

Support and *public policy*

This chapter discusses family farming research activities along two main lines: supporting farmers regarding innovations or resource management, and interactions between public policies and local or regional stakeholders.

Eight research units of the Agropolis International platform are involved in these activities. Four of these units devote substantial research to the development of tools and methods to support family farming and their organizations regarding innovation, resource and territorial management.

A first group of case studies presented in this chapter deal with participatory (or action research) interventions that link farmers and local stakeholders in the research process on a relatively diverse range of topics (acceptance of livestock vaccinations, farm changes and management, market access, taking up farming, and pluriactivity support, etc.). Action research in partnership or support initiatives (e.g. using mapping, simulation or modelling tools) generate scientific knowledge for the academic community of course, but also knowledge that farmers or other stakeholders associated with the studies can directly mobilize and use. The aim is to strengthen their decisionmaking or management capacities (markets, sector globalization, climate change, local development strategies). Interventions specifically regarding action research in partnership also address social and organizational change issues, alongside research on technical changes. Moreover, technical innovations are designed in close to real conditions with the participation of farmers and/or local technicians.

A second series of case studies highlight examples of different research positions regarding public policies focused on family farming. Agricultural and/or development-oriented research is conventionally

mobilized by policymakers to generate technical or economic innovations that could contribute to updating the content of public policies and, more recently, to directly participate in fora for public policy debate and formulation. A second area of research concerns the assessment of impacts—especially economic—of policies on target communities (e.g. economic and social evaluation of animal health programmes).

A third approach concerns the analysis of public policy development and implementation. This is, for instance, the case when programmes include the participation of local communities in decisionmaking on the terms of initiatives and projects on territorial management and development or forest resource management. Finally, another approach regarding interactions between public and private stakeholders is to begin by an analysis of standards. The production, application and processes pertaining to the certification of standards (sanitary, commercial and quality) now have increasingly marked impacts on the production and marketing of fruit and vegetables, animal products, wood, as well as various tropical products faced with sustainable development challenges (palm oil, GM seeds, etc.).

Regardless of whether the issue concerns supporting stakeholders or public policies, the time has come for 'participation' in a broad range of ways, and for the contribution of very diverse stakeholders (public and private, agricultural and nonagricultural, local or not) in defining problems and family farming futures. In this new discussion and action setting, the examples in this chapter show that research has been able to develop positions, methods and tools to renew its status and contributions.

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& Pierre Gasselin (UMR Innovation)**



▲ Business and employment cooperatives (here Terracoopa, on the outskirts of Montpellier)—an alternative to overcome difficulties concerning land access and finding funds to get set up in farming.

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Supporting stakeholders in their innovation initiatives

Rural societies are currently undergoing major changes due to rapid transformations in their environment, ranging from globalization to the advent of new forms of local governance. Territorial stakeholders innovate

to take advantage of development opportunities, manage dwindling resources and cope with crises.

This is a new setting for research intervention on territorial dynamics and changes in agricultural and agrifood production systems.

The joint research unit *Innovation and Development in Agriculture and the Agrifood Sector* (UMR Innovation, CIRAD/INRA/Montpellier SupAgro) conducts multidisciplinary research in France and abroad on innovations, which are considered as individual or collective, technical, organizational or institutional processes. It focuses on the entire innovation process, including stakeholders' motives and objectives (farmers, organizations, companies, administrations, politicians, research, etc.), ways that stakeholders actually implement change, methods for supporting innovation and innovation-induced development impacts. The unit conducts joint agronomy-social science research on 'location-specific innovation', with stakeholder involvement in various agricultural development situations and on different topics (agricultural techniques, alternative

farming systems, localized agrifood systems, etc.). Further research is aimed mainly at promoting the development of family farming which, because of its innovation and adaptation capacities, is a sustainable production model. The researchers combine comprehensive, diagnostic and modelling approaches, while also designing tools to support stakeholders in the innovation process. They opt for action research in partnership initiatives with the aim of including stakeholders in the research and supporting innovation processes.

