[redacted]

5128

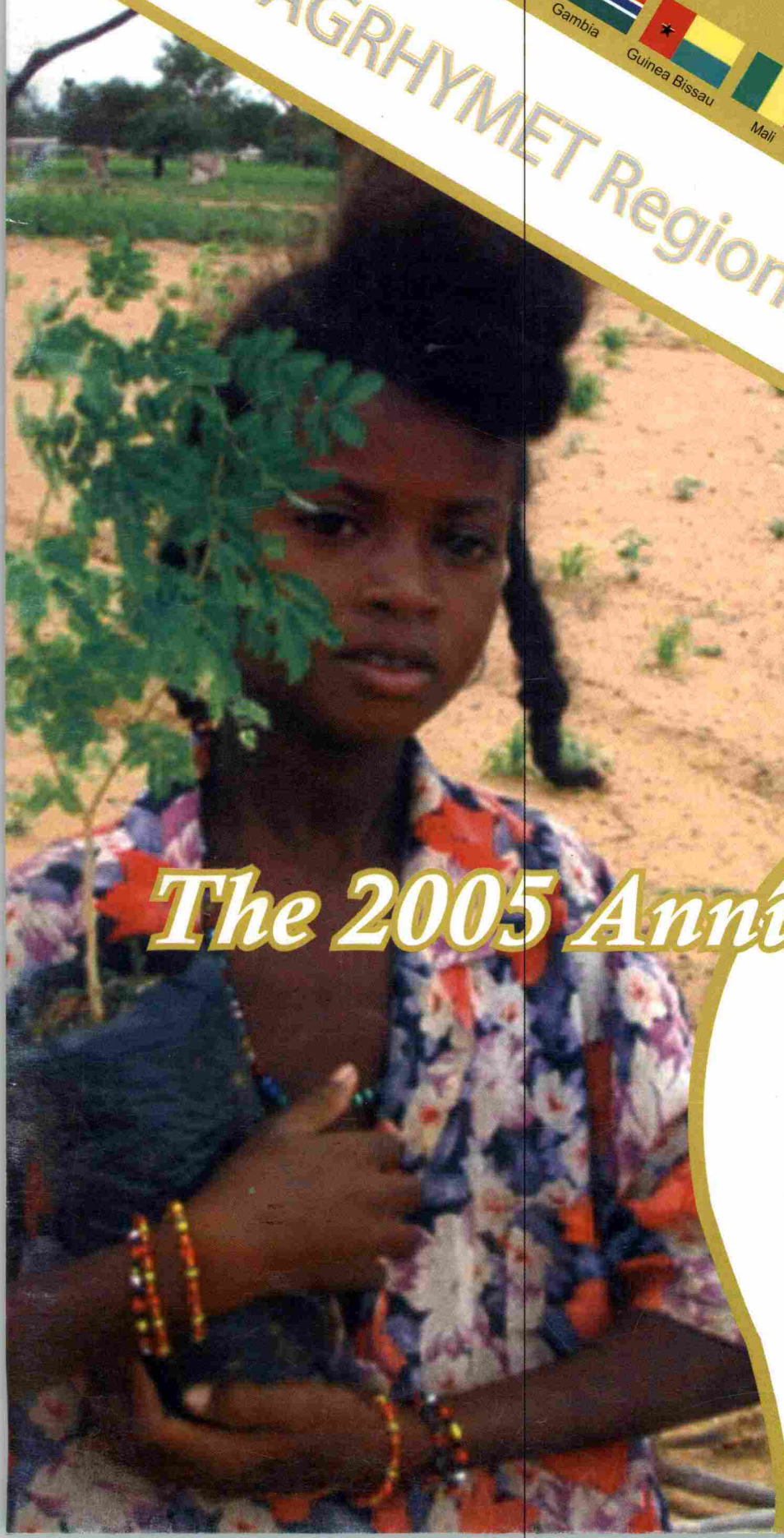
Comité Permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel

Permanent Interstate Committe for Drought Control in the Sahel

[redacted]

Burkina-Faso
Cape Verde
Gambia
Guinea Bissau
Mali
Mauritania
Niger
Senegal
Chad

AGRHYMET Regional Centre



The 2005 Annual Report

The 2005 Annual Report

The AGRHYMET Monthly Bulletin

COMITÉ PERMANENT
INTER- ÉTATS DE LUTTE
CONTRE LA SÉCHERESSE DANS
LE SAHEL

PERMANENT INTERSTATE
COMMITTEE
FOR DROUGHT CONTROL IN THE
SAHEL

MENSUEL AGRHYMET

N° M-05/05 Juillet 2005

La pluviométrie globalement bonne et assez bien répartie dans le temps et dans l'espace, la précocité des semis, le bon état végétatif des cultures et une situation phytosanitaire relativement calme ne doivent pas masquer les cas localisés de stress hydriques des cultures en juillet, d'inondations et de débordements de certains plans d'eau dans des zones à surveiller au cours de cette campagne.

■ La pluviométrie mensuelle de juillet 2005 a été mal répartie dans le temps. La première partie du mois a été certes caractérisée par des pluies abondantes et bien réparties. Par contre, une pause pluviométrique, allant de quelques jours à deux semaines, a été observée dans la deuxième partie du mois. Par conséquent, les quantités relevées ont été inférieures à la normale dans plusieurs localités de la zone agricole des pays du CILSS. Ces déficits pluviométriques localisés ont été observés dans les Wilayas de Guidimaka et Hodh el Chargui en **Mauritanie**, dans le sud de la région de Tambacounda, dans la région de Ziguinchor et dans la région de Niayes au **Sénégal**, dans la zone ouest de la **Gambie**, dans la quasi totalité de la **Guinée Bissau**, dans la quasi totalité de la zone agricole du **Mali**, dans le sud-ouest et le centre du **Burkina Faso**, dans la région de Tillabéry et au sud de celle de Dosso au **Niger**, et dans les préfectures de Guéra, Salamat, Ouaddai, Moyen Chari, Logones oriental et occidental au **Tchad** (figures 1.1 et 1.2). Quant aux cumuls saisonniers au 31 juillet, ils ont accusé des déficits dans la bande côtière des Niayes au **Sénégal**, par endroits dans les régions de Kayes, Sikasso et Ségou au **Mali**, dans le sud-ouest et l'ouest du **Burkina Faso**, par endroits dans le nord-est de la région de Tillabéry et le sud de celle de Dosso au **Niger**, et dans l'extrême Sud du **Tchad** (figures 1.3 et 1.4).

■ Avec l'installation définitive de la saison des pluies au mois de juillet sur l'ensemble du Sahel, caractérisée cette année par des pluies relativement régulières de juin à juillet avec des cumuls assez importants, on a assisté à une montée des eaux sur pratiquement l'ensemble des cours d'eau pérennes ou temporaires. La régularité des pluies jusqu'à la mi-juillet au Sahel central a conduit à des écoulements exceptionnels au niveau de certains cours d'eau non pérennes. La pause pluviométrique observée durant la dernière décade de juillet toujours au Sahel central a ralenti l'importance de la montée des eaux. Dans le même temps, dans la partie Ouest du Sahel, des pluies appréciables observées, causant par endroits des inondations notamment en **Gambie** et au **Mali**. Ces bonnes conditions pluviométriques sont responsables d'une montée appréciable du niveau d'eau des réservoirs de moyenne taille avec même des débordements au niveau de certains

Avec le renforcement attendu des pluies en importance sur l'ensemble du Sahel, on assistera à des montées des bassins et à des risques de débordements

Centre Régional AGRHYMET
FAX : (227) 72...

N° S-02/05

BULLETIN SPECIAL CRIQUET PELERIN

Situation du 21 au 30 juin 2005

Situation acridienne relativement calme, malgré l'amélioration des conditions écologiques

La situation du criquet est restée calme dans le Sahel occidental malgré une amélioration sensible des conditions écologiques. Au **Mali**, l'arrivée de populations allochtones matures au début du mois a été rapportée par une source nomade et la présence de groupes d'adultes immatures a été notée dans la région de Kidal. Des solitaires matures ont été observés dans le sud-est de la **Mauritanie**. Au **Niger**, les opérations de lutte menées depuis le début des premières infestations en mai ont été efficaces puisque la situation du criquet est relativement calme dans la région de Zinder.

Une information non confirmée a fait état de fortes infestations en Afrique de l'Est par des essaims qui seraient venus du Soudan.

Les conditions écologiques se sont améliorées dans les aires d'habitat du criquet ainsi que dans la zone agricole, suite aux précipitations reçues pendant le mois de juin.

Au cours des prochaines décades on ne s'attend pas à un développement important du criquet dans le Sahel Occidental (Mauritanie,Ouest Mali, Sénégal, Guinée Bissau et Gambie) ni dans le Sahel Central (reste du Mali et Burkina Faso). Les éclosions se poursuivront au Tchad où de nouveaux adultes commenceront à apparaître vers la fin juillet ou dans la première semaine du mois d'août.

Le Sahel Occidental (Cap Vert, Mauritanie, Ouest Mali, Sénégal, Gambie et Guinée-Bissau)

Conditions écologiques

Au cours des deux premières décades, des pluies généralement faibles à modérées, mais localement fortes, ont touché le sud-est de la Mauritanie (la région des 2 Hodhs). Elles ont touché le Centre en troisième décade. L'extrême Nord (El Hank) semble avoir reçu de faibles précipitations en première décade. L'ouest du **Mali** (régions de Kayes et de Koulikoro) a enregistré des pluies modérées dans l'extrême nord, localement fortes au Centre et au Sud. Au **Sénégal**, elles ont été faibles à modérées. faibles dans l'extrême ouest et fortes dans le Sud. En **Gambie** et en **Guinée Bissau**, elles ont été faibles à modérées. à l'exception du sud de la **Guinée Bissau** où elles ont été fortes.

Situation acridienne

Des individ...
Charg...

...nt été observés dans le sud-est de la **Mauritanie** (Hodh EL ...res décades.

...dérées pourraient toucher le sud-est de la Mauritanie, la Gambie, la ...au Mali. Dans le reste de l'Ouest Mali, les pluies seront modérées ...e ouest, où les pluies attendues seront fortes, les précipitations

...la Mauritanie. Bien que la situation soit relativement calme, il ...nt de s'améliorer.

2

N° S-03/05

BULLETIN SPECIAL INONDATIONS

RISQUE D'INONDATION AU NIGER EN 2005/2006

Généralités

Le régime hydrologique du Niger à Niamey est caractérisé d'une part, par les apports des écoulements en provenance des affluents de la rive droite durant la période de la saison des pluies et d'autre part, par les écoulements en provenance du haut bassin du Niger dont la part la plus importante arrive à Niamey durant la saison sèche au cours de la période allant de décembre à janvier. Les bassins versants des affluents de la rive droite sont situés au **Burkina Faso** (Gorouol et Sirba, cf. figure ci-après). La crue associée aux apports des affluents du **Burkina Faso** est appelée crue locale à cause de son caractère localisé dans le temps et dans l'espace, par opposition à la deuxième crue appelée crue malienne (ou soudanienne) qui est due à des apports lointains venant du haut bassin du fleuve Niger de **Guinée** et du **Mali**.

La première crue (locale) est directement liée à l'abondance des précipitations en quantité et en fréquence au sein de la partie nigero-burkinabé du bassin du fleuve Niger, mais aussi à l'état de surface des bassins qui détermine leur capacité de drainage. La crue malienne est quant à elle entièrement déterminée par la situation pluviométrique de la saison dans le haut bassin du fleuve Niger en **Guinée** et au **Mali**.

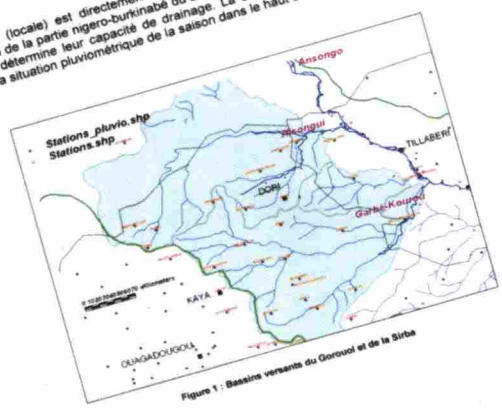


Figure 1 : Bassins versants du Gorouol et de la Sirba

3

BULLETIN MENSUEL AGRHYMET - Juillet 2005, Volume 15, N° M-05

The AGRHYMET Monthly Bulletin, a source of reliable and relevant information on seasonal crop monitoring, the cereal balance sheet, pastoral monitoring and agrometeorological predictions in the Sahel.

Foreword by the Director General

The year 2005 was characterized by the refocusing of CILSS' activities on its initial objectives in accordance with the resolution adopted by the Summit of Heads of State and Government held on January 25th, 2004 in Nouakchott, Islamic Republic of Mauritania.

The information, training and research activities carried out in 2005 by the AGRHYMET Regional Centre, fall within this framework and contribute to building capacity for poverty alleviation in the Sahel.

The AGRHYMET Regional Centre capitalized on and strengthened its achievements within the information domain through the development and transfer of new tools and methodologies to the CILSS member countries for early warning, agro-hydro-climatic predictions, seasonal crop monitoring, cereal balance sheet etc.

The execution of new projects allowed the AGRHYMET Regional Centre to have the right tools to meet the Sahelian populations' concerns in the domains of food security, water control and management and desertification control. These include such projects as the Rural Areas Based Information System referred to as "Carte d'identité rurale", Integrated Grasshopper Control in the Sahel (PRELISS), Vulnerability Monitoring in the Sahel, Strengthening the Capacities of the CILSS Member States to Adapt to Climate Change and West Africa Land Use and Land Cover Trends (LU/LC).

With regard to the strengthening of the capacity of national Services, the private sector and civil society, the AGRHYMET Regional Centre in 2006, distinguished itself through the graduation of 26 Engineer Students (BA Level) in Crop Protection and the recruitment of three new intakes of Engineer Students in Hydrology, Agrometeorology, Instrumentation and Microcomputing.

The quality of its know-how, which is recognized at national, regional and international levels, was confirmed by the promotion of seven of its experts by the African and Malagasy Council for Higher Education (CAMES) in 2005.

Furthermore, the AGRHYMET Regional Centre seeks to achieve excellence through the holding of regular meetings of the Scientific and Pedagogic Council to assess research activities in its areas of intervention.

Building on its experience and expertise, the AGRHYMET Regional Centre also developed new tools and training programmes to meet the challenges of the third millennium, notably climate change and biodiversity. The start in 2006 of the Master's Degree Programme in Concerted Natural Resource Management testifies to this.

This report is a synthesis of our institutions' activities and results. It is meant for the consumption of the general public and is therefore written to better inform and sensitize it on the AGRHYMET Regional Centre's achievements and opportunities.

The results presented in this report are the fruit of collaboration between our institution, national AGRHYMET Components, technical partners and donors and the international community.

Enjoy your reading!

The Director General

Issa Martin BIKIENGA

Contents

Presentation of ARC

The AGRHYMET Regional Centre is a specialized institute of the Permanent Interstate Committee for Drought Control in the Sahel (CILSS), which is composed of nine member States, namely Burkina Faso, Cape Verde, The Gambia, Guinea Bissau, Mali, Mauritania, Niger, Senegal and Chad.

It has an international status and is based in Niamey, Niger.

The Centre's main mission is to promote information and training in food security, desertification control, water control and management and market monitoring. It is a regional institution specialized in sciences and techniques applied to agricultural and rural development and natural resource management.

The AGRHYMET Centre's operational activities are shared between four Departments: the Training and Research Department (TRD), Technical Support Department (TSD), Information and Research Department (IRD) and the Management Support Department responsible for Administration, Finance and Accounting (MSD/AFA). They are assisted by common support units attached to the Director General's Office: the Communications, Information and Documentation, Monitoring-Evaluation and Scientific Coordination Units.

