



Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program

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Executive Summary

In terms of research and development issues for sustainable agriculture and natural resource management there are two zones of primary interest: the wildlife corridor from Nikolo Koba to the Ferlo and Malian frontier; and the humid zones, particularly the mangroves of Sine Saloum. The key issues appear to revolve around transhumance, brush fires, and hunting reserves in one zone and protection of the mangroves in the other. While the SA & NRM problems are not limited to these zones, they are the ones that those I spoke with emphasized.

Currently, the mode for addressing these issues is through locally developed management plans, variously named depending on project and/or priorities. This approach conforms to Senegal's policy of decentralized management of natural resources. However, the *Communautés Rurales* (CRs) are weak and need other partners. Mechanisms to simultaneously reinforce local capacities and promote public-private initiatives are required. The development of "*reserve communautaire*" for biodiversity conservation is becoming more common. While some progress has been made, mechanisms for valorizing resources to provide incentives for local management still require further efforts.

USAID/Senegal has a document of biodiversity threats developed in 1997, but it is not clear that it is complete or up to date. The Government of Senegal has prepared a biodiversity strategy. However, this appears to be based on isolated accounts of declines in wildlife and habitat. Existing information is dispersed and hard to access. Overall measurement of the degree of degradation, wildlife movements, and indicators of associated dynamics has yet to be conducted. Furthermore, issues of transfrontier movement are beginning to be recognized, but little is known, as with livestock-wildlife interactions.



Consolidated Meeting Notes

I met with Malcolm Marks and Baidy Ba at Wula Nafaa. The Wula Nafaa (Ag/NRM) project has two primary thrusts: (1) helping local communities to use the devolved authorities which they have been given (training and awareness building is the primary focus); and (2) helping local communities to profit from their natural resources (focuses on building small enterprises in forest (panne de singe; gum mbopp) and non-traditional agricultural (fonio, bissap, palm oil, cashew) products).

The key researchable issues are how to increase the productivity of fonio (from ~200k/ha), the regeneration of Baobab, and the regeneration of “sterculia” (gum mbopp). Why doesn't the baobab regenerate in nature? It doesn't produce real wood – is hollow (as is mbopp). Actually the problem is that herders will destroy trees for the honey held inside. Research on these issues could be conducted by ISRA in the Direction de Recherche sur les Produits Forestiers (DRPF) or elsewhere.

In Tambacounda they focus on the volet filière, which doesn't include horticultural production although the Tambacounda City Council has horticultural development in their development plan. The key problems are bush fires and transhumance. These two problems are linked. *Convention locale* can be the solution to address these whereby communities take control of their own destinies. However, the applicable laws are rarely known or applied. The population doesn't know the forestry code, their rights and obligations. However, some of the Wula Nafaa communities have accomplished a great deal. For example, using their plan d'aménagement, a community instituted a fine of 300,000 for setting a bush fire (in one case this resulted in prison). In another case, a sous-prefet signed a community forest control act but then took a bribe giving authorizing access to a non-local individual (the community immediately censured him). In Kousanar, mbopp sales are profitable enough to finance guardians. The guardians also get 30% of the fines charged.

It seems that change, however, only comes when the situation becomes desperate. Wula Nafaa has taught communities about the laws and how to implement them. However, Wula Nafaa is just a facilitator. One thing they have done has been to organize the market around some of the key products mentioned above. Previously, many harvested products were sold to truckers as they passed down the road, without concern for production cost recovery or profit (simply to get cash). Now producers are marketing in groups at prices two to three times higher than before. Once the truckers realize that a whole commune has been organized to sell at a set (higher) price, agreed to pay the higher prices. Alternatively, Wula Nafaa has found urban based buyers who are prepared to transform the products. There is a concern over a limited number of buyers in this market. Higher incomes are associated with specialization which seems to be associated with market access (i.e., along the major highway).

The organization of common sales prices and standardization of commodities is driven by the establishment of *convention locale* which includes production plans by commodity as well as implementation procedures. “*Codes locales*” are local forest management plans found within “*Convention Locale*”.

Wula Nafaa is organized at the “arrondissement” level with 3 or 4 facilitators (CR-level). These facilitators are locally recruited. They form the basis for implementing local activities and conducted a survey on the following forest use issues (450 households-25/facilator).

Forest ecology indicators: (1) income from forest;
(2) ecological
- extent of bush fires;
- extent of woody species regeneration
- extent of woody species biodiversity
(a good overall biodiversity indicator)

The Charcoal Question: In time, the charcoal production system will change so that more value is retained by local communities. This will occur as CRs develop their Plan d’Aménagement (which explains how they will manage their ligneous resources) and have them approved. Piece by piece (CR-par-CR) the quota system will be dismantled. This should not lead to a complete dismantling of the commodity chain. There is a role for existing processors. They can bid for exploitation of a CR’s ligneous resources or become wholesalers for community-led production systems. In either case, the Casamance method will be required – this is the most efficient method of charcoal production. Thereby, decentralized management will be reinforced by a particular (centrally mandated) technical method for quality control (standards).

