

## Sustainable Development of Family Farming in the Vale do Rio Pardo Region, RS, Brazil

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### Summary

The Vale do Rio Pardo region, in the state of Rio Grande do Sul, is a typical rural area, and 45% of its population live and work in the countryside, on family farming holdings. The main crop is tobacco, which, in its productive process, is highly labor intensive, and requires huge amounts of agrochemical applications. It is in this context that several initiatives, concerned with the development of the region, have been studying the viability of alternative crops to tobacco. This text seeks to find evidence of modern agriculture's unsustainability, and present, as an alternative to rural development, the agro-ecological model. Within this context, on-going experiences in Vale do Rio Pardo were surveyed, in an attempt to analyze the propeller agents of the agro-ecological production development model on family farms, as well as the consequent socio-spacial transformations, aimed at contributing toward the region's sustainable rural development. The main evidences of the survey lead to the statement that one of the basic conditions to make agro-ecological practices viable on family farming is the commitment of the community involved in the process, once the implantation of such practice requires multiple knowledge and strong determination in seeking results. To this end, organizing associations and/or farmer cooperatives acquires specific importance, because they turn mutual support and information exchange feasible, which turn out to be difficulty overcoming strategies, both during the growing stage and product commercialization season. Likewise, it is fundamental to be knowledgeable of the natural environment in which agro-ecological practices are developed, such as climate, soil, relief, flora, fauna, and others, once ecological control of diseases and pests is extremely vulnerable to such factors. It is also necessary to value the use of inputs produced on the property, so as to reduce external dependence to a minimum, which will reflect in production cost reductions.

**Key words:** Agro-ecology, sustainable rural development, family farming.

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## INTRODUCTION

Transformations of the rural environment brought about by technical and scientific means, intensified over the 20<sup>th</sup> century, have made human actions on the territory ever more remarkable, once science and technology started remodeling, transforming and reconfiguring the geographical environment, with the aim to meet hegemonic interests<sup>7</sup>.

These transformations represent an expanding increase in science, technology and information, which, in practice, meant the incorporation of advances into the productive process, such as mechanization, new technologies and the decrease of space-time relations, speeding up special transformations.

In the rural area, such transformations resulted into the introduction of several equipment, cultivation and management practices, new inputs (fertilizers, seeds), which have practically standardized the production forms, disregarding the local/regional traits, linked with ecological processes, concerned only with high yields, through monocultures, made viable through a technological package based on agrochemical production, known as Green Revolution.

Nowadays, it has become clear that advances of such model happen through the use of biotechnology (genetically modified organisms/transgenics), characterizing the so-called “Double Green Revolution”<sup>8</sup>.

This production model is challenged for its impacts on the ecosystems. Several studies attest to the waste, pollution and destruction of the natural resources utilized in agricultural production, especially water, soil and forest cover.

In the same way, it has to be recalled that human health – both of the rural growers, directly exposed to agrochemicals, and of the people in general, who consume foods laden with toxic residues, and of low nutritional content -, is in jeopardy because of the way such foods are produced.

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<sup>7</sup> SANTOS, Milton. *A Urbanização Brasileira*. São Paulo: Hucitec, 1993. P. 35 – 49

<sup>8</sup> CAPORAL, Francisco Roberto, COSTABEBER, José Antônio, *Agroecologia e Desenvolvimento Rural Sustentável: Perspectivas de uma nova Extensão Rural*. In: ETGES, Virgínia Elisabeta (Org.) *Desenvolvimento Rural: Potencialidades em Questão*. Santa Cruz do Sul: EDUNISC, 2001.

Just to give an example, according to the Campinas Agronomic Institute<sup>9</sup>, it is estimated that one hectare of modern/conventional farm production ends up wasting 25 tons of soil a year. This translates into a total loss of 1 billion tons, or approximately a one-cm-layer of superficial soil in the whole country.

The Green Revolution's technological pattern displays its incompatibility with the local features in several regions in the world, a fact that gave rise to the building of a new concept of agriculture, by groups in the whole world, engaged in finding a sustainable alternative model, which respects the regional traits of nature, popular culture and the family farmer's need of independence and income.