The UMR is organized around three teams:

- On the farm scale, the 'Technical and organizational changes in farming systems' team studies change dynamics involving farmers and rural households.
- On the agrifood system scale, the 'Food markets and territorial development' team studies the dynamics of agrifood products and markets.
- On the project territory scale, the 'Dynamics and governance of urban agriculture' team studies the dynamics and territorial governance of 'urban area-farming' relationships. ●●●

Main teams

**UMR Innovation
Innovation and Development
in Agriculture and the Agrifood Sector**
(CIRAD/INRA/Montpellier SupAgro)
50 scientists

**UMRTETIS
Spatial Information and Analysis
for Territories and Ecosystems**
(AgroParisTech/CIRAD/IRSTEA)
73 scientists

**UPRAGIRs
Animal and Integrated Risk Management**
(CIRAD)
27 scientists

**UPR B&SEF
Goods and Services of
Tropical Forest Ecosystems**
(CIRAD)
45 scientists

Supporting mixed crop-livestock family farms in their change dynamics

Family farms often combine mixed crops and livestock for income security and autonomy. These complex production systems require specific tools to support their change dynamics. To this end and in collaboration with partners, several UMR Innovation researchers designed and tested an individual support approach in various settings: predominantly dairy farms in Brazil, Morocco and Peru; diversified farms with suckling cows in southwestern France; and diversified farms with livestock production units of different sizes in Burkina Faso and Madagascar.

This approach is based on a spreadsheet simulation tool (Crop Livestock Farm Simulator, CLIFS) which can be used in combination with other tools (e.g. Olympe in Madagascar).

CLIFS integrates crop and livestock farm components and their interactions while retaining a general structure, calculation procedures and output variables that can be readily understood by farmers. Farm change scenarios are designed with farmers and assessed on the basis of several resource supply and demand balances (food products, fodder, organic manure) and related economic results.



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The support approach is structured in three phases based on the design and simulation of an initial scenario representing the current farm situation, a 'project' scenario based on the farmer's future intentions, and alternative scenarios that open a range of possibilities. The issues addressed concern the choice and sizing of livestock production units to increase milk production, the choice of fodder system with a view to autonomy, the introduction of innovations such as relay crops or partial use of cover crop biomass, and the analysis of farm sensitivity to climate and economic shocks. This approach, which is well rated by farmers since it specifically addresses their situations and questions, should now be transferred to advisory providers to assess its relevance in a professional environment.

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▲ Working session with a farmer in the Lake Alaotra region, Madagascar.

Supporting pluriactive farmers in Languedoc-Roussillon region

The geographical and economic, and to some extent historical and cultural, features of Languedoc-Roussillon region (France) are amenable to pluriactivities. This includes seasonal tourism activities in coastal and inland areas, the wine growing crisis, historically pluriactive settings in the Mediterranean highlands and high-growth periurban areas. Pluriactivity is, however, nowadays as much conducive to the creation and development of activities as it is representative of precarious employment and work. It is a widespread social and technical model that is often misunderstood.

The *Insertion territoriale des systèmes d'activités des ménages agricoles* (INTERSAMA) project, which combined 10 researchers (UMR Innovation, TETIS and METAFORT³) and six regional development structures, aimed to analyse the functioning and dynamics of farming household activity systems in Languedoc-Roussillon, while also studying their territorial integration and support mechanisms devoted to them. This partnership research involved activities and training in which researchers and stakeholders were joint instigators in the process and

outcomes. Everyone participated in defining the issues, drawing up responses and assessing the process, with the threefold aim of generating knowledge, supporting social transformation and enhancing individual and collective skills and expertise.

The INTERSAMA collective contributed to various theoretical frameworks, especially on the activity system concept, the support relationship, as well as the analysis of work conditions and organization. Pluriactivity projects give rise to fundamental support issues due to their precarious nature, incompatibility with the standard enterprise model and the Fordist labour system. In addition to its scientific output, INTERSAMA designed and tested three complementary tools to support the creation of activities in rural areas (accessible online), while contributing to the debate and formulation of a regional rural pluriactivity support policy.

