



BEYOND ORGANIC AGRICULTURE

Centro Ecológico

Centro Ecológico is an NGO that started its activities in 1985 in the town that today is named Ipê, located in the highlands of Rio Grande do Sul, southern state of Brazil. In 1999 it opened a second office in the coast region of the same state, known as Torres Region or North Littoral. Each of these regions has singular social and environmental characteristics that all along the institutional history have been contributing to enable the reflection about guiding principles for ecological agriculture and its implementation in distinct and specific contexts.

Centro Ecológico is one of the most prominent Brazilian NGOs in the field of ecological agriculture and has as its strategic focus the promotion of sustainable agricultural systems through the adoption of environmentally sound technologies oriented by social justice.

During these 26 years of activity, it has managed to reach a lot of positive results such as helping to organize more than 40 ecological smallholders' associations in Southern Brazil, and helping to establish innumerable commercialization initiatives. Centro Ecológico has an extensive experience in advising small scale ecological agro-industries and has played a major role in the development of products such as fruit juices, wines, marmalades, and tomato sauces, among others, processed by several ecological farmers' organizations.

In terms of new technologies, Centro Ecológico was the main responsible for the development of a biofertilizer called Supermagro, used to protect plants against pests and diseases. In any organic agriculture endeavor in Latin America (and certainly in many other parts of the world) thousands of farmers spray their crops with this groundbreaking homemade liquid fertilizer. It is estimated that millions of gallons of pesticides were prevented to be applied due to this biofertilizer.

The development of the Participatory Guarantee Systems (PGS) network was another significant contribution of Centro Ecológico to the field of organic agriculture. PGS are alternatives developed in the local sphere by several groups of farmers to guarantee the ecological status of their production.

During all these years Centro Ecológico has established cooperation with many partners and has had support of several organizations. Framtidsjorden from Sweden was the first one, back in the 1980's. Since then, it has been developing projects supported by: Misereor, Germany; ICCO/Kerkinactie, Holand; Swedish Society for Nature Conservation, Sweden; Fundação Luterana de Diaconia, Brazil; Heifer International, the United States; and Federal and State Governments, Brazil, among others.

Centro Ecológico is a member of ECOVIDA network, an umbrella organization in southern Brazil, comprising almost 3,000 families of ecological farmers organized in 200 groups, 20 NGOs, 10 cooperatives, and more than 100 ecological street markets and other organic products outlets (www.ecovida.org.br); of National Articulation of Agroecology (Articulação Nacional de Agroecologia – ANA <http://www.agroecologia.org.br/>); of Latin America and Caribbean Agroecology Movement (www.maela-lac.org); and of Future Earth network.

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I. INTRODUCTION

The incentives to promote agricultural intensification in Brazil historically have been connected to the expansion of large-scale monocultures for the purpose of producing commodities for export. This market-driven model has been successful in achieving the desired effect (increasing exports) but has largely been accomplished by generating deceptive and unsustainable economic growth. Evidence suggests that in most Latin American countries agricultural expansion, based upon the exploitation of the once abundant natural capital, i.e., land and natural resources, typically does not translate into long-term sustained economic growth or regional development. In fact, it is our belief that such monocultural processes, answerable less to local concerns than to the economic needs of what might be called “absentee stakeholders,” are unresponsive to an increasingly pressing need for continued regional development. In addition, this market-driven model has been woefully inefficient in addressing the social and the environmental impasse which characterizes most South American rural areas. Food sovereignty at risk, loss of biodiversity, soil erosion, water contamination, a continuing destruction of forest fragments and the impoverishment of rural communities, are just some of the persistent results of large-scale monocultures. Given the negative consequences, why then does the country continue such practices? The answer perhaps lies in their apparent successes.