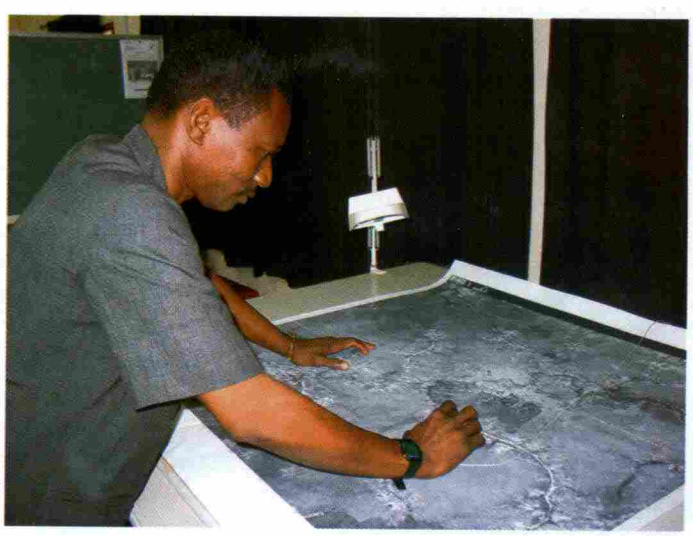
Reliable and Useful Methodologies and Tools

One of the priority objectives of the AGRHYMET Regional Centre is to sensitize and inform decision makers and other stakeholders towards more rational decision-making about food security, desertification control, natural resource and environmental management in the Sahel and West Africa.

The AGRHYMET Regional Centre collects, analyses and disseminates climatological, agrometeorological, hydrological, pastoral, phytosanitary and natural resource (soils, water, forests) data among the CILSS member countries and the international community concerned with the living conditions of Sahelian populations.

As part of its early warning system, the Center prepares and disseminates geo-referenced products based on a geographic information system (GIS). These include maps of rainfall estimates and NDVI (greenness) maps obtained from METEOSAT and SPOT Vegetation satellite imagery, respectively.

The AGRHYMET Regional Centre disseminates specialized information to various groups of stakeholders (policy makers, technical partners and donors, students, officials in rural development services, farmers' associations, non-governmental organizations, etc.) in different forms including the AGRHYMET's Monthly Bulletin, Annual Report, Website, Newsletter, thematic maps, workshops, etc.



Map digitisation at the GIS laboratory

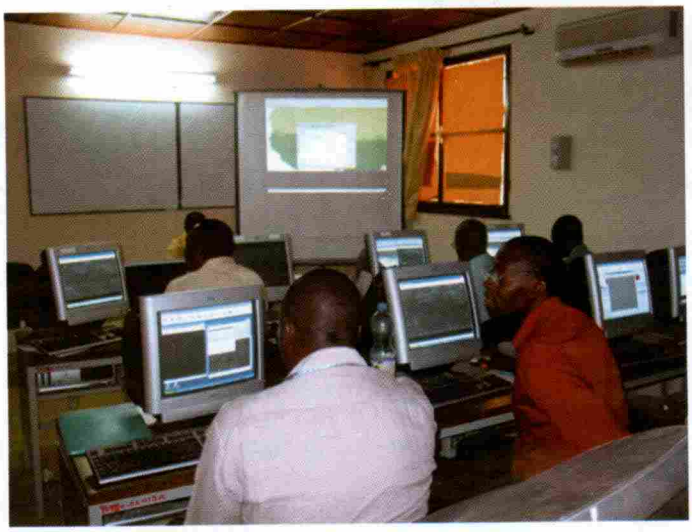
Good Quality Training Programmes Adapted to the Sahelian Context

The Centre's training programmes are designed and executed by Sahelian experts. These training programmes aim at strengthening the capacity of Africans in the conception and execution of programmes and activities in various domains such as food security, desertification control and water control and management. They have the advantage of better considering the socio-professional realities of the Sahel in particular and of West Africa in general.

Training has been successfully conducted at the Center since 1975 and comprises two-level courses (Higher Technician and Engineering levels) in crop protection, agrometeorology, hydrology, instrumentation and microcomputer maintenance. From 1975 to 2005, a total of 819 students have graduated from the AGRHYMET Regional Centre in the above-mentioned domains.

The success of these training programmes is confirmed by the recognition of the Centre's degrees by the African and Malagasy Council for Higher Education (CAMES).

The AGRHYMET Regional Centre also contributes to developing human resources in technical services of development ministries, NGOs, research institutions etc. by means of Short-Term Continuous Education Programmes on various themes related to geographic information systems, remote sensing, early warning, integrated pest management etc.



The ARC's new computer lab

Finally, the Centre has an entirely computerized Documentation Centre with approximately 31, 000 scientific and technical references in its database. These documents cover various fields related to agriculture, crop protection, climatology, rural development, natural resources, food security, and remote sensing. This Documentation Centre is an excellent source of information for lecturers, researchers, students and professionals worldwide interested in Sahelian development issues.

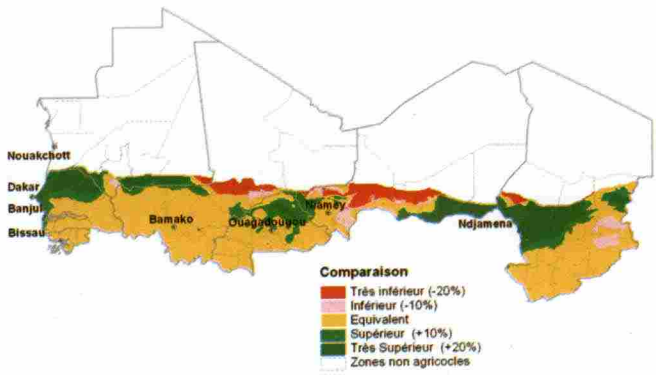
Significant Achievements

The AGRHYMET Regional Centre has asserted itself as a regional centre of excellence in the following domains:

- training of officials from within and outside the Sahelian countries in crop protection, agrometeorology, hydrology, computing, remote sensing, geographic information system, agricultural statistics, sustainable agriculture etc.;
- putting in place decision support tools to meet rural communities' needs (monitoring small-scale irrigation, assessing vulnerability, rural areas-based information system -referred to as Carte d'identité rural- Sahelian decennial atlas etc.);
- strengthening of interstate co-operation through the exchange of methodologies and technologies on food security, desertification control, natural resources and environmental management;

ARC also capitalised on know-how and experience in the following domains:

- regional agrometeorological and hydrological monitoring;
- development and transfer of new predictive models of the agricultural, food and environmental situations (Decision Makers' Special Bulletin and conceptual matrix for predicting food crises – referred to as Calendrier de prévision de crises alimentaires- etc.);
- setting up of a regional database system;
- management and dissemination of information on natural resource monitoring in the Sahel;
- publications on agrometeorology, crop protection, environmental monitoring, desertification, natural resources management, etc.;
- maintenance of meteorological instruments and electronic equipment;
- setting up of a market information system.



Provisional millet yields as at September 30th, 2005 in the CILSS member countries

Multiform and Useful Support to Technical Services in the CILSS Member Countries

The Centre contributes to equipping the CILSS member countries by providing them with computer equipment, training their officials and provides supplementary financial support for agrometeorological, hydrological, phytosanitary, pastoral and socio-economic data collection and transmission. This multiform support contributes to strengthening the operational capacity of these countries to achieve food security and sustainable natural resource management.

The Center also encouraged the creation of a Multidisciplinary Working Group (MWG) in each country, which comprises public services and development organizations concerned with seasonal crop monitoring. The objective is to set up and to strengthen, in the CILSS Member States, a competent team capable of collecting, analyzing and providing information at national level through dekadal bulletins using methodologies developed by ARC

Dynamic Partnership and Diversified Co-operation

The AGRHYMET Regional Centre has signed partnership agreements with several institutions and organizations in Africa and elsewhere in the world (WMO, FAO, IRD, the Abdou Moumouni University of Niamey, University of Reading, CIRAD, CERAAS, CERE, the Polytechnic University of Bobo-Dioulasso, the Danish Meteorological Institute, etc.). These relationships mainly concern project execution, information exchange, training support, and the provision of documentary products.

The AGRHYMET Regional Centre is also broadening its technical cooperation at regional level by joining research and development poles such as the Platform of Regional Institutions for the Environment and Meteorology (PIREM) comprised of NBA, ACMAD, AGRHYMET, CRESA, EAMAC, and CERMES.

The CILSS member countries contribute to the operation of the AGRHYMET Regional Centre, which receives technical and financial support from the following partners to fulfil its mission: Member States, USAID, Danish International Development Agency (DANIDA), French Co-operation, Italian Co-operation, Canadian International Development Agency (CIDA), Belgian Cooperation, European Union, WMO and Arab Bank for Economic Development in Africa.

Working visit of the Deputy Executive Secretary of ECOWAS responsible for Integration

Way Forward

The AGRHYMET Regional Centre intends to undertake new actions to effectively meet the needs of member countries and the international community. These include:

- developing more efficient tools and methodologies for agroclimatological, pastoral, environmental and socio-economic data processing;
- designing ever-changing training programmes and using new teaching methods such as distance learning;
- conducting the Master's Degree Programme in Concerted Natural Resource Management;
- conducting the Master's Degree Programme in Integrated Water Resources Management;
- developing and implementing a regional phytosanitary and pastoral database;
- expanding and strengthening the agroclimatological information network through dynamic collaboration of the meteorological Services of all the ECOWAS member countries;
- setting up a disaster monitoring and evaluation system;
- opening the Centre's long-term training programmes to all the nationals of ECOWAS member countries;
- effective and targeted dissemination of information to users;
- developing a more socio-economic vision on the fight against food insecurity and on natural resources management
- better communication with member States for greater visibility of ARC;
- involving ARC, together with the CILSS member States, in major global issues stemming from the generation of Rio conventions (Biological Diversity, Climate Change, Desertification).

Main Activities in 2005

General Coordination Activities

From January to December 2005, the Director General has coordinated policy, administrative and scientific matters as part of the achievement of the Centre's overall objectives.

On the Policy Level

Participation in the CILSS Council of Ministers

On the Scientific and Technical Levels

- holding of the fourth meeting of the Scientific and Pedagogic Council;
- holding of the eighth meeting of the Technical and Management Committee of ARC.

Participation in workshops on:

- the launching of the vulnerability monitoring test in Mali;
- crop loss assessment;
- presentation of the results of the vulnerability monitoring test carried out in Niger;
- gender and climate change;
- utilization of satellite imagery for natural disaster management;
- workshops on the validation of the results of the Pilot Projects on Adaptation to Climate Change implemented in Niger, Mali and Burkina Faso.

Participation in the following meetings:

- PREGEC;
- PIREM;
- FAO/ World Bank on locust control;
- FAO/CLCPRO (Commission for Controlling the Desert Locust in the Western Region) /COSRELA;
- WMO Executive Committee;
- two NBA Councils of Ministers;
- two meetings of the Technical and Steering Committee of the Harmonized Framework;
- two meetings of the CILSS Executive Board;
- meeting of the Steering Committee of the ACER Project;
- technical consultative meeting on the ex-post and provisional cereal balance sheets;
- meeting of the Steering Committee of the Project for Strengthening the Capacity of the CILSS Member States to Adapt to Climate Change;
- Meeting of the Food Crisis Prevention Network;
- Eleventh UNFCCC Conference of Parties.

Visit of the CTA Director

Working sessions with:
- French co-operation (Chairperson of the Group of Donors of Niamey);
- European Union;
- Chairman of the Scientific and Pedagogic Council;
- Belgian Co-operation;
- Canadian International Development Agency;
- Danish International Development Agency;
- WMO Regional Director for Africa;
- Head of the WMO Communications Unit;
- DCT- WMO / IBIMET;
- WARP/USAID;
- European Space Agency;
- Canadian Space Agency;
- Algerian Space Agency;
- Islamic Development Bank (MC and ES/CILSS);
- Minister of Rural Development and the Environment (Mauritania);
- Permanent Secretary and the Principal Private Secretary in the Ministry of State for Agriculture and Water Engineering of Senegal;
- Technical Advisor and CONACILSS of Mali;
- Director of the Club of Sahel and West Africa;
- experts of IRI –CS;
- officials of IITA;
- Director General of CTA;
- scientists of TUCSON University;
- Director General of EIER-ESHTER;
- Regional Representative of IUCN for West Africa;
- communications team under the AMMA Project
- President of the Polytechnic University of Bobo Dioulasso
- Vice-Chancellor of the University of Nouakchott
- Internal Controller of CILSS
- team from the General Inspectorate of USAID
- team of auditors charged with the joint auditing of the CILSS. system.

Regional Production and Cereal Balance Sheet for the 2005/2006 Cropping Season

The final revision of the 2005/2006 cropping season's regional cereal production in June 2006 stood at 14,580,000 metric tonnes. This marks a decrease of 3.8% compared to the November 2005 predictions and an increase of 28% relative to the 2004/2005 final production results. Per country, the cereal production decreased by 6%, 9.7% and 10% compared to the November 2005 forecasts in the Gambia, Senegal and Burkina Faso, respectively. It remained unchanged elsewhere in the CILSS member countries. Compared to the 2004/2005 production, the 2005/2006 revised output was up by 8%, 10%, 24%, 26%, 28%, 36%, 62% and 77% in The Gambia, Mali, Guinea Bissau, Burkina Faso, Senegal, Niger, Chad and Mauritania, respectively. On the other hand, it decreased significantly by 64% in Cape Verde. The per capita production followed the same trends. Available cereals at regional level stood at approximately 12,385,100 metric tonnes and covered only 92% of the cereal requirements of the populations. Per food commodity, upland cereals amounted to 11,074,900 metric tonnes and were well above the requirements (113%). On the other hand, rice and wheat, which were 1,213,900 and 96,000 metric tonnes, were well below the requirements and accounted for 43% and 11% of the requirement coverage rate. Per country, requirement coverage rates were 18%, 34%, 57%, 64%, 93%, 97%, 107%, 118%, and 119% for Cape Verde, Mauritania, Senegal, Guinea Bissau, Mali, Niger, The Gambia, Chad and Burkina Faso, respectively. The lowest cereal requirement coverage rates were registered in Western Sahelian coastal countries (Cape Verde, Mauritania, Senegal and Guinea Bissau), which could offset the production shortfalls by revising their import programmes.

The Sahel Regional Food Security System

Composition of the Sahel regional monitoring system: in addition to the CILSS member country delegates (from Services of agricultural statistics, early warning and food security analysis units), the Sahelian system includes regional and international food security information systems (CILSS, FAO, WFP, FEWS Net, NGOs), as well as the CILSS development partners (European Union, USAID, MIFRAC, CIDA, Italian Cooperation).

How does the system operate? Its operations are based on rapid assessments carried out on an ad hoc basis, inputs from national agricultural sample surveys, joint annual pre-harvest assessment missions, by tapping of satellite images and market data. The data collected at national and regional levels by the members of the Sahel regional monitoring system are validated through five regional consultative meetings scheduled during the year:

- the June meeting: it serves as a consultative framework to the regional monitoring system to update the areas at risk at the beginning of the lean season. It also helps prepare for the start of the cropping season in the Sahel and to take stock of the monitoring system;
- the September meeting: it makes a mid-term assessment of the rainy season (provisional qualitative assessment of harvests, preliminary identification of areas at risk and food outlook). It specifies the timetable and composition of joint pre-harvest assessment missions (CILSS/FAO/FEWS Net), which take place in October in the Sahelian countries;
- the November meeting: it serves as a framework for consultation and validation of provisional cereal production results, allows to prepare the national and regional cereal balance sheets and comes up with the food prospects for the next food consumption year;
- the December meeting: it allows consultation among stakeholders dealing with food security in the Sahel and donors within the framework of the Sahelian Food Crisis Prevention Network. It makes the overall assessment of the Sahelian agricultural and food situation and makes it possible to provide decision makers and donors of the Sahel with the synthesis of relevant information for better decision-making;
- the March meeting: it updates the assessment of the previous cropping season using final production figures (including o?-season production and late crops), brings up to date the areas and populations vulnerable to food insecurity, takes stock mitigative interventions and actions and addresses recommendations to the CILSS member States and Partners.

Cereal Market of Tillabéri, Niger

What was Done to Prevent Food Crisis in the Sahel in 2005?

