

URBAN AGROECOLOGY IN CAMPO GRANDE, BRAZIL

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Abstract: Sustainable agriculture has a different meaning from region to region, most of scientific literatures highlight a dichotomy between developed and developing countries approaches. In this general context agroecology in Brazil is linked to the family farming which produce more than half of food consumed domestically. Historically, a set of policies were implemented in order to address food security on federal, state and municipal levels, with large impact on family farming, like urban agroecology. This paper aims to develop a diagnosis on the urban agroecology in Campo Grande.

Key words: urban agroecology, organic farming, family farmers, Campo Grande, Brasil

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INTRODUCTION

The concept of sustainable agriculture has evolved since the early 1980s on the basis of ecological principles of agroecology, in order to host ecological and equity problems posed by the adoption of modern industrial agriculture. Sustainable agriculture is obviously a normative concept, leading to different definitions by various disciplines and affiliations (Altieri, 1998). Under the sustainable agriculture umbrella emerged many new concepts like organic farming, agroecology and urban agroecology. The most prominent example of urban agriculture is represented by the Cuban experience, where become a significant source of fresh produce for the urban and suburban populations. As a grassroots movement in response to the crisis brought about by the loss of trade, a large number of urban gardens emerged in Havana and other major cities (figure 1) (Altieri et al., 1999).

Cuban peasants were the main pawns who made possible the transition to more agroecologically integrated and diverse farming systems. They have been able to boost food production without scarce and expensive imported agricultural chemicals by using more ecological inputs (Duff and Padilla 2015). The new habits caused by the modern life shaped the relationship between urban inhabitants and food producers. In response to the lost link with the food production today, in large urban centers, it has increased the number of people who often - even in small spaces in their backyards and apartments - grow culinary herbs, medicinal, vegetable and even some fruit (Mougeot, 2000).

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Figure 1. Urban agroecological farm in Havana, Cuba
(Source: Photograph by author, 23 February 2017)

The expansion of the organic sector in Brazil is seen as a leverage for the social emancipation of the small family farmers. Large cities take advantage of the initiative of family farmers from the peri-urban districts (Altieri and Nicholls 2008).

In the paper it will be explored the urban agroecology in Campo Grande, the capital and also the largest city in Mato Grosso do Sul. Campo Grande occupies 8.096 km² in the central part of the state, near the watershed divide of the Paraná and Paraguay basins (figure 2). Altitudes range from 500 to 675 m (Campo Grande, 2013). The city is one of the most dynamic in terms of demographic growth, increasing from 140,000 people in 1970 to 853.622 people in 2016 (IBGE, 2016). The climate is tropical humid with wet summers and dry winters. The precipitation is heaviest from October to March, which is the period when mean temperatures are approximately 24°C. June, July, and August are the driest months.