Such agriculture, which intends to be an alternative to the prevailing model, tries to value local knowledge, the experience of the farmers (they frequently stick to production practices and systems considered traditional, passed on from one generation to the other) along with the contributions brought by technicians and by the scientific community, through a permanent dialog between these agents, thus promoting an open and flexible production system, which provides for and contemplates the social, cultural and environmental diversities of the regions, proposing and counter-proposing to knowledge homogenization, techniques and materials, so deeply characteristic of modern/conventional farming.

### **Alternatives to the conventional/modern farming model**

Within this movement of alternatives and proposals of a new agriculture, lies a great discussion as to what is really proposed, and what is meant by “alternative”, “sustainable”, or “agro-ecological” farming.

The discussion over the meaning of sustainable or agro-ecological agriculture involves several mainstreams and trends of thinking, which ends up by generating a certain inaccuracy about such terminology, once its meaning may vary in accordance with the discourses and interests inherent to such words. In general, according to Caporal and Costabeber<sup>10</sup>, the notion of sustainability involves two main mainstreams: the eco-technocratic and the eco-social.

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<sup>9</sup> Citado em BEZERRA, Maria do Carmo Lima, VEIGA, José Eli da (Coord.). *Agricultura Sustentável*. MMA, IBAMA, Consórcio Museu Emilio Goeldi. 2000. P. 57.

<sup>10</sup> CAPORAL e COSTABEBER, op. Cit., p. 15

The eco-technocratic mainstream believes in the viability of “green intensification, that is, it presupposes that it is possible to follow the same prevailing technological pattern, incorporating a new generation of technologies, theoretically less damaging to the environment”<sup>11</sup>.

As to the eco-social mainstream, one of the main contemporary approaches within this perspective, as a new focus for analyzing the problem involving development, it arose back in the 70s of the 20<sup>th</sup> century, parting from the concept of eco-development.

The notion of eco-development insists on the idea of the need for a new rationality criterion, supported by two solidarity dimensions: *diachronic* solidarity, regarding the future generations, but without overlooking *synchronic* solidarity, which is to be established between the present generations. In addition, it presumes technological pluralism, based on the importance of the adequate use of modern and traditional technologies, respecting the conditions of local ecosystems and, at the same time, complying with the needs and conscious decisions of the actors involved in the development processes<sup>12</sup>.

Thus, it can be presumed that the eco-social mainstream is closer to the ideals of an actually sustainable agriculture, because the eco-technocratic one is only intent on higher production efficiency and rationality, without major transformations toward a cleaner environment which would ensure health and dignity to both farmers and consumers.

With regard to the definitions of sustainable, biodynamic, organic and biological farming, we have decided to group them within agro-ecology, which consists of a science that seeks to join the different denominations given to sustainable management of agro-ecosystems<sup>13</sup>. Some guiding agro-ecological principles, according to Bezerra and Veiga, refer to:

- maintenance, in the long run, of the natural resources and agricultural productivity;
- minimum number of adverse impacts on the environment;
- production maximization with a minimum of external inputs;
- meeting human food and income needs;
- fulfilling social demands of families and rural communities<sup>14</sup>.

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<sup>11</sup> CAPORAL e COSTABEBER, Op. Cit., p.15.

<sup>12</sup> CAPORAL e COSTABEBER, Op. Cit., p. 26

<sup>13</sup> “Agro-ecosystem is a location of agricultural production – a rural farm, for example, taken as an ecosystem,” according to GLIESMANN, Stephen R. *Agroecologia: ecological processes in sustainable agriculture*. Porto Alegre: Ed. Da Universidade/UFRGS, 2000. P. 61.

<sup>14</sup> BEZERRA e VEIGA, Op. cit., p. 57

## Some Features of Vale do Rio Pardo

For the Vale do Rio Pardo Regional Development Council (COREDE – VPR)<sup>15</sup>, this region includes 25 municipalities that cover 5.09% of the total Rio Grande do Sul state area. Although being a planned region, its municipalities are greatly different when it comes to socioeconomic issues. Just to give an example, comparing the Gross Internal Product of Santa Cruz do Sul to Lagoão, it is easily perceived to what extent income is concentrated. While per capita income in Lagoão comes to US\$ 1,156.39, in Santa Cruz this figure goes to USD\$ 12,210.64<sup>16</sup>.