CILSS organized the technical consultative meeting on the ex-post and provisional cereal balances of its member States from 1 to 4 November 2004 in Banjul, The Gambia. The meeting witnessed the participation of information systems (early warning, agricultural statistics), member States, representatives of sub-regional and international organizations and institutions (FEWSNet/USAID, FAO/GIEWS, WFP/ODD), development partners (USAID/WARP) and CILSS o?cials and experts. In the light of the presentations made by the CILSS member country delegates, except for Mali, and by the team members of joint pre-harvest assessment missions (CILSS, FAO, FEWS Net, Government), the meeting issued a press release, which concluded that some localities of the northern boundaries of the agricultural areas of Senegal, Mali, Niger, Cape Verde and Burkina Faso would encounter food problems resulting damage caused by crop pests (grasshoppers, grain-eating birds....), the locust invasion and drought.

These localities, whose mainstay is not agriculture and where most of the structurally food insecure populations live, accounted for less than 20 % of national productions.

Therefore, a better identification and analysis of the food situation of areas at risk was necessary in order to adequately consider the needs of vulnerable populations. The national monitoring systems (EWS, CSA, CASAGC, FEWS Net, WFP/VAM, Food Security Analysis Unit) thereafter carried out this diagnosis, identified vulnerable areas and populations and proposed a series of responses in line with each country's food security strategic framework.
The meeting of the Food Crisis Prevention Network composed of CILSS, FEWSNet USAID, FAO, WFP/ODD and development partners and members of the Club of the Sahel and West Africa, which was presided over by the Minister Co-ordinating CILSS, Minister of Rural Development of Mauritania, in the presence of his counterpart from Niger, the Regional Director of WFP O?ce for West Africa, the representative of development partners and donors of CILSS, was held from 06th to 09th December 2004 in Niamey in Niger. The meeting noted that in the Sahel, only three CILSS member countries registered surpluses during that year (2004-2005). These include Burkina Faso, The Gambia and Mali. The others had variable deficits ranging from 2,600 metric tonnes to 364,100 tonnes. It was also noted that the region's cereal food situation would be average on the whole with, however, localised price hikes in the areas a?ected by drought and/or locust invasion. These include the Cape Verde archipelago, Northern and North Central Senegal, Eastern, West Central and Northern Mauritania, the northern boundary of the agricultural area of Mali, the provinces of the Sahelian climatic zone of Burkina Faso, the Sahelian climatic zone of Chad, the areas of Tillabéri, Tahoua, Maradi, Di?a and Zinder in Niger.

Cerea prices were expected to increase during 2005 in the production deficit areas. The mobilization of cereals in surplus production areas and their transfer to vulnerable areas were expected to ease accessibility. In addition, crisis-mitigating operations (sales at subsidized prices, setting up of cereal and animal feed banks, intensification of o?-season crop cultivation, food for work...) were deemed necessary in the areas, which had production deficits, to mitigate food insecurity in 2005.

The Conference on the Agricultural and Food Outlook and Trade Opportunities in the Sahel and West Africa was held from 16 to 18 March 2005 at the Palais des Congrès (Conference Centre) of Bamako, Mali, under the aegis of CILSS and in collaboration with IFDC (MITSOWAS Project).

During this meeting, the various CILSS member country presentations, the report of the joint CILSS-FEWSNet mission conducted in Mauritania, Niger and Chad and the regional synthesis made by the AGRHYMET Regional Centre concluded that the 2004-2005 cropping season was characterized by severe locust invasion in some localities of Mauritania, Niger, Mali, Chad and Senegal as well as the occurrence of prolonged drought in some places. These two phenomena resulted in production deficits of local cereals and fodder. The Conference pointed out that although the regional seasonal crop monitoring system forecasted mixed or average harvests , the populations of some localities might find it di?cult to a?ord food due to the fall in production in Cape Verde, Mali, Mauritania, Niger, Senegal and Chad. Despite the adequate supply of markets with food commodities, the high price levels in some areas resulted in reduced purchasing power for the underprivileged.

It also recommended the continued strengthening of crisis-mitigating operations, including targeted free food aid to the populations vulnerable to food insecurity.

The CILSS Executive Secretary paying a visit to stricken populations in Tillabéri, Western Niger

Locust Control Support to the CILSS Member Countries

In 2005, CILSS/AGRHYMET Regional Centre contributed to strengthening the operational capacity of member countries to control locusts, notably desert locusts.

This support consisted of the provision of equipment and conduct of training courses for the benefit of employees of crop protection services (CPS), auxiliary sta? of CPS and farmers. The total budget amounted to one million three hundred and fifty thousand (1,350,000) US dollars.

This locust control support was funded by two development partners of CILSS: the United States Agency for International Development (USAID) and the Arab Bank for Economic Development in Africa (BADEA), which provided 600,000 and 750,000 US dollars, respectively.

Components of the CILSS Locust Control Support – USAID (US $)

Beneficiary countries	Control gear(Vehicles + pesticide application equipment)	Treatments and operations	Training of phytosanitary brigades	Assessment of crop losses due to locusts	Training of trainers	Total
Niger	54 644.81	15 171.30	12 402.57	9 261.81		91 480.49
Chad	49 986.11	16 796.75	18 299.80	9 261.81		94 344.49
Mauritania	97 249.23	17 376.03	14 828.75	17 818.93		144 272.94
The Gambia	13 601.01	4 657.11	6 547.74	0		24 805.86
Guinea Bissau	13 601.01	4 657.11	6 547.74	0		24 805.86
Burkina Faso	56 311.94	15 171.30	18 250.02	5 557.10		
Regional training course					100 000.00	100 000.00
Total						575 000.00

Components of the CILSS Locust Control Support – BADEA (US$)

Beneficiary countries	4x4 vehicles	Vehicle mounted ULVAMAST - type ultra-low volume sprayers	Driver controlled motor sprayer	Mobile HF transceivers for vehicles	Communications equipment (GPS-type)	Protective gear
Niger	3	3	3	3	3	6
Mali	3	3	3	3	3	6
Senegal	3	3	3	3	3	6
Chad	3	3	3	3	3	6
Total	12	12	12	12	12	12

Special Report on the 2005 Food Crisis in Niger

CILSS/AGRHYMET Regional Centre and CIRAD published a special report in 2005 entitled: "After the Famine in Niger... What Actions should be Taken in Terms of Research and Control of Food Insecurity in the Sahel?" This special report can be downloaded from these two organizations' websites at the following addresses:

http://www.agrhymet.ne
http://www.cirad.fr

Pick-up mounted ULVAMAST sprayer

● Improvement of Information and Harmonization of Vulnerability Analysis Methodologies

• Seasonal Crop and Food Situation Monitoring

The AGRHYMET Regional Centre took an active part in the facilitation of 3 meetings organized by RSP/FS-DC/POP-DEV:

- the meeting on the start of the cropping season and the food situation in vulnerable areas organized in Dakar from 7 to 9 June 2005.

The contribution of the Centre to the June meeting consisted of presenting the conditions under which the cropping season started at regional level, the desert locust situation during the period under review and an outlook of the rainy season, the results of the Harmonized Framework test carried out in Niger as well as the conclusions and recommendations of the workshop on the presentation of these test results.

- the meeting of the Steering Committee responsible for the implementation of the Harmonized Framework extended to include the Technical Committee;

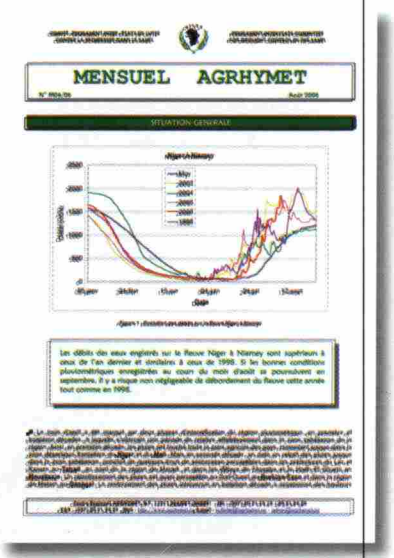
- the regional meeting on the agricultural and food outlook and harvest prospects held in Bamako, Mali, in September.

During this meeting, ARC presented the progress of the cropping season and production scenarios.

AGRHYMET monthly bulletins for January-February-March, April, May, June, July, August and September were prepared and disseminated.

• Operationalizing the Early Warning System (EWS) in Burkina Faso, Chad and Cape Verde

A mission was conducted by experts in September 2005 in Chad in order to assess the situation of the early warning system in the country and to propose actions aimed at improving its operationality and internalising it at national level. The team of experts prepared and submitted a draft document on the revitalization of the EWS of Chad.



Monthly bulletin on seasonal agropastoral monitoring in the Sahel

• Revitalizing the Agricultural Sample Survey in Guinea Bissau

This activity, which was initially scheduled to start at the beginning of the cropping season (April-May), began in September because of the socio-political situation prevailing in Guinea-Bissau.

The main results achieved were as follows:

- preparation of the technical documents on the agricultural sample survey;
- training of controllers and enumerators
- data collection for harvest forecasting

- development of programmes for data entry and processing
- publication of provisional results
- organization of the publication of final production results in March 2006.

• Disseminating the Results of the Vulnerability Monitoring Test in Niger

The actions carried out in 2005 were the following:

- organization of workshops on the launching of the Harmonized Framework tests in Mali and Burkina Faso;
- holding of the workshop on the presentation of the results of the Harmonized Framework tests in Niger.

The national experts who took part in these workshops come from various Services involved in the monitoring of the agricultural and food situations: early warning systems, agricultural, livestock, agricultural statistics Services and analysis unit.

View of the conference room during the Tahoua workshop

● Strengthening Capacity for Information Analysis and Decision Support

• Transfer of the Methodology for the Preparation of the "Decision Makers' Special Bulletin"

A training workshop on the methodology for the preparation of the Decision Makers' Special Bulletin was conducted from 19 to 22 July and from 24 to 27 July in Senegal and Mauritania, respectively. In each of these countries, the workshop witnessed the participation of national experts from meteorological and agricultural Services. Decision Makers' Special Bulletins are from now on prepared and disseminated by these countries.

✦ West Africa Land Use and Land Cover Trends Project

This USAID funded project comprises two phases:

The first (1997-2001) is focused on the methodology for data collection, socio-economic surveys, Corona and Argon satellite photography of the following countries: The Gambia, Mali (Kalokani), Burkina Faso (hippopotamus pond) and Niger (Mahayi).

The second phase is underway. It mainly deals with long-term monitoring of land use and land cover in the Sahel and West Africa.

The Project demonstrates the rates, magnitudes and spatial extent of human alterations of the land surface in West Africa. It aims at developing a unique opportunity to document, describe and quantify the impacts, detailed in both time and space, of the environmental and land resource trends sweeping across West Africa.

Availability of documentation on this issue is insufficient, even non-existent. For the first time, ARC has a complete time-series image data from the 1960s to the present.

This vast and detailed image resource, assembled in 2003, has barely been tapped. Yet, it holds the key to documenting spatially explicit alterations and transformations of the natural resource base, much of it at the hands of humans.

Only by seeing and understanding how humans (and climate) are modifying the land resources can we get a sense of what the likely trends are for the next 50 years, and what mitigation opportunities are feasible.

The primary audiences include West Africa's political leaders, environmental decision-makers, and the broader scientific community in countries throughout the region.

Goal

The overarching goal is to promote awareness and use of spatially explicit and graphic information on natural resource trends among national and regional decision-makers, and engage them in modelling future scenarios that will help them formulate sound and sustainable policy responses leading to better natural resource management.

Activities

During year 2005, a training workshop was conducted at ARC and brought together 22 participants from 13 West African countries.

The objective of this training was to enhance participants' skills in the production of spatially explicit raster maps of current and historical land use and land cover of West Africa using Landsat images for 1972-75, 1984-86 and 2000-03.

This workshop provided the participants with the necessary tools and methodology for the production of maps started during the course of the workshop to be completed in their countries. To this effect, the Centre provided each country with a high capacity micro-computer and a licence for ARCGIS 9.1 software. Furthermore, Landsat ETM data for 1972, 1986 and 2000 covering all the countries were provided to each country.

Another training workshop was scheduled to take place at ARC in 2006 to allow the countries concerned to finalize the maps.

1975

Laba in Niger: reappearance of agricultural areas (1975-2005)

2005

The West African Rural Areas-Based Information Systems

Objectives

At the request of the "Reseau des organisations paysannes et de producteurs agricoles de l'Afrique de l'Ouest –ROPPA -" (Network of Farmer and Agricultural Producers' Organizations of West Africa), the AGRHYMET Regional Centre has been implementing the "Rural Areas-Based Information Systems Project (RABIS)" Project in the Sahel with funding from USAID.

The ultimate goal of the RABIS project is to contribute to enhancing the knowledge base for decision-making by stakeholders at local level: farmers, NGOs, decision makers.

RABIS, which will be the subject of capacity building, is "a decision support tool for family holdings engaged in agricultural, pastoral, fish and sylvicultural production". It aims at:
- creating integrated databases enabling connection between biophysical and socio-economic information;
- developing multi-level information systems allowing any user or decision maker to know what are the available information resources, to quickly locate a piece of information and to make simple or complex queries and analyses
- capacity building for decision-making by stakeholders at regional or local level: specialists, technicians, farmers, NGOs, decision makers

Activities

RABIS consists of a partnership, which fully involves all the parties concerned. At this stage, apex farmers' organizations (AFOs) form the core of the system. They made it possible to access and to compile the existing information.
After the identification and adoption of the software tool to support the prototype of the system, activities in year 2005 were focused on systematic inventory, collection and integration of existing data among farmers' organizations. The relevance of RABIS consists in considering information of interest to farmers/producers and which is not contained in any other system.

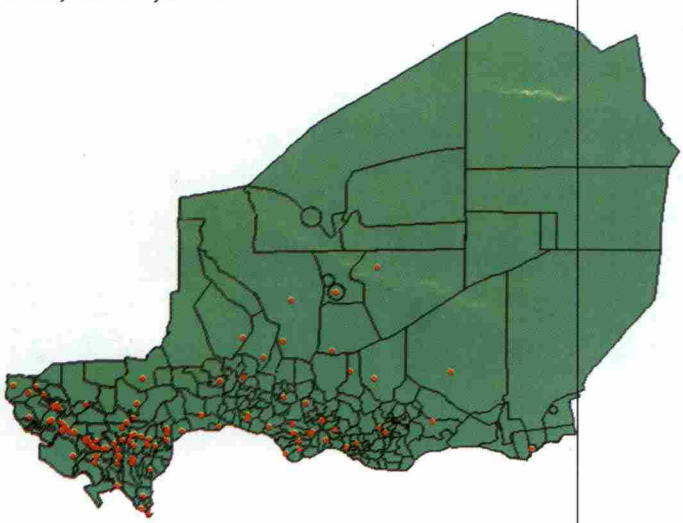


Fig. 1 : Niger: Location of the 25,411 apex farmers' organizations

Several descriptive data sets on farmers' movements were created and incorporated in four target countries: Burkina, Mali, Niger and Senegal. Some operations were carried out on the one hand to build the framework of the RABIS databases and on the other hand to assess the additional needs for data, hardware and expertise.

Results

The results achieved during 2005 include:

- all the data collected in Niger, Burkina and Mali were fed into the RABIS prototype (fig.1);

- the system was transferred to the Farmers' Platform of Niger.

- training of the officials responsible for information and communication of the Farmers' Platform of Niger in the use of the software.

AMMA and PRESA-AO

Multidisciplinary Analysis of the African Monsoon (AMMA) Project

In 2005, ARC got involved in the following:

- implementation of the workpackage (WP) involving ARC under AMMA-Europe
- participation in the 3rd meeting of the AMMA International Scientific Steering Committee;
- organization of the first international scientific conference of AMMA, which was held in Dakar, Senegal in November and of the AMMA workshop on impacts in Thiès, Senegal.

Implementation of the Workpackage Involving ARC under AMMA-Europe

The activities of AMMA-Europe were officially launched on 17 February 2005 in Paris. This project is composed of 43 European and African partners including the AGRHYMET Regional Centre. It is worthy of note that ARC is involved in the implementation of the activities below:

- WP 1.4: issue of scale, rainfall downscaling.
Analyzing rainfall data and developing downscaling methodologies.
- WP 3.1: impacts on land productivity.
Crop modelling, data collection and validation, assessing climate change impacts on agricultural production.
- WP 3.3: impacts on water resources.
Analyzing climatic and hydrological data, hydrological modelling, assessing climate change impacts on water resources, assessing vulnerability level (Sirba Basin).
- WP 4.4: database
Testing the AMMA-IP database architecture, contributing to the implementation of the metadatabase, managing the mirror server of the AMMA-IP database.