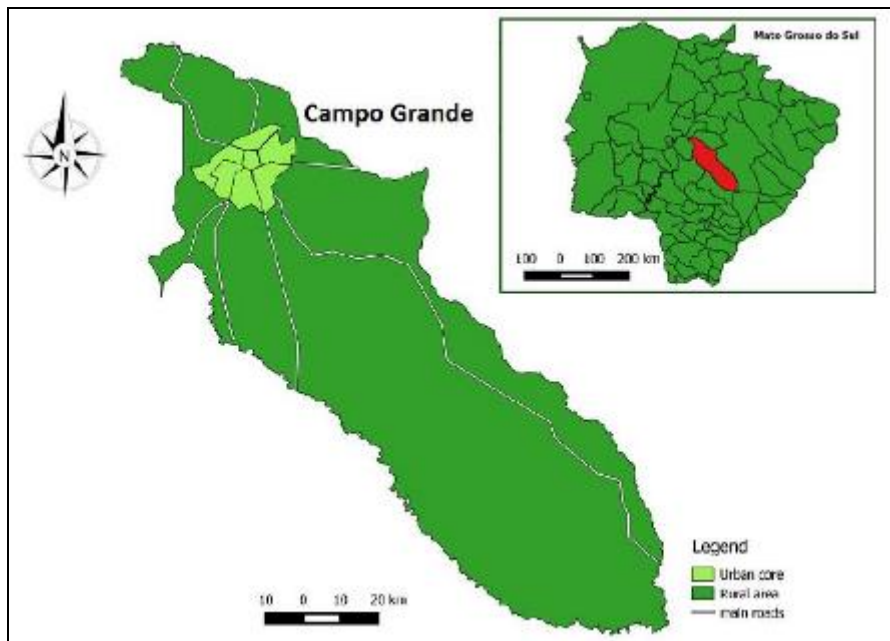


Figure 2. Location and structure of the administrative unit
(Source: own realization)

METHODS

This paper aims to develop a diagnosis on the urban agroecology in Campo Grande. A mixed method of questionnaires and interviews was conceived as a means of obtaining data to be used in support of research on agroecology in Campo Grande. While questionnaires can provide evidence of patterns amongst large populations, qualitative interview data often gather more in-depth insights on participant attitudes, thoughts, and actions (Kendall, 2008).

The questionnaire was applied in two different days in an organic market. The organic market is organized twice per week on Wednesdays and Saturday from 6 am to 9 am in the Radio Club Park (figure 3). The organic market group up to 10 farmers from the urban outskirts. The questionnaire was applied in Portuguese, therefore the help of a translator was considered. The language barrier was one of the main limitation in the research.



Figure 3. Organic market in Radio Club Park, Campo Grande – MS
(Source: photograph by author, 23 March 2016)

The survey was applied to all available farmers in the market, respectively 10 farmers. The questionnaire was designed to provide a profile of the family farmer that use agroecological practice from different perspectives. Those perspectives included, experiences, practices, motivations, personal preferences. The questions were refined a number of times and the questionnaire was reviewed by an expert that works with agroecological farmers for clarity of instructions, completeness of alternatives, and use of appropriate language and terms. The final version of the questionnaire contained 38 items that comprehensively investigates the transition from conventional farming to organic production. Other topics are the factors prompting conversion and the effects of output changes. Data were gathered on farm resources, sales possibilities and farmers' future expectations. Data were evaluated using simple statistical methods, which were completed using Excel. The questionnaire was accompanied by an interview with some of the farmers, and also a farm visit in order to understand better the reality.

RESULTS AND DISCUSSIONS

The investigation of the organic farm location in Campo Grande shows that the producers are coming from the peri-urban side, within half hour drive (figure 4). Mainly, their farm is located very close to the main roads that cross the administrative unit. Four farmers need approximatively one hour to get to the market, from this it can be deduced they are leaving farther. Only one interviewed farmer needs almost 2 hours, being also the only one who comes from another municipality, respectively Rochedinho.

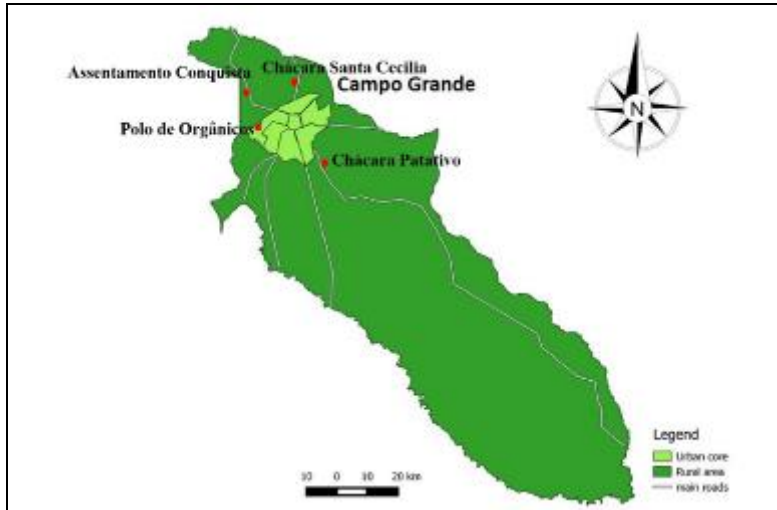


Figure 4. Localisation of the organic farms
(Source: own realization)