What has been called by some the “triumph” of Brazilian agribusiness reflects this monocultural market-driven approach. According to the Ministry of Development, Industry and Commerce (*Ministério do Desenvolvimento, Indústria e Comércio – MDIC*) the soybean complex, cattle meat, sugarcane products (sugar and ethanol), and paper manufactur-

ing are among the ten most economically significant exported commodities – all a result of Brazil’s agribusiness interests. In fact, the growth of large-scale monocultures in the country has indeed been responsible for much macroeconomic progress – such as a systematic decrease in food prices compared to other goods. And having to devote less of the household income on food items frees families to purchase other consumer goods thereby directly favoring the industrial sector. Further, it has been affirmed that at least a portion of the recent Brazilian economic stabilization can also be attributed to the agribusiness segment of the economy. By increasing commodity exports, the country has been able to guarantee a positive commercial balance thereby avoiding the recurrent cambial crisis so familiar to those who lived through the currency fluctuations of the 1990’s. But such economic victories do not come as cheaply as one might think, for the negative impact of the agribusiness sector has also been significant as has the burden such practices have forced upon the less affluent in the country.

With a hard to visualize sum of more than 1 billion liters of pesticides (yes – 1,000,000,000) sprayed on crops every year, the Brazilian pesticide consumption is the largest in the world – more than five liters of agrotoxics per capita. “Land use change” (a euphemism for Brazil’s forest destruction) is a major cause of carbon emissions. And the resulting loss of biodiversity has become the shame of the nation. But in spite all the evidence documenting this massive destruction, public incentives to promote industrial agriculture and the production of exportable agricultural commodities are still vigorously pursued. Even given the context of a demonstrable world climate crisis and the millions

of voices calling for change, the country continues to lay waste huge tracts of arable land through aggressive agriculture practices and possesses a public mindset resistant to any and all attempts to modernize.

But there are glimmers of hope amidst the gloom and doom – subtle signs that tell us that change is possible and perhaps actually occurring. Over the last few decades, thousands of Brazilian farmers have begun converting their production systems to organic agricultural processes. Most of these ecological production systems are associated with local or regional marketing schemes that potentially can play a fundamental role in promoting social and environmental advancements. For example, income-generating activities through which farmers can garner better economic returns for their efforts are becoming more commonplace and are essential for making household agriculture a viable option while helping to promote sustainable rural development.

The creation of employment opportunities in both rural and urban areas is also another hopeful element related to short circuits of commercialization. When farmers are directly involved in the commercialization process through business ventures (such as street markets and cooperatives), a number of associated activities, positive in nature, can be created. It has been reported that in some Brazilian regions many of the households involved in direct marketing have had to contract permanent or temporary local helpers to assist in newly created farming tasks. Such activities tend to enhance the local economies as they continue to create new sources of income.

Given the world-wide trend toward rural exodus (mainly by women and young adults), any endeavor that establishes living and employment alternatives in rural areas thereby preventing an influx of people to urban centers is particularly important for creating more

stable and fruitful farming centers. Environmental benefits such as biodiversity enhancement and reduction on carbon emission can be achieved as well by direct commercialization initiatives.

And while the global commodity market is an underlying cause for ever-increasing biodiversity loss, tending as it does to homogenize and favor high value crops, local markets have, at the same time, the potential to stimulate agro-biodiversity. For example, several varieties of vegetables, categories of underutilized crops, are not sold in mainstream markets. But through local commercialization endeavors farmers have the added opportunity to make meaningful profits from these otherwise less-than-marketable crops. Further, shortening the distances between producers and final consumers has proven beneficial in fostering less transport energy consumption thereby decreasing the greenhouse gas emissions. Thus, the creation of local systems and economies, in a growing context of climate and economic crisis, tends to reduce food-miles and are growing in importance to a world hungry for ecological answers.

One possible response to this search for reasonable and humane answers has found purchase in Southern Brazil. Contrary to the linear approach characteristic of conventional food systems, Centro Ecológico, a regional Non-Governmental Organization (NGO) based in Rio Grande do Sul, together with its partner organizations, has been engaging in a number of projects that promote sustainable agriculture at the local level. Production, processing and marketing initiatives are molded into what might be called “virtuous circles” of ecological food production and distribution. The main thrust of this present document is to describe the development and results garnered by Centro Ecológico and its partners while emphasizing the advantages of virtuous circles of production and distribution as they have functioned in rural Brazil.