- WP 5.2: Early warning towards food security
Contributing to assessing the input of AMMA-IP in the enhancement of early warning towards food security
- WP 6.2: Capacity building (workshops, summer school etc.)
Contributing to organize summer schools (the first one will deal with food security) and AMMA-IP workshops, supervising AMMA-IP doctoral students and post-doctoral trainees.

It should also be recalled that the Centre coordinates the Workpackage on impacts on water resources. To this effect, it has coordinated the preparation of six-monthly and annual progress reports of the various partners dealing with this theme.

AMMA International Scientific Steering Committee

The AMMA International Scientific Steering Committee coordinates scientific activities conducted within the various AMMA components (Europe, Africa and America). It is composed of about fifteen scientists hailing from the various AMMA components. ARC sits on this Committee in its capacity as representative of the AMMA-Africa component and is also co-responsible for the international working group on impacts.

ARC took part in the 3rd meeting of the Committee, which was held in Paris from 22 to 26 August 2005. In addition, it contributed to organizing the AMMA International Scientific Conference in Dakar, particularly in the evaluation and selection of abstracts for the conference.

First International Scientific Conference of AMMA in Dakar

The first international scientific conference of AMMA held in Dakar in November 2006 witnessed the participation of more than 250 scientists from Europe, America and Africa. About one hundred African scientists took part in this Conference.

In total, there were five sessions during which more than 70 papers were presented.

The experts and trainees from the AGRHYMET Regional Centre presented the papers below:

- Approach to Integrated Modelling of Rainfall Variability in the Sahel by Abdou Ali, Abou AMANI and Thierry Lebel
- Validation of GCM Model Rainfall Outputs for the Sahel at Monthly and Daily Scales by Mohamed Hamatan, Abou Amani and Thierry Lebel
- Seasonal Climate Outlook for West Africa: Application to Agricultural Yield Forecasts in the CILSS Member Countries by Seydou Traoré.
- Introduction to the Session on Impacts: Case Study of Impacts on the River Niger and Agricultural Yields in Niger by Abou Amani

ARC was also involved in the papers below:
- Using MSG for GPCP products enhancement, F. Chopin, C. Bergès, M. Desbois, A. Ali and A. Amani
- Scale Issues in Assessing the Water Balance of a Regional Sahelian Catchment (poster), T. Vischel, T. Lebel, C. Messager

Alongside the AMMA Conference, the AMMA international working group on impacts organized a workshop on impacts on 3 and 4 December 2005. The main objective of the workshop was to take stock of climatic information needs of decision makers in the various socio-economic sectors and to discuss climatic issue in the presence of the international community in order to bridge the gap between climatic data and information and the needs of decision makers.

A workshop on the impacts of climate on agriculture and agricultural production took place from 5 to 9 December 2005 at CERAAS in Thiès. This workshop was organized in close collaboration with the AGRHYMET Regional Centre. Five representatives of ARC took part in the workshop.

Animals watering in a tributary of the River Niger

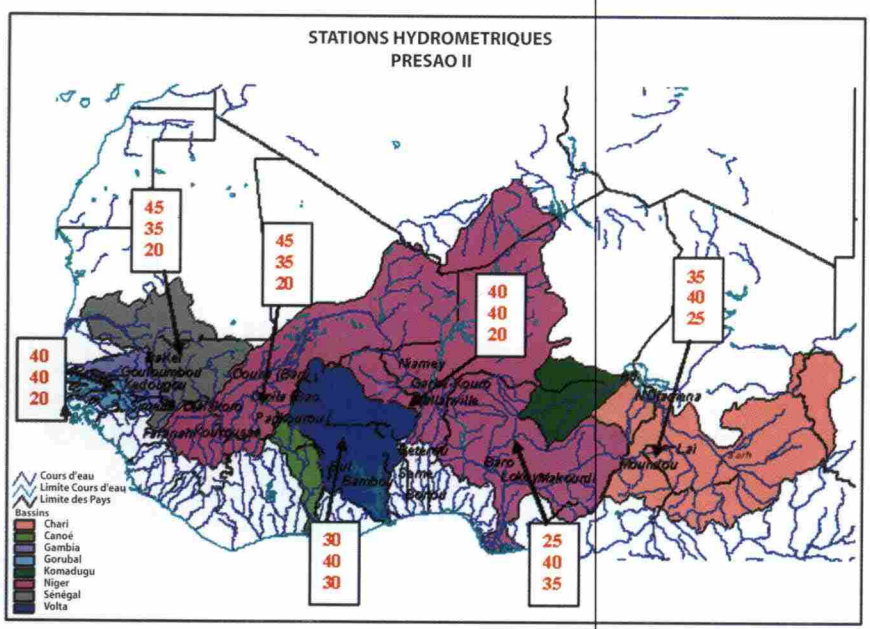
Crossing the River Niger in Niamey

Seasonal Outlook for West Africa (PRESA-AO)

In 2005, the ARC coordinated the preparation of the 2005 seasonal hydrological forecast for all the major basins of the region.

ARC also took part in the 8th PRESA-AO forum held from 30 May to 2 June 2005 in Niamey during which the presentations below were made:

- Evaluation of the 2004 Seasonal Hydrological Forecast for the Region's Major Hydrographical River Basins (Niger, Senegal, Gambia, Lakes Chad and Volta);
- Overall Evaluation of the 1999 – 2004 Seasonal Hydrological Forecasts;
- The 2005 Seasonal Hydrological Forecast for the Major Basins;
- Overall Evaluation of the 1998 - 2004 Seasonal Climate Outlook for the CILSS Member Countries;

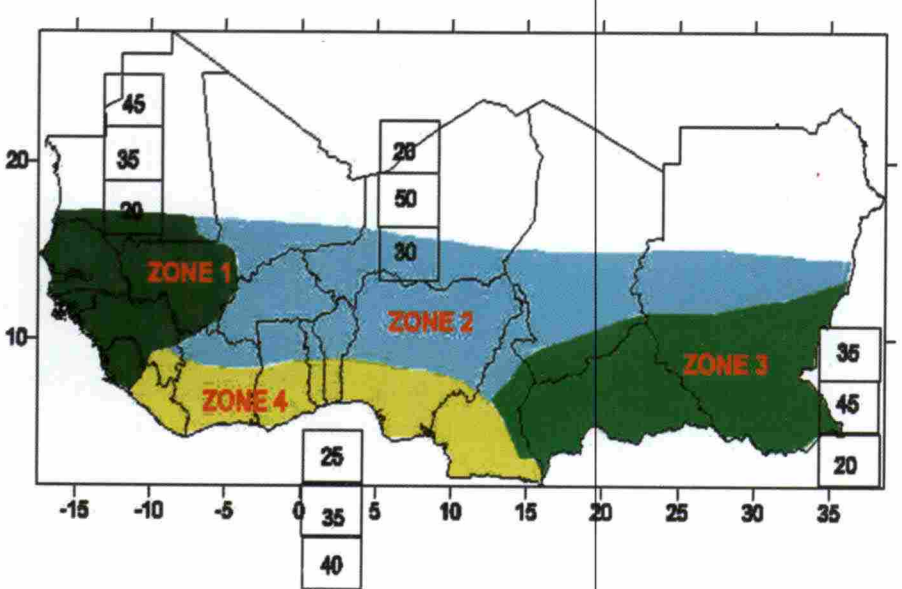


Legend of the hydrological map

For each zone, the numbers in the three boxes indicate the probabilities of monthly streamflow conditions during high waters in each of the following three categories: "higher streamflow conditions" (top number), "near normal streamflow conditions" (middle number) and "lower streamflow conditions" (bottom number). For the Lake Chad basin, for example, there is a 35%, 40% and 25 % probability of monthly discharges during high waters occurring in the above normal, near normal and below normal categories, respectively (see the section on the definition of the 3 categories).

Definition of categories

- The normal hydrological value is defined here as the mean discharge over the series of historical data available at the station.
- The "higher streamflow" category corresponds to one third (1/3) of the years with the highest discharges (33%).
- The "lower streamflow" category corresponds to one third (1/3) of the years with the lowest discharges (33%).
- The "normal streamflow" category corresponds to the remaining years (33%).



Legend of the precipitation map :

For each zone defined by the regional experts in forecasting, the numbers in the three boxes indicate the probabilities of total seasonal precipitations in each of the following three categories, " above normal " (top number), "near normal" (middle number) and "below normal" (bottom number). Thus, for zone I there is a 45% probability of total seasonal precipitation occurring in the "above normal " category, a 35% probability for the " near normal " category and a 20% probability for the " below normal " category.

It should be emphasized that boundaries between the various zones on the map should be considered as transition areas of the forecast

TRAINING

Long-Term Training Programmes

They were conducted smoothly thanks to financial support from the Government of Denmark.

The 2005-2008 intakes of Engineer Students in Agrometeorology (ESA), Engineer Students in Hydrology (ESH) and Engineer Students in Instrumentation and Microcomputing (ESIM) completed the first year of training. Theoretical and practical instruction went smoothly and was followed by internships.

The academic results of ESA, ESH and ESIM indicate that:

- twenty-nine (21) ESA out of thirty-one (31) obtained an annual general average mark higher than 12/20, i.e. a success rate of 93.5% - nineteen (19) ESH out of twenty-two (22) obtained an annual general average mark above 12/20, i.e. a success rate of 86.6%; - twenty-two (22) ESIM out of twenty-two (22) obtained an annual general average mark higher than 12/20, i.e a success rate of 100%.

About fifteen lecture documents were prepared by the full-time and part-time lecturers.

The selective entrance examination for the recruitment of the 2005-2007 intake of Higher Technician Students in Crop Protection (HTSCP) took place on 12 April 2005 in all the CILSS member countries except for Burkina Faso, which did not submit any application for the said training programme. The nnal selection of the 18 scholarship holders considered the percentage of women (50%) recommended in the Danish support project document - phase II.

Several ARC marketing missions to Gabon and Cameroon made it possible to promote the Centre's training programmes. They allowed the mobilization of 5 scholarships for the Higher Diploma Programme in Crop Protection and 17 scholarships for the Engineer Programme in Crop Protection.

Graduation of the First Intake of Engineer Students in Crop Protection

The AGRHYMET Regional Centre hosted the graduation of the 2002-2005 intake of Engineer Students in Crop Protection on 19 September 2005.

The ceremony was presided over by Mr. Mohamed Fadel Ould AGHDHAFNA, Director General of the AGRHYMET Regional Centre in the presence of members of the diplomatic corps, representatives of development partners and many guests.

In his remarks, the Director General underscored the fruitful and dynamic partnership existing between ARC and partner institutions in the field of training, namely the Danish Institute of Agricultural Research, the Polytechnic University of Bobo Dioulasso and CRESA, which was translated into remarkable participation of their experts in the training of the graduating class. He also paid tribute to the good behaviour of the graduating Engineers who obtained excellent academic results during their training at ARC. Thus of the 27 students recruited during the first year, 26 graduated with degrees.

The Director General urged the degree holders to effectively and rationally use the knowledge acquired during the three-year training period for the benefit of Sahelian populations faced with various scourges such as locust invasions.

Before concluding his remarks, the Director General thanked the partners who supported the training of the graduates . These include the Danish International Development Agency, French Co-operation, Belgian Technical Co-operation, USAID, Senegalese Institute for Agricultural Research and Crop Protection Department of Niger.

At the end of the ceremony, the prizes below were awarded to the best students of the graduating class:

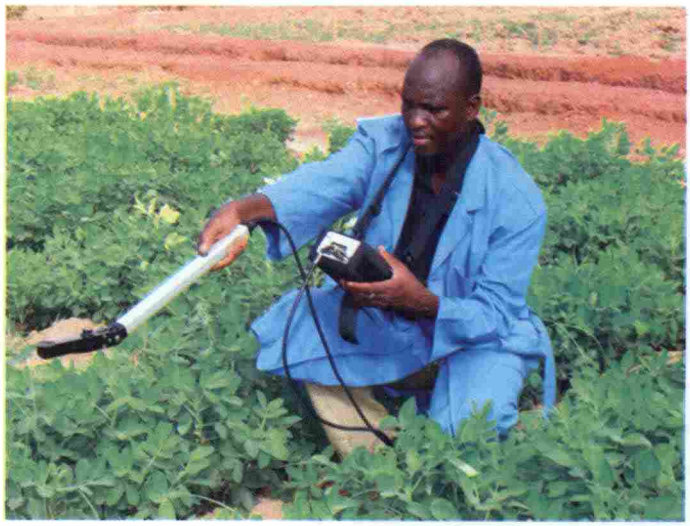
- 1st prize (Arnold Van Door Prize) awarded to Mr. Souleymane TRAORE
- 2nd prize awarded to Mrs. DABO née Aby Ciss
- 3rd prize awarded to Mr. Kémo BADJI.

The Bully SAGNIA prize for the best thesis was awarded to Nouhou Boubacar GAOH.

Awarding of a degree to a graduating student by the Director General of ARC

Research Supported Training Activities

Various tests were carried out on the irrigated plots as part of the final theses of Engineer Students in Crop Protection. Several trainees were also supervised within the framework of research supported training activities. Some of these research results were presented at colloquia by ARC experts and others published in scientific journals.



Measurement of leaf area index in groundnut fields

Promotion by CAMES: ARC Experts honoured

The following ARC experts were promoted by the African and Malagasy Council for Higher Education (CAMES):

Family name and forename	Academic rank	Speciality	Date of promotion
Adamou Moussa	Lecturer (assistant-professor US)	Automation and Information Technology	Session of 12 to 19 July 2005
Amani Abdou	Senior Research Scientist	Hydrology, Water Engineering and Climatology	Session of 12 to 19 July 2005
Atta Sanoussi	Lecturer (Assistant-Professor US)	Agronomy	Session of 12 to 19 July 2005
Bal Amadou Bocar	Lecturer (Assistant-Professor US)	Entomology	Session of 16 to 24 July 2004
Bazie Pignima	Lecturer (Assistant-Professor US)	Water Science	2000
Sarr Benoît	Lecturer (Assistant-Professor US)	Climatology	Session of 12 to 19 July 2005
Traore Seydou	Research Associate	Agrometeorology	Session of 12 to 19 July 2005

ARC hereby wishes to commend and encourage them to persevere in the search for excellence in order to contribute to the good reputation of CILSS.

Locust rearing at ARC

Soil moisture measurement with TDR probe

Short-Term Training Programmes

About one hundred o?cials attended the ARC short-term training programmes. The short-term training programme on agricultural water control and management, scheduled for December 2004, was conducted from 17 to 27 January 2005 and was attended by all the CILSS member countries with the exception of Cape Verde.

The first short-training programme for administrators of the CLIDATA hydrometeorological database management system was conducted from 18 to 28 January 2005 and brought together all the CILSS member countries.
Seventeen individual training courses were conducted by ARC experts from January to September 2005.

Training course in computing

Themes	Activities	Achievements
Water Control and Management	Agricultural water control and management 17 to 27 January 2005	17 participants from 9 CILSS member countries. Course conducted by ARC experts assisted by specialists from the Niger Agency for Private Small-Scale Irrigation
CLIDATA Hydrometeorological Database Management System	First training workshop for administrators of the CLIDATA hydrometeorological database management system 18 to 28 January 2005.	18 participants. The course was conducted by a Czech expert assisted by 2 ARC experts
Crop pests	Training workshop on transboundary crop pests10 to 20 May 2005.	14 participants from Burkina Faso, Cape Verde, The Gambia, Guinea Bissau, Niger and Chad attended this training workshop.
Locust control	Training workshop on locust control 13 June to 1 July 2005	10 participants from Benin, The Gambia, Ghana, Mali , Mauritania, Niger and Senegal
Hydrological Modelling	Training workshop on hydrological modelling and evaluation of climate change impacts on the Sirba basin 8 to 19 August 2005.	Conduct of the training workshop on hydrological modelling and evaluation of climate change impacts on the Sirba basin

Group Photo of the participants of the training workshop on the CLIDATA Hydrometeorological Database Management System

Technical Support

The activities of the Technical Support Department mainly related to the design and setting up of a sustainable system for data collection and production of quality information for the benefit of the operational units of the AGRHYMET Regional Centre and National AGRHYMET Components (NACs).