Most of the producers interviewed (4 out of 10) are having their farm situated in Polo do Orgânicos Polo Empresarial Oeste (exit Aquidauana) (figure 5). The settlement, regroup family farmers that decided to adopt agroecological practices becoming an important center for knowledge in the field. The sight uses various types of agroecological practice, from the PAIS¹ model supported by SEBRAE² till own models based on life experience.

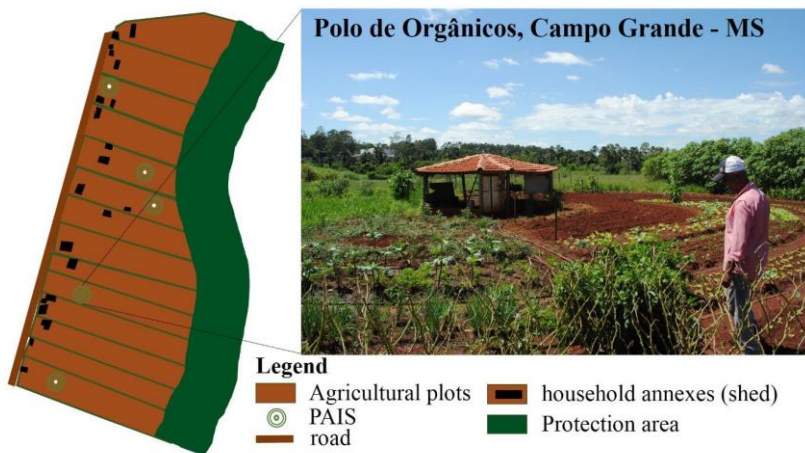


Figure 5. Polo do Orgânicos, Campo Grande – MS
(Source: own realization)

Other producers are from various Assentamentos from the periurban area, such as Conquista, Indu Brasil, Colônia Rezolândia Aguão, Nova Era, Só Alegria, and Três Barras. The Agrarian Reform in Brazil aims to promote better distribution of land by changing the ownership

¹ PAIS - Integrated and Sustainable Agroecological Production (Produção Agroecológica Integrada e Sustentável);

² SEBRAE - Brazilian Service of Support to Micro and Small Enterprises (Serviço Brasileiro De Apoio As Micro E Pequenas Empresas);

and land use system in order to meet the principles of social justice, sustainable rural development and increased production. INCRA³ is the institution charged with current land reform that promote the implementation of an assentamento rural model based on economic viability, environmental sustainability and territorial development. There are more than 9334 assentamentos across Brazil that impact the life of 977.491 families. In Mato Grosso do Sul there are 204 assentamentos with 27.841 families that benefit from this land reform (Komori, 2007).

According to the datas published by INCRA, in Campo Grande there are 14 Assentamentos, from which 7 were attributed through the Agricultura Familiar program, respectively more than 1000 families (table 1).

Table 1. Family farmers in Campo Grande
(Data source: INCRA, 2015)

Municipality	Community	Community type	No. of families
Campo Grande	Anhandui	Agricultura Familiar	70
Campo Grande	Buriti	Remanescente de Quilombo	61
Campo Grande	Campo Grande	Outros	120
Campo Grande	Colônia Rezolândia Aguão	Agricultura Familiar	65
Campo Grande	Conquista	Agricultura Familiar	70
Campo Grande	EFA COAAMS	Escola Família Agrícola	129
Campo Grande	Indu Brasil	Agricultura Familiar	700
Campo Grande	Nova Era	Agricultura Familiar	30
Campo Grande	Pantanal Industrial	Agricultura Familiar	30
Campo Grande	Penitenciária Federal de Campo Grande	Outros	289
Campo Grande	Só Alegria	Projeto de Crédito Fundiário	16
Campo Grande	Terra Boa	Projeto de Assentamento INCRA	30
Campo Grande	Três Barras	Agricultura Familiar	60
Campo Grande	Três Corações	Projeto de Assentamento INCRA	160