Agroforestry system: bananas, juçara and other species of Atlantic Forest

II. THE VIRTUOUS CIRCLE APPROACH

Please understand that “virtuous,” in this context, has nothing to do with sin or redemption, but has more to do with decisions being driven by value-based impulses rather than by profit commitments to corporate stakeholders. By definition, a virtuous circle is a series of episodes in a web-like pattern where one element reinforces and contributes to the success of the others through a series of what might be called “feedback loops.” In other words, this is a dynamic relationship between several events where positive “feed-

back” (return or interaction) helps to improve the performance of the next. Such an interactive process results in the advancement of the whole system for the benefit of all stakeholders in that system.

Conversely, a linear approach (as in the previously-discussed conventional or “monocultural system”) presupposes that each unit of a given system stands as an independent and self-sufficient component, without any apparent or designed responsibility to its other

parts. In virtuous circles the residue or by-products of one activity frequently become the raw materials for the next step or entity in the circle. Waste, pollution, and gigantic land-fills are more often the results of the conventional system.

Açaí production through agroforestry systems is a convenient example of this waste limitation approach. In *açaí* production, the seeds derived from extracting pulp from the *juçara* tree (*Euterpe edulis* Martius) become the raw materials for planting new trees thus becoming a self-perpetuating system. Thus, not only is a healthy, marketable commodity derived from the *juçara* (pulp and juice), new trees and other commercial goods are produced from the byproducts (seeds, stem and bark). The results: no waste, no harmful hydrocarbons, an increase in marketable commodities and a wider number and variety of jobs.

Thus, the monocultural process is an example of a linear approach applied to food production and supply systems. From production to retail and distribution, to the final consumer, the whole system generates large amounts of waste and pollution that have no intrinsic value – waste that is not used for any commercial or organic benefit and pollution that, under present circumstances, is a curse for any clear thinking, modern culture.

Such production methods are based on the employment and use of an immense variety of external inputs such as agro-chemicals, pesticides, herbicides, hormones, antibiotics as well as fossil fuel energy. The results of this combination of external inputs are soil loss, polluted runoff, organic waste and an increasing concentration of greenhouse gases in the atmosphere. As a result, we have a significant and unnecessary impact on the world's environmental quality, thereby compromising the very existence of life on the planet.

There are also other more subtle drawbacks to the large-scale monocultural methods. For example, products coming from industrial pro-

