

 Swedish Society for Nature Conservation

## Report

# Organic Farming in Brazil

- Participatory certification and local markets for sustainable agricultural development

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# Contents

1. Introduction	7
2. Small-scale trade and participatory organic certification	10
3. Development of expertise and exchange of knowledge key to success	13
4. Agroforestry provides ecosystem services and protects the Atlantic rainforest	15
5. Conclusions	20
6. Recommendations	21
7. Sources and recommended reading	22





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# Foreword

Agriculture plays a fundamental role in developing countries. This is not just a question of food security, but also because around 75% of the world's poor still live in the countryside and have farming as their main source of income. Securing this livelihood base in order to decrease hunger and increase global food security in a way that is sustainable in the long term is one of the greatest challenges facing us. In order to meet this challenge we need a pervasive change of course within agriculture. We need to develop a type of agriculture that is based to an increasing extent on biological diversity and ecosystem services. With the right design, this can decrease the need for fossil fuel and make agriculture less vulnerable to climate change.

Agriculture is increasingly coming into focus due to the rising cost of food world-wide and a probable worsening food crisis. In an age when we are constantly being besieged by increased reporting on climate change, environmental disasters and non-sustainable use of our natural resources, the Swedish Society for Nature Conservation would like to provide some positive examples. In this report we therefore present a farming project in Southern Brazil and the work of the organisation Centro Ecológico on participatory certification of organic foods. These examples show that it is possible in practice to increase food production and secure livelihoods with the help of small-scale trade and organic farming, both of which conserve and draw benefits from ecosystem services. Through being active in a range of different networks, Centro Ecológico has been able to influence the development of organic farming both nationally and internationally.

The report concludes with a range of recommendations, which we hope can inspire practitioners and decision-makers to make more sustainable decisions in both the national and international arena. For example, it is suggested that we increase the conditions for sustainable farming through working to change international trade agreements that promote rather than hamper the conditions for the environment and secure access to food. In addition, countries that require it should be given the right to support domestic, sustainable food production. Furthermore, it is suggested that international aid should prioritise the agricultural sector to a greater extent than at present and increase investment in sustainable rural development in order to decrease poverty.

This report was produced by Albaeco at the behest of the Swedish Society for Nature Conservation. Work on the report was carried out within the framework of the Swedish Society for Nature Conservation's international environmental policy programme in partnership with Albaeco, researchers from Stockholm University and Johanna Björklund at the Centre for Sustainable Agriculture (CUL) at the Swedish University of Agricultural Sciences (SLU). The report would not have been possible without the valuable assistance we received from the Brazilian environmental organisation Centro Ecológico and its co-workers and from local farmers and agricultural advisors in Rio Grande do Sul. The Swedish Society for Nature Conservation extends warm thanks to all those involved. This is the second report in a series presenting positive examples of how agriculture can be designed so as to contribute to sustainable development with secure access to food for the world's population.



Mikael Karlsson  
Chairman, Swedish Society for Nature Conservation





## BRAZIL



In the states of Rio Grande do Sul and Santa Catarina, it has been possible to successfully promote organic farming that conserves and draws benefit from ecosystem services, e.g. by combining crops and trees in agroforestry.

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# 1. Introduction

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**Agriculture is a fundamental pre-condition for human welfare. This is not simply a question of all people needing secure access to food in order to have a decent life, but also because almost three-quarters of the world's poorest people live in rural areas and have farming as their main livelihood. Agriculture also plays an important indirect role, not least in developing countries, since it forms the basis of the rural economy. Brazil is one example. In this huge country with a high proportion of poor people, there is enormous potential for agriculture. With its starting point in the organisation Centro Ecológico's unique work in southern Brazil, this report shows that it is possible to increase food production and secure livelihoods with the help of participatory certification system, small-scale trade and organic farming that protects and draws benefits from ecosystem services. By being active in a range of networks, Centro Ecológico has been able to promote the development of organic farming both nationally and internationally.**

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## Global trade and the role of agriculture in fair and ecologically sustainable development