Based on the given answers, it can be highlighted the type of production practiced on the farms. On the studied farms, mixt organic production and conventional production were practiced, revealing a transition from conventional to organic. Of the 10 farms, on 7 farms (70% of those studied) only crop production was practiced while 3 farms (30%) raised crops and kept animals. However, there is a desire of the farmers to create a more diverse exploitation. Some of the farmers mentioned, their intention to introduce fishery or bee keeping on their farm.

Research on organic farmers is popular but only in few situations is explored the motivations that contributed to the conversion to the organic practices. It can be distinguished to main reasons behind the conversion process respectively: personal factors and economic benefits. In the study Organic production in the context of family farming in Mato Grosso do Sul conducted by Padua (2014), in which 101 farmers were interviewed, 49% declare themselves as organic, and 8% this condition is mainly attributed to possess organic production certification. Others indicated this condition for not using chemical inputs in crops or respect all the practices recommended in organic production.

However, among the 51% of farmers who consider themselves in transition, 32% mentioned the great difficulty to fully use all the agroecological practices. At least 70% of the

³ INCRA - National Institute of Colonization and Agrarian Reform (Instituto Nacional de Colonização e Reforma Agrária)

interviewed farmers have produced food using the conventional agricultural model. However, those are the ones attributed greater difficulties in agroecological transition, due to the need for changes in management. Studies reveals a complex environment who contributes to the decision making in the conversion toward organic farm. Fairweather (1999), identified two types of organic farmers, the - committed and the - pragmatic as well as three types of conventional farmers. More detailed Darnhofer et al., (2005), defines based on 15 criteria's five farmer types: committed conventional, pragmatic conventional, environment-conscious but not organic, pragmatic organic and committed organic.

Nevertheless, the applied surveys indicated that 70 % of converted farmers did so because of the financial perspective, a new market (figure 6). A major role in the conversion was played by the presence of a subsidized program (PAIS) most of the farmers adhering to this program. According to the datas collected the economic reasons were determinant for the conversion, followed by 20 % for ethical reasons (environmental concern, production of healthy food). Farmers were able to choose from a list of motivating factors, most of them marked all the categories and attributed a value from 1-5 according to the importance in their choice (figure 6).

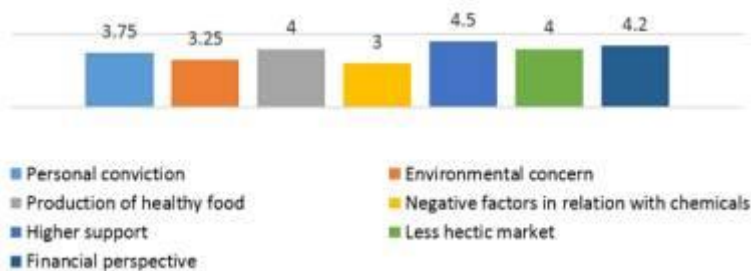


Figure 6. Reason for conversion from conventional agriculture to organic agriculture

Four out of ten of the interviewed farmers converted their farm in 2008, being the moment when PAIS project was launched, the others converted in the following years, respectively, two in 2009, one in 2010 and two in 2011. Only one farmer converted his farm more than 10 years ago, when organic farming was less known. Another farmer, inherited the farm from the parents who practiced conventional farming and he was the initiator of the conversion, mainly due to personal conviction. All the farmers kept the same production type after the adoption of the agroecological practices. In the depth interview carried with the owner of an organic restaurant (Márcia Chiad), who is one of the customers of the organic farmers emphasize the *“need of changing the production type of the organic farms in order to answers to some urban demands”*.

