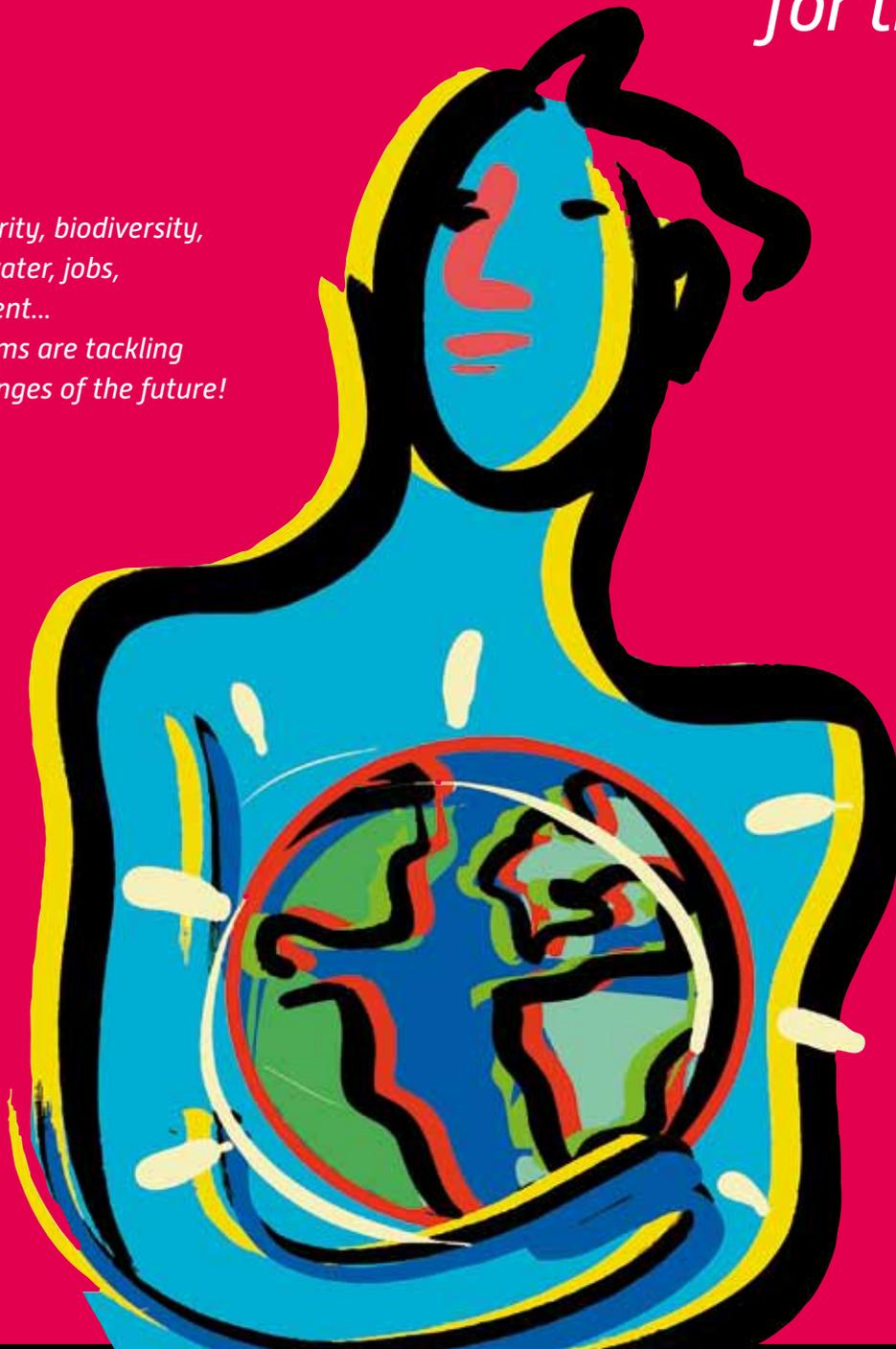


# *Family farming* an asset for the planet...

● *Food security, biodiversity,  
climate, water, jobs,  
environment...  
family farms are tackling  
the challenges of the future!*



> [www.cirad.fr](http://www.cirad.fr)





Family farming has always been one of the main human activities.