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For further information: www.intersama.fr

* UMR Transformations in Activities, Areas and Forms of Organisation in Rural Territories (AgroParisTech/INRA/IRSTEA/VetAgroSup)

Family farmers—major tropical forest management stakeholders

The scientific project of the **internal research unit *Goods and Services of Tropical Forest Ecosystems*** (UPR B&SEF, CIRAD) aims to study the ecology of tropical forests, while defining, implementing and assessing policies, instruments, regulations and practices associated with these ecosystems. The overall goal is to facilitate the adaptation of social and ecological systems to constraints and opportunities resulting from global changes and to enhance the sustainability of services provided by tropical forest ecosystems for the benefit of societies at local and global scales.

The team focuses on three research topics:

- ❶ Natural tropical forests: these are a challenge for sustainable development because of their potential to produce essential goods and services for our societies. They are the richest terrestrial biodiversity and carbon pool and the focal point of major global changes.
- ❷ Societies that inhabit or depend on them: the unit studies regulations, practices, uses, knowledge and representations regarding forests, as well as cooperation-competition and social capital building dynamics.
- ❸ Public policies: policies or instruments that apply to forests can be external to the studied social and ecological system (international conventions, national taxation, national plans for adaptation to climate change, markets and associated financial mechanisms, etc.) or internal to them (domestic markets, local management regulations, practices, organizations and institutions, etc.).

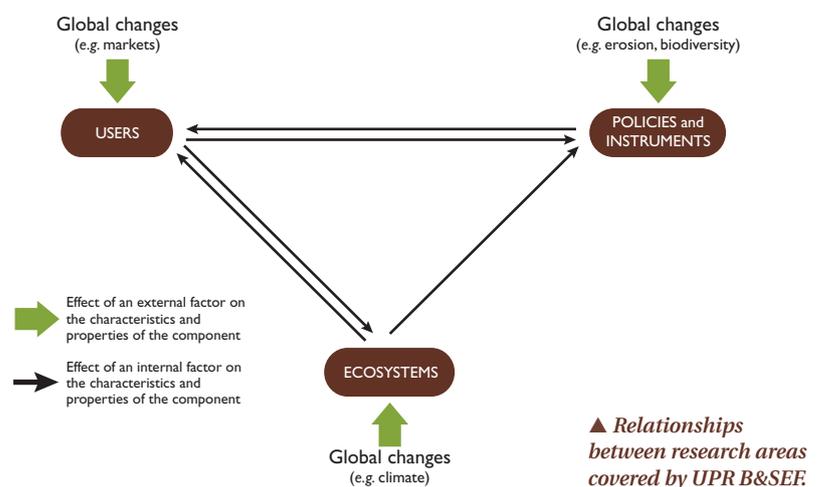
This choice acknowledges the importance of interrelationships between ecological dynamics, stakeholder behaviours and political and collective decisions at different geographical scales. The unit studies these topics and constituents to address a series of social and research issues.

The unit has decided to structure these research issues as well as its entire research team in three general research areas (*see below*), each with its own specific research hypotheses. It also elicited two major cross-sectoral issues that the entire team is addressing.

The unit studies interactions between forests and communities that inhabit or depend on them. Family farmers living in the vicinity of or within dry or humid tropical forests are major stakeholders in the management of these forests—which they tap, preserve, transform or destroy. The unit analyses the impact of family farming on goods and services generated by forest ecosystems, while proposing participatory tools to promote sustainable forest resource management. ●●●

UPR B&SEF focuses on social and ecological systems for which forests and forest resources are key elements.