The average size of the organic farm of those questioned was 10.9 hectare, but a deeper look offers a clear image. One of the interviewed farmers had in possession a 40 hectares farm, determining in consequence an average surface for the other farmers around 7 hectares. Even this average surface is in reality smaller, farmers declaring they use between 1 and 2 hectares for organic farming, respectively 30% of the whole surface.

The other two third has different functionality, respectively protected areas, pasture, forest or conventional production. However, those who are beneficiaries of PAIS project have 0,5 hectares of agroecological model and on the rest of the farm is used different type of organic production. The average surface of organic farmers is lower than the average surface of the family farms in MS (37 ha) or in the municipality of Campo Grande (12 ha) (IBGE, 2006).

The farmers were asked if since the adoption of organic farming changed the size of the farms. Six of them kept their original size and the other four increased slightly their surface. The questioned farmers revealed the type of properties of their farm, respectively half of the (five) were operating on their own private land and the other half (five) used a governmental land

(INCRA usufruct property systems). In one case the farm was leased from family member. Research on the land area locations aimed also to highlight the perceived quality of the land. In unanimity respondents were appreciated their land as good quality.

Concerning the labor force in all the cases the human resource was represented by family members. In all farms there were no employees, and when a need for labor occurred day-workers were hired (figure 7).

Despite of the large size of the farms, mechanization was partly used (figure 7). In seven farms they use farming machines mainly small tractor (Tobata) and the most present electric equipment was the irrigation system in some farms received as a kit through the PAIS project.



Figure 7. Crop protection and small mechanic tractor used

(Source: photograph by author, 8 March 2016)

The irrigation system is partly used. There is the climatic advantage given by the presence of the rainy season when the irrigation is used occasionally.

Concerning the plant protecting methods employed, the majority of farmers (eight) used a biological method learn in trainings delivered mainly by SEBRAE agronomists (figure 8). Sometimes mechanical or agrotechnical methods are employed.



Figure 8. Biological protective substances

(Source: photograph by author, 8 March 2016)

Benefiting from a good quality soil and favorable climate, farmers are not concerned about the need of nutrient supply. Nevertheless, farmers use organic manure, green manure, mulch and compost in order to increase production (Larsen, 2009).

As mentioned, the economic factors played a key role in the changeover the production system. Therefore, the respondents when questioned about the sales price of their organic product, appreciating with small variations similar with to the conventional products. The price of designated organic products is generally higher than the usual market price. The fluctuation of the production determined by the climate has an impact in establishing the price. When overproduction is occurred the price decrease. The higher price is decreasing from year to year and sales price trends differ for week to week.

In the exploration of the sales channels of the organic products, the vast majority sold their products in the organic market (the organic market is organized twice per week, respectively Wednesday and Saturday from 6 am to 9 am). The farmers interviewed were satisfied with the organic market, indicating that already at 7 o'clock almost all their products being sold. As other means of product distribution, the national program of school supply PNAE⁴ or PAA⁵ is facilitating their product selling to different public entities. Once per week SEBRAE is opening its door for an organic farmer to sell organic products to its employees, being highly appreciated by both producers and employees.

More limited is their access to specific shops. Several managed to sell organic products to organic restaurants. The owner of the Recanto das Ervas organic restaurant (Márcia Chiad) emphasized the importance of *"supporting organic farmers by buying their products"*. Mentioning that other *"organic restaurants from Campo Grande prefer to buy organic products from Sao Paulo"*. She considers that is *"not sustainable to neglect the local farmers and it's important to strengthen the relationship with them"* (figure 9).