Some 1.3 billion people worldwide currently work on family farms.

Family farming is the world's leading source of jobs and food supplies, but involves most of its poorest people.

To fulfil its potential and address the challenges of the future, it needs appropriate public policy.

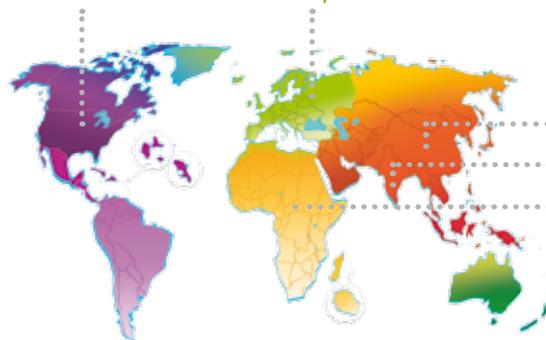


*An "affair of State"*  
Whatever form it takes, agriculture depends on public action and is a major concern for governments.

*40% of workers worldwide*

*Less than 5% of the working population in North America and Europe*

*500 million family farms*



*59% of the working population in China, 53% in India and 53% in Africa*



95% of the world's farms cover less than five hectares. Farms of more than ten hectares are really only found in the Americas and Europe.







From marginal, sparsely populated and largely infertile zones to the heart of towns, family farms are found on every continent and in every type of ecosystem.

From “jardins créoles”, farmed by hand, to intensive mechanized cereal farms, through greenhouse crops, family farms have an impressive ability to adapt and innovate in response to the challenges they face.



> *A difficult shift*

During the 20th century, in Europe, the working population gradually left agriculture to work in industry or services. That same shift is impossible in today’s southern countries, where although towns have grown substantially, they will not be able to absorb all the new arrivals on the job market.

## Substantial innovation capaci

1 >  
Challenge

### Creating jobs and alleviating poverty

By 2025, 330 million young people in Africa and 570 million in southern Asia will be on the job market, in regions that are currently the poorest and most rural on Earth.

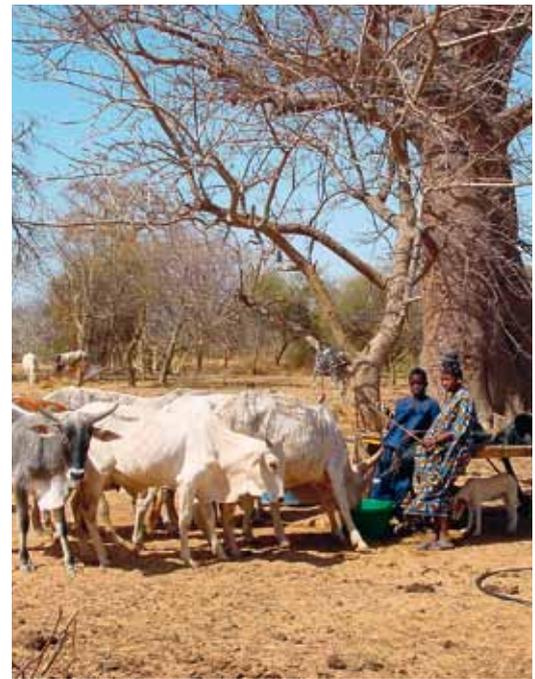
Maintaining jobs in agriculture is thus vital for many countries.



> *Cotton producers in Peru: a cooperative to fight international competition*

In northern Peru, 5600 family cotton farmers have joined forces in a cooperative to promote Pima cotton, which is exceptionally fine and strong. The cooperative collects the cotton and prepares it for export, and the eventual aim is to obtain a “Peruvian Pima cotton” label that will guarantee higher prices for producers.





ty to help address future challenges!

2 > **Boosting solidarity**  
Challenge



Family farms and the communities to which they belong maintain close supportive links between generations. However, in an increasingly urban world in which family relationships are changing and women are increasingly independent, young people are drawn to urban areas and the social links within families are under threat.



