates himself to the present day.

Likewise, the Creole seeds keeper Luiz Valter Hedel, had as influence the engineer Anna Maria Primavesi² for her work on organic production, soil care, among others, as Hedel said (2021) during the interview for this study,

Professor Ana Maria Primavesi taught us to follow her fundamentals, for example by adopting some practices such as the vegetable cords of native trees to cut the effects of the wind, because the property suffers from North exposure, and the North wind dries more than the sun, these are some of them that I still use today. I also think the big push that gave us to continue in this ecology, right? It was when she came to give a lecture here for us, here in Marechal Cândido Rondon, in July 2001, in the central square of the municipality, there we saw her teachings in almost two hours of lecture, practically a class, who was not convinced, in doubt at that time, how it is and was to produce this way, she took the doubts, it is possible to produce even when our environment is contaminated (HEDEL, 2021).

From the interviewee's perspective, we need teachings aligned with the thoughts that reflect on our behaviors and actions of each day. There may be doubts, but with training through lectures, courses to apply techniques in daily practices, there is efficiency and

² See the bibliography of the agronomist Ana Maria Primavesi at the link: <https://anamariaprimavesi.com.br/biografia/capitulo-8>

willingness to want to make happen, as regards not to lose the sense of observation of the environment we live in.

Still in Table 3, it is noticed that the property of the Perikito Colony of Marechal Cândido Rondon - Brazil, has 24 hectares, where there is a vast production of organic products and a diversity of Creole seeds, so, according to the seed keeper, the property has the initial name of colony, the second name came because of the location that is inside the city, positioned on the periquito line, so the property was named with this name. See below figure 3 that contains part of the farmer's production.

Figure 3 - Productions of the property of the creole seeds keeper Luiz Valter Hedel Perikito Colony



Source: Personal Producer Archive, 2021.

From a quantitative point of view and seed varieties, the producer stated that he has a great deal of difficulty making this calculation, but it is estimated that he has, for example, 50 varieties of maize creole seeds, more than 30 types of tomatoes; as for pepper and other varieties, I would not know how to say for lack of help and time for work. In Figure 3 and Table 3, we can see the difficulty of the producer in accounting for the products, sometimes we can see the need for institutional supports, either by extension project by universities, to try to meet this need.

In Argentina, the Wanda Colony is located in the same city, where the seed keeper Beatriz Zemunich, a family farmer, has lived in for 20 years. The trajectory of the keeper is crossed by the historical and productive context in which she began her activity in 2001, during one of the strongest economic crises in Argentina, in which she began her activity, where the food security of a large part of the population was heavily limited by neoliberal strategies that attacked regional economies and limited state actions. At this point, a series of responses emerge that try to ensure the safety and accessibility of food from various strategies such as self-production of food and exchange.

These various strategies aimed to give a creative and innovative response from the recovery of traditional production patterns. The seed keeper Beatriz, started her activity driven and motivated by the family tradition strongly linked to the agroecological production and technical assistance of extensionists of INTA (National Institute of Agricultural Technology).

The people who helped me make agroecological production and decide for this was a technician of INTA, Isabel Aquino, my mother and my family. Isabel made me see and empower myself on the topic that I love more and more. My mother passed on to me all her ancestral knowledge, which has changed my heritage a lot, because it has a greater biodiversity in the space where I live (ZEIMUNICH, 2021).

From the learning process given by the transmission of popular knowledge, family activities developed in a small property of 2 hectares, where productive processes with an agroecological focus are implemented that allow the reproduction of various cultures and Creole seeds. This process takes place according to the seasons and in agreement to the cycles, in order to offer these seeds in the regional meetings of exchange as a way to cooperate with society. Seeds play a relevant role in the process of reproduction of genetic resources and ancestral common goods, since they guarantee food safety. As the seed keeper reported: "My family leads me to choose the agroecological production system so that I can produce all the seeds in the farm, all the inputs in a more economical and healthy way" (ZEIMUNICH, 2021).

In Table 3, the wide varieties of seeds are appreciated that are reproduced by the keeper, an indicator of the high capacity of the agroecological system where the keeper develops its activity. It should be noted that many of the seeds reproduced are aimed at safeguarding food sovereignty, since they are intended for family self-consumption.

In the case of Argentina, the logic that predominates in the process implemented by the seed keeper is outside the standards of economic logic that seeks profit generation. Trying to rescue both the value of the place and diversity, as well as the social ties that are generated by the seeds circulation. What is prioritized and stands out in this process is the promotion of care, security and food sovereignty. The keeper said: "To be a keeper you need to have the necessary knowledge, have love for the way to plant, care, preserve, keep. I do not think it is so difficult, what is necessary is to love, love production, love the soil, love the water, love the earth, love the environment" (ZEIMUNICH, 2021).