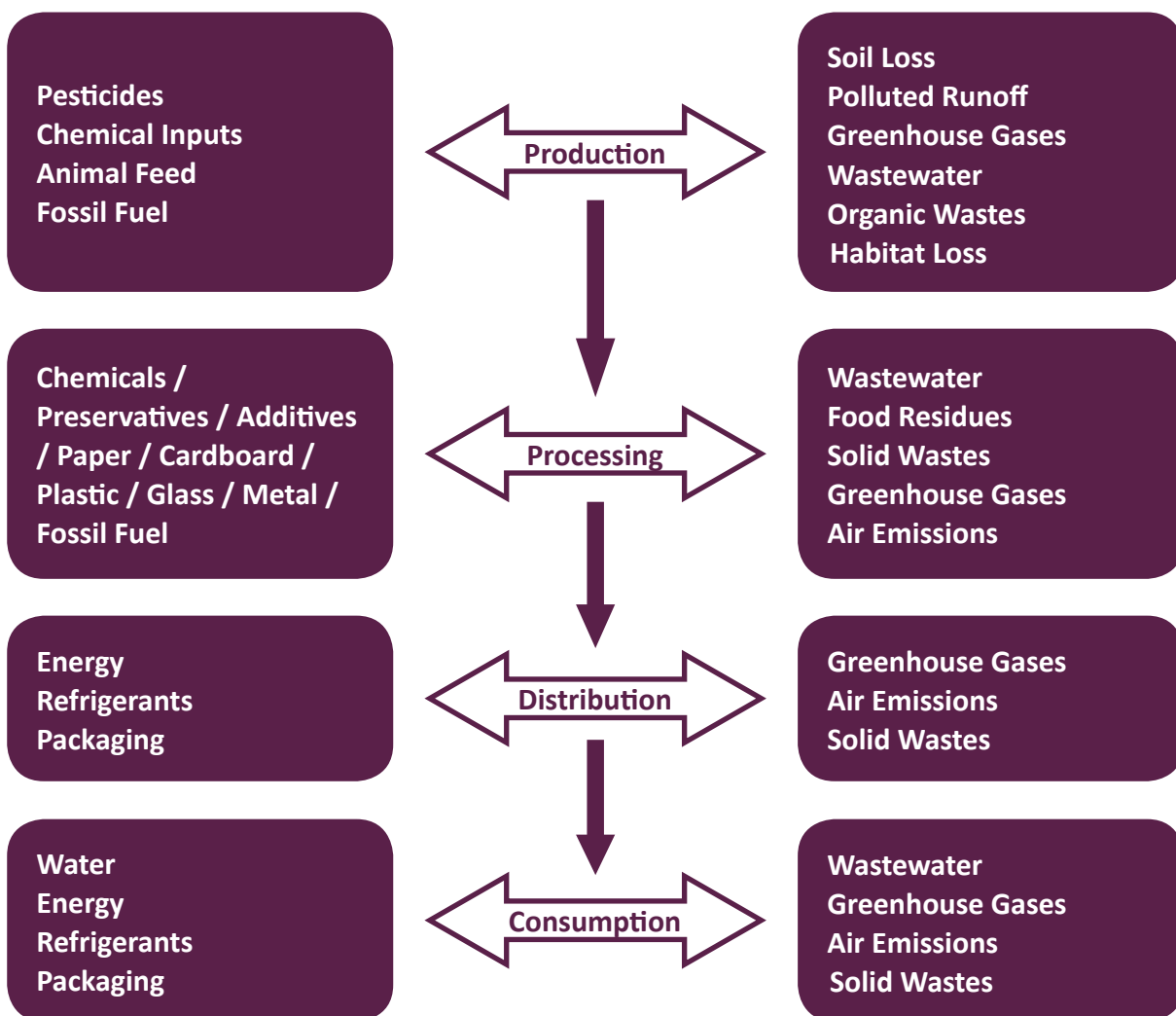
duction systems have to travel long distances to be processed and must travel sometimes even further to reach their intended markets. Thus, investments in ports, roads, and infrastructure are necessary to accommodate the needs of a very few to create and deliver their goods to market. And it perhaps need not be stated that these longer distances do little to improve the greenhouse gas emissions issue.

Another significant disadvantage to the monocultural approach is the disenfranchisement of the unincorporated small rural farmer, someone who depends upon his own plot of land and his own or his family's toil to produce enough consumable goods to survive in a competitive environment. The rural farmer who is not connected to either a monocultural entity or any other kind of system (virtuous or otherwise) is at the mercy of uncontrollable market and environmental forces that must be battled on a daily basis.

The farmers who are part of the linear approach are small cogs in a very large wheel – an immense and complex global agricultural system that demands their reliance upon the use of various external inputs to enable and enhance production. And once the harvest occurs they are forced to employ a cumbersome and vertical commercialization chain to sell their products. Thus, although there is a certain amount of security to the single crop lives they lead, choice and freedom that might enhance their lives is certainly not a part of their existence.

In next page a diagram clarifies the agribusiness linear approach and the related by-products.

Conversely, the theoretical approach to designing a sustainable agriculture system mirrors, as much as possible, the basic patterns of the original ecosystem. Non-linear husbandry practices, by design, recuperate functional and structural characteristics of the ecosystem and simultaneously produce marketable products. Agroforestry, as a land-use

Figure 01. Agribusiness linear approach¹

system also mimics the natural pattern (by commercially integrating crops with original flora) and is therefore more appropriate than single crop practices. Such complex land-use processes encourage the colonization of a variety of below and above-ground organisms thereby restoring original ecological processes. As a consequence, a number of environmental functions provided by nature such as carbon sequestration, soil protection, pollination, habitat for wildlife, and nutrient and water cycling are also promoted.