> **Pastoral camps in the Sahel: more than a farm, a way of life**

In Sahelian regions, Fula families are structured around pastoral camps, comprising several adults and their children, headed by an elder. These camps are more than a production unit: they are a way of life and provide a home, solidarity and mutual assistance.



> **The role of young people and women in family farming**

• How can we reconcile the promotion of family farming, which means working collectively, with the development of individual rights, particularly those of women and young people?

Families provide security, but they also trap individuals in relationships based on dominance and hamper their dreams of greater freedom and independence.





### 3 > Challenge

## Ensuring food security

While family farms first and foremost guarantee the family's food security, they also contribute substantially to feeding both urban and rural areas.

The strong population growth forecast for the coming decades will mean increasing agricultural production while respecting stringent quality criteria.



### > Family fruit farms in Madagascar: quality products for global markets

Tropical family fruit farms vary significantly in terms of their area and the number of species grown.

They are largely geared towards domestic supply chains, but also supply global markets, particularly in Europe and North America. This is the case for lychee and clove orchards in Madagascar.



### > Suburban livestock farming

Some 80% of the milk consumed by Cairo's twenty million inhabitants comes from the small farms that surround it, some of which do not even own any land.

These farms are very fragile in the face of urban expansion and livestock feed price variations.



• Family farms are subject to competition from industrial farms keen to grab arable land.



### > Local or global bananas

In tropical regions, bananas are a major daily staple, and most plantations are family farms.

However, the dessert bananas produced for export to temperate countries come from industrial plantations that have grown rapidly in response to global demand.





### > Fallow: a sustainable system

Traditional fallow consists in cultivating a small area for a few years, and then allowing forest to recolonize the plot, which serves to reconstitute organic matter stocks and eliminate weeds.



Such systems have ensured the subsistence of human communities for thousands of years, but only work if population densities are low.



• The proximity between family and farm, the close contact with the environment, and local know-how enable family farms to develop more environmentally friendly production systems.



### > A town-farm alliance to recycle waste

In Yaoundé, Cameroon, associations make compost from urban waste, which is 70% organic matter. They then supply market gardeners on the fringes of the city.



• Because there are so many of them, family farms can also have an adverse effect on the environment if they do not have access to modern technology, if public policy is inappropriate or if population pressure on resources is too high.



## 4 > Reconciling production and the environment

Challenge



To respond to growing population levels and food demand, family farms will need more land, water and energy. For the most part, they know how to manage their resources sustainably and preserve their know-how. However, without the support of appropriate policies, they can also harm the environment. We now urgently need to develop agro-ecology, so as to reconcile production and environmental balances.



### > Farming families within the Office du Niger: a structure at the heart of efficient rice production

In Mali, within the Office du Niger irrigation scheme, several generations of workers operate under the authority of a patriarch, who allocates activities, manages the family rice store and decides on sales.

The fact that everyone contributes enables high rice production and makes the area one of the country's main rice growing regions.

However, when families expand, the areas available for cultivation are no longer sufficient, and new land is hard to find.





## 5 > Developing territories

Challenge

By clearing and planting land, modelling landscapes, moving their herds around or selling their products, family farmers develop territories sustainably with a view to passing on their farms to their children. They have to cope with an increasingly urbanized world and are in competition with residential, industrial, mining or forestry activities.



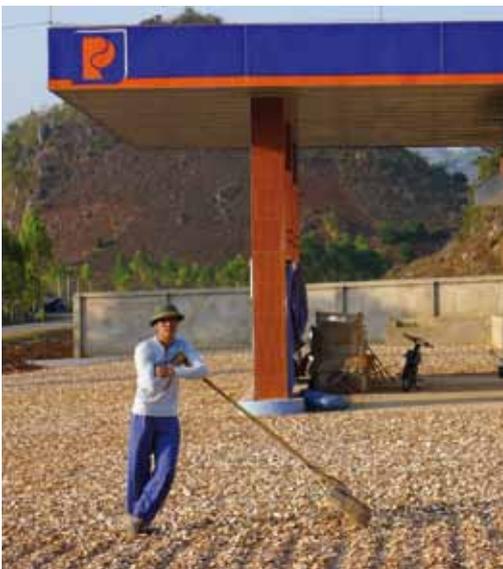
### > Indonesian smallholders: guaranteeing a long-term future

In Indonesia, smallholders have substantial experience of complex agroforestry systems based on rubber, fruit trees, timber trees and other products (rattan, medicinal plants, etc).