Other teams focused on this topic
<p>UMR ART-Dev Actors, Resources and Territories in Development (CNRS/UM3/CIRAD/UPVD/UMI) 70 scientists</p>
<p>UMR G-EAU Water Resource Management, Actors and Uses (AgroParisTech/CIHEAM-IAMM/CIRAD/IRD/IRSTEA/Montpellier SupAgro) 70 scientists</p>
<p>UMR MOISA Markets, Organisations, Institutions and Stakeholders Strategies (CIRAD/INRA/Montpellier SupAgro/CIHEAM-IAMM) Around 60 scientists</p>
<p>UPRAIDA Agroecology and Sustainable Intensification of Annual Crops (CIRAD) 56 scientists</p>
<p>UPR GREEN Management of Renewable Resources and Environment (CIRAD) 20 scientists</p>
<p>UPR HortSys Agro-ecological Functioning and Performances of Horticultural Cropping Systems (CIRAD) 28 scientists</p>





▲ Discussion to draw up a simple management plan in a village in Bas-Congo province, Democratic Republic of the Congo.

Public policies and sustainable land-use planning

Some research activities of UPR B&SEF are aimed at supporting public policies so as to mainstream family farming activities in sustainable land-use planning and sustainable natural resource management. This has been done, for instance, regarding oil palm in Cameroon, as well as village land management in Indonesia and the Democratic Republic of the Congo.

CIRAD, in partnership with the World Wide Fund for Nature (Central Africa Regional Programme Office, WWF-CARPO), IRD and the Center for International Forestry Research (CIFOR), supports the Cameroonian Ministry of Agriculture in defining a national sustainable development strategy for oil palm. The aim is to promote family and small-scale palm oil production while preserving high conservation value forest cover and ecosystems.

Locally, village communities in Indonesia participate in decisionmaking regarding their lands via land-use plans to integrate family farming and forest activities in a landscape

mosaic. A participatory mapping tool is used for this purpose, which shows the scale of land-use plans on a subnational level (districts, 1:50 000). Village communities produce a set of maps showing the current uses of their land and their expectations for the future. These maps are then discussed with decisionmakers (local government).

In the Democratic Republic of the Congo, simple land management plans are drawn up in a participatory manner with village communities. These plans should help stall deforestation induced by the growing demand for fuelwood in large urban centres by organizing sustainable wood and food production on village lands. Village communities located on the periphery of large urban centres are currently living in an environment that is so degraded that forest ecosystems and associated goods and services have almost disappeared.

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Efficiency and acceptance of livestock disease control by family livestock farmers—avian influenza in Vietnam and Egypt

Phan Dang Thang © CIRAD



▲ Vaccination of a reared duck flock in Long An province, Vietnam.

Highly pathogenic H5N1 avian influenza is endemic in several countries (China, Bangladesh, Indonesia, Egypt, Vietnam), with significant socioeconomic impacts. Vietnamese and Egyptian governments set up a mandatory mass vaccination programme against this disease implemented through biannual vaccination campaigns for family-reared village poultry (2005-2010 in Vietnam, 2007-2009 in Egypt). Vaccination of commercial poultry (partly from family farms) is handled by the private sector, with varied efficiency depending on the country and type of production.

Studies carried out by UPR AGIRs highlighted the importance of social, cultural and economic factors in the acceptance of community-controlled measures. In Egypt,

family poultry farms (village or commercial) did not vaccinate their flocks, partly because of their limited confidence in government practices, the lack of information, etc. In Vietnam, such vaccinations seemed to be more acceptable, but with marked geographical variations due to the decentralized administration, problems of accessibility and local management of the risk by smallholders, thus reducing the economic benefit they could gain from the vaccinations.

Economic evaluation of health programmes is a major argument in designing control strategies on a national scale. However, the economic priorities of family poultry farmers differ from those at the national level. Moreover, the effectiveness of these programmes depends on the acceptance by farmers to implement the measures and report disease cases. Current evaluation methods do not take these aspects into account and are based on national surveillance data of often questionable quality and reliability. Control programme evaluation methods should involve participatory and interdisciplinary approaches in order to fully understand these constraints, while ensuring that family farmers participate in the decisionmaking process. In Egypt, mass household poultry vaccinations were stopped after these efficiency studies were conducted on family poultry farms.