Real estate concentration, demographic density, urbanization rate, among other indicators, also vary considerably within the Vale do Rio Pardo region.

Regarding regional agricultural production, there is a diversity of cultivated crops, where corn occupies the biggest area (38%), tobacco (22%), soybeans (13%), and cassava (5%). As to income, tobacco accounts for 55% of the total, though occupying only 22% of the planted area, which attests to the economic importance of this crop<sup>17</sup>.

In fact, the region specializes in tobacco, with the exception of the municipalities of Encruzilhada do Sul and Pantano Grande. The majority of the family farms depend on the income from tobacco, and grow other crops on the side as a complement. A direct consequence of the region's heavy dependence on tobacco is the concentration of wealth brought about by this crop, in addition to turning the region vulnerable, in view of the economic instabilities caused by the tobacco market oscillations, both in global and domestic terms.

The average size of the region's family farms is 18 ha, of which, 2.5 ha are planted to tobacco, on average.

The production systems in use in Vale do Rio Pardo have been causing environmental impacts. It is a process in effect since the arrival of the European settlers, resulting into

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<sup>15</sup> THE VALE DO RIO PARDO REGIONAL DEVELOPMENT COUNCIL – COREDE. Plano Estratégico de Desenvolvimento do Vale do Rio Pardo – Caracterização da região. 1ª parte. Santa Cruz do Sul: EDUNISC, 1998

<sup>16</sup> NÚCLEO DE ESTUDOS E TÉCNICAS EM GESTÃO – NUTEP/UFRGS. Informações Socioeconômicas do Estado do Rio Grande do Sul. Disponível em <http://nutep.adm.ufrgs.br>. Acesso em 21 de janeiro 2002.

<sup>17</sup> COREDE, Op. Cit.

destruction processes and the exhaustion of natural resources. In 1858, right after the implantation of the colonial nucleus of Santa Cruz, traveler Avé-Lallemant witnessed huge destructions of native forests for farming purposes.

The magnificent trees stand upright, one beside the other, sad and isolated. Under them, in the midst of a scenario of fresh and lush crops, everything is brutal and sheer destruction. Everywhere, charred and grey tree trunks – remains of greedy fires in the semi-scorched forests<sup>18</sup>.

Several regional agricultural production problems, such as erosion, slash and burn farming, destruction of native fauna and flora, result from land use, based on primitive land rotation, practiced by the immigrants and their descendants. Geographer Leo Waibel, which studied the production systems in use in Brazil in the 1940s, identified three agricultural systems:

1. Primitive land rotation system: characteristic feature of the pioneer colonization period, the slash and burn practice, using the land for intercropping, and raising hogs to take advantage of crop remains. When productivity of the first clearing wears out, it is time for another clearing, abandoning the first one.
2. Improved land rotation system: it is put in use when technical and economic conditions improve, as a result of farming area expansion and availability of labor (...). Human work is replaced with draft animals and the use of the plough. Even using organic fertilizers, after some time, the fields are abandoned to second growth vegetation.
3. Land rotation in connection with cattle raising: crop rotations in plowed and fertilized fields, is the final agricultural development stage in South Brazil. Everything has to do with cattle raising. New crops are grown. The production of milk byproducts is on the rise ...<sup>19</sup>

We have to take into consideration that Waibel used to say that these three systems, “represent, theoretically, successive stages of the colonial landscape historical development”<sup>20</sup>. In Waibel’s assessment, only 5% of the European settlers in South Brazil managed to reach the last stage.

Thus, it is necessary to seek new agricultural production systems and practices in the region that provide for a more sustainable utilization of the natural resources.

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<sup>18</sup> AVÉ-LALLEMENT, Robert. Viagem pela província do Rio Grande do sul. Trad. Teodoro Cabral. Belo Horizonte: Ed. Itatiaia, São Paulo: Ed. Da Universidade de São Paulo, 1980. Cap. Segundo (p. 161 – 168).

<sup>19</sup> ETGES, Virginia Elisabeta. *Geografia Agrária: a contribuição de Leo Waibel*. Santa Cruz do sul: EDUNISC, 2000. P. 144.

<sup>20</sup> ETGES, Op. Cit., p.144.