By using more productive rubber clones and planting a few hectares of oil palm, Indonesian farming families can build up valuable assets and guarantee their long-term future.



• With the development of towns and of industrial agriculture, family farms are losing their influence over territories, which are becoming more uniform and more fragile



### > Urban agriculture

By 2030, 60% of the population in developing countries will be living in urban areas, and the number of workers involved in urban agriculture is set to increase.

The lack of social protection in these countries means that farming is a vital necessity.



### > "Learn to feed yourselves"

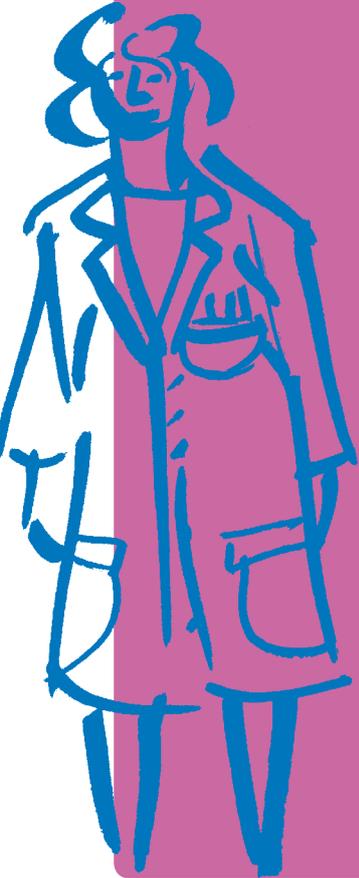
In Accra, Ghana, where market supplies are far from guaranteed, the city authorities have taken steps to protect agriculture, by setting land aside.

They have also launched an operation to encourage urban residents to grow food crops.



6 >  
Challenge

## Addressing health risks



Since the 1950s, globalization, climate change and intensification have led to the multiplication of pests and diseases that affect crop and animal farms.

Because family farms are so numerous and so widely scattered, they are vulnerable, but in another way, they are robust, thanks to their flexible, diversified production system and use of rustic varieties and races.



• In South Africa, the stem borer *Eldana saccharina* causes less damage on small sugarcane farms than on commercial farms.

The presence of other crops (market garden crops, banana and maize), shrubs and hedges fosters predators of the pest, such as ants and spiders.



### > Organizing farmers to fight health risks

In Haiti, groups have been set up to provide their members with animal and plant health services.

The various groups make up a federation, enabling them to act on a national level and participate in the bodies that coordinate food security and safety issues, hence improving the visibility of family farms and defending their interests.



### > Ducks in rice fields in China: a habitat with a range of health issues

Rearing ducks in rice fields is an age-old practice in China. The ducks eat certain weeds, insects and parasite hosts, and thus protect the rice fields.

However, at the same time, combining rice growing and duck rearing risks triggering the appearance of avian influenza foci, since wild birds come to feed in the rice fields and may transmit the virus.

• In some cases, family farms are more vulnerable than agro-industry, since they often do not have access to information and new technologies.

Newcastle disease regularly causes poultry losses of between 50 and 90% on traditional farms, while large poultry farms, which vaccinate their birds, are largely unaffected.