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Health risks associated with livestock and wild animals in developing countries

The internal research unit *Animal and Integrated Risk Management* (UPR AGIRs, CIRAD) aims to understand, predict and manage health risks associated with livestock and wild animals in developing countries in a global change setting (habitat simplification, biodiversity loss, urbanization, deforestation, trade globalization, global warming). A broad range of methods—descriptive epidemiology, ecology, geomatics, biostatistics, health geography, anthropology, quantitative epidemiology, modelling of complex systems—are thus implemented under two complementary approaches jointly applied in research programmes

and projects in various geographical areas, including Southeast Asia, Southern Africa, Madagascar and the Mediterranean region:

- ① The first approach aims to identify factors determining the behaviours and spatiotemporal evolution of animal diseases—zoonotic or not—that are important in terms of health and economic impacts. These diseases are emerging or endemic, vector-borne or directly transmitted (avian influenza, foot and mouth disease, tuberculosis, African swine fever, Rift Valley fever, etc.). Such disorders—by causing mortality, morbidity or decreased milk or meat production—weigh heavily on the economy and subsistence of small family farms.
- ② The second approach focuses on the functioning of socioecosystems jointly inhabited by hosts (wild

animals and livestock, humans, i.e. farmers and/or consumers) and pathogens. The aims are to assess the animal and public health risks and to propose methods for managing these risks (monitoring and control) that are tailored and optimised for the considered socioecosystems. Efficient control of animal diseases requires rapid responses when an epizootic disease emerges. Addressing this challenge is essential in developing countries where resources (specific expertise, funding, information technology tools, etc.) are limited.

The unit works closely with many partners—research and development institutions—in France and developing countries (Africa and Asia) and is involved in several international networks. ●●●

Supporting territorial development stakeholders

The joint research unit *Spatial Information and Analysis for Territories and Ecosystems* (UMR TETIS, AgroParisTech/CIRAD/IRSTEA) produces methods and knowledge to enhance spatial information management in order to gain insight into environment-society interaction dynamics and support stakeholders in sustainable land management.

The development and transmission of useful, usable and used spatial information underlies all of the unit's research. It is structured in four teams spanning the entire 'spatial information chain': acquisition of spatial (especially satellite) data and processing; analysis and spatiotemporal modelling of agroenvironmental and territorial systems; information system management; and conditions for the use of spatial information by territorial stakeholders.

This latter team, in particular, conducts research focused on farming: analysis of the effects of the development of agrobusinesses or mining companies on territories and family farms; and the use of spatial information to support small-scale farmers.

The unit's activities—besides producing knowledge and methods on the spatial information chain—are also focused on training (initial training, research-based training and ongoing training) and on transfer, especially through public policy support, partnerships in developing countries and expertise or partnerships with private operators.

UMR TETIS operates in various thematic areas—agriculture, environment, territories, resources, health and natural risks—associated with territorial development and sustainable agroenvironmental management. It works closely with territorial managers and stakeholders and develops partnerships with other thematic teams.

A crosscutting and unifying component of the unit's scientific project focuses on 'observatories'—a unique type of information system—which are taken to be 'sociotechnical information and communication mechanisms'. These downstream mechanisms mobilize and integrate complementary functions (data acquisition and production; analysis and synthesis; management, editing and dissemination), thus enabling unit members to span the spatial information chain and work on common ground.

The unit is also involved, through the EQUIPEX GEOSUD project*, in a strategy geared towards the sharing of satellite information between the scientific community and territorial and public policy management stakeholders. ■

* <http://geosud.teledetection.fr/projet-equipex-geosud.html>

Capacity of family farmers to manage the impacts of globalization in the eastern Amazon region

In the eastern Amazon region, in Baixo Tocantins (State of Pará), and in cooperation with the Federal University of Pará (UFPA) and IRD, UMR TETIS is analysing the impact of globalization (models, capital, infrastructures, information, etc.) on local societies, and especially on small-scale farming in a so-called peripheral area. The PERIMARGE project (ANR project 'Peripheral and marginal spaces: interpreting relationships to centres in a global world'), coordinated by IRD, conducts a comparative analysis of data from six countries in Latin America and Africa. The aim is to understand the contemporary sociospatial dynamics, particularly those that affect small-scale farming patterns in areas 'on the margins of development'. The analysed territory—the Mocajuba municipality—is marginal because it is relatively isolated, but also due to the construction of an upstream dam (which has made small-scale fishing almost impossible) and pest and disease problems that have almost annihilated pepper cash crops in this region.