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Agriculture is coming into increasing focus due to rising food prices and the challenges to food security posed by climate change and efforts to produce bioenergy. The impact of food production itself on the climate and environment is also being discussed increasingly, while a new discussion is emerging on the fundamental role of agriculture for human welfare. For example, in its recent publication World Development Report (WDR) 2008 - Agriculture for Development, the World Bank claims that the agricultural sector in developing countries has been neglected in the past 20 years. According to WDR 2008, targeting agriculture is four times more effective than other investments when the aim is to stimulate economic development and decrease poverty. The central role of agriculture in combating poverty and achieving the UN Millennium Development Goal of halving poverty and world hunger by the year 2015 cannot be overemphasised. Despite this, only 4% of world aid goes to agriculture in developing countries. WDR 2008 therefore states that the agricultural sector

must be a priority development issue and that investment in rural areas must increase. Agricultural policy in Europe and the rest of the Western world has often been criticised for subsidising its own exports and being too protectionist, with high import duties and other trade restrictions that exclude poor farmers in developing countries from the global markets. Many believe that the quickest way out of poverty for developing countries is simply increased free trade within agriculture. Others are more doubtful about this conclusion and claim that access to local and national markets is the single most important component allowing development to take place more on the terms of the environment and poor farmers. In this debate on trade, environment and development, it is important to point out that trade between countries and people is in general something good. The problem is not trade itself but the structure of the international trade regulations and how goods are produced and transported. While the governments of rich countries have the greatest power in institutions such as the World Trade Organisation (WTO), the World Bank and the International Monetary Fund, the regulations are criticised by many developing countries and NGOs for mainly benefiting big busi-

### Box 1: Ecosystem services

Ecosystem services comprise all the benefits that ecosystems provide. Human welfare and development are completely dependent on these services, for example air and water purification, climate stabilisation, erosion control, pollination of crops, natural pest control, the ability of seas to produce fish and the ability of ecosystems to buffer the effects of natural disasters.





Centro Ecológico is working e.g. on promoting and developing organic production of bananas. The organisation was founded in 1985 in Brazil's southernmost state, Rio Grande do Sul, as a protest against the chemical-intensive agriculture brought by the green revolution. Photo: Jakob Lundberg / Centro Ecológico

ness and rich countries at the expense of people and environments in the South.

Despite the current financial crisis, the global economy is expected to treble or quadruple in the next 50 years. This economic growth, together with an ever-growing world population, brings with it a range of challenges for the climate and for the ecosystems that form the basis for economic and social development. For the poor and hungry, who to a greater extent than other people are directly dependent on healthy local ecosystems and the services they deliver, this is an unfortunate development. The same applies to agriculture, which is dependent on a range of ecosystem services (see Box 1), such as pollination, water purification, natural pest control and maintenance of soil fertility. At the present time, 60% of ecosystem services are already overexploited or under threat due to e.g. climate change, land degradation, invading species, eutrophication and environmental pollution (Millennium Ecosystem Assessment, 2005). If this negative development continues, it can have extensive consequences for future food security and can undermine the possibility of meeting the UN Millennium Development Goal of halving the number of people suffering from hunger by 2015.

In light of this, growing numbers are now pressing for fundamental changes in global regulations so that they better promote sustainable and fair development. Increasing globalisation and free trade would not automatically solve the problems of hunger and poverty in the world. For example, Brazil would not necessarily benefit from trade agreements that deregulated agricultural trade completely so that its agricultural products could compete freely in the markets of the North.

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### From minor research station to national node for socially and ecologically sustainable agriculture

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The state of Rio Grande do Sul in southern Brazil has a population of more than eleven million. Today, the proportion of organic farming in this state is greater than in most countries in Latin America or Europe. However, around 25 years ago the picture was completely different. At that time the region was severely affected by the chemical-intensive green revolution, with a range of negative consequences for the environment and human health. It was against this background that Centro Ecológico began its work with a small research station to investigate whether it was possible to grow crops without pesticides and artificial fertilisers.

Today, both organic farming and the work of Centro Ecológico are steadily expanding in the region and throughout southern Brazil. The organisation has gradually grown from being a small research station to become a whole centre for ecologically and socially sustainable development of agriculture. The aim is to use alternative and innovative technologies and methods to expand organic growing and make small-scale farming economically and socially viable.