Again, coupled with the ecological benefits promoted by agroforestry systems, a number

of social and economic advantages are enhanced. Food security and food sovereignty are likely to be supported by such practices as the diversity and availability of edible products increase. On the human level, diversified diet also contributes to better health. This is because, it has been discovered, the consumption of a variety of products, principally some traditional foods, can help improve the human immune system. Alternatively, some products can constitute new sources of income, specially for women and young adults just entering the labor market by creating job opportunities (harvest, processing, marketing, etc.).

¹ Adapted from Andy Jones, Michel Pimbert and Janice Jiggins, 2010. *Virtuous Circles: Values, Systems, Sustainability*. IIED, London.

III. A LOCAL AND REGIONAL EXAMPLE OF INTERDEPENDENT SYSTEMS – VIRTUOUS CIRCLES APPROACH

In 1991, when Centro Ecológico first came to the Torres Region, Rio Grande do Sul, Southern Brazil, much of the land on the steep hillsides was mainly devoted to banana cultivation – a typical traditional monoculture. The use of external inputs (chemicals) was predominant; the original forest was eliminated to make room for the plants, and banana production was the only source of income for most farmers thereby making them vulnerable to regional fluctuations in price.

Young farmer Elias Strege Evaldt harvesting juçara berries for processing.
Community of Três Passos, municipality of Morrinhos do Sul/RS - Brazil

The system, as it existed, was biologically impoverished, vulnerable to external threats and detrimental to the land upon which the farmer depended. Traditional marketing practices consisted of the farmer being dependent upon a middleman who set the price, purchased the product, and was responsible for the distribution and retailing of the bananas. The farmer, therefore, was a virtual slave to the chemicals and practices that enhanced his single product and the middleman who set a price that benefited only himself. The farmer had few options.

The system promoted by Centro Ecológico conversely proposed an interdependent system that would give the local farmers and other stakeholders more choices and control of their own production, distribution and variation of their products. One option of their system was an integration of various multi-purpose species (protective, consumable, fertilizing, etc.).

The fundamental principle for this technical intervention was the management of the natural species succession toward what is called a “dynamic climax.” This process is based upon the introduction and sequential cultivation of annual and perennial crops thereby promoting the enrichment and regeneration of the original ecosystem. After recovering the natural vegetation, the idea was to cultivate a mixed system of plants and native species of herbs, shrubs and trees, imitating the natural pattern. Management of the land was also predicated upon a periodic renovation of the system – vegetation is pruned selectively in order to facilitate nutrient cycling and to favour the crops of selected by the farmers.



Such processes occur frequently in nature by disturbances like fire, windstorm and floods while Centro Ecológico's is a controlled and timed intervention.

As mentioned above, one of the many species that have been promoted as systemically beneficial has been the *juçara* palmtree. The common uses of the *juçara* include the harvest of *açaí*, the extraction of the heart of the palm, a food delicacy called *palmito*, and the use of the tree's stem in home construction. In the last two cases it is necessary to harvest the plant. This harvesting, however (since it does not spontaneously regenerate) causes a risk to the species, thus making human intervention, in the form of replanting, a necessity.

To protect it from extinction, and to emphasize its importance to the Brazilian Atlantic Forest, government law requires special licensing for the cutting and processing of the *juçara* tree. However, this requirement has ironically stimulated an increase in illegal harvesting and a clandestine market. Such illicit activity compromises the integrity of forest fragments by contributing to the disappearance of a key-species, opens farmers to menacing from illegal harvesters, and criminalizes those who cultivate it for their own consumption. Because of these reasons, cultivating a neglected crop to extract its berries is a distinctive and elegant solution for an acute problem. The benefits are: a continuing flow of income for households, protection of a key-species, and the production of a highly nutritious product thereby enhancing general food security. And, again, the byproducts of the production process are the seeds that can be used to expand the *juçara* population thus potentially drawing more and more farmers into the system.