Those who participate as seed keepers are committed to an integral social and environmental model, many of them are involved in the fight for an agroecological model, in the Argentine case, the keeper actively participates in various activities, both

productive and political, in the search to generate production modes based on agroecology that prioritize the sustainability of the communities and family farmers that are part of them.

Figure 4 - Products of the property of the keeper of Wanda Colony - Argentina



Source: Personal File Beatriz Zemunich, 2021.

Figure 4 shows the various varieties of seeds that are in reproductive state (cabbage, carrot, lettuce, spring onion, among others), this process is carried out in each of the seasons in order to keep, exchange in practice, exchange the elements to encourage production from creole seeds.

4.1 Discussing and comparing the experiences of the keepers in both countries

In this section the main contributions and placements of seed keepers are thought in both countries, to discuss the effects of experiences on sustainability, environment. Besides agroecological productions, table 4 is presented with the characteristics.

Table 4 - The characteristics of seeds in Brazil and Argentina, a summary of the two producers' speeches

Experience	Wanda Colony - Argentina	Marechal Candido Rondon- Brazil
Agroecological Production	Self-sustainable, it provides the seeds and inputs for the production. "Increase of biodiversity in the space where one dwells"	Quite diversified; "The agroecological production is a way of life, producing also with fertilizers and biofertilizers is expensive. In addition, I have to produce to my family, I am going to plant, but I am not going to use anything.
	It allows to keep a wide variety of seeds	
Planning of property and teachings	I plan according to the terrain and take care to respect what nature already has and offers me	There is no specific planning, because it depends on rainfall, but, our environment is contaminated, that is the big problem.
Production of Creole seeds	The importance of creole and native seeds is that they are resistant and are accustomed to the characteristics of the site	Today it is quite difficult for me to keep these seeds, because of the high cost of electricity, mainly. Thus, it decreases the impacts on the creole seeds for a good agroecological production, I have a lot, it is difficult, right? And I don't know, there are tens and many varieties (HEDEL, 2021).
What it is like to be a keeper	One needs to have the necessary knowledge, have love for the way to plant, care, preserve, keep. Whoever sees the whole system as a whole can be a keeper	Being a seed keeper is difficult, but it is pleasurable, right? You have to have love for your work, so it does not become a job, you already have love for what you do and then it becomes a hobby (HEDEL, 2021). Saying seed keeper is one who also holds one variety, two or three
Food security and sovereignty	The seeds guarantee the possibility that I have the ability to produce my own food	Food sovereignty, it has to start with Creole seeds and I no longer agree much today when someone buys it, conventional seed, here ecological production is made and, for me, that is not 100% ecological (HEDEL, 2021)
Rural succession	My son accompanies me in each of the activities, he contributes to the production and participates in the events of seed exchange and agroecological production	I have a single son, "He has always worked here at home, never interested in wanting to go to work in the city" in "regarding this is referred" (HEDEL, 2021).
Sustainability	My system is self-sustaining, without the use of pesticides	We need to be sustainable, so we also have to use our weapons to heal, produce for our family in a sustainable way.
Cooperation's, a type of exchange	I participate and am part of the collectives of exchange and protection of seeds in the State. We are part of commercialization collectives in the region.	I participated in meetings, in several places, including outside Brazil, in "exchange of seeds, I participated a lot, so we ended up picking up the taste for it, I have a great variety for example, I used to take two and brought four, and so on.

Source: Interviews data, 2021.

When discussing the ideals of Table 4, we focus on the first speech of the Creole seeds keeper Luiz Valter Hedel in the perspective of agroecological production, the idea of production for his family member is highlighted, also for the communities that his products

are sold that involve love of nature, an act of wanting to progress without harming the environment that he lives. As stated by keeper Hedel (2021): “Our environment totally contaminated,” he points out that we have access to information on our computers and on the internet to make it easy to produce ecologically, putting into question the importance of understanding ecology, as Capra argues (1999).

For Capra (1999), it is possible to think of a sustainable community, provided that everyone values the ecological learning of people, allowing their experience with knowledge. In this same way, Capra (2002) states the same, who continues to recommend the importance of practice and theory in the sense of constant learning, in which, there must be a deep approximation with ecology to balance our environment.