Malcolm Marks suggested that I might also talk with: (1) Jean-Philippe Jorez, PERACOD (GTZ-rural electric and domestic energy project); (2) Adama Ly, E&F biodiversity project; and Assize Touré, CSE.

At ANCAR, I met briefly with Youssoufa Diouf and his office partner, Meur Gueye. They are responsible for overall coordination of development activities at the local level, but are still building their operation. Youssoufa suggested that I contact the ISRA Directeur Scientifique Taib Diouf. Meur Gueye responded to the general question of what research is needed to support development in the SANREM context. His term was Regenerative Agriculture. This would be the primary point of intervention focusing on the rehabilitation of the soil. “We must shift from non-adopted technological fixes to technologies which valorize resources.”

I visited ACA and spoke with Ibrahima Yade. He suggested that to best understand the priorities and potential research themes that I should review the components of an email listserv (Casa Group) highlighting newspaper articles on issues of NRM in Senegal, Gambia, and Guinea-Bissau for the past 2 years. He shared the articles with me. One recent article he found quite interesting was in Le Quotidien lundi 13 juin (www.lequotidien.sn): “les algues font pousser (as fertilizer) des bananas”. This is the work of Abdourahmane Tamba (not of ISRA/CDH).

ACA has a project with the Ministry of Elevage who have contracted them for PAPEL implementation. This is a way that the government can attain its objectives without using

fctionnaires-a service contracted by the State. One interesting thing is that instead of charging for water by the head of cattle, they are selling water by volume – thus, reducing waste.

At Senagrosol, I met with Mamdou Daffé and Soukèye Thiongane. They are in the midst of the training program to mount the data collection effort for the DRSP (World Bank-driven Poverty Reduction Strategy). This involves a lengthy questionnaire which will target 15 villages. Although it could involve both urban and rural areas, they will be targeting only rural areas. I learned that they had had a biodiversity project financed by the PNUD through Italy. A transfrontier project of Senegal and Mauritania, but this project amounted to merely parallel play. Daffé mentioned that GREEN-Senegal was a strong biodiversity-type NGO with which to collaborate,. Mme Wore Seck is the Director, ex-Rodale.

I met with Eaux et Forêts DG, Matar Cissé. I asked him what were the critical issues in SA&NRM. He began immediately by noting the importance of decentralized NRM and local development. On reflection, he stressed the growing importance of crossborder NRM – (Gambia, Senegal, and Guinea Bissau). How can this be coordinated, and consequently, managed? He said that managing brush fires was an essential aspect of biodiversity conservation. He stressed that these fires must be managed. He also noted that the full commodity chain for non-traditional forest products needs further examination.

At USAID, I met with Peter Trenchard, Aminata Badiane, Diallo and a DG fellow. I presented that SANREM CRSP program, expanding on our approach and interests. There were questions of clarification. They seemed generally interested in what we could do, although disappointed that Senegal did not figure among the central research sites for planning awards. I said that we were looking for the points of entry for a research program that coincided with their needs, so that as our program evolved we would be able to serve them. To that end I asked some questions.

The first thing mentioned was a current fisheries conflict. We discussed biodiversity. Peter has been asked twice about their Biodiversity Threat Assessment (by Chris and by me). Apparently, a report was drafted in 1997. Nevertheless, Senegal has a biodiversity strategy. A biodiversity threat assessment takes anywhere from 4 to 9 weeks (could be done 4-6 weeks). Peter wanted to know if SANREM had funds to do something like this. He is concerned that wildlife is not really considered in current activities, noting that the work that has been done only focuses on vegetation.

The reigning doyenne of biodiversity in Senegal is apparently, Amadou Tidiane Ba (biologie végétale) at UCAD. Diallo mentioned that there had been a lot of work done on the subject by students (Masters/PhD) but this hasn't been disseminated. He noted that there is wildlife info in the university libraries. Peter was not satisfied that they had done enough (or anything substantial). Publishing is an issue. Peter wants to know what is the situation of livestock – how does this fit in the ecology. Why do wildlife numbers appear to be dropping? He spoke of 5 turtle species going extinct, the yellow dolphin in the mangroves of Fatick, and monkeys. The

National Park Service (Min of Env) should have information on wildlife. There is a question about how to best exploit the available information.