## **Agro-Ecological Experiences in Vale do Rio Pardo**

With the aim to come to know the dynamics of the region's agro-ecological experiences (number of experiences, growers, production and its transformation, motivating agents, etc.), qualified informants were surveyed, that is, professionals who work with research organs, promotion and rural extension service in the Vale do Rio Pardo municipalities. For survey purposes, we included those municipalities which run a rural fair, or some other commercialization practice (in rather periodical terms) of agro-ecological products.

According to the interviewees, agro-ecological productions take place on family farms, most of them smaller than 15 ha, where more than 40 products are produced, commercialized fresh, while approximately ten of them are previously processed. More than 330 rural families are involved in agro-ecological products in the region.

Agro-ecological products in Vale do Rio Pardo have a primary commercial purpose, once the producers earn a living through such activities. However, as they are family farmers, production for own consumption is inherent to their activities.

Agro-ecological products are commercialized in specific fairs, as well as in regional and local retail outlets, in supermarkets, shops, restaurants, etc.

From field surveys, it became clear that EMATER's (Rio Grande do Sul Company for Technical Assistance Enterprises and Rural Extension Services) rural extension service, Municipal Departments of Agriculture and NGOs (such as CAPA – Small Farmer Support Center), make the organization of agro-ecological products groups viable, and they also provide technical assistance, and help with distributing and commercializing the whole production.

According to these agents, agro-ecological products are related, arranged according to interview results, to added income, public policies, availability of raw material, economic globalization and environmental education. Whereas the production limiting factors are: the small production volumes, product offer frequency, the producer's limited capacity and, on a smaller scale, the product's lack of credibility or quality.

This survey gave an optimistic view with regard to the agro-ecological market conditions, seeing that 70% of the interviewed believe that there are excellent perspectives for

the local and regional markets. Therefore, a quantitative increase in the region's agro-ecological ventures is expected, and the projections from some technical assistance institutions mention 10 to 15-percent yearly increases in this activity.

To improve the distribution and commercialization system of agro-ecological products, two regional cooperatives were set up, one in Santa Cruz do Sul (ECOVALE), and the other, in Sobradinho (COAGRICEL). In the same way, in addition to family agroindustrialization of agro-ecological products, there is a community agroindustry in operation in Candelária, for ecological products transformation.

This is also the time to mention the existence of three institutions in Vale do Rio Pardo, which teach agro-ecological principles and techniques, through courses and area training. Such institutions are vital in making the farmers' transition to the new agricultural production model viable. Besides such institutions, the work of the technicians and rural extensionists contributes towards spreading knowledge and experiences pertinent to this issue.

The certification of agro-ecological productions is given directly by the institutions that guarantee technical assistance and social organization, or even in a participative manner, for example, through the Rede Ecovia, which holds meetings of groups of farmers, consumers and farm technicians, which, in a solidarity and participative manner, give the certification, whereby one group "inspects" the other, and vice versa, thus lowering costs, because certification by national institutes (IBD, AAO, and others), is not feasible for small-scale productions, due to the high costs.

At the end of the interviews, the qualified informants were asked to give suggestions toward increasing agro-ecological productions in the region. The main answers are as follows: the need to make the growers aware of the advantages of agro-ecological cultivations; market guarantee for product; direct selling to consumers; the creation of distribution centers; product diversification; increases in production volumes; the creation of cooperatives; incentive to productions and more financial resources to growers.

The suggestions toward market expansion, are: consumer awareness toward their knowledge of the advantages resulting from the consumption of such products, ease of product transport, decrease of profit margin of traders and middlemen.

Another relevant step of the survey was the analysis of the production costs of three crops: peaches, maize and black-beans. For each crop, two growers were identified: a



conventional and an agro-ecological. From the on-field data collection, an analyzing structure was built, comparing the results of the two systems.

We have to point out that, on analyzing such production systems, various limits were detected as to several particularities derived from agro-ecology, when compared to conventional farming. Agro-ecology, for example, grows two crops in the same plot, providing for an ecological diversity which creates a higher energetic cycle, better pest control, animal-plant cooperation, and the development of an inputs chain, features that do not normally occur in conventional systems. Moreover, because agro-ecological experiences are quite recent, it is difficult to analyze medium and long-term results. It must also be emphasized that the conversion of conventional fields into agro-ecological farming takes two to three years until the optimal ecological conditions of agro-ecological sanity are restructured.