In this way, as the seed keeper reports, the teachings in trying to show people that the environment is contaminated and sick need to be taken more seriously if we want a healthy nature, because it directly impacts the production and planning of properties due to lack of rain, to cite an example.

Considering both cases, the issue of agroecological production and a support to sustainability, recovering biodiversity, not only in relation to food production, as well as with the care of the flora and fauna that is linked to the environments where the seeds are produced. In this sense, the fact that the production has an agroecological focus and not a random choice is based on the fact that, as Nodari and Guerra (2015) demonstrate, “it does not use chemical inputs, is sustainable in all its dimensions, it makes use of great genetic diversity in cultivation, is socioeconomic-associated, stimulates neighborhood relationships and produces foods with high biological and nutritional quality”, which favors its implementation and reproduction in various environments and communities.

In this sense, the agroecological production mode adapts with planning the property within guidelines that respect the design of nature and the cycles of it, as the keepers report, based on the principles of sustainability mentioned by BOFF (2016), which focus on care and prevention.

Other important points that must be highlighted here are the challenges that must be faced in the process, and, as Hedel 2021 said: “it is difficult to be a seed keeper”. This raises even more the difficulties of production, mainly due to lack of investment, high maintenance costs for the farmer who decides to follow this path, but this does not limit his or her production, as it can be seen in figure 4.

Beatriz Zemunich, in turn, places focus on the process of learning and dedication that implies the transmission of knowledge in the process of becoming a keeper. This knowledge is very relevant because, according to Guzman (2020, p.91) “when selecting and keeping the seeds there is knowledge of the environment, the soil, the life cycle of the plant, the food or the healing uses it could have.”

Thus, it is possible to understand the seeds as common goods, because the various local varieties involve a set of cultural traditions, management, selection and community practices that are transmitted from generation to generation, where farmers have control of their seeds (PINEDA PINZON, 2012).

Given a context in which there is an advance of seed companies and agro-industries that propose a productivist logic that does not consider the environment and the communities that live in it, which is attentive to food sovereignty and accessibility (BROWN et al., 1999).

At this point, the conservation of agricultural biodiversity through the conservation of Creole seeds by family farmers through various social technologies: Seed and knowledge exchange network, community seed banks, participatory breeding processes and open seed registration as pointed out (DE ARAUJO PINHEIRO et al., 2020; LLAMAS-GUZMÁN, 2020; MARÍN; VAN ZWANENBERG; CREMASCHI, 2021^a; SILVA; SANT’ANA, 2021).

Figure 5 - Diversity of products in the property of the creole seeds keeper Luiz Valter Hedel of Perikito Colony

