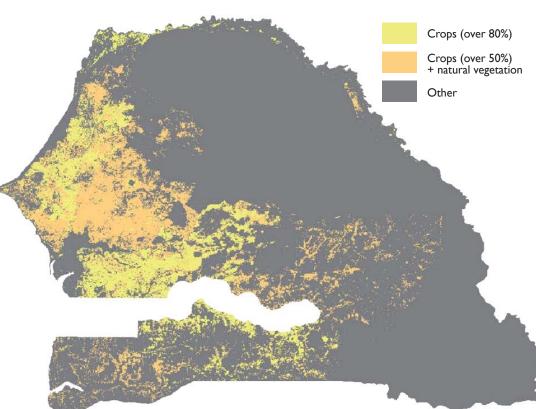
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▲ Cultivated area in Senegal in 2005.

Main teams

UPR AIVA - Agro-ecological Adaptation and Varietal Innovation (CIRAD) 28 scientists, with 1 involved in the topic Director: Michael Dingkuhn, michael.dingkuhn@cirad.fr www.cirad.fr/en/research-operations/researchunits/aiva

UPR Functioning and Management of Tree-Based Planted Ecosystems (CIRAD) 17 scientists, with 2 involved in the topic Director: Jean-Pierre Bouillet, jean-pierre.bouillet@cirad.fr

www.cirad.fr/en/research-operations/researchunits/functioning-and-management-of-treebased-planted-ecosystems

> URP Pastoralism (CIRAD) 5 scientists, with 3 involved in the topic Director: Amadou Tamsir Diop, <u>amtadiop@sentoo.sn</u>

UPR SCA - Annual Cropping Systems (CIRAD) 51 scientists, with 6 involved in the topic Director: Florent Maraux, florent.maraux@cirad.fr www.cirad.fr/en/research-operations/researchunits/annual-cropping-systems

Other team focused on this topic

UMR AMAP - Botany and Computational Plant Architecture (see page 18)

Mapping agricultural intensification patterns in Senegal and production modelling

Agricultural production forecasting is a keystone of early drought warning systems in Sudanian-Sahelian regions where climate change has a heavy impact. The aim of this project is to improve the production forecasting capacity by characterizing agricultural landscape variability via remote sensing. It addresses two questions:

- How can this variability be expressed on different scales?
- How can it be taken into account to improve yield estimations?

Agricultural landscape descriptions are based on the characterization of landuse patterns through the analysis of spectral, spatial and temporal information derived from remote sensing images. The data and methods should be tailored to semiarid environments and to their heterogeneous mosaic patterns (rangelands, crops, wooded savannas, etc.), while also being adapted to the economic conditions in these regions (low-cost monitoring). MODIS and SPOT VEGETATION images were used for this study.

Initial results have been obtained for Senegal (African Monsoon Multidisciplinary Analysis [AMMA] European Integrated Project, 2005-2009) by combining thematic information from different sources with time-series SPOT VEGETATION and MODIS satellite images. A first 'stratification' phase involves delimitation of homogenous agroecological zones by visual analysis of thematic maps (heterogeneous in terms of dates, media, etc.) describing the soil, relief, vegetation and climatic features. A second 'classification' phase is focused within each of these zones, and then photointerpretation of each class is done using SPOT set images (high resolution) and monitoring the normalized difference vegetation index (NDVI) on MODIS time series (NDVI is used to monitor plant phenology). Finally the crop land-use rates are mapped (classification at three levels: absence, >50%, >80%) by analysing, per pixel, decadal NDVI time series datasets derived from the satellite images.

Temporal changes in types of land use will be the focus of further studies.

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