The corn and black-beans agro-ecological production system yielded positive financial returns, because many inputs from the farms themselves were utilized, which pressed down production costs. Even with little lower yield levels, if compared to conventional farming, selling prices made up for the difference.

Agro-ecological black-beans had returns of R\$ 433.70 per hectare, while conventional systems came to R\$ 549.69 per hectare. Yields in the agro-ecological system amounted to 800 kg/ha, while conventional black-bean farming came to 1,500 kg/ha.

With regard to corn, conventional farmers needed five main inputs (lime, fertilizer, urea, ant killer and diesel fuel oil), while agro-ecological farmers basically used chicken manure, and fuel oil for threshing. This results into lower buying costs of such inputs, as well as scarce transport and application expenses.

Agro-ecological corn growers also managed to rake in higher profits because the need for labor was smaller, and their agro-ecosystems proved to be better adapted, and they were also more knowledgeable of the most appropriate management of the natural resources in their properties. This is the moment to point out that, while conventional production had a negative result (R\$ 274.87), agro-ecological production, even having lower yields (500 kg less per ha, as compared to conventional farming), had a gain of R\$ 117.24.

The peach production system showed limitations, because of its status as a permanent culture, which needs at least three years to yield satisfactory results. However, the first harvest of the agro-ecological orchard was very good, because if we sum up all costs incurred from

planting to the second year, the sales of the crop resulted into a negative balance of only R\$ 804.00. However, if the inputs produced on the property and the labor of the rural grower are disregarded, the financial result is entirely on the grower's side (R\$ 1039.09 in profits).

### **Transforming and vigorously enacting agro-ecological production in the Vale do Rio Pardo Region**

In order to improve and make even more dynamic regional agro-ecological experiences, the infrastructure and organization of the on-going experiences have to be further enhanced, by creating stimuli for their development in municipalities where they do not exist yet. This is a highly complex task, because for implanting and consolidating a new production matrix, it is necessary to rethink the organization of the growers, associative forms, technical assistance, the distribution and commercialization channels, as well as marketing and advertising strategies.

Within this perspective, in order to make new forms of agro-ecological development in the region viable, associative and partnership policies should be promoted, either among the growers (because experiences show that product commercialization and processing is done in associative form, in groups formed according to each member's interests), or among the promoting agents of this practice (community associations, unions, government and non-government bodies, and others). By joining the efforts of these agents it will be possible to gain access to credit lines, appropriate techniques and consumer markets.

A difficulty you come across when seeking innovations and new methods of production in the rural area in our region is a sense of discouragement of the family farmers, because the technological packages, introduced mainly in the tobacco crop, over the years, make things easier for the growers. This way, they receive a "ready-to-use" model, which does not require their participation.

Crop commercialization adopted by tobacco companies generates the so-called "partnership contracts", whereby the whole production is purchased, and the growers have nothing to worry about. This jeopardizes the introduction of new crops, such as the agro-ecological ones, because the growers are not used to facing unstable markets, they can always count on the "purchasing facility" granted to them by the tobacco transnational

companies, which obviously inhibits those growers' initiatives in seeking new markets for their products.

## **Conclusions**

The Vale do Rio Pardo agro-ecological production experiences are in their initial stage, and the crops under this production system are now from two to five years in effect. From this, we can draw the conclusion that this production system is in the process of expanding its production and consumption capacity, having as positive factors, which contribute toward its expansion, the association of the agro-ecological farmers, government bodies and NGOs which provide the growers with technical assistance and advice.

Agro-ecological production in the region in question shows that it takes place especially in the municipalities where family farming prevails, on holdings of 18 ha, on average.

We cannot forget to mention market interest, once the interviews with the qualified informants made it clear that the trend is for increasing production, a fact that attests to the fact that agro-ecological products are appealing to people. One of the drawbacks is the fact that these products are seasonal, and the market requires constant production and product variety, factors that sometimes make it difficult to develop such production systems. Higher productions also require higher consumption levels, and this can only happen in a massive way, when such requirements (constant production and variety) become a constant.

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