The results achieved include:

- availability of a complete, reliable, secured data management infrastructure accessible to authorized users;
- development of regional and national data management strategies;
- development and improvement of information producing software;
- improvement and modernization of data processing tools;
- constant support to NACs through the transfer of increasingly efficient tools and continuous provision of technical assistance.

The 2005 activities aim at consolidating these achievements and finding innovative solutions in line with the objectives of the operational units provided for in the 2004-2008 work programme. They mainly concern:

Strengthening Observing Networks

This was translated into the strengthening of climatological and phytosanitary data management systems and of computer and telecommunication systems.

• Strengthening climatological data management systems

During the year under review, this included , the replacement of the climatological data management software of the national meteorological Services of Niger, Burkina Faso, Senegal, Mali, The Gambia, Guinea Bissau and Cape Verde. Missions were conducted in these countries to install, parameterize, reformat and feed historical data into the new system. Approximately fifty people were trained. The system was deployed and is functional in these countries.

• Entering and validating phytosanitary data

The data of The Gambia, Niger and Guinea Bissau were validated. The other countries' data were not validated yet, due to delay in the disbursement of funds.

• Providing support and supervising the network

Additional training and technical support was provided to 6 staff members of the agricultural and livestock Services of Niger and Burkina Faso.

• Strengthening computer and telecommunication systems

This activity consisted of maintaining and verifying all the electrical equipment (UPS, generators), computer (servers, micro-computers, dedicated PCs, UNIX workstations, all peripheral pieces of equipment), telecommunication facilities (automatic switch, telephones, E-mail and Web server, fax machines), METEOSAT and NOAA satellite ground receiving stations etc.

The repair and maintenance work carried out on the standby equipment (generators and UPS) helped keep these critical facilities in good working order.

The upgrade of some PCs and acquisition of new ones made it possible to transform the entire pool of computers along with improved configurations (Pentium III – Pentium IV).

Strengthening national and regional Systems

This activity resulted in the improvement of the NOAA, METEOSAT and NDVI/SPOT databank management with a view to providing users of ARC products with useful and reliable tools and methodologies.

• Administering the Regional databank

These include updating data and server management systems, installing new servers and ensuring the optimal operation of these servers. During the year under review, the CLIDATA hydrometeorological database management system was installed in the servers and their operation was optimised.

System administration tasks also comprise backing up/ restoring. Backups were carried out on a monthly basis. Specific backups were performed following significant data updates on the servers.

Maintenance of the NOAA satellite dish antenna

• Reorganizing the regional databank

The work on the conceptual model of the regional databank was altered as follows:

- continuing the design and implementation of data models for bush fire monitoring.
- continuing the design and implementation of data models of climate scenarios.
- updating the model to merge it with the CLIDATA model with a view to implementing this system at ARC

Feeding data into the regional databank

The data fed into the regional databank during the first quarter include:
- data on bush fires;
- data on climate scenarios;
MODIS Metadata were fed into the regional databank ("Nouakchott" server). This work is expected to continue.

•Satisfying data needs

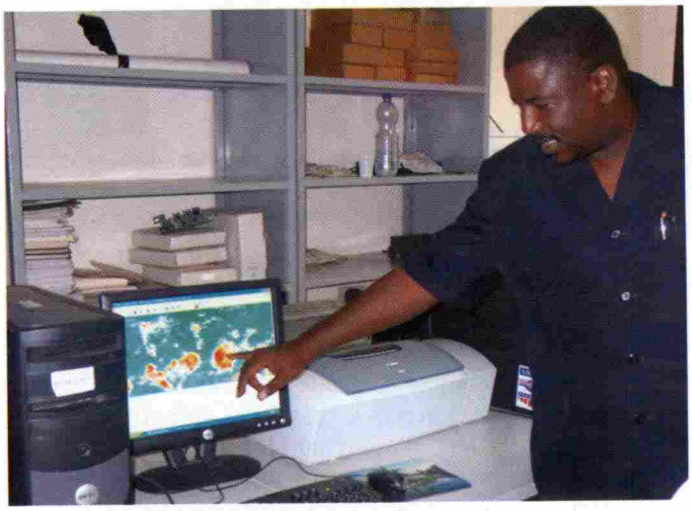
Many requests for data were received and were satisfactorily met. These requests were recorded in a logbook. The requests came from ARC theme leaders, trainees, consultants and from abroad, notably within the framework of the AMMA project.
New tools under development will allow customized access without human intervention in the short term.

•Acquiring, processing and archiving satellite data

NOAA, METEOSAT, NDVI/SPOT data, received by the stations, were properly preprocessed, quality controlled and archived.
Spot Vegetation NDVI Data were received via the EUMETCAST network. The data required for ARC and NAC operational activities were retrieved and provided to users. They were sent to the CILSS member countries every dekad during the cropping season. They were also accessible through the file transfer protocol (FTP).

•Satellite-based rainfall estimates

During the cropping season, METEOSAT data were used for satellite-based rainfall estimates. This activity started in May and provided the experts with spatialized rainfall data for seasonal crop monitoring.
In similar vein, the environment generating these data was parameterised at the beginning of the cropping season. Every dekad, rainfall estimates were produced in due time and provided to the ARC Experts and NACs.NOAA's GAC data were adapted to meet the needs of users.



Animation of METEOSAT second generation (MSG) satellite images

Improving the Performance of Decision Support Tools

Mainly maintenance activities were carried out in 2005 to make the decision support tools produced by ARC to perform well.

• Maintaining the crop water balance software package (DHC_CP)

This activity was translated into specific assistance provided to users in the installation and configuration of the software package.
Porting the satellite-based rainfall estimate algorithm
This activity consisted of developing data transformation procedures.
Maintaining satellite data processing lines

•Updating the MSG data receiving line

Following the breakdown of the PUMAPC2 ground receiving station, the data collection and processing system was upgraded and the data processing line was redesigned.

•Maintaining the NOAA data processing line

Developments were underway to allow the GIMMS/ AVHRR system to process NOAA 17 data. This activity was conducted in collaboration with a computer specialist of the NASA's GIMMS team.

•Maintaining the bush fire detection software

The bush fire detection algorithm was under development with a view to processing NOAA 16 and 17 satellite data.

Capacity building in Environmental Change-Related Risk Management

• Setting up of a spatial data infrastructure in collaboration with the Natural Resource Management (NRM) Unit. This activity consisted of collecting data on land cover, standardizing data formats, preparing metadata and the map processing software control.
The data and metadata were prepared. A clearinghouse was installed and interconnected with the USGS server. A server for downloading data through FTP was also put in place.

This activity continued with the development of interfaces for data retrieval and downloading.

• Development of products to optimise the use of results achieved by the regional Project for Strengthening the Capacity of CILSS Member Countries to Adapt to Climate Change.
Within the framework of the setting up of an information system on the Pilot Projects under the regional Project for Strengthening the Capacity of CILSS Member Countries to Adapt to Climate Change, a mission was conducted in the Sirba basin (Burkina-Faso) and in the River Niger Inland Delta (Mali) to collect data, to film indigenous practices to adapt to climate change, to harmonize data and to define indicators to measure climate change impacts. These data were fed into the information system.

Research

Fourth Meeting of the Scientific and Pedagogic Council of ARC

The fourth meeting of the Scientific and Pedagogic Council of ARC took place from 29 to 31 March 2005 on the premises of the said Centre. It was chaired by Professor Abdoulaye S. GOURO from CIRDES in the presence of the following members:

- Prof Amadou Tidiane BA, Sheik Anta DIOP University;
- Dr. Marie Francoise COUREL, Ecole Pratique des Hautes Etudes. France;
- Prof Jean ROUSSELLE, Ecole Polytechnique, Département des génies civil géologique et des mines (CGM), Canada ;
- Dr. Gerrit HOOGENBOOM, University of Georgia;
- Dr. Clémentine DABIRE, Entomologist, Programme Manager;
- Dr. Mamadou Kabirou NDIAYE, Agronomist, Director of Research;
- Prof Eric TOLLENS, Katholieke Universiteit Leuven.

The Council examined the following items on the agenda: status of implementation of the recommendations of the 3rd session of the CSP, presentations on the ARC activities, examination and discussions on the ARC's Scientific and Technical Report, stocktaking of the CILSS reform, proposed organizational charts for ARC, stocktaking of partnership with research and training institutions.
Following thematic presentations were examined:

• Study of the Genetic Variability in Roselle (Hibiscus sabdariffa L.) Yield (S. Atta);
• Physiological Variability of Macrophomina phaseolina from three Sahelian Cropping Systems (M.Ndiaye);
• Analysis of the Vulnerability of Sahelian Soils to Rainfall Intensity (Messrs. Nguétora and P. Bazié);
• Utilization of Agrometeorological Modelling for Evaluating On-Farm Practices with regard to Irrigation Scheduling and Formulation of Advice for Irrigation practionners (B Sarr);
• Remote Sensing of Cropped Areas (A. AlKhalil);
• Study of the dynamics of sand accumulation and Environmental Changes in the Arrondissement (administrative district) of Mainé Soroa, Niger (A. Nonguierma);
• Monitoring the Change in the Lake Chad's Surface Area from 1999 to 2004 using SPOT VEGETATION images (J. Andigué);
• Sahelian Rainfall Estimates: Utilization of an error model to evaluate ground-based networks and satellite products (A. Ali);
• Impact of Rainfall Variability on Water Resources across the Sirba Basin (A.Amani).

At the end of the deliberations, the members of CSP commended ARC for the regular holding of this scientific forum and the good quality of the documents presented to them. Furthermore, they made the recommendations below:

- production of an annual progress report by the ARC Research Commission;
- improvement of the scientific report with all the scientific activities of ARC and to be illustrated with scientific presentations;
- representation of the ARC Research Commission on the committee responsible for managing the revenue generated by ARC.

millet ear attacked by pests

Regional Project for Integrated Grasshopper Control in the Sahel: PRELISS

This Project is jointly implemented by IITA based in Cotonou, the AGRHYMET Regional Centre, NERI and Hedeselskabet based in Denmark. It is a follow-up to the Biological Locust and Grasshopper Control Project (LU.BI.LO.SA).

PRéLISS covers four countries: Burkina Faso, Cape Verde, Niger and Senegal.

During the first phase of the Project, which has just ended, the following activities were carried out:

- dissemination of the Green Muscle biopesticide: actions were taken by the Project to make crop protection Services to include Green Muscle in their locusts control strategies. In addition, the biopesticide was disseminated in rural areas in collaboration with the FAO input project and the Crop Protection Department of Niger;
- development of strategies for use in the various components of integrated pest management to reduce the quantity of chemical pesticides used to control grasshoppers in the Sahel;
- assessment of environmental risks associated with the use of pesticides to combat locusts;
- development of GIS based decision-making tools: in the long term, the project intends to provide national programmes, NGOs, farmers' organizations with better GIS-based decision-making tools to combat grasshoppers;
- capacity building: about 150 personnel of national crop protection services were trained in biological control;

Until the beginning of phase II of the project in September 2006, a pilot project was initiated in order to collect all the data on various locust surveys and treatments.

Oedaleus senegalensis (OSE) attacking millet stems

Desert locusts killed by Green Muscle

Green Muscle, the main achievement of the Project

Green Muscle is a biopesticide made from entomopathogenic fungi Metarhizium anisopliae developed by the LUBILOSA project.

Advantages of the product:

- fungi can easily be produced;
the product can be used with
- Ultra Low Volume application equipment;
- persistence of the fungus spores;
- the product is not harmful to the environment, humans and livestock.

Limitations of Green Muscle:

- reduced effectiveness under extreme climatic conditions;
- no knock-down effect.

Application of Green Muscle:

It varies according to the locust species to treat:

- Oedaleus senegalensis: 25 g/ha
- Zonocerus variegatus: 12.5 g/ha
- Hieroghyphus daganensis: 25 g/ha
- Schistocerca gregaria: 50g/ha

GREEN MUSCLE

● Vulnerability Monitoring in the Sahel (SVS) Project

The SVS Project is a 3-year Project funded by the Italian Co-operation and whose main objective is to equip the Sahel with appropriate tools for monitoring vulnerability in the areas of food security and natural resource management.

Activities in 2005 include the transfer of tools for food crisis prevention matrix referred to as "Calendrier de prevention des crises alimentaires –CPC-", organization of a workshop on carbon sequestration and transfer of the thematic database management system (TDbase).

a) Transfer of the CPC Tools

This transfer was carried out through a series of 5 training workshops conducted in the priority countries of the project:

from 14 to 18 March 2005, Mali
from 21 to 25 March 2005, Senegal
from 27 to 31 March 2005, Mauritania
from 4 to 8 April 2005, Burkina Faso
from 18 to 21April 2005, Niger

The training workshops brought together 10 participants per country, i.e. is 50 participants in total. The participants came from all the member institutions of the Multidisciplinary Working Groups (MWGs) in the Sahelian countries. It should be underscored that in Mali, the representative of the WMO o?ce for technical cooperation attended the training workshop as part of monitoring the actions taken by the Project in the CILSS member countries.

This transfer was organized for o?cials of MWGs of the five above-mentioned countries. It aimed at capacity strengthening with focus on the CPC tools developed by the SVS project. These include SPM, SVN and the PRVS software. In addition to these tools, emphasis was placed on the concept of food crisis prevention matrix and the role played by each tool in the matrix. The workshops aimed also at identifying the di?culties experienced by the countries with regard to the operationality of the CPC during the cropping season. During these workshops, some pieces of information were collected to programme the activities of year III of the Project and to set up national networks, to serve as focal points for the CPC activities.

Results obtained: These national workshops mainly allowed the participants to enhance their knowledge of the various tools and to better understand the CPC concept. It was an introduction to an operational concept of identification of areas-at-risk and vulnerability monitoring for most of the participants.

b) Organization of the Workshop on Carbon Sequestration (SOCSAB).

The SOCSAB workshop was held in Niamey from 20 to 30 July 2005 and brought together 19 participants from the CILSS and ECOWAS member countries. The workshop was facilitated by ARC, USGS, IBIMET and CSE experts.

The workshop aimed at training national o?cials in aspects related to modelling, remote sensing data analysis for carbon stock assessment and management. Within the framework of the SOCSAB initiative, the workshop aimed at identifying various themes, Sahelian expertise and preparing a work programme for each group.

Result obtained: in terms of tools, the workshop mainly introduced the participants and ARC experts to existing methods in carbon sequestration. With regard to the initiative itself, the originators of SOCSAB identified some human resources, themes and projects. These include among other things:

- identification of projects on carbon sequestration with corresponding human resources;

- capacity building of experts of the CILSS and ECOWAS member countries in the domain of carbon sequestration;

- setting up of a network of experts and institutions in the domain of carbon sequestration.

c) TDBASE Transfer

The activities for TDBASE transfer were conducted in the form of assistance and monitoring missions in 5 countries: Burkina Faso (18 to 19 August 2004 and 16 to 19 May 2005), Mali (27 September to 1 October 2004), Mauritania (3 to 7 October 2004), Niger (30 to 31 August 2004 and from 24 to 26 May 2005) and Senegal (12 to 15 October 2004).

The objective of TDBASE transfer is to strengthen and revitalize the national network of administrators. The activity also aimed at making data exchanges between ARC and technical Services more operational.
Results obtained:

- TDBASE is disseminated at country level, installed and operational in the technical services concerned (agriculture and livestock);
- the procedure for data exchange between the national services concerned and ARC is adopted and its implementation is better specified;
- the principle and outline of mechanisms or tools including the publication of a newsletter, development of a self-training plug-in, WEB-based exchanges, long-term training programmes at ARC in order to revitalize and make the administrators' network more operational are adopted.

Project for "Strengthening the Capacity of the CILSS Member Countries to Adapt to Climate Change"

The Project for "Strengthening the Capacity of the CILSS Member Countries to Adapt to Climate Change" aims, in the long run, at reducing the vulnerability of Sahelian countries and populations to the adverse effects of climate change. It comprises two components:

- a regional component;
- a component on pilot projects.