A model was developed to characterize the impacts of globalization influences on the conditions and nature of production systems, on the distribution of value (income) and on governance. This model links the multiplication of centres and the diversification of material and immaterial flows. A trajectory analysis will be conducted to assess the capacities of small-scale farmers and other territorial stakeholders to manage these influences, thus reflecting a differentiated capacity for the activation of current resources (including cocoa and natural rubber, whose qualities are acknowledged) and for organization. A certain degree of autonomy regarding centres is foreseen.

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▲ The introduction of oil palm on family farms in Amazonia—an example of agricultural globalization.

This work is part of a project that the research unit is developing with UFPA, which aims to question the current territorial development model and assess possible future patterns at different organizational levels in collaboration with rural development stakeholders.

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Standards and family farming

The demand for products that meet sustainable production criteria led to marked development in voluntary standards regarding environmental and social 'good practices'. Is family farming able to benefit from these standards?

Two research projects on voluntary international standards in which UMR MOISA is involved—European NTM Impact project (2009-2011) and the ANR Prigoue project (2011-2014)—have generally highlighted the difficulties family farmers encounter regarding their inclusion in these certified sectors. They benefit little from labelling due to their inability to adapt to the physical and human capital requirements. This situation could also be explained by these farmers' low participation in defining these standards (e.g. multi-stakeholder roundtables for sustainable soybean and palm oil). The hegemony of these standards and differential access to quality assurance generate inequalities between producers (e.g. the exclusion of small Peruvian mango producers from GlobalGap-certified export channels, and the disparity in impacts on different producers of GlobalGap-certified liches in Madagascar).

The dissemination and adoption of these private standards by smallholders often requires the assistance of non-governmental organizations (NGOs), donors or even industrial operators, indicating that certification sustainability is an issue for family farming. This could be illustrated, for instance, by the fact that many litchi producers in Madagascar lost their certification, especially following the departure of donors, that chocolate manufacturers are pervasively present in the organization of



▲ An increase in the number of voluntary sustainability standards.

the Rainforest Alliance certification of Ivorian cocoa, and that Amazonian communities in the Forest Stewardship Council lost their certification due to the mismatch between NGO support and that of local public institutions.

Finally, family farmers should form collective organizations to gain access to the benefits of certification through the adoption of standards that are tailored to local realities and practices (e.g. organic rice in Laos), and by adopting less expensive certification strategies (e.g. participatory certification in Latin America).

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For further information:

- NTM Impact project: www.bioeconomy-alcue.org/gg
- Prigoue project: www.prigoue.cluster1.easy-hebergement.net

Strengthening smallholder farmers' capacities for better market access

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▲ A wholesale market at Alexandria.

The access of smallholder farmers in developing countries to agricultural markets is a strategic lever for enhancing their livelihoods and reducing rural poverty. Sustainable market integration of these farmers depends on the implementation of institutional arrangements—contracts, bundled sales, information systems on prices—to reduce asymmetries which constrain them, and on the formulation of public policies to facilitate implementation of these institutional arrangements.

The Empowering Smallholder Farmers Into Markets (ESFIM) project, funded by the International Fund for Agricultural Development (IFAD), supported farmers in 11 countries (Benin, Kenya, Uganda, Malawi, Madagascar, Peru, Bolivia, Uruguay, Costa Rica, India and the Philippines) in their appeal to public authorities and donors to improve their access to markets. With the support of researchers from three AGRINATURA institutions (Wageningen University & Research Centre, CIRAD and Natural Resources

Institute), farmers' organizations identified priority issues and supervised studies conducted by local experts. The findings of these studies have furthered these organizations' reflection on the market access issue, while substantiating their arguments and strengthening their claims in the public debate.