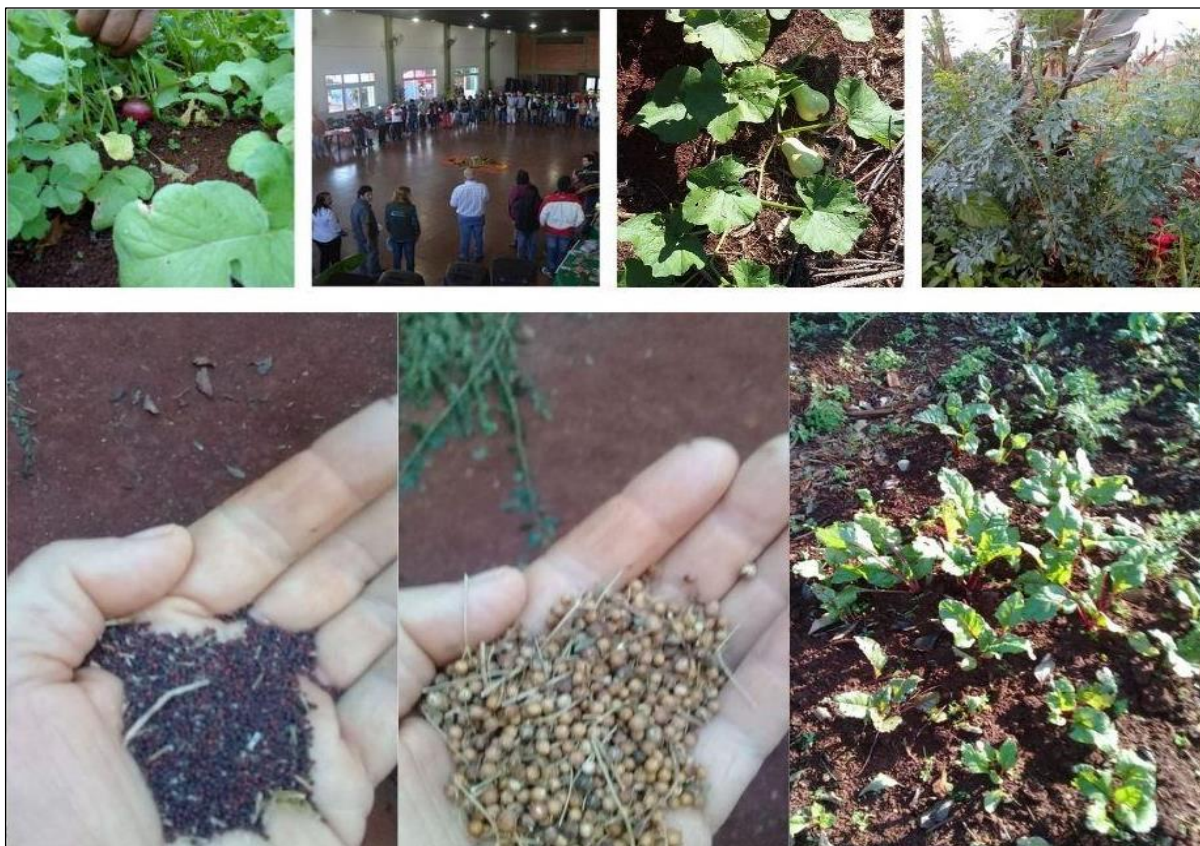


Source: Personal Producer Archive, 2021.

The diversity of products, in figure 5, is the representative importance that Creole seeds have in food production in the world. The seeds keeper Hedel (2021),

struggles to maintain his diversity of products, even with the adversities faced by producers, as shown in figure 5, where we observe the products of the seed keeper in Argentina.

Figure 6 - Diversity of products in the property of the seeds keeper of Argentina



Source: Personal file seeds keeper, 2021.

The products of figures 5 and 6 shows the strength of the production of the seed keepers, in particular in this case that can serve as an example of how it can be produced with Creole seeds in an ecological way without the use of “fertilizers and biofertilizers” that can affect the soil. Together with the ideas of Hedel 2021, it is possible to start thinking about the issue of hunger and poverty, aiming at solutions linked to “food sovereignty”, because “it has to start with Creole seeds”, that is, producing from this perspective.

This lack of food in the world, especially in underdeveloped countries, can be seen from different perspectives; but in this particular study, the relationship between seed production and food insecurity stands out and, as Hedel, 2021, said: “Food sovereignty, it has to start with Creole seeds”. It is a way of saying who produces his own seeds and manages to conserve them has a great chance not to depend on purchases of high-cost seeds, since the financial problem is present in the lives

of family farmers. Thus, considering the growth of the population, we need to think about how to feed this population, in addition, a quality diet to avoid a crisis of food insecurity.

When asked about rural succession, it was noticed that in the case of Luiz Valter Hedel, succession was always thought and fed with the presence of the son in the property, which in turn has agroecological experience, a custom aligned with sustainable food production, since he grew in the property, as Hedel said (2021): “this succession is going forward, he is already dating a girl and they are certified ecological farmers as well.”

For the experience of Argentina, the issue of succession is also not a problem, since it is ensured by the transmission of knowledge and ownership to the guardian's son, who actively participates in the processes linked to the conservation of seeds.

It is understood that there are no grounds for concern of succession, one of the cases that discuss the authors Toledo and Zonin (2021), in relation to the search for marriage that accompanies the family in the place they live, considering reasons for abandonment that end the ecological rural succession.

As it was possible to realize, during the course of this study, agroecology goes along with sustainability. As Boff (2016) said, one must protect the “natural capital” that refers to the care of the environment so that we can live well, live in harmony with the surroundings and everything that exists in nature. In addition, Hedel (2021) points out: “We need to be sustainable”. Considering this need, the main reason is to improve our lives, preventing many from starving because of non-cooperation, to have a good balance among cultivating, planting and living.

Supporting sustainable agriculture, ecological agriculture and organic production is aiming at a way to face the traditional production system, being a conscious alternative of consumption, which was recognized in Brazil from the year 2000, supported by the State to encourage family farmers to cooperate through public policies. (COSTA JUNIOR et al., 2021).

When it comes to cooperation, whether at national or international level, we can always cooperate for the good of humanity, without thinking about the gains, but, in an exchange based on love, passion; considering a situation that involves the good of a society or the development of a country, (EXIME et al., 2021).