Together with other plants such as cassava, papaya, guava, avocado, citrus, and innumerable native fruits, the products from the *juçara*



Processing *juçara* berries. Rosimere H.C. Becker, Morro Azul Processing Plant, municipality of Três Cachoeiras/RS - Brazil

are locally commercialized, thus helping to improve the farmers' income and to create local webs of commercial activities.

The search for alternative methods to market their products was also considered important. Centro Ecológico proposed that it would be advantageous to minimize the distance between producers and consumers through the development of alternative markets which would allow for the retention of added value at the local level.

Virtuous Circle Production

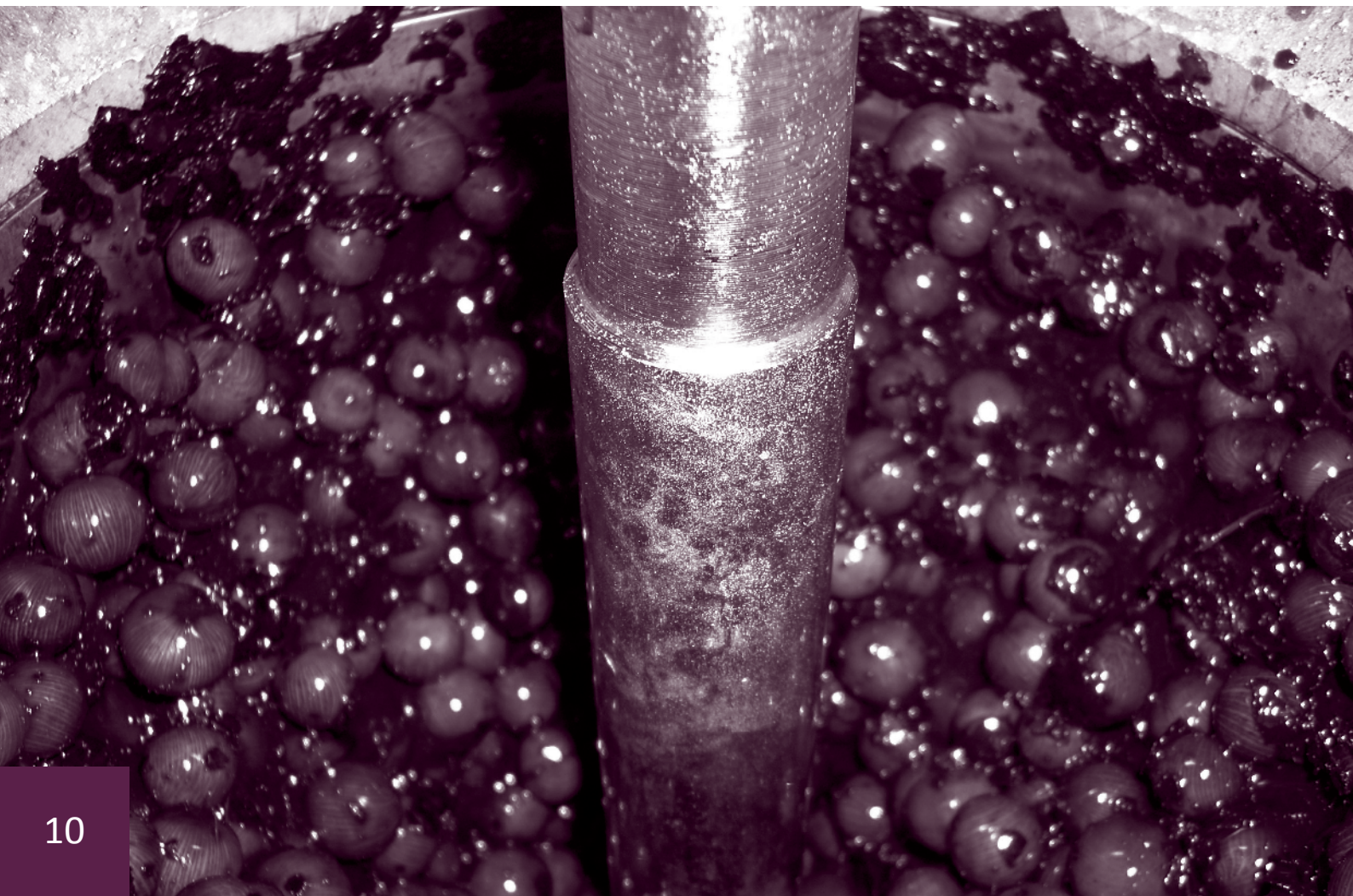
The agricultural systems promoted by Centro Ecológico, particularly in the Northern coast of Rio Grande do Sul, has been based upon an agro-forestry or interdependent model. Farmers are encouraged to conjoin banana (the main cash crop in the region) with other tree species. Currently, one of the species that has been increasingly adopted by farmers is *palmito* (*Euterpe edulis* Martius) or palm heart. Apart from the conservational role that this species might play in helping to preserve the Atlantic Forest, it is also an alternative income-generating crop and food security improvement.