By being active in different networks, Centro Ecológico has been able to influence the development of a range of issues associated with organic farming, both nationally and internationally. The organisation now acts as a knowledge bank for organic farming through e.g. the following activities:



- Partnering and supporting groups of organic family farms so that they can certify their products and set up organic markets.
- Directly advising farmers in the region with the help of the centre's agronomists, who share their practical experience.
- Providing courses in e.g. organic farming, various forms of processing and commercialisation.
- Establishing organic markets in a number of cities so as to link town and country.
- Supporting consumer co-operatives and shops run by farmers' groups.
- Collaborating with farmers who produce, barter and sell their own crop seed.
- Closely collaborating with schools on different forms of environmental education projects.
- Supporting the development of agroforestry to provide e.g. fodder, fuel and shade, while also acting as an erosion barrier and a natural nitrogen fertiliser.
- Working actively in international partnership projects to promote rural development and develop organic farming.

### Box 2: Centro Ecológico

Centro Ecológico was founded in 1985 in Brazil's most southerly state, Rio Grande do Sul, as a protest against the chemical-intensive agriculture brought by the green revolution. The organisation has gradually grown from a small research station for organic farming into a national node for ecologically and socially sustainable development of agriculture. Today the centre has its own educational centre with demonstration and experimental crops. It organises courses and meetings and provides advice to support groups of organic family farms in production, processing, certification and trade in organic food. The aim is to use alternative and innovative technologies and methods to develop organic production and make small-scale farming economically and socially viable.

In Sweden, Centro Ecológico is perhaps best known due to its long partnership with the society Framtidsjorden and in later years with the Swedish Society for Nature Conservation

[www.centroecologico.org.br](http://www.centroecologico.org.br)



a) Nelson Bellé (see portrait below). b) Açaí berry (assai), an important fruit in agroforestry (see p. 15). Photo: Jakob Lundberg

### Portrait 1: Nelson Bellé: Works as advisor at Centro Ecológico and was the first eco-farmer in Rio Grande do Sul

It was after hearing a committed priest talk about the relationship between Man and Nature that Nelson Bellé changed his path. At that time, in the mid-1980s, he became a pioneer in the region when he left the family farm in Sierra and began growing organic vegetables. Today he is working at Centro Ecológico, where he acts as an advisor for farmers who are interested in beginning to grow organically and for those organic farms that are already working with Centro Ecológico. He keeps himself continually updated on the latest

research findings and when anything important emerges he usually organises a course with representatives from various farmers' cooperatives that are collaborating with the centre. Through his long commitment to organic farming, Nelson has seen increasing numbers of farmers convert once they find out that they can actually make a good income while also reducing the money spent on expensive and health-damaging pesticides and decreasing the number of middlemen. He is working actively to diminish the use of chemicals and to find alternatives to monocultures in order to create more sustainable long-term livelihoods for the rural population.

According to Nelson, one of the greatest challenges today is to expand the organic market and increase collaboration between eco-farmers and consumers in a time when supermarkets continue to expand.



Establishing local organic markets where producers and consumers can meet is a central part of Centro Ecológico's work towards creating agriculture that provides long-term sustainable livelihoods. This picture shows the organic street market in Porto Alegre, which is the state capital of Rio Grande do Sul. Photo: Jakob Lundberg.

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## 2. Small-scale trade and participatory organic certification

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**I**n Brazil, a number of farmers' co-operatives have opted to convert to organic farming and supply directly to selected local organic markets. These are attended by a growing number of consumers who are particularly interested in where and how the food they buy is produced. The profits that previously went to middlemen are now divided between producers, consumers and the environment.

In the beginning of the 1980s, Centro Ecológico initiated an organic street market for locally produced food in the state capital, Porto Alegre. Here in the major city, local smallholders sell their goods directly to consumers. This provides higher income for the growers, since the profits that previously went to middlemen are redistributed. Centro Ecológico also makes organic products available to a wider public at competitive prices. Market stalls loaded with locally produced organic products appear every Saturday morning in what over time has also become a popular meeting place for smallholders and city dwellers. The conventional market has had to move as the organic market has expanded and today there are organic markets at several sites in Porto Alegre.

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### Small-scale trade in networks

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Centro Ecológico has focused its efforts on small-scale trade in networks. It actually does not have any expressed aims to establish its food on the international market. There are several reasons for this. It believes that the global food market sets demands that would encroach on the freedom of the organic farmers and also that there is a risk of it benefiting a small elite that can afford organic food. It is just as important to ensure that the regional market is promoted and to act so that even the poor in their home country have access to nutritional organic food.