For the guardian, working with seed becomes something very pleasurable, ends up not being a job. This energy spreads to the way of sharing and exchanging seeds during one’s travels and national and international events. This cooperation becomes automatic because the authors involved are not necessarily concerned with losses and economic opportunities, this is the reason for forming the networks with automatic cooperation.

It is noticed that the two experiences, that of Wanda Colony, Misiones - Argentina and Perikito Colony Marechal Cândido Rondon, Paraná - Brazil, are clear in Tables 3 and 4, the points in which there are coincidences among the experiences, even though two properties with different sizes, but, with the same ideas of construction, for the love they possess for nature, making their productions become unique.

5 FINAL CONSIDERATIONS

The problems related to food security in the world have become a constant challenge, especially in developing and underdeveloped countries, which suffer from lack of production, healthy food, low-cost food and affordable food. The available resources become scarce by means of production, sometimes due to lack of incentives for good quality production, food must be a right for everyone, without exclusion.

The farmers and Creole seeds keepers develop this role effectively and masterfully to bring food that supplies our kitchens daily, the two experiences report in depth their experiences and their productions with plenty of diversity to strengthen food sovereignty, contribute to avoiding the constant food crisis in the world and in communities. Thus, the seed keepers demonstrate this ability to influence, besides easily produce healthy foods, respecting the environment with agroecological productions in order to produce with love nature.

It is observed that the role of seed keepers is not only to keep, but to produce for self-consumption with autonomy, by which they need freedom to do so. It is understood that a person who has a small production and holds only a type of Creole seed is also defined as a seed keeper. The keepers take place within the framework of several experiences of self-management in networks that prioritize interaction and knowledge exchange. In this process, the cooperative and solidarity actions are great allies in the framework of

sustainable development. Thus, the Creole seeds keepers need the support of public policies that articulate the defense of common goods to foster sustainable rural development processes.

As for the case in Argentina, a series of elements that are of vital relevance and that can be considered for the analysis of other cases, both in the region and increasing the number of countries, also for the construction of public policies aimed at sustainable rural development. The elements to highlight are the transmission of knowledge, the role of extensionists who promote and encourage family farmers to continue or initiate agroecological actions, the sense of community by participating in fairs, meetings and activities guided to this activity, which takes place within the framework of popular pedagogy.

Finally, sustainability is part of the life of seed keepers, and, from agroecology and innovations serve to improve this process and adapt to reality, without exceeding the biophysical limits of nature. The seed keepers in Argentina and Brazil have the same ideas of how to produce and the reasons that we should be more sustainable, cultivate with love, even with a large difference in the number of hectares, so, in this case, size is not decisive.

So, for the guardian investments are necessary for the maintenance of the Creole seeds, as it is the case of the Brazilian producer. Help is also necessary to count the seeds, since alone it becomes difficult to catalog and count the diversity of stored seeds. This work presents limitations as a deeper analysis of the seeds produced in the properties, it is recommended to do more interviews to analyze and compare more cases of seed guardians, in-depth studies on the co-operations between seed keepers and construction, in addition to maintaining networks to encourage new public policies. These mentioned points can be considered as future work on the subject.

Guardiões de sementes na Argentina e no Brasil: comparando experiencias

RESUMO

As sementes crioulas têm sido utilizadas pelos agricultores familiares como forma de ampliar sua autonomia produtiva e segurança alimentar, assim como contribuir para o fortalecimento da produção agroecológica. A natureza deste estudo é qualitativa e faz uso da metodologia comparativa para discutir os dados de duas entrevistas não-estruturadas dos guardiões no Brasil e na Argentina. O objetivo é discutir o fortalecimento da soberania alimentar visando à importância das experiências dos guardiões de sementes nas Cidades de Wanda do Estado de Misiones, na Argentina e em Marechal Candido Rondon no estado do Paraná, no Brasil. Procura-se responder a seguinte pergunta: De que forma, os guardiões de sementes podem diminuir a insegurança alimentar na perspectiva da sustentabilidade? Conclui-se que a sustentabilidade faz parte da vida dos guardiões de sementes e, a partir da agroecologia, as inovações servem para melhorar esse processo e adaptar à realidade sem ultrapassar os limites biofísicos da natureza. Os guardiões de sementes na Argentina e no Brasil possuem as mesmas ideias de como produzir e os motivos pelos quais devemos ser mais sustentáveis, cultivar com amor, mesmo com uma grande diferença de quantidade de hectares.

PALAVRAS-CHAVE: Inovação aberta; redes de sementes; Argentina-Brasil; soberania alimentar; Agroecologia e sustentabilidade.

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