I told them about some of the planning awards in Africa that might correspond to their interests like the teams in Madagascar, in Tanzania, and in Zambia. Perhaps one of these could be interested in developing a cross-country comparative approach. They suggested that I talk with Adama Ly who is running a biodiversity project in Eaux et Forêts.

When asked about their new country strategy, Peter said that they were in a shake out period and awaiting direction from Washington. There is change going on in Washington that they don't fully understand, but he thinks there is going to be one strategy for Africa. He wants to know what they are going to invest in.

I visited the Projet de Gestion Intégrée des Ecosystèmes (PGIES) and spoke with Adama Ly. Ly says they are building on the lessons of the past, which have presented a set of five constraints. He is very detailed and we only managed to discuss two in depth. The PGIES is nearing the end of the first 5 years of a potential 10 year project.

The first is institutional (land tenure and charcoal). Land tenure is a major problem for herders who cannot demonstrate "mis en valeur". Their project has been developing 15 Reserve Naturelle Communautaire (RNC-400,000 hectares). Five are buffer zones around Nikolo Koba. They have also been developing Unités Pastorales. In 2003, three (200,000 hectares) were designated in the corridor north of Nikolo Koba next to the Ferlo-Sud Reserve Forestiere. He claims that since these were established, there have been no brush fires within their boundaries.

The second barrier is using adapted technologies like a string on which oysters will grow so that the harvesters don't chop off the roots of the mangroves where oysters normally attach themselves. Apparently this works, but more research is needed to fully develop the system. He also mentioned the Casamance method for making charcoal which is 30 percent more efficient than traditional methods. This has not been adopted by the charcoal makers – in part because the charcoal producers are itinerant and have no incentive to make the investment.

We investigated that maps which Ly has. He showed me a migratory corridor for wildlife between Nikolo Koba and the Ferlo and how rented hunting lands are set up all along this corridor. Wildlife movements go from Nikolo Koba to the frontier of Mali as well as the Ferlo. He is concerned with issues of ecosystem interconnectivity. They are (or have plans to) collar some animals to determine their actual movements. The key species is: *Taurotragus derbianus* (Elan de derby). This species is only found in West Africa (Senegal, Mali, Guinea). This is what has driven the development of the community (not national) reserves – in order to establish protection along the corridor.

Ly says that the key issues revolve around transhumance, brush fires, and hunting reserves. He mentioned that Abdourahmane Tamba (ISRA/CNRF) has a GEF project of interest: the Desert Margin Program (DMP).

I met with Henri Lo at the Institut des Sciences Environnementales (ISE) – UCAD. We discussed research and development priorities. He noted that conflict was a fundamental question that revolved around the governance of natural resources. Decentralization was at the center of this. Local populations are demanding more authorities at the local level. However, they have not yet mastered control of those they already have (i.e., over their natural resources). He says that the key conflict is with the central government, although this is not overt. Slowly leaders are demanding increased capacity to govern at the local level. Henri says that research on consensus building is needed, particularly focusing on how to promote public-private partnerships. The CRs are weak and need other partners.

Decentralization has been on the books since 1972, with serious legislation in 1996, but still there is only talk of training and more training. Leaders come and go, and the next set claim to need training again. This cannot persist. There seems to be no mechanism to institutionalize the lessons learned. There needs to be some sort of structure – public/private or parapublic. He suggested some avenues to address this issue.

(1) a consulting office established at the local level. They could provide studies, “appui d’accompagnement”, and advice. This would provide immediate feedback to local decision makers and they could learn by doing. In this regard, ISE is developing a Masters program through a Fulbright grant with Clark University: *Gestion décentralisée et gestion des ressources naturelles*. This program would train those who will work with CRs. I suggested that this might make an interesting partnership if these students were to take their stage in a CR to assist in their development while learning about the real issues.

(2) There are some retired fonctionnaires who are returning to the CRs and taking leadership positions. This is an interesting and promising development. They have a better understanding of what to do and are asking for the powers to accomplish their tasks. [example: Baldé in Pata.] Here he knows personally of conflicts between local leaders and the State. Neither of us could figure out how this might be promoted through a program, but the phenomena is indeed worth study because of the natural strengths and experience such leaders can bring to local communities.

(3) Henri spoke of “cooperation décentralisée” where the “collectives locales” could arrange for technical assistance directly from international donors and NGOs. This is a point of intervention for the Master program graduates. (4) These graduates could also find positions through developing linkages with the private sector. In either case, their salaries could be covered in the financing.

Henri has most recently (past two years) been working on a study of the Poverty Reduction Strategy Program (PRSP). He says that it has not been based on a good analysis of the situation. In particular, he sites the relationship between poverty and natural resources. They have ignored the interface between sectors. Each sector was analyzed separately and this will not lead to sustainability. For example, the Health sector focuses on building hospitals for the sick, but does not consider prevention of environmental conditions promoting malaria. The report he has been working on, Sustainable Development Strategies, focuses on these interfaces. There needs to be

an enabling framework for the PRSP. Impact studies and training are needed. They have identified six strategic dimensions.