Above: Locally produced food being sold in consumer co-operatives in southern Brazil. Embedded photo: Two of the women who run the consumer co-operative Ecotorres, which sells organically produced and locally processed foods and ecoclothing. Photo: Jakob Lundberg

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### Alternative to external certification increases confidence of local population

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Initially, there was no certification at all for organically produced goods since it was not considered necessary when producers and consumers had such a close relationship. However, the feeling gradually developed that a certification system was necessary to deal with the claim that certification was lacking because the goods were of lower quality. The Participatory Guarantee System (PGS) that was then established by local consumers and producers is based on trust instead of the international certification system model with

expensive external controls. A particular aim is to stimulate self-determination and to build up a sense of pride in local producers. The network Ecovida, where Centro Ecológico is one of the driving parties, coordinates the work on PGS. Ecovida bases its work on a high level of confidence between producer and consumer, and now covers the three states Parana, Rio Grande do Sul and Santa Catarina. The network consists of 24 nodes that all work both regionally and locally through consumer and producer groups and through environmental groups and other voluntary organisations. In dialogue with the Ministry of Agriculture, PGS has today spread throughout Brazil. Similar systems have been developed in e.g. Chile, Bolivia and Costa Rica.

#### Box 3: Renaissance for the local in an increasingly globalised world?

It is not an obvious advantage for poor smallholders in Brazil to certify themselves according to the international system and aim for export farming. National import regulations and the fact that the international certification bodies charge high fees for assessing and certifying farmers tend to drive development towards agribusiness, with plantations run by major multinational companies. Therefore a more local system for trade in farm products and their certification brings a range of advantages for farmers in the region. In recent years the costs of transport and energy have also risen in a way that can strengthen Brazil's own farmers in the competition against imported food. Locally produced food grown without expensive and energy-demanding inputs may undergo a renaissance. When cheap oil and biased subsidies are history, monoculture of soybeans and palm oil for production of animal feed for the Western world's cattle and pigs may become increasingly rare. It will hopefully be replaced by more variation-rich agriculture based on ecosystem services and biological diversity, with the aim of stimulating long-term sustainable rural development on the poorer countries' own terms.





a) Banana candy, an example of farm processing. b) Anelise wants to take over the family processing industry, which produces e.g. organic tomato sauce and fig jam (see portrait below). c) Selling locally produced food and processed foods at the organic street market in Porto Alegre. Photo: Solomon H. Mariam.

## Portrait 2: Anelise Becker wants to take over family processing industry

Anelise's parents run a processing industry, which produces items such as tomato sauce, fig jam and banana candy. Anelise is training to be a teacher and is active in the youth movement. 'I want to take over the business in the future so that I can stay here in the village. By also training to be a teacher I hope to contribute to more people having the opportunity to remain in the area'. The industry was started by three families with an interest-free state loan. Now they see the market for organic products increasing. The next step for the family business is to concentrate more on the local market and to improve administration in the company.

### Box 4: Trade in ecosystem services

Payment for Ecosystem Services (PES) is being tested and developed in several areas of the world and means that activities that support or generate ecosystem services are paid for by those who use these services. This can involve e.g. providing farmers with incentives to make agriculture more environmentally friendly and to manage their land so that they produce a multiplicity of services such as preservation of biological diversity, uptake of carbon dioxide from the atmosphere and prevention of soil erosion. These ecosystem services are undervalued as a rule, while markets and subsidies have a tendency to promote maximum production of food, fibres and biofuels at the expense of other ecosystem services.

### Box 5: Research on networks verifies Centro Ecológico's work



Network of collaborating partners, according to Centro Ecológico

Working with the aid of network structures can be extremely effective in spreading ideas and fundamentally influencing the surrounding world with relatively few resources, e.g. for studies of how different ecosystems and their capacity to deliver ecosystem services can be further enhanced. By analysing a landscape and its links and nodes, for example how one type of forest is connected to another through green corridors, points where nature conservation measures are best introduced can be identified. Centro Ecológico and its partner organisations are actively working in network structures (see picture on left) so as to exchange new knowledge on organic farming and certification as efficiently as possible.



“Development of expertise and exchange of knowledge are two of the most important components of our operations”, say husband and wife Ana and Laércio Meirelles (above right), who are two of the key individuals in Centro Ecológico today. Photo: Jakob Lundberg.