A regional team coordinates the project.

On top of this team, there are also a pool of AGRHYMET experts, national focal points, executing agencies, Sahelian consultants and Canadian experts hailing from Environnement Canada and the chair of studies on urban ecosystems of the University du Quebec à Montreal - Quebec University at Montréal - (UQAM).

The two main areas of intervention of the Project are:

to enhance scientific knowledge of climate change and their implications in the Sahel;
to strengthen the capacities of Sahelian countries and populations to cope with climate change

Two complementary approaches were implemented by the Project to enhance scientific knowledge of climate change and their implications in the Sahel for decision-making:

- studies on impacts and vulnerability based on climate change scenarios;
- implementation of community-based pilot projects in order to assess more accurately the various interactions between climate and impacts on socio-economic activities across the identified sites, as well as the measures and strategies implemented by the populations to cope with these impacts;

The results achieved include:

- climatic, hydrological, agrometeorological, phytosanitary and environmental databanks were updated for use in studies on impacts, vulnerability and adaptation;
- a series of regional climatic indicators was produced;
- a databank on climate scenarios for some Sahelian areas (pilot project sites) for the assessment of future vulnerability was built;
- studies on climate change impacts were carried out in the following sectors: water resources, agriculture and livestock;
- water resource atlas;
- implementation of the pilot projects.

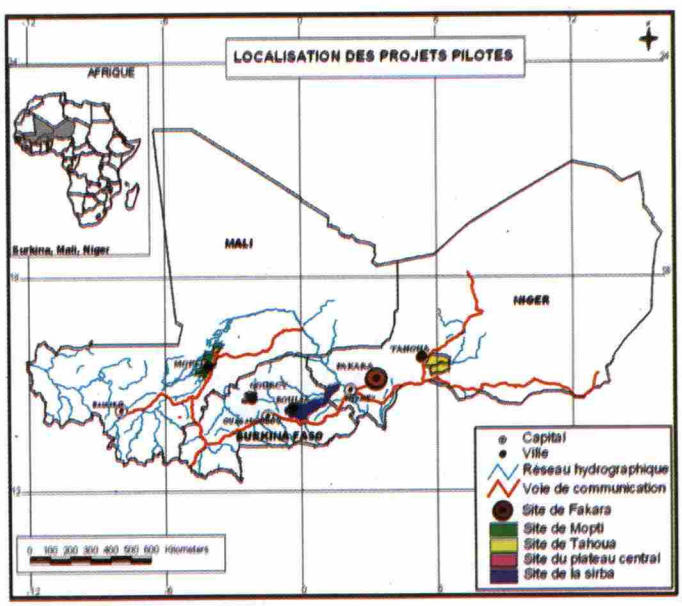
The actions taken as part of capacity building of Sahelian countries and populations were:

- organization of two regional workshops on methods for the assessment of climate change impacts and the mapping out of adaptation strategies;
- equipment of the AGRHYMET Regional Centre and the CILSS member countries with computer hardware and software;
- networking of Sahelian experts in the field of climate change (GIEC-Sahel –Intergovernmental Group on the Study of the Sahelian Climate);
- awarding of scholarships for studies and internships;
- creation of a website on climate change in the Sahel;
- admission of trainees to work on case studies;
- organization of a regional workshop on tools and strategies for communication on issues at stake in climate change for the benefit of Sahelian communicators;
- organization of nine national workshops on tools and strategies for communication on issues at stake in climate change;
- setting up of a network of communicators on issues at stake in climate change in each country;

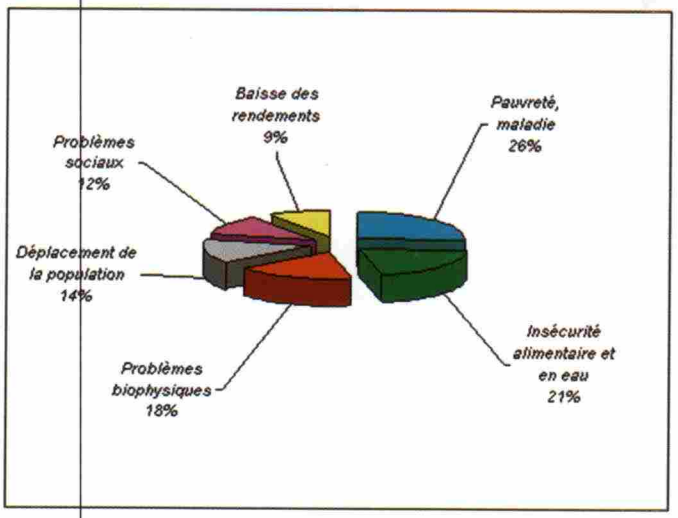
Pilot Projects

The Pilot Projects deal with five themes: integrated water resource management; water erosion control, pastoralism, agropastoralism, agricultural production and soil fertility management.

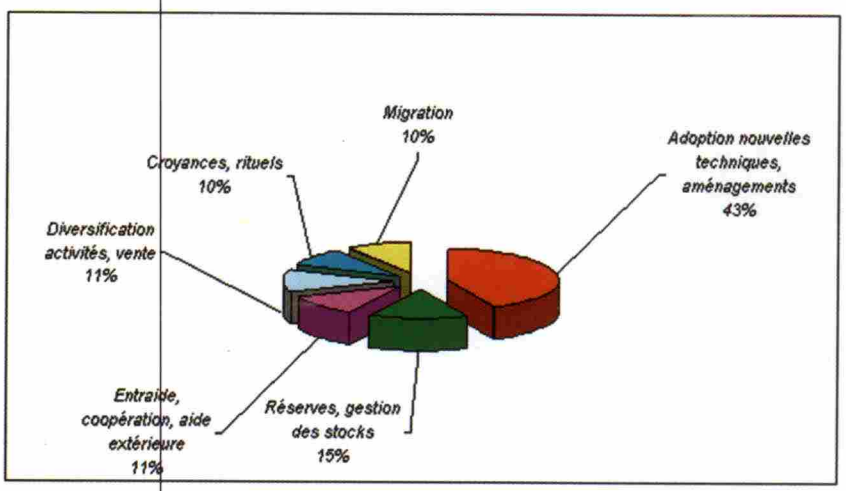
The location of the pilot projects sites in Burkina Faso, Mali and Niger is illustrated on the map below



Location of the pilot projects on climate change



Graph 1: consequences due to climate variability and change



Graph 2: Strategies adopted to cope with climate variability and change

The survey of coping practices was the main part of the data collection activities undertaken by the Pilot Projects. It provided the knowledge base on local know-how used by the populations to adapt to climate variability and change, using Access, NVIVO and SPSS software.

The information on the impacts of climate variability collected on the pilot projects sites is shown in the figure above.

To cope with climatic risks, the populations implement various adaptation strategies shown in the figure below.

Other results achieved by the Pilot Projects were:

- adaptation tests in the sector of agriculture and livestock
- inventory and quantitative as well as qualitative analysis of water resources and development of a methodology for water resources modelling: case of the Sirba basin;
- design of a Flood Forecasting, Information and Warning System for the River Niger Inland Delta (SPIAC/delta) to help local stakeholders optimise the use of the delta water resources;
- conduct of several sectoral studies, particularly in the River Niger Inland Delta and on the vulnerability of women on the sites of Tahoua, Niger Republic and Central Plateau, Burkina Faso;
- preparation of a self-training manual on the UNFCCC and Kyoto Protocol to this Convention;
- in a bid to allow dialogue between stakeholders, the Project encouraged the setting up of consultative frameworks in the Fakara area, in Tahoua and Mopti;
- documentary on the Pilot Projects of Burkina Faso and Niger;
- an information system on the Pilot Projects (SIPPCC) was designed to systematize all the pieces of information generated during the execution of the Pilot Projects.

The implementation of the project was assigned to the AGRHYMET Regional Centre, which is the lead institution in the field of climate change in West Africa. The collaboration of the Centre is therefore much solicited towards the establishment of partnerships. Furthermore, CILSS approached CIDA for the implementation of a second phase of the Project to:

- strengthen the achievements;
- optimise the use of the knowledge produced (transfer of knowledge produced to farming systems);
- consideration of new themes.

● Collaboration between FEWSNet and the AGRHYMET Regional Centre

The AGRHYMET Regional Centre and FEWSNet have been working in close cooperation since 2000.

In 2005, the fruits of this collaboration are illustrated through the summary of activities conducted by the FEWSNet Regional Scientific O?cer based at the AGRHYMET Regional Centre. They consist of the participation of FEWSNet in training and research at ARC

With regard to training, the FEWSNet expert:

- supervised the preparation of a manual on food crisis prevention by a Malian trainee;

- took part in the supervision of the internship of two agronomists from Côte d'Ivoire and Djibouti in techniques for agrometeorological crop monitoring and early warning with focus on FEWSNet tools.

With regard to research, two important Sahelian topics were dealt with. These include "Remote Sensing of Cropped Areas" and "a Practical Use of Seasonal Climate Outlook: Anticipation of WRSI"

Through the use of remote sensing, FEWSNet and the AGRHYMET Regional Centre conducted research on e?cient, quick and cheap methods for estimating cropped areas. To this e?ect, a dot grid method was used on LANDSAT images to estimate cropped areas in Senegal. The results obtained are satisfactory compared to the agricultural census data (see table below).

Administrative region (département)	Administrative region (département) area (ha)	# of dots over cropped area	Agricultural census cropped area (ha)	Departure (%)
Dakar	8586.95	0		
Pikine	8882.42	0		
Rufisque	40470.30	2517	2431	0.04
Fatick	268177.80	81697	77924	0.05
Foundiougne	298347.98	92780	85821	0.08
Gossas	294126.42	87030	69341	0.26
Kafrine	1117738.94	300552	301843	0.00
Kaolack	185730.25	85060	83225	0.02
Nioro	223817.28	150681	149836	0.01
Kebemer	392754.74	93245	93532	0.00
Linguere	1989216.89	61328	50632	0.21
Louga	570266.09	88810	87587	0.01
Bambeye	135169.80	68387	78034	-0.12
Diourbel	125438.82	47027	44179	0.06
M'Backe	167755.11	65613	64168	0.02
Thies	152888.25	45776	44706	0.02
Tivaouane	320052.20	91871	92141	0.00
M'Bour	199014.56	65870	68297	-0.04
Sedhiou	727655.88	79015	81107	-0.03
Kolda	829217.40	96889	89015	0.09

Concerning the use of seasonal climate outlook, a cell-based linear relationship between WRSI at the end of September and cumulative RFE amounts for the July-August-September period was found using regression analysis. This model was used along with the FIT (Forecast Interpretation Tool) outputs to predict the water requirement satisfaction index at the end of the growing season.

FIT (Forecast Interpretation Tool) is a tool developed by FEWS NET to address such issues as translating the seasonal rainfall forecast from probabilistic tendencies into rainfall probabilities and quantities.

It makes it possible to consider the outputs of di?erent rainfall scenarios that the regression model translated into an index. The index resulting from this analysis re ects the trends of the seasonal climate outlook.

These various studies were presented during the fifth meeting of the Scientific and Pedagogic Council of the AGRHYMET Regional Centre held on 8 and 9 May 2006 in the said institute.

Communication, Information and Documentation

ARC Marketing Missions in Yaoundé, Cameroon and Libreville, Gabon

An ARC delegation composed of the Head of the Training and Research Department, Head of the Communication, Information and Documentation Unit and the Head of the Instrumentation and Micro-computing Unit conducted a marketing mission in Yaoundé, Cameroon and Libreville, Gabon from 25 June to 2 July 2005.

This mission aimed on the one hand at promoting the ARC products and services and on the other hand at identifying areas of cooperation with the national technical Services of the countries concerned and cooperation agencies.

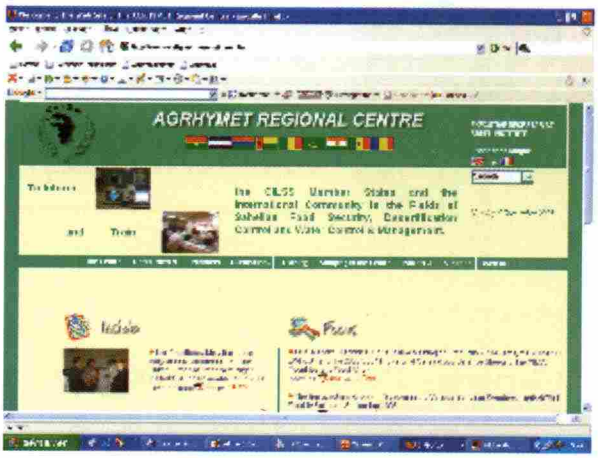
The following bodies were visited by the ARC delegation:

Yaoundé: the Service of Co-operation and Cultural Action of the Embassy of France, Commercial Service of the Embassy of Italy, Inter-African Phytosanitary Council, Institute of Agricultural Research for Development, Department for Higher Education, Scholarship Award Department, FAO, Institute for Mining and Geological Resources, RSP Project and Crop Protection Department.

Libreville: The Agricultural Department, Scholarship and Internship Department, Embassy of Italy, AFRICA N°1 Radio Station, National Meteorological Department, Civil Aviation Authority, Department of Water Engineering, Finance and Economic Planning, Central Africa Regional Programme for the Environment (CARPE), Department of Higher Education, Research and Innovation (DESRI), Embassy of France, Department of the Environment and Environmental Protection (DEPE), Gabonese Development Support Institute (IGAD), Coordinating body of NGOs dealing with forests.

The ARC delegation was highly satisfied with the smooth conduct of this mission. The heads of institutions visited unanimously welcome this ARC communications and marketing move, which beyond the opening up to Central African countries, makes it possible to lay the foundations for true partnership in the domains of information and training.

There are real opportunities for collaboration between ARC and the institutions visited. Actions should be taken on both sides to make them a reality. The members of the ARC delegation will see to it that this South-South collaboration is maintained and strengthened with a view to optimising the use of the ARC expertise and also finding new outlets for its products and services.



Web portal of the AGRHYMET Regional Centre
www.agrhymet.ne

Exhibition on the achievements of CILSS in Praia, Cape Verde

This exhibition took place alongside the 36th ordinary session of the CILSS Council of Ministers held in Praia, Cape Verde from 25 to 29 January 2005.

It was coordinated by the Head of the Communications and Public Relations Unit and consisted of the exhibition of 32 posters and information products (maps, bulletins, reports, etc) on the CILSS activities and achievements.

The 2005 Agricultural Forum of Dakar

The AGRHYMET Regional Centre took part in the first International Forum on the Global Agricultural Divide from 4 to 5 February 2005.

During the forum, the Head of the ARC Communications and Public Relations Unit took part in the workshop on the improvement of access to scientific progress and technological innovation by developing countries in order to reduce the wide gap in productivity while ensuring that farmers have full control over inputs.

During the course of the workshop, contacts were established with a number of scientists and officials responsible for research and development institutions to identify areas of co-operation with ARC. In addition, as part of the enhancement of the ARC visibility, he distributed brochures and handouts on the Centre's activities and achievements to the participants.

Monitoring & Evaluation

The activities of the Monitoring & Evaluation Unit mainly contributed to improving the methodological tools for monitoring-evaluation of the cropping season.

The exercise consisting of monitoring the activities through a performance chart based on the Plan of Operations was carried out with the various Departments. The operationalization of this performance chart in 2006 will allow a better monitoring and evaluation of the ARC activities.

Other Highlights of ARC

Celebration of the CILSS Day

On 12 September 2005, Niger celebrated the 20th CILSS Day under the theme "Renewable Energy Sources and Sustainable Development".

The official ceremony of this Day, which was celebrated in all the CILSS member countries, took place at the AGRHYMET Regional Centre and was co-presided over by the Ministers of Agricultural Development and of Mining and Energy of Niger in the presence of the Minister of Animal Resources. Many personalities and guests also took part in this celebration.

In his welcoming remarks, the Director General of ARC underscored the efforts made by CILSS in general and the AGRHYMET Regional Centre in particular to promote renewable energy source in the Sahel. He recalled the training and information activities carried out by ARC in the field of renewable energy sources.