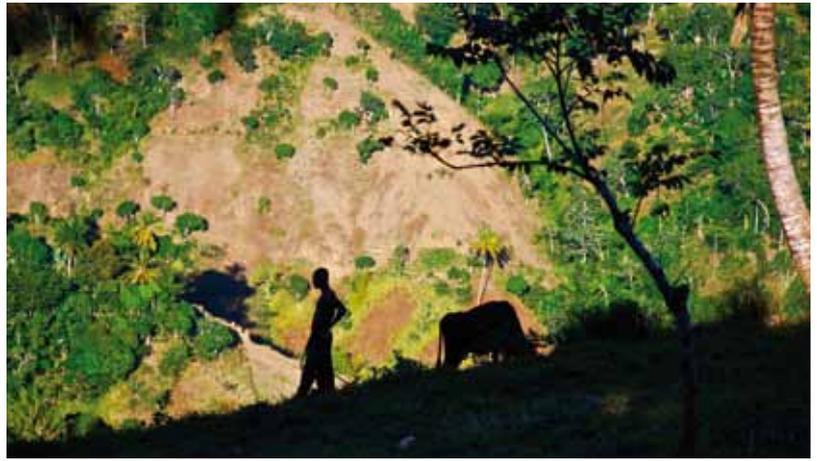


### > The "greening" of the Sahel

One of the best recent examples of "climate-smart" agriculture on a landscape scale is the "greening" of the Sahel in Niger.

Within a few years, transferring ownership rights over trees from the State to farmers has led to a spectacular increase in tree density per hectare and helped modify the microclimate, boost soil fertility and improve farmer incomes.

• Family farming has less of an impact than industrial farming in terms of greenhouse gas emissions, soil erosion, water consumption and biodiversity shrinkage.



• Family farms need to switch to so-called "climate-smart" methods capable of mitigating or adapting to climate change.

### 7 > Mitigating climate change

Challenge

Family farms are suffering the consequences of climate change (drought, storms, changes in biodiversity), and need to adapt.

However, they also have a role to play in mitigating that change, by adopting more climate-neutral practices.



### > Seeds from the association of professional farmers' organizations in Mali

In response to the disappearance of some varieties, the Association des organisations paysannes professionnelles (AOPP) in Mali has set up seed cooperatives backed up by a network of experimenter-farmers.

They now sell certified millet, sorghum, maize, rice, cowpea, fonio, groundnut, sesame, okra and hibiscus seed suited to local conditions.





8 >  
Challenge

## Fostering the energy shift



Family farms need to prepare for the expected exhaustion of fossil fuel supplies, and they are concentrated in zones where access to electricity, diesel and gas is already difficult.

Demand for new agricultural products to produce bioenergy is an opportunity for smallholders, but generates increased competition for land use



## > The opportunities offered by biofuels

- Antananarivo, the Madagascar capital, draws 90% of its domestic fuel supplies from eucalyptus wood produced in small-scale plantings.

In Brazil, to satisfy growing demand for fuel, the Ministry of Agrarian Development is encouraging family farmers to grow oil crops: castor, soybean, jatropha, sunflower and oil palm.



Processing firms (including the national company Petrobras) receive tax breaks if they agree to buy the products supplied by family farms and sign contracts with farmers that specify prices, delivery conditions and technical support services.



- In the event of very high population pressure, cutting trees to provide fuelwood can result in deforestation.



## > Energy to process food: mango drying in Burkina Faso

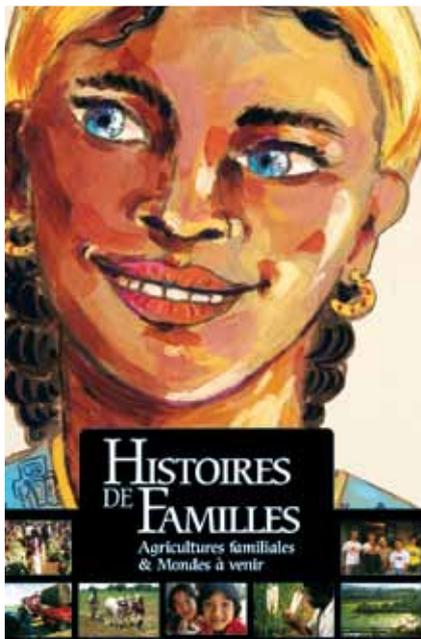


In Burkina Faso, mangoes are mainly grown on family farms, and dried mangoes are one of the jewels in the crown of the small-scale food export industry.