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### 3. Development of expertise and exchange of knowledge key to success

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**C**entro Ecológico could never have developed from a minor research station into a national node for the development of organic agriculture had it not been for its persistent work on exchange of knowledge and continual development of expertise. The centre’s agronomists carry out a range of tasks from research and advisory work to visiting farms and schools. Together with their partner organisations, they actively work in network structures so as to spread new information on organic farming and certification as efficiently as possible.

Centro Ecológico and its partner organisations are actively working in network structures (see Box 5) to spread information and develop skills within organic production in southern Brazil. Building up and strengthening various networks with numerous smaller centres has a greater effect than spreading all information through a single centre. The work involves visits, meetings and training of smallholders. It deals with everything from production and processing to the marketing of organic produce and the formulation of guidelines to stimulate more sustainable agriculture and increased environmental protection.

Centro Ecológico works on a number of levels from the local to the international. For example, it is

a member of Ecovida, a Brazilian network that was started during the 1980s to support small farmers and to promote organic production and consumption. In total, Ecovida organises 3000 families in 270 groups. The network, which consists of 30 volunteer organisations and 10 organic consumer cooperatives, is divided into 24 regional nodes spread over three states in southern Brazil.

Centro Ecológico also has strong relationships with teachers through a network consisting of 40 teachers in 10-15 schools who together provide training in environmental conservation at the schools (see Box 6). Centro Ecológico is also linked to ANA (National Articulation on Agroecology), which focuses on organic





a) Hibiscus is one of many different types of flowers grown between the various crops and fruit trees in agroforestry. b) Research carried out by Andre, shows that organic farming in Rio Grande do Sul is better for the environment and more economically beneficial in the long run (see portrait 3). Photo: Christine Clifstock and Jakob Lundberg.

farming at the national level, and is an active member of MAELA (Movimiento Agroecológico de América Latina y Caribe), which is working on organic farming and social justice in Latin America and the Caribbean. It also has international contacts via exchange of knowledge with organisations such as Framtidsjorden and the Swedish Society for Nature Conservation.

#### Box 6: Working with schools

Centro Ecológico works with schools from primary level to high school to integrate environmental knowledge into the curriculum. The work mainly consists of advising teachers and producing teaching material for specific environmental projects. Continual assessment and improvement are the cornerstones of this collaboration, where exchange of knowledge between teachers, farmers and researchers is stimulated. The aim is to promote contact between different disciplines and to investigate how scientific and practical knowledge can be combined for better joint activities within the environmental area. Through discussions and application of a method based on a step-wise model of learning, theoretical and practical applications are proposed for joint projects.

#### Portrait 3: Dr. André Gonçalves works for Centro Ecológico and has a doctorate from Cornell University in the USA

André Gonçalves obtained his doctorate from Cornell University in the USA in 2008, with a thesis that compared organic and conventional banana cultivation. The results show that organic banana production is admittedly somewhat less productive in terms of kilograms per hectare, but is better financially in the long run since organic bananas mean higher prices for producers and lower costs for expensive inputs such as pesticides and artificial fertiliser. In addition, the agroforestry of the organic plantations is better for the biological diversity of the unique Atlantic rainforest and provides considerably more ecosystem services, thus increasing the socio-economic benefits. Before he began his research, André worked for Centro Ecológico as a coordinator of various projects within sustainable agriculture and rural development directed at smallholders and grassroots organisations. Now he is back at the Centre again, using the results of his own research to improve organic agriculture in southern Brazil. André was recently one of the authors of the report 'International Assessment of Agricultural Science and Technology for Development' (IAASTD).





Agroforestry is the name given to a system where farmers grow their crops, e.g. bananas, together with trees, bushes and other plants. The trees chosen often have nitrogen-fixing roots systems, which provide natural fertiliser for the surrounding vegetation. The trees also provide shade and act as a windbreak. These systems have been shown to bind more carbon than monocultures in which only one crop is grown – a feature that is becoming an increasingly important ecosystem service in view of climate change. Photo: Solomon H. Mariam.

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## 4. Agroforestry provides ecosystem services and protects the Atlantic rainforest

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**A**groforestry means that in contrast to monocultures, many different crops, bushes and trees are grown together. These systems imitate the natural systems in many ways. They can be high-yielding if correctly designed, while they also provide a range of environmental benefits – such as promoting ecosystem services and biological diversity – and provide a more secure livelihood.