The Minister of Agricultural Development of Niger thereafter read the message of the Current Chairman of CILSS.

The opening speech of the ceremony to celebrate the 20th CILSS Day was delivered by the Minister of Mining and Energy. During his address, he emphasized the efforts made by Niger to promote the use of renewable energy sources within a context of poverty reduction and conservation of the environment.

This official ceremony ended with a guided tour of the exhibition on renewable energy sources, which brought together the Regional Solar Programme, Tout Hydro, SONIHY and the AGRHYMET Regional Centre.

Visit of the officials to stands

The Director of Renewable and Household Energy Sources gave a lecture in the afternoon on the theme of the 20th CILSS Day. The number of interventions from the audience and the good quality of the discussions was an indication of the interest taken by the participants to this lecture on renewable energy sources.

Ceremony for the Handing-over of Office to Incoming Director General

The official ceremony for the handing-over of office between Mr. Alhassane Adama DIALLO, outgoing Director General and Mr. Mohamed Fadhel Ould AGHDHAFNA, incoming Director General of the AGRHYMET Regional Centre took place in the lecture hall on 18 March 2005. It was presided over by Mr Musa Saihou MBENGA, Executive Secretary of CILSS in the presence of the Permanent Secretary of the Ministry of Agricultural Development of Niger, members of the diplomatic corps, the Permanent Secretary of the National CILSS Committee (CONACILSS) of Niger, members of the Group of Donors of Niamey and of PIREM, personnel and students of the AGRHYMET Regional Centre.

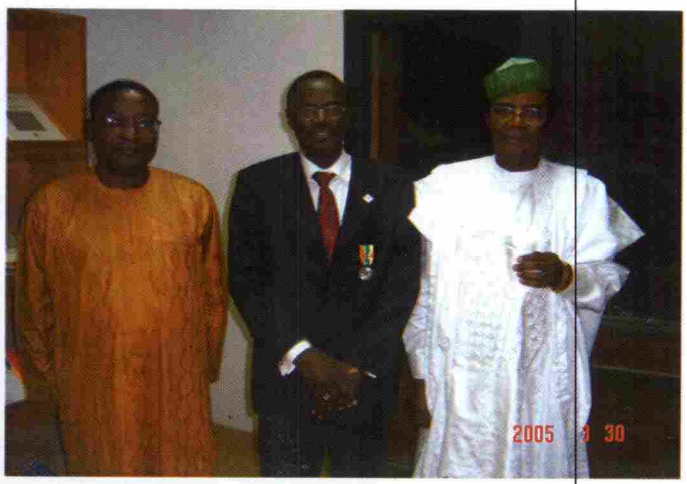
The ceremony, characterized by emotions and solemnity, began with speeches by the representatives of the ARC personnel and students, the outgoing Director General, the incoming Director General and finally that of the Executive Secretary of CILSS.

Messrs. Alhassane Adama DIALLO and Mohamed Fadhel Ould AGHDHAFNA signed the minutes of the handing-over of office with applause from the audience. The ceremony for the handing-over of office ended with a reception.

Decoration of Mr. Alhassane Adama Diallo, outgoing Director General, by the authorities of the Niger Republic

Mr. Alhassane Adama DIALLO was elevated to the rank of Officer of the Order of Merit by the authorities of the Niger Republic. This decoration ceremony, which was presided over by the Minister of Agricultural Development of Niger, took place on Wednesday 30 March 2005 at the AGRHYMET Regional Centre.

The decoration of Mr. DIALLO is in recognition of 6 years (1999- 2005) of success in the capacity of Director General of the AGRHYMET Regional Centre.



Mr. Alhassane Adama DIALLO (in the middle) in the company of the Ministers of Agricultural Development and Transport of Niger

During his term of o?ce, several achievements were registered by ARC. These include:

- mobilization of significant financial resources from development partners for the implementation of regional projects such as the Project for Strengthening the capacity of the CILSS member States to Adapt to Climate Change, the Vulnerability Monitoring in the Sahel Project and the Master's Degree Programme in Concerted Natural Resource Management etc.;
- capacity building of National AGRHYMET Components through training and the provision of material and financial resources;
- organization of conferences of policy makers on the DIAPER and AP3A Projects;
- organization of the scientific conference on rainfall enhancement through cloud seeding in the Sahel,
- intensification of collaboration between the AGRHYMET Regional Centre and several development, research and higher education institutions such as the Centre for Environmental Studies (CERE) of Guinea, the Regional Study Centre for Improving Adaptation to Drought (CERAAS) of Senegal, the Abdou MOUMOUNI University of Niger, the Polytechnic University of Bobo-Dioulasso, Burkina Faso, the Danish Institute of Agricultural Research, the Danish Meteorology Institute, RECTAS (Regional Centre for Training in Aerospace Surveys) of Nigeria to name but a few;
- setting up of the Scientific and Pedagogic Council (SPC) to assess the scientific work of the experts of the AGRHYMET Regional Centre
- development of the experts and increasing the credibility of the AGRHYMET Regional Centre by joining the African and Malagasy Council for Higher Education (CAMES),
- opening up of the AGRHYMET Regional Centre to the ECOWAS and UEMOA member countries
- creation of the Platform of Regional Institutions for the Environment and Meteorology (PIREM)
- naming the ARC's o?ce blocks after "General SEYNI KOUNTCHE"
- construction of the 3600-metre perimeter fence of the AGRHYMET Regional Centre's 71-hectare land area.
- setting up of the Association of the personnel of the AGRHYMET Regional Centre, etc.

Participation of CILSS in the 7th Conference of Parties (COP 7) of the United Nations Framework Convention to Combat Desertification.

From 14 to 28 October 2005, CILSS took part in the 7th Conference of Parties (COP 7) of the United Nations Framework Convention to Combat Desertification in Nairobi, Kenya. The delegation was led by Mr Musa S. M'Benga, Executive Secretary of CILSS.

The CILSS delegation took part in the various technical meetings of the Conference of Parties in order to rea?rm its leading role in the coordination of the desertification issues in the Sahel and also to take a stand with regard to the new issues at stake in land degradation.

Furthermore, it facilitated two side events in collaboration with technical partners such as USAID, GTZ, the Swiss Co-operation and OSS.

The first one focused on: " Natural Resource Management, Fully-Fledged Component of Economic Growth and Poverty Reduction in West Africa: Assessment of Success Stories in Desertification Control". The field experience of Niger and Ghana were presented.

The theme of the second side event was: "Taking Di?erent Action... Global Dynamics and Agroforestry Opportunities in the Sahel". During this side event, the discussions highlighted the following aspects: i) need to strengthen monitoring/ evaluation at regional level; ii) need to conduct studies to go beyond pilot projects; iii) need to provide information to decision makers.

Throughout the 7th COP, CILSS had a stand to present the institution's activities and achievements in the field of natural resource management. Posters showed CILSS' achievements regarding desertification control, in particular in terms of information and training. New initiatives of CILSS, namely the Land Use / Land Cover Trends Project, the Regional Initiative "Global Environment and Desertification Control in West Africa " and the achievements of its Regional Programmes such as the Regional Household and Alternative Energy in the Sahel Programme such (PREDAS) and the Regional Solar Programme (RSP I and II) were also presented to the general public.

This activity, which aims at improving the visibility of CILSS, allowed more than 800 visitors to be acquainted with the potential and expertise of CILSS as regards desertification control in the Sahel.

The latter were mainly made up of the participants of COP 7 and Kenyan representatives working in non-governmental organizations, development projects and national technical Services of the environment and nature conservation.

Speech by the Executive Secretary of CILSS at the 7th Conference of Parties of the UNCCD

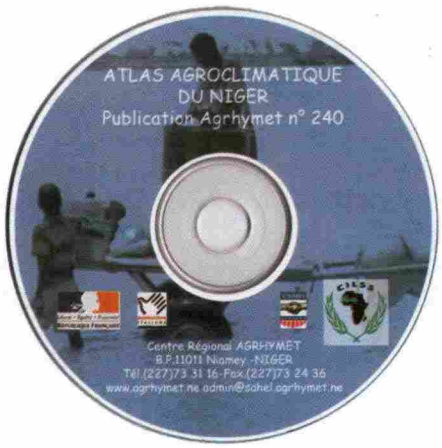
During this exhibition, small posters and various documents of CILSS (brochures, handouts, lea ets, etc.) on desertification were distributed to the visitors. Scientific and technical publications of ARC, INSAH and the Executive Secretariat of CILSS were presented to the general public (see appendix) and a list of people requesting for these documents was drawn up.

Alongside the o?cial working sessions of the 7th COP and "Side-events ", the members of the CILSS delegation had several informal meetings and consultations with various partners, particularly the representatives of the Sahara and Sahel Observatory (OSS), the Point focal of the UNCCD for West Africa, the o?cial of Dry Lands Development Centre (DDC), the Global Mechanism and the International Centre for Research in Agroforestery (ICRAF).

During its stay in Nairobi, the CILSS delegation met with the o?cials of ICRAF. It had discussions with Mr. Warwick Easdown and Mrs Jacinta Kimwaki, o?cials in charge of communications and the Documentation Centre of ICRAF, respectively. The discussions highlighted the need to establish a partnership between the two institutions, in particular in the field of communications through exchange of technical and scientific documents and finally connection of the respective documentation centres.

The delegation gave a pack of CILSS publications to the o?cial responsible for the Documentation Centre of ICRAF. In addition, the ARC o?cial responsible for communications met the heads of the documentation services of UNEP and UNCCD, to examine opportunities for collaboration with CILSS in the domains of exchange of technical and scientific information on the environment.

Some information products published by ARC in 2005



Consolidated budget statement for the period 1 January to 31 December 2005

Funding source	Budget	Commitment	Difference	Execution rate
DANIDA II	921 060 360	820 107 807	100 952 553	89.04%
USAID-IL18-15	810 000 000	754 159 577	55 840 423	93.11%
USAID-IL16	12 500 000	12 394 875	105 125	99,16%
ITALY-SVS	430 926 000	163 130 672	267 795 328	37.86%
ACDI	374 760 000	410 603 257	-35 843 257	109.56%
DGCD	16 253 003	4 993 306	11 259 697	30.72%
AMMA	19 323 118	9 577 406	9 745 712	49.56%
MTAP	69 060 017	69 060 017	0	100.00%
MEMBER STATES	69 700 000	93 917 385	-24 217 385	134.75%
FUNDS GENERATED BY ARC	138 667 000	155 901 252	-17 234 252	112.43%
SOSAR	81 660 000	91 158 700	-9 498 700	111.63%
PRELISS	49 091 541	25 588 536	23 503 005	52.12%
TOTAL	2 993 001 039	2 610 592 790	382 408 249	87.22%

Consolidated budget and financial statement for the period 1 January to 31 December 2005

Line item	Budget	Commitment	Difference	Execution rate
Personnel costs	762 531 081	724 327 181	38 203 900	94.99%
Overhead costs	386 865 456	378 152 079	8 713 377	97.75%
Investment	203 415 323	188 543 106	14 872 217	92.69%
Activities	1 640 189 179	1 319 570 424	320 618 755	80.45%
TOTAL	2 993 001 039	2 610 592 790	382 408 249	87.22%

Funding of ARC's operational activities in 2005

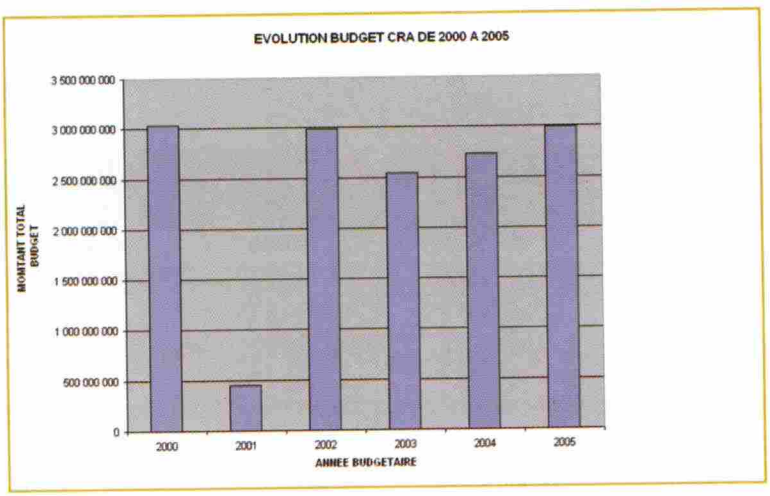
TRAINING

Long-term training programmes: DANIDA
Short-term training programmes : DANIDA - USAID

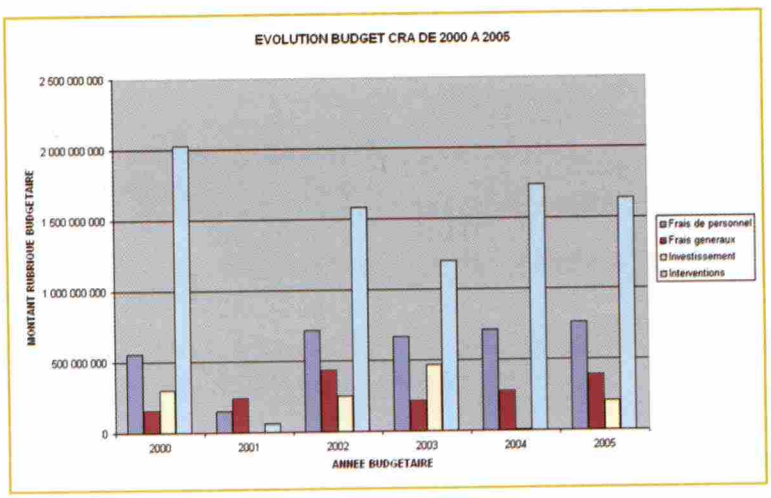
INFORMATION AND TECHNICAL SUPPORT

USAID, Italian Cooperation, CIDA, French Cooperation, DANIDA, European Union

ARC's budget from 2000 to 2005



ARC's budget from 2000 to 2005



ARC's personnel from 2002 to 2005

Years	Experts	Assistants	Administrative sta?
2002	34	22	17
2003	36	21	16
2004	35	21	17
2005	35	21	16

Appendices

The 2005 ARC Visits

M. Xavier Darcos, Junior Minister responsible for Development Cooperation and the Francophony (Commonweath of French Speaking Countries) of the French Republic and Mr. Hilary Benn, Minister of International Development of the United Kingdom - 7 February 05.

Mrs. Carleene Dei, Director of WARP based in ACCRA. GHANA - 10 February 2005

A group of French journalists
25 March 2005

Mrs Anne-Grethe JORGENSEN, Minister of Foreign Affairs of Denmark - 16 February 05

The 2nd and 4th year students from the IPDR of Kolo Thursday - 5 April 2005

A group of students from the University of Boston - 15 April 2005

A delegation of the Regional Project for Integrated Grasshopper Control in the Sahel (PRELISS) - 11 May 2005

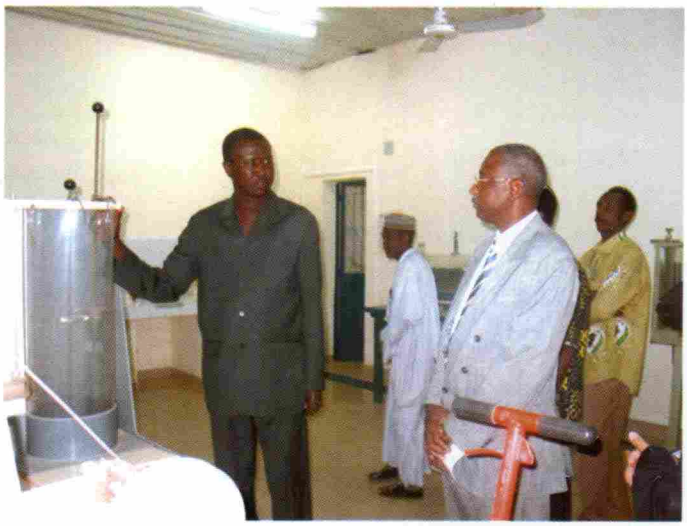
A team of experts from the African Development Bank (ADB) - 11 Mai 2005

Dr. Hansjörg Neun, CTA Director, in the company of Dr. Ibrahim Khadar responsible for planning and common support Services - 13 June 2005

A French team of experts on a global governance evaluation mission led by Mr. GOSSARD - 13 June 2005

Dr. Madeleine THOMSON from the International Research Institute for Climate and Society (IRI) - 19 July 2005.