Thus, the concept of “virtuous circles” is a demonstrated reality in the Centro Ecológico process. The land is continuously protected and improved by this cultivation method. The farmer has ultimate control over his land, his choice of product, and (because he markets it

himself or through his representative organization) the price he receives for his products. The consumer benefits because he or she receives fresh, healthy (non-pesticide inundated) produce at a reasonable price.

Another relevant benefit facilitated, but rarely recognized by such initiatives, is the straight and unambiguous connection between rural and urban dwellers. Direct interaction between farmers and consumers has created relationships based upon values of solidarity, cooperation, and friendship – values that reach far beyond a simple commercial transaction. Many farmers with whom Centro Ecológico works have declared that they like to participate in street markets not only to “sell stuff,” but because they are also recognized as “nature’s stewards,” a status few of them have ever before experienced. Moreover, such contacts can promote the establishment of strategic alliances to advance both the economic and environmental agendas.

Processing juçara berries



Virtuous Circle Marketing

We believe it to be true that ecological agriculture should be motivated more by its intrinsic merits than for the existence of a distinct market. But the increasing demand for pesticide-free products and the desire of farmers (who have consciously chosen such agriculture systems) to value their products, permit some experimentation in what is called “alternative commercialization circuits.”

The aim of a commercialization network is to build up participatory, solidary, democratic and efficient markets – markets designed specifically to generate jobs and income in rural areas. The system is also calculated to guarantee the economic viability of sustainable strategies for local development as well as creating channels to interchange organic products. By adopting this organizational framework, the functioning of social organizations as well as the environmental consciousness that has been developed is preserved. By virtue of this process it is possible to avoid what has been called, “the ecological agriculture movement,” being transformed into simply providing organic products to a limited and distinct market with the parameters of quality ensured by private and exogenous certification institutions.

The certification process supported by Centro Ecológico – the Participatory Guarantee System (PGS) – is also based on a network structure and is defined by the objective of associating the organic product with a democratic and participatory image of credibility. Instead of private institutions having the political right to determine what is organic and what is not, networks are organized to allow producers, consumers and technicians to participate without eroding agreed-upon standards. Individually, principally and organizationally, the various segments of the network are permanently interconnected (hence the concept of the “network”) and are responsible for the quality of what they sell, buy or advocate.



1. Ecological street market - Torres/RS - Brazil | 2. Consumers' cooperative - Cooperativa de Consumidores de Produtos Ecológicos de Três Cachoeiras/RS - Brazil | 3. Ecotorres - Cooperativa de Consumidores de Produtos Ecológicos de Torres/RS - Brazil

This system thus demands a continuous reassessment, not only for the products that are grown and sold, but also (and principally) for the production process as a whole. And it is not based solely upon technical criteria, but is instead grounded upon the ethical agreed-upon parameters that permit and control the entire network.