Figure 9. Organic restaurant owner (Márcia Chiad) buying from local organic farmers

(Source: photograph by author, 23 March 2016)

Two farmers, managed to establish strong relations with their customers, therefore sometimes they sale directly from home. None of the farmers possessed sales contract. Selling directly from one's farm location is a typical practice offering the advantage of maintaining personal contacts, product identity and fewer logistic problems (Kis, 2007).

Farmers observed an increasing demand for organic products, therefore most of them intend to improve production. In order to improve production without using chemicals is hard task, therefore interviewed farmers are engaged in different activities in order to improve their knowledge. Some of the farmers inherited the agricultural practices from their ancestors, the other part discovered those practices through different courses/seminaries realized by technicians and combined with their own experience.

⁴ PNAE- National School Feeding Program (Programa Nacional de Alimentação Escolar)

⁵ PAA - Food Procurement Programme (Programa de Aquisição de Alimentos)

Most of the farmers (seven) admitted that one of the main sharing knowledge activity in the fields is Dia di Campo. Dia di Campo is event organized yearly by Secretaria Municipal de Desenvolvimento Econômico, Ciência e Tecnologia, Turismo e do Agronegócio (SEDESC) with the main aim to create a sharing environment in the agroecological field. More than 250 small farmers participate at this event, together with technicians, experts and different decision making that all share knowledge and practice. Participants have the opportunity to learn organic production techniques directly from those have a high expertise and also is a place where useful information concerning organic farming are spread by local authorities.

When asked about the future, they were unanimously optimistic considering that organic market has a large potential and is and observable positive trend (figure 11). In which consist the market opportunities and consumers interests majority of farmers highlighted the huge potential and believes it will be better for them in the future.

When asked about local support, regulation and bureaucracy, they were concerned and aware that in the future, the organic environment will be more regularized and probably more regulations. They were concerned about the organic certifications (figure 10) that they need to produce. The farmers are certifying their products through different agents such as Ecocert Brasil Certificadora, IBD Certificações LTDA, Cooperativa dos Produtores Orgânicos da Agricultura Familiar de Campo Grande.

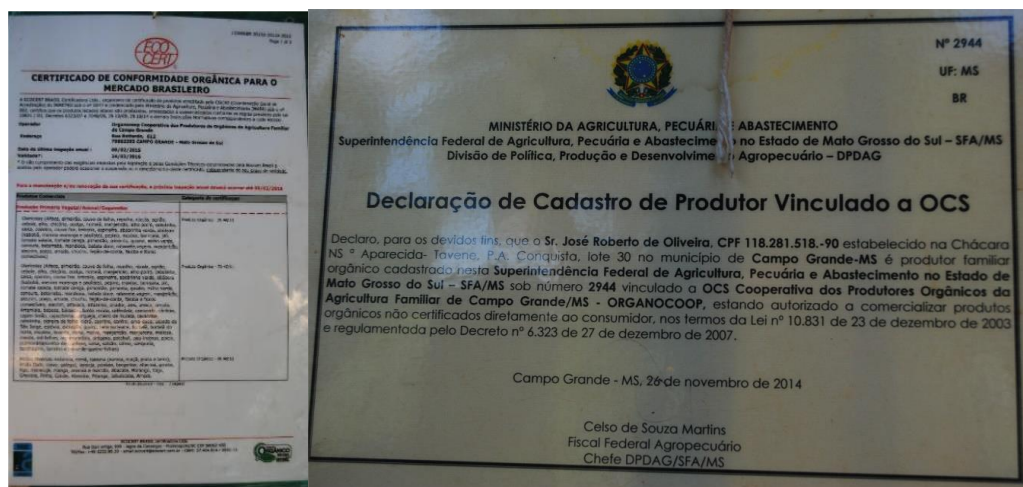


Figure 10. Organic certificates own by family farmers from Campo Grande

(Source: photograph by author, 23 March 2016)

When asked about climate change, opinion was different half of them considering climate change is contributing positively to their production due to the increased amount of precipitation. By other hand the others were aware about the implications of climate change and possible risks saying that they need to think about protection methods.