A delegation from the Africa Union, composed of FARA des and WECARD (CORAF) members - 8 November 2005



Visit of the Minister coordinating CILSS

Visit of Mrs. Carleene Dei, Director of WARP-USAID

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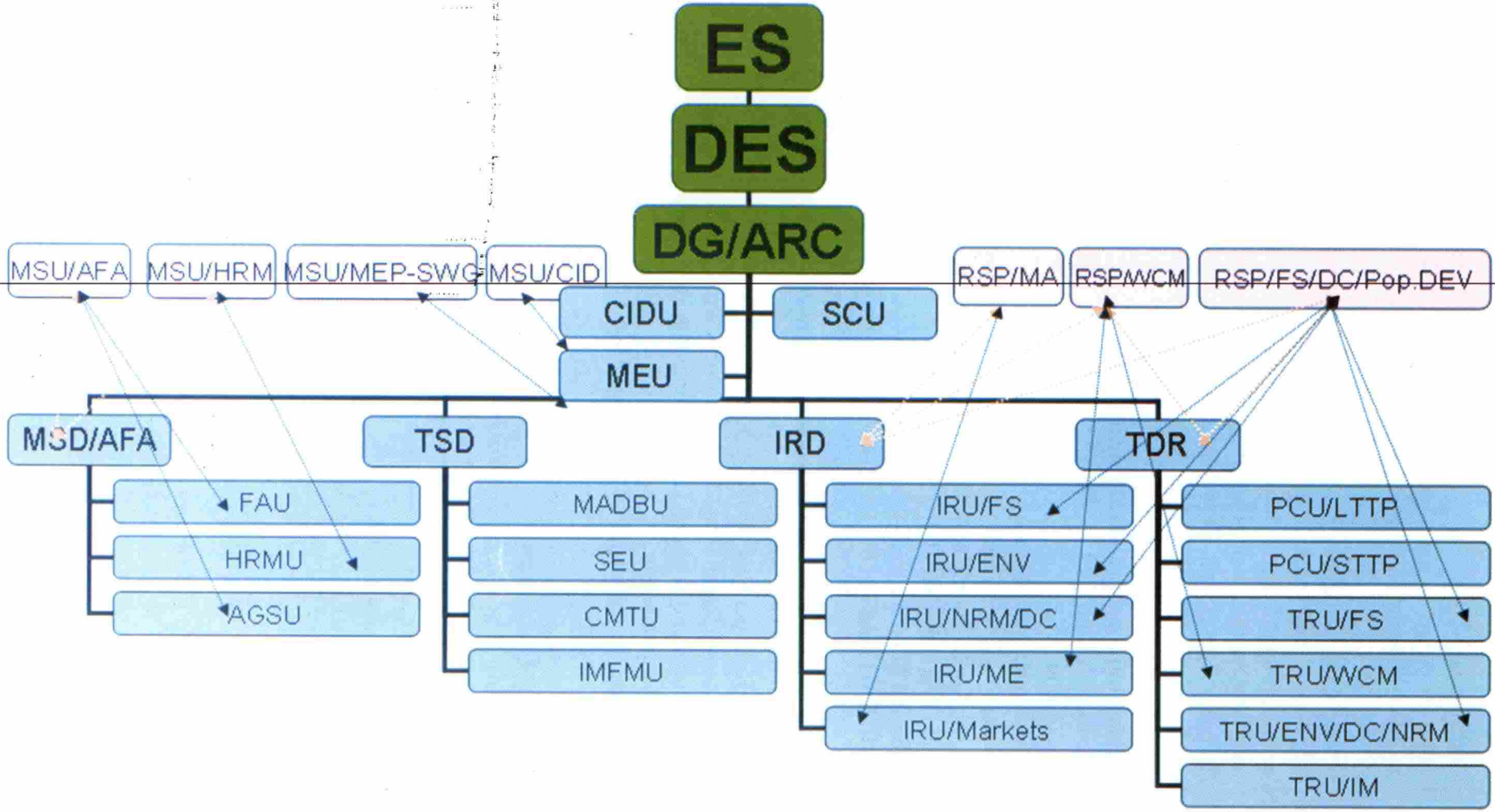
Website: www.insah.org

List of Theses Written by the 2002-2005 Intake of Engineer Students in Crop Protection

NAME & FORENAME	THEMES
SY Moussa	Retrospective Analysis of Desert Locust Invasions (Schistocerca gregaria, Forksal ,1775) Orthoptera Acrididae in the Sahel: Prediction of Outbreaks.
BAOUA Ibrahim Abdou	Contribution to the Study on the Choice of the Main Locust Species with Embryonic Diapause Breeding Biotopes and to the Identification of Natural Enemies of Eggpods in the Sahelo-Sudanian Climatic Zone: Case
DIOUM Abdoulaye	Agronomic and Phytosanitary Characterization of three Red Sorrel Ecotypes (Hibiscus subdariffa L.)
SANOGO Seydou	Agronomic and Phytosanitary Monitoring of three Sesame Varieties (Sesamum indicum L.) A1, A5 (Improved Varieties) and VL (Local Varieties) in the irrigated plots of AGRHYMET Regional Centre in Niamey (Niger).
Souley Hassana Ibrahim (Mrs.)	Evaluation of the Effectiveness of Jatropha Oil (Jatropha curcas, Linne, 1753) on Callosobruchus maculatus, Fabricius,1775, Pest Attacking Cowpea Seeds During Post-Harvest Conservation
OUEDRAOGO D. Rasmata (Mrs.)	Experimental Study of Factors Inducing Breeding in Desert Locusts Schistocerca gregaria (Forsk.): Case of Moisture Effect
ALVES Guilhermina (Miss)	Investigation of Agrometeorological Indicators for Phytosanitary Risk Analysis : Case of Grasshoppers in Niger
DABO née Aby CISS (Mrs.)	Study of the Effectiveness of Jatropha Oil (Jatropha curcas, Linne, 1753) in Desert Locust Schistocerca gregaria (Forskal, 1775) Control
TEMWA Aggée	Contribution to on-Farm Studies on the Effect of Jatropha Oil on Arthropods
GUEYE Youssoupha	Contribution to the Study on the Biology and Ethology of Schistocerca gregaria (Forksal) in a Controlled Environment.
NELOUMTA MADIBE (Mrs.)	Cowpea Protection Trial Based on Intervention Threshold Set for Megalurothrips sjostedti Trybom populations
BOUBACAR GAOH Nouhou	Contribution to the Study of Trichogrammatoïda spp.: Utilization in Biological Control against Heliocheilus albipunctella de Joannis
TRAORE Souleymane	Contribution to Controlling Larger Grain Borers, 1878 (Coleoptera Bostrichidae) in the Sahel
Tourawa Zouéra Nafiou (Mrs.)	Study of the Behaviour of 4 Varieties of Cowpea (Vigna unguiculata [L]. Walp.) vis-à-vis Main Insects Pests (Megalurothrips sjöstedti Trybom, Maruca vitrata Fabricius and Clavigralla tomentosicollis Stäl)
Maïko Rahamatou SANDA (Mrs.)	Contribution to the Study of Prostephanus truncatus and Ceratitis capitata, Pests Attacking Imported Crop Products to Niger
BADJI Kémo	Assessment of Potential Yield and Variability of Tolerance to Climatic Stress of 4 Isolates of Metarhizium anisopliae var acridium (Metschinkoff) Sorokin, Candidates for Locust Control
SONKO Lamine	Effect of Crop Sensitivity and Nitrogen Fertilizer on Competition between Weeds and Irrigated Rice
FAYE J. MANNEH	Combined Effect of Organic Amendment and Solarization on the Development of Cowpea Charcoal Rot (Vigna unguiculata [L.] Walp)
DIARRA Fatoumata Demba (Mrs.)	Variability of Isolates of Macrophomina Phaseolina (Tassi) Goid in terms of Pathogenicity on Hibiscus sabdariffa L.
DABO Mamadou	Variability of Macrophomina Phaseolina Isolates in terms of Pathogenicity on Arachis hypogea
FALL Waly Binetou (Miss)	Controlling M. Phaseolina (Tassi) Goid on Cowpea (Vigna unguiculata walp) through Organic Amendments and Antagonistic Fungi (Gliocladium spp. And Rhizopus spp.)
SILVA Gilbert Duarte	Contribution to the Study of Meloidogyne and Nematofauna Associated with Market Gardening in Niger.
KIEMA K. Raki (Mrs.)	Assessment of the Effect of Neem (Azadirachta indica A. Juss Meliaceae) Oil in Integrated Protection of Stored Cowpea Seeds (Vigna unguiculata Walp. Fabaceae) against Callosobruchus maculatus Fab.
Da Costa C. Zinha (Miss)	Contribution to Cowpea (Vigna unguiculata[L] Walp.) Protection against its Main Pests on-Farm Using Acqueous Extracts of Neem (Azadirachta indica A. Juss) and Pepper (Capsicum spp.) et de pourghère (Jatropha
BOUBACAR Alzouma	Study of the Effects of Neem (Azadirachta indica A. Juss) Oil, Jatropha (Jatropha curcas L.) Oil, Metarhizium anisopliae var. Acridum (Metchnikoff) Sorokin, Deltamethrine, Fenitrothion and Diflubenzuron through Topical Application and Ingestion by Schistocerca gregaria (Forskal, 1775) under Laboratory Conditions.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TRU/FS
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TRU/ENV/DC/NRM
TRU/IM

Legend

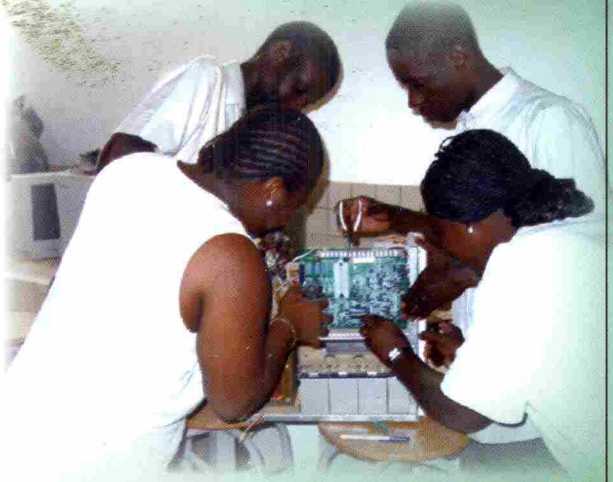
ES : CILSS Executive Secretary
DES : Deputy Executive Secretary
RSP - FS/DC/Pop.DEV : Regional Support Programme - Food Security/Desertification Control/Population and Development
RSP - WCM : Regional Support Programme- Water Control and Management
RSP - MA: Regional Support Programme - Market Access
MSU - AFA: Management Support Unit - Administration, Finance and Accounting
MSU - HRM: Management Support Unit - Human Resource Management
MSU - CID: Management Support Unit - Communications, Information and Documentation
MSU - MEP-SWG: Management Support Unit / Monitoring-Evaluation, Planning - Strategic Watch and Gender
DG/ARC: Director General/AGRHYMET Regional Centre
CIDU: Communications, Information and Documentation Unit
MEU: Monitoring-Evaluation Unit
SCU: Scientific Coordination Unit
TRD: Training and Research Department
PCU - LTTP: Pedagogic Coodination Unit - Long-Term Training Programmes
PCU - STTP: Pedagogic Coodination Unit - Short-Term Training Programmes
TRU - FS: Training and Research Unit - Food Security
TRU - WCM: Training and Research Unit - Water Control and Management
TRU - ENV/DC/NRM: Training and Research Unit - Environment/ Desertification Control/ Natural Resource Management
TRU - IM: Training and Research Unit - Instrumentation and Microcomputing
IRD: Information and Research Department
IRU-FS: Information and Research Unit - Food Security
IRU - ENV: Information and Research Unit - Environment
IRU - NRM/DC: Information and Research Unit - Natural Resource Management / Desertification Control
IRU - Markets: Information and Research Unit - Markets
IRU - ME: Information and Research Unit - Water Control and Management
TSD: Technical Support Department
MADBU: Methods, Applications and Database Unit
SEU: Software Engineering Unit
CMTU: Computer Maintenance and Telecommunication Unit
IMFMU: Infrastructure Maintenance & Farm Management Unit
MSD - AFA: Management Support Department - Administration, Finance and Accounting
FAU: Finance and Accounting Unit
HRMU: Human Resource Management Unit
AGSU: Administration and General Service Unit

——— Linkages between the ARC's Departments and the CILSS Executive Secretariat's Regional Programmes and Support Units
— — Linkages between the ARC'Units and the CILSS Executive Secretariat's Regional Programmes and Support Units

Abbreviations & Acronyms

ACMAD	African Centre of Meteorological Applications for Development
AMMA	Multidisciplinary Analysis of the African Monsoon
AP3A	Early Warning and Agricultural Production Forecasts
APM	Assessment and Programming Mission of ARC
ARC	AGRHYMET Regional Centre
CAMES	African and Malagasy Council on Higher Education
CERMES	Medical and Health Research Centre
CILSS	Permanent Interstate Committee for Drought Control in the Sahel
CIRAD	International Cooperation Centre of Agricultural Researchy for Development (France)
COP	Conference of Parties (United Nations Framework Convention on Climate Change)
CRESA	Regional Education Centre Specialized in Agricultural Sciences
DBMS	Database Management System
DGCS	General Department for Development Cooperation
DHC	Crop Water Balance
DSYS	Department of State for Youth and Sports (The Gambia)
EAMAC	African School of Meteorology and Civil Aviation
ECOWAS	Economic Community of West African States
ESA	European Space Agency
ESA	Engineer Student in Agrometeorology
ESCP	Engineer student in Crop Protection
FAO	Food and Agriculture Organization of the United Nations
FEWSNET	Famine Early Warning Systems Network
FRIEND	Flow Regimes from International Experiments and Network Data
FUL	Luxembourg University Foundation
GTZ	German Agency for Technical Co-operation
HTSA	Higher Technician Student in Agrometeorology
HTSCP	Higher Technician Student in Crop Protection
HTSH	Higher Technician Student in Hydrology
HTSIM	Higher Technician Student in Instrumentation and Microcomputing
HYCOS AOC	Hydrological Cycle Observing System for West and Central Africa
IAHS	International Association of Hydrological Sciences
IAO	Italian Agronomic Institute for Overseas
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IHP	International Hydrological Programme
IITA	International Institute of Tropical Agriculture
IMI	International Mycological Institute
IRD	French Research Institute for Development (ex Orstom)

NAC	National AGRHYMET Component
NBA	Niger Basin Authority
NDVI	Normalized Di?erence Vegetation Index
NRM	Naturel Resource Management
OSE	Oedaleus senegalensis
OSS	Sahara and Sahel Observatory
PIREM	Platform of Regional Institutions for the Environment and Meteorology
PRESAO	Seasonal Outlook Forum for West and Central Africa
PROMISE	Predictability and Variability of the Monsoon Impacts and Agricultural and the Hydrological Impacts of Climate Change
RDBMS	Regional Database Management System
SAS	Situational Analysis System
SCAC	Service of Cooperation and Cultural Action of France
SIAC	Statistics in Agroclimatology and Hydrology
SIAP	Integrated System for Early Warning
SISEI	Environmental Information and Monitoring System on the Internet
SPC	Scientific and Pedagogic Council
SRAP	Sub-Regional Action Programme
SVMS	Structural Vulnerability Mapping System
TAS	Territorial Analysis System
TMP	Training Major Programme of CRA
ULV	Ultra Low Volume
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
USGS	United States Geological Survey
VMS	Vulnerability Monitoring in the Sahel
WFP	World Food Programme of the United Nations
WHO	World Health Organization
WHYCOS	World Hydrological Cycle Observing System
WMO	World Meteorological Organization
WRI	World Resource Institute
ZAR	Area at Risk
ZVA	Zonocerus variegatus



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