In organic agroforestry in southern Brazil, the crops grown include banana, papaya, acerola berry (*Malpighia puniceifolia*, a small bush with extremely vitamin C-rich fruits), guava, pineapple, maize and other vegetables. Another example is the native species heart-of-palm (*Euterpe edulis*), which is one of the key species for the preservation of biological diversity in the Atlantic rainforest since its fruit is an important food source for many birds, insects and mammals. Açaí (assai), is another important species in agroforestry. It has long been used by the local population, but in recent years it has attracted attention for its high content of antioxidants, vitamins and minerals. Today it is regarded as a type of ‘super fruit’, with claims of positive effects on everything from heart

disease to ageing and cancer. In addition, its marrow (palm heart) is a popular delicacy and therefore the assai palm has been felled widely in South America. In Brazil it is now a protected species. Many would like to be able to grow it legally and sustainably, but this is not possible under the current legislation, which includes a general ban on its harvesting.





Agroforestry creates complex and varying habitats where a multitude of birds, insects and plants can thrive. Photo: Jakob Lundberg/Solomon H. Mariam.

### Trees and crops grown together for greater diversity and secure livelihood

In addition to all the crops and fruits produced, agroforestry in Rio Grande do Sul also includes ornamental plants such as orchids and bromelids, which can be sold on the market. Furthermore, lumber is produced from trees such as cedar and brazil-nut. Overall, this provides a more secure livelihood throughout the year and lower vulnerability to crop failure and price changes than when a single crop is grown. Including trees and bushes in crop plantations provides shade for plants that are susceptible to sun and protects the soil from

drying. Trees planted are often nitrogen-fixing trees that have the ability to bind atmospheric nitrogen (with the help of bacteria in the root system) and that provide natural fertiliser for the surrounding plants. They also produce large amounts of organic material in the form of twigs, branches, leaves, bark, fruits and roots, which contribute to improving the humus content of the soil. Moreover, the trees also act as a windbreak, which protects sensitive crops, and via their root systems they transport some minerals up from deeper layers and make them available to crops. Extensive experiences from South America and Africa show that this type of cropping, if correctly designed, can more than double crop yields compared with previous growing systems. In Rio Grande do Sul the increasing number of grow-

#### Box 7: Agroforestry – learns from natural ecosystems to achieve important environmental and development goals

In agroforestry, different types of trees, bushes and farm crops are combined in cropping systems that often try to resemble natural ecosystems. Agroforestry can thus be seen as a form of biomimicry, which is a growing research area inspired by and learning from nature in order to find more long-term sustainable solutions. Agroforestry does this by focusing on recycling and diversity instead of fossil fuel-based technology. It also creates more complex and varying habitats at several levels where a multitude of birds, insects and other animals and plants can thrive. Correctly designed, a system such as this can bind the soil, resist pests and fertilise itself – almost completely without our help. By being more multifunctional, it contributes to providing benefits in addition to food and can therefore provide a more secure livelihood while also promoting ecosystem services and biological diversity (see Table 1 and Box 8). In recent years agroforestry has been raised in a number of international forums and reports as an important link in the work of achieving the goals set by the global environmental conventions (e.g. on biological diversity, desertification and climate) and in achieving the UN's goals on halving poverty and hunger.



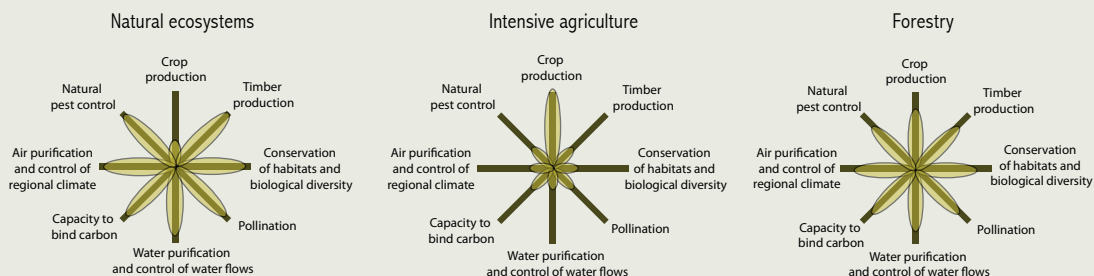
a) Bushes and flowers in agroforestry are important for landscape value and for the generation of ecosystem services. For example they can provide habitats for pollinating insects and pest-eating birds. b) Toninho (see portrait 4) is a proud farmer who is reaping the benefits of multifunctional agroforestry. Photo: Jakob Lundberg/Solomon H. Mariam.

ers converting to organic production is contributing to not only protecting but also restoring the environment, particularly the valuable Atlantic rainforest.