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For further information: www.esfim.org

Participation of family farmers in rural development in Latin America

Research conducted by UMR ART-Dev under the 'Public policy and inequality in Latin America' partnership research platform revealed that the participation of family farms and their organizations in rural development policy negotiations or implementation is linked to a combination of four factors:

- The emergence of national family farmer or peasant organizations in democratic transition settings; which, in the 1990s and especially the 2000s, led to the drawing up of targeted policies on family farming.
- The more or less marked withdrawal, depending on the country, of the State from technical assistance, training, marketing, sectoral regulation, credit, etc.
- Policy decentralization and/or territorialization.
- Finally, the adoption of a crosscutting approach to policies (concerning the environment, health, etc.).



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In Brazil, a focus country, this participation is combined with production-oriented support, but with few allocated resources.

Assessments of federal rural territorial support policies launched in 2004 showed that this participation opened windows of opportunity for family farming representatives regarding training and inclusion in public policies. However, a closer look revealed that this mainly benefitted local leaders and traditional farming community representatives.

Once they were 'transactional leaders', they became professionalized in negotiating rural development projects with technicians, while also being instrumental in overseeing policy implementation. Farmers remain dependent on the expert technical and agricultural system which maintains control over projects. Territorialization is hampered by the federal administrative and financial structure and procedures, and the crosscutting approach is thwarted by corporatism of the sectoral ministries (Brazil, Uruguay).

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▲ Participation in action...

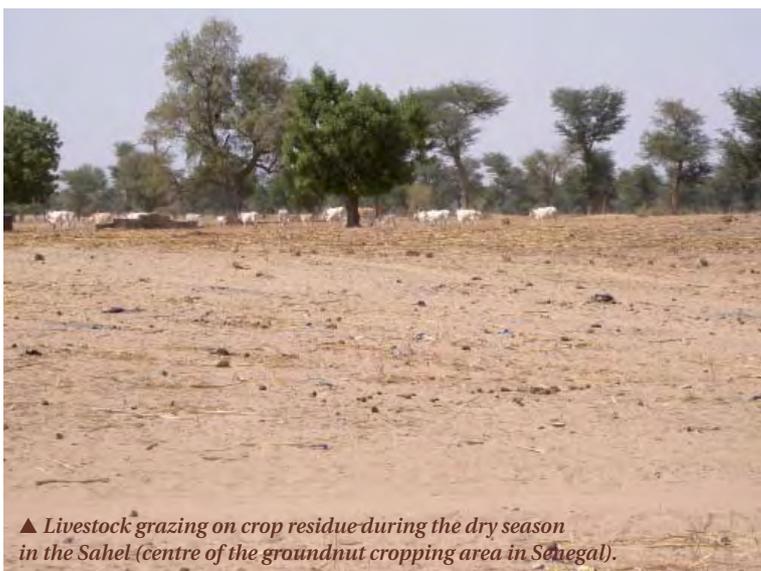
Vulnerability of family farming in West Africa to variability and climate change

The aim of the 'Environmental and Social Changes in Africa: Past, Present and Future' project (ANR-ESCAPE, 2011-2015) is to characterize the vulnerability of family farming in West Africa to variability and climate change and to the economic context, while proposing adaptation options for the future. In this project, which involves climatologists, sociologists and micro- and macro-economists, UPR AIDA agronomists contribute to bioeconomic farm modelling in order to determine the extent of farmers' technical flexibility according to their biophysical and economic environment.

The model will help assess the impact of climate change scenarios on farming families' income, food security, farm production and their main environmental impacts. These climate change scenarios will be matched against economic change scenarios: variations in the price ratio between products and inputs and their interannual variability, the development or not of credit and insurance against climatic hazards. The impacts of farmers gaining access to climate information and meteorological information will also be investigated. The bioeconomic model and simulations will also be compared to farmers' viewpoints so as to identify potential adaptation strategies not taken into account in the modelling process.

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For further information: www.locean-ipsl.upmc.fr/~ESCAPE



▲ Livestock grazing on crop residue during the dry season in the Sahel (centre of the groundnut cropping area in Senegal).

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