Efficient drying is crucial for product quality, but since 2007, rising gas prices have made mangoes from Burkina Faso less competitive.

Access to cheap energy is also important for other sectors, such as shea butter or dried fish production.





Regardless of the discipline concerned, conducting agricultural research in southern countries above all means working for, with or on family farming. Over the past thirty years, CIRAD has worked with its partners on research programmes, published numerous scientific articles and helped launch public policies devoted to family farming. Well before 2014, the International Year of Family Farming, it chose to place this topic centre-stage at the 2005 Paris International Agricultural Show.

## *Working with family far*



### 1 > *Creating jobs and alleviating poverty*

Challenge



> *The RuralStruc\* study recommends massive action in favour of family farming*

The study, of 8000 households in seven countries, has demonstrated that the role of family farms goes well beyond merely supplying agricultural products, particularly by providing young people with jobs.

<http://www.worldbank.org>



\*RuralStruc is a joint initiative by the World Bank, the Agence française de développement, the French Ministries of Foreign Affairs and of Agriculture, CIRAD and the International Fund for Agricultural Development. Its results are to be used by the New Partnership for Africa's Development (NEPAD).





## 2 > Boosting solidarity

Challenge



### > Assessing public policy

In Brazil, the "Bolsa familia" programme is providing public support for the poorest households. This is dependent on the households undertaking to provide their children with healthcare and schooling. The Plano Brasil sem miseria, launched in 2011, aims quite simply to eradicate extreme poverty. These programmes primarily concern family farms, and CIRAD's research has shown that they are an effective way of boosting production and reducing poverty long term.



# ms in southern countries

## 3 > Ensuring food security

Challenge



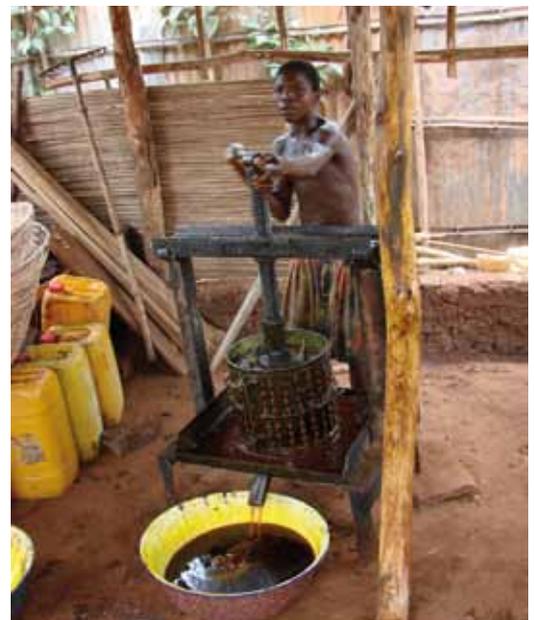
### > Urban markets: major outlets for local agriculture

The meat, fish and eggs, as well as fruit, vegetables and oil, sold on African urban markets are largely produced locally. Studies have shown that what was previously known as "subsistence" food crop farming has now become a commercial operation.



### > Determining the economic weight of family farming

Family farms play a dominant role in agricultural product markets, but the statistics available are not sufficient to measure their share of global production accurately. Thanks to its networks and partnerships, CIRAD has substantial expertise to enable it to determine their economic weight in certain supply chains more accurately.



## 4 > Challenge

# Reconciling production and the environment



### > Intercropping cocoa and forest trees

In Cameroon, cocoa yields are surprisingly stable long term in agroforestry systems managed without chemical inputs.

Research conducted by CIRAD has shown that when intercropped with cocoa, many fruit and forest species serve to regulate cocoa pests and reduce pesticide use.



### > Conservation agriculture

Conservation agriculture centres on three principles: no-till, maintenance of a permanent soil cover using plants, and diversification of the species grown.