#### Portrait 4: Toninho, agroforester

Toninho (pictured above) runs the banana plantation while his wife grows flowers to sell at market. They save suitable self-sown trees and bushes and plant some trees that fit together well with the banana plants. In many respects he tries to replicate the Atlantic rainforest that was present at the site 'before the colonisers came and cut down all the valuable timber'. Today there are around 20 different types of trees on his farm. Since he converted to organic farming, he keeps 80% of the profits. In the past there was seldom more than 20% net profit, as middlemen took the rest.

Box 8: Agroforestry gives a greater diversity of ecosystem services



Agroforestry gives a greater diversity of ecosystem services than intensive farming, which tends to maximise cereal production at the expense of most other ecosystem services. More people are now recommending multifunctional agriculture that contributes additional benefits as well as food. The diagram is modified from Foley et al. (Science 2005).





**Table 1:** Matrix with examples of important cropping practices in organic agroforestry and ecosystem services promoted by the respective practice. The number of plus signs shows the degree of effect on each ecosystem service: +++ strongly promoted, ++ moderate effect, + detectable effect. This matrix was produced together with André Gonçalves and Ana Meirelles at Centro Ecológico and Johanna Björklund, Centre for Sustainable Agriculture at the Swedish University of Agricultural Sciences.

Ecosystems (as categorised by Millennium Ecosystem Assessment - excluding a fourth category 'Cultural services')	Cropping practices in organic agroforestry					
	Promotion of diversity of crops and different types of seeds	Green manuring (different types of crops grown, cut and worked directly into the soil as manure)	Use of animal manure	Use of liquid biofertiliser produced on-site	Polyculture (growing of several different types of crops, trees & bushes on the same field and active seed collection)	Use of nitrogen-fixing legumes
Provisioning services (goods)						
Food	++	++	++	++	+++	++
Ornamental flowers	++	+	++	+++	+++	+
Biochemicals, natural remedies & pharmaceutical	++	++	++	++	+++	++
Retention of genetic information	++	+++	+	+++	+++	++
Access to fresh water	+	+	++	+	+	+
Supporting services						
Photosynthesis/biomass production	+++	+++	+++	+++	++	++
Improved water-holding capacity	++	++	+++	+	+	++
Improved soil structure	+	+++	+++		+	+++
Nutrient recycling	+++	++	+++		+	+++
Biological nitrogen fixation	++	++	+++		++	++
Regulating services						
Pollination	+++	+	+++	+++	+++	+
Natural weed and pest control	++	++	++	++	++	++
Erosionsskydd	+++	+++	+++	+++	+++	++
Flood buffer	++	++	++	++	++	++
Ability to bind carbon	+++	++	+++	+++	+++	++
Effect on security of farmers' livelihood	Improved ability to adjust to variations in climate and environment	Increased yields, decreased costs for commercial fertiliser	Increased yields, decreased costs for commercial fertiliser	Increased yields, decreased costs for commercial fertiliser	Higher and more stable yields, increased diversity of products	Increased yields, decreased costs for commercial fertiliser





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## 5. Conclusions

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- The unique work of Centro Ecológico in southern Brazil demonstrates that it is possible to increase food production and secure livelihoods with the help of organic farming, which in combination with participatory certification stimulates small-scale local and regional trade.
- The organic farming developed maintains biological diversity and draws benefit from ecosystem services. This is an essential alternative to the monoculture of soya for animal feed concentrate, which is expanding throughout parts of Brazil, e.g. in Cerrado and the Amazon region.
- Through working actively on actor participation, exchange of knowledge and development of expertise in network structures, Centro Ecológico and its partner organisations have been able to influence the development of organic agriculture nationally and internationally.
- Certification according to the international systems is not necessarily the best option for poor smallholders. The work of Centro Ecológico shows that local certification systems can function well and that they can take place on the terms of the local population, while also promoting increasing organic production and giving a broader range of consumer groups access to organic food.
- Agroforestry gives a greater diversity of potential livelihoods and ecosystem services than intensive farming, which tends to maximise the production of one crop at the expense of most other ecosystem services. It also binds more carbon dioxide (combats the increasing greenhouse effect) and is better for the unique biological diversity in the threatened Atlantic rainforest.
- Research shows that organic banana production in Rio Grande do Sul is more financially advantageous in the long run and better secures local food supply. Organic banana plantations admittedly produce somewhat fewer kilos of bananas per hectare and require higher labour inputs, but they tend to compensate for this by generating a range of other crops and ecosystem services with high economic value for the individual farmer.