Finally, when asked what should be improved in the system or what recommendation they have, some of the farmers highlighting several needs. First of all, of them considered agroecology practice as being physically hard, more time being requested in the production. Therefore, only perseverance and long-term thinking can be successful. One of the farmers proposed for the hard labour to acquire equipment within the community, otherwise the investment is too high. Increased subsidies could contribute in improving the organic farming. Despite the fact that is an increased demand for organic products, several farmers mentioned the need to promote more efficiently their products.

Education for both producers and consumers are key vectors in the improvements of the system.

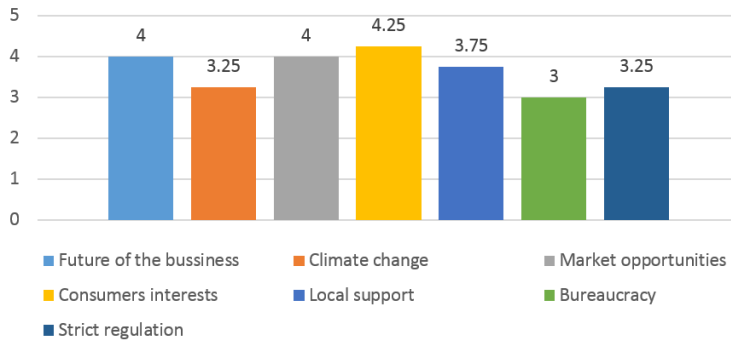


Figure 11. Future perspective of family farmers

One of the most mentioned complain was related to the seeds and high price. Farmers mainly by their seeds and only few of them are producing their own seeds and only for few products. Sometimes they exchange seeds or they buy from cooperatives. It is a common practice to use hybrid seeds, easily found on the market. Another important remark is that the concerns about seeds are not present in the peasant's mindset, probably because they do not have a strong tradition in family farming, whereas, in traditional communities (more experienced with this type of production) have developed an ancient knowledge about seeds restoration/conservation. It can be observed that those who inherited the farm from their parents were aware about the need to produce their own seeds (Padovan, 2005).

CONCLUSION

The present research aimed to portray the profile of the organic farmers from Campo Grande. The farmers questioned converted they farm less than 10 years ago mainly due to the economic opportunities accompanied by personal conviction. The main characteristic of the organic farms is that they have only family members that are supporting the farm without hiring employees. Also, the opportunity to be self-employed appeared to be a motivating factor behind conversion to organic farming as it also meant access to greater subsidies.

Beside the subsidies that are attributed to organic farmers other governmental facilities are supporting agroecological practices. Producers can have access to government markets (PAA and PNAE) with obvious advantages, such as guaranteed sale, fixed location, small delivery is accepted and one of the most appreciated is the wide diversity of products required (vegetables, fruits, herbs). Concerning agroecological practices used on the farm, farmers inherited knowledge and developed skills through own experience. A major role is played by several institutions engaged in transfer of knowledge through courses/seminaries or at *Dia di Campo*. Considered physically difficult, farmers are enthusiastic about the benefits and positive about the future.

Organic producers from Campo Grande benefits from governmental support, however there are still some difficulties. There is an incipient network created but not enough for the sustainability of the system. Therefore, it is desired the consolidation of the associations of the farmers that share the same goals and extremely important is to integrate consumers in the network. Farmers are anticipating the demand of the consumers, being affected by change of their behavior. If the relationship producer – consumers is enhanced than a more coherent market can be foreshadowed. There is an obvious competition with conventional products, which in many cases benefit from a better aesthetic and a better price attracting many consumers. Therefore, a better promotion of the organic products should be envisaged. Improvements in the flow of production and expansion of marketing channels could contribute to the stability of the farmers. Parallel with the projects that aim to support the farmers, educational activities should be addressed to consumers in order to understand the benefits of agroecological practice.

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