This agro-ecological technique, which CIRAD has been studying for some time, has now proved its worth and covers more than a hundred million hectares worldwide, primarily on industrial farms.

However, financial constraints mean that most family farms are unable to adopt the technique, since abandoning tillage initially encourages weed growth and reduces yields, which in the short term means more work or using herbicides or fertilizers.



## 5 > Challenge

# Developing territories



### > The global land rush: the Land-Matrix\* database

The database compiles information on large-scale land acquisitions and rentals worldwide.

It should ensure greater transparency in terms of land investment.

<http://www.landmatrix.org/>

\* Land-Matrix is the fruit of a partnership between the International Land Coalition (ILC), the French Agricultural Research Centre for International Development (CIRAD), the Centre for Development and Environment (CDE), the German Institute for Global and Area Studies (GIGA) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).



### > How are family farms and industrial farms complementary?

In Indonesia, investors are increasingly often setting up oil mills that are supplied by small-scale local palm oil producers.

This type of system is also found in Africa, where the red oil from small-scale producers and that from industrial mills have distinct commercial outlets.

This means smallholders can negotiate with firms without fear of losing their activity



## 6 > Challenge

# Addressing health risks



### > Fighting African animal trypanosomiasis

To fight this disease, which is transmitted by tsetse flies, a campaign has been launched throughout Africa.

By combining trapping flies, treating livestock and releasing sterile male flies, the disease can be controlled and sometimes eradicated in animals, and also in humans.

This could improve family livestock farmers' living standards by almost 30%, thanks to increased milk and meat production.



### > Minimizing agricultural product contamination by chlordecone\*

CIRAD is working with farmers in the West Indies to design agro-ecological banana cropping systems suited to family farmers' practices, which limit pesticide use and the associated risks.

\* Chlordecone is an insecticide that was used in banana plantings from 1971 to 1993 and caused long-term soil and water pollution.



## 7 > Mitigating climate change

Challenge



### > Labelling landscapes

How about labelling landscapes to ensure more sustainable water, soil and biodiversity management?

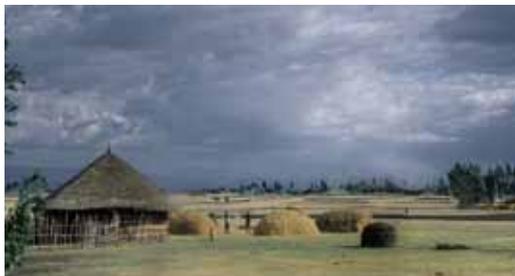
CIRAD is working to establish payment mechanisms for environmental services, and on a landscape label for farms that reconcile agricultural production and environmental quality.



### > Reducing water consumption

With intermittent irrigation techniques tested by CIRAD, rice growers reduce their water consumption.

They also limit the decomposition of submerged organic matter in their rice fields, which cuts emissions of methane, a greenhouse gas.



## 8 > Fostering the energy shift

Challenge



### > Agricultural by-products, a source of energy

In Madagascar, three power stations, combining a gas generator and an electricity generator, supply three villages with electricity produced from rice husks.

Research conducted by CIRAD and its partners\* has shown that the by-products generated by family farming can help address the energy challenge.

\* The Institut international d'ingénierie de l'eau et de l'environnement (2iE) and EIFER (EDF), through a project funded by the European Commission.



### > Securing wood supplies to provide towns with energy

This is an aim for CIRAD\*, which is working in Kinshasa, Kisangani and Brazzaville to help farmers manage their forests better and make charcoal production more efficient.

\* Makala project



CIRAD is a French research centre working with developing countries to tackle international agricultural and development issues.

With those countries, it works to generate and disseminate new knowledge, support agricultural development, and contribute to the debate on the main global issues concerning agriculture, food and rural territories.

CIRAD has a global network of research and training platforms in partnership and regional offices, from which it conducts joint operations with more than 90 countries.

It has a staff of 1800, including 800 researchers. It has an annual budget of 218 million euros, with two thirds provided by the French government.

> [www.cirad.fr](http://www.cirad.fr)

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