a) Various fruit juices are included in the range of organic products which have been certified through the Participatory Guarantee System (PGS). b) Spiders hardly exist at all in the conventional banana plantations, but they are very common in the organic agroforestry systems. Photo: Jakob Lundberg / Solomon H. Mariam.

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## 6. Recommendations

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- International aid and research must try to prioritise the agricultural sector as an important development issue and increase investment in sustainable rural development in order to decrease hunger.
- Trade policies must be consistently adapted so that global trade agreements promote, rather than destroy, the conditions for the environment and food security.
- National strategies for agricultural development and countering poverty must focus more on support and economic incentives for small farmers wishing to convert to ecosystem services-based farming that uses less fossil fuel and fewer chemical inputs.
- Participatory certification systems based on mutual respect between consumer and producer should be promoted. They provide scope for more flexible certification regulations, which are developed with greater respect for the environmental, social and cultural context.
- Initiatives that promote contact between farmers and consumers willing to contribute to sustainable development should be developed, e.g. through establishing local markets for organic food or providing support for farmers who want to process their own organic products and bring them to market.
- Various systems for paying farmers for the production of ecosystem services should be investigated more closely and developed so that they benefit smallholders in the South.
- Decision-makers at local and regional level should cooperate to create better conditions for increased consumption of locally produced organic food in public catering, particularly food to nurseries, schools and homes for the elderly (e.g. by setting up percentage targets or providing tax relief for organic food).
- The legislation should be changed so that it improves the conditions for agroforestry to access the market with more of its products (e.g. today the farmers in Rio Grande do Sul are not allowed to actively grow or sell products from wild plants and trees used in their agroforestry).



#### Nine positive results from Centro Ecológico's work

1. More farms producing organically.
2. Lower use of chemical pesticides that are damaging to human health and the environment.
3. Increased self-confidence in farmers.
4. Improved relations and increased trust between producers and consumers.
5. Stronger protection for the unique biological diversity of the threatened Atlantic rainforest.
6. Improved and diversified opportunities for making a living.
7. Enhanced generation of ecosystem services.
8. Increased knowledge of the environment and sustainable development among farmers and schoolchildren.
9. Greater use of agroforestry, which binds more carbon than monoculture – and is thus positive from a climate perspective.

## 7. Sources and further reading

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This report is based around the unique work of Centro Ecológico in southern Brazil and shows that it is possible to increase food production and secure livelihoods with the aid of participatory certification, small-scale trade and organic farming that maintains biological diversity and draws benefit from ecosystem services. By being active in a range of different networks, Centro Ecológico has been able to influence the development of organic farming nationally and internationally.

The Swedish Society for Nature Conservation is collaborating with Centro Ecológico. We have established an exchange of information between our organisations and we are working together to develop sustainable agriculture.

The Swedish Society for Nature Conservation is also providing financial support for Centro Ecológico and is collaborating with many other farming organisations in the South and with organisations working with seas and fishing, climate, hazardous chemicals, trade and foodsecurity.

In total, the Swedish Society for Nature Conservation is working in partnership with around 60 organisations in over 20 different countries. This work is mainly funded by Sida.



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The Swedish Society for Nature Conservation is an environmental organisation with power to bring about change. We spread knowledge, map environmental threats, create solutions, and influence politicians and public authorities, at both national and international levels. Moreover, we are behind one of the world's most challenging ecolabellings, "Bra Miljöval" (Good Environmental Choice).

Climate, the oceans, forests, environmental toxins, and agriculture are our main areas of involvement.

[www.naturskyddsforeningen.se](http://www.naturskyddsforeningen.se)



Bra Miljöval