Student Luana Alvarenga Valim drinking juice mix of *juçara* berries and organic bananas at Fernando Ferrari School - Três Cachoeiras/RS - Brazil

The Regional Web of Environmental Educators

One exciting concept promoted by Centro Ecológico, one which neatly dovetails with the idea of virtuous circles, is working with local schools to promote environmental education. Currently more than thirty schools in Rio Grande do Sul are participating in this program and involves more than fifty teachers and literally thousands of students. The concept is basic to the principals of reforestation and the replenishment of the soil. Just as the *juçara* tree must be replanted from seed to ensure continued crops of *juçara* product, young farmers must be nurtured in order to continue the noble process of providing food for a hungry planet.

Further, students see by virtue of the teachings of trained educators that a good and value-driven life can be achieved with sufficient economic returns thereby allowing them to raise their families in dignity. Such students might well become farmers and be less inclined to leave the land for the tumultuous

confines of urban centers where life might be less advantageous and certainly more complex.

Centro Ecológico has indeed contributed to achieving such a system, a network of educators. Some of the educational activities involve the sons and daughters of farmers, so both the teachers and the students learn about environmental issues, how to care for the land, and the practical demands of value-driven agricultural. And they work constantly to improve their skills and to promote environmental education. The schools thus promote concepts held dear by Centro Ecológico. The classroom becomes a forum to describe the advantages for farmers to use their local resources wisely and judiciously.

There is yet one more important development that has come from the efforts of organizations like Centro Ecológico – that is governmental regulation ensuring that at least 30% of the meals served as student lunches be purchased from local smallholders, thus helping to close the virtuous loop.

Under a national effort to combat hunger, the Brazilian government has been promoting a number of endeavors to build up the National Policy and System for Food and Nutrition Security (*Conselho Nacional de Segurança Alimentar e Nutricional*) that favor smallholders. Two of these endeavors are Brazil's Food Acquisition Program (*Programa de Aquisição de Alimentos*) and the National School Meal Program (*Programa Nacional de Alimentação Escolar*). In both programs the government, through a procurement program, purchases products from smallholder farmers to distribute to those people suffering from food and nutritional insecurity, as well as to students in public schools. It is easy to see how Centro Ecológico's philosophy and practices have met with a favorable environment to thereby provide a means of meeting these governmental program requirements.



Juçara palm tree (*Euterpes edulis*) berries

IV. CONCLUSION

One of the most important conclusions of this paper is that, at least for Brazil, traditional large-scale agricultural monocultures simply no longer work, and, at least in the long term, perhaps they never really have. There simply is too high a price to pay, economically, culturally and environmentally, to support a process that has, at its heart, the concerns of a small number of absentee stakeholders at the expense of the larger and more urgent demands of a world in crisis. Further, it is beyond the scope of this article to dictate or suggest a re-making of public policy to fit our values and beliefs. The material above simply depicts

one successful local response to a collection of global issues and is in no way to suggest that all geographic areas should follow, lock step, the processes or belief structure discovered to be so successful for Centro Ecológico in Southern Brazil.

That having been said, however, we do strongly believe that introducing the concept of virtuous circles, including the three elements – agroforestry, networks of commercial initiatives, and environmental education – will be a source of inspiration that might yield dramatic results for those who wish to avoid the pitfalls of a linear approach to food production.

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As in any other field of family farming and of agroecology, women are not only mere coadjuvants in the daily activities of planning, harvesting, processing, commercializing and, above all, organizing themselves. They also play an important role in the establishment and implementation of Agroforestry Systems as well as in the processing and commercialization of the *juçara açaí* berry.



Agroindustry of AMADECOM (Associação de Mulheres Agricultoras para o Desenvolvimento Comunitário - Women Farmers Association for the Community Development - in Três Forquilhas, North Littoral)



This paper presents information generated by the work of Centro Ecológico and demonstrates the benefits of small-scale agriculture in mitigating greenhouse effects, maintaining biodiversity and promoting food sovereignty through organic production, local markets and participatory certification systems.

It aims to:

- Highlight the technical and social viability of ecological agriculture in contrast to the expansion of the agribusiness sector in Brazil;
- Propose the virtuous cycle approach as a theoretical framework to develop initiatives to promote sustainable rural development;
- Support and influence Brazilian policy-makers to design programs to expand ecological agriculture under the National Policy for Environmental Services.