(1) information, education, communication; to maintain sustainable development these must be integrated into the curriculum. We discussed the trade-offs between specialization and interdisciplinarity.

(2) sustainable production/consumption; satisfy basic social needs while respecting the environment will lead to sustainability; the rest comes after this has been established.

(3) promote balanced development – a return to land use management tools.

(4) regional cooperation, as in the NEPAD, which needs to be locally based for sustainability. He notes the UEMOA has no environmental strategy. Impact assessment, integrated sustainable development.

(5) promote good governance through social and economic incentives, and capacities to manage conflict (consensus building).

(6) a framework to achieve the Millennium Development Goals, localizing MDGs.

This sounds very much like the « Lettre de politique sectorielle de l'environnement ».

I spoke by phone with Abdou Sene (Wula Nafaa). He noted that there were both inter-ministerial problems (sectoral) and local challenges to developing hunting reserves and biodiversity in the corridor zone. Sectoral ministries seem to pre-empt local decision-making. For instance, the Min of Env was currently convoking the annual meeting for reforestation. This meeting involved only forestry agents, seemingly oblivious to the fact that CRs now have the authority for reforestation. The Min of Ag also has programmatic activities for development in the corridors. This leads to a situation where agents from different ministries come out imparting contradictory messages to the local population.

I found Abdourahmane Tamba, not at the Forestry Resource Center, but at the Horticulture Center. I introduced myself and we met with Center Director Mbaye and Tanou Babagallé Ba. Mbaye provided an overview of their activities. The center focuses on fruits and vegetables, including such non-traditional products as bissap, meringa, amaranthe, and manioc (the latter with IITA). They develop technologies which are then adapted, sometimes with the assistance of an NGO, in response to needs of producers.

The Desert Margins Project (Tamba's activity) focuses on rehabilitation of ecosystems, reinforcing local capacity, establishing plans, and evaluating those plans. It is based on voluntary participation of the population. They have 15 technology and 8 international partners (CGIAR and CIRAD). They diffuse appropriate technology. They have established "mis en

defense” in some 20 CRs of the Peanut Basin. They are interested in working with the populations to develop systems to manage these zones sustainably.

They are also developing tropical household garden projects based on “*école paysan*” community gardens. This is still in the planning stage. They have already begun micro-irrigation (drip) with kits for 1000 square meters and 500 square meters. Some 60 producers are testing them, and some have already purchased the foreign made kits. Mbaye also noted that they are working on assisting export competitiveness, issues of pesticide residues, techniques appropriate to the regulations. They are working on developing how to manage and use chemicals properly.

Tamba noted that he was collaborating with PGIES on developing reserve communautaire in 4 CRs in Sine Saloum. They are developing plans de gestion at the CR level to reduce pressure on the “*aire protégée*” (reserve communautaire). Activities include micro-credit for women’s groups to dry or smoke fish, horticultural production, and apiculture. Partners include ANCAR which is in charge of local coordination. There are also NGOs in the area but it is not clear the extent to which they are involved. These include CARITAS, Africare, and CAREM (the latter are mangrove specialists).

I met with Assize Touré and Amadou Moctar Dièye at CSE. I asked Assize about what he thought were the breaking issues in SA & NRM in Senegal today. Assize has two fundamental questions to be addressed: (1) how has the landscape evolved in terms of the diversity of fauna and flora? and (2) what can be done about it? CSE is working on two primary dimensions of research. The first is carbon sequestration, soil fertility improvement, and relationships with climate change (Dièye’s interest). The second is the wildlife corridor (Nikolo Koba-Ferlo) and the hunting leases. Their focus is on understanding the movement of wildlife and the relationship to floral diversity. They have a proposal that was developed for collaboration with the University of Lausanne. Unfortunately, that proposal was not accepted because it didn’t coincide with the University’s grant focus which was more health oriented.

Assize also noted that there was a lot of work to be done in restoration of the humid zones. The mangroves are slowly disappearing and salinization is increasing. What first needs to be established is measurement of the degree of degradation and its dynamics. Then, work needs to be done to develop a strategy for restoration which includes the population. There are a lot of partners that could be included in this effort – the National Park Service, UCAD, ISRA (production végétale).

The Ministry of Environment and Nature Protection has published a « Lettre de politique sectorielle de l’environnement ». This document frames the strategy that the government of Senegal is pursuing with regard to environmental issues. New Dutch development policy is to fund the government directly through the budget with funds earmarked for certain purposes rather than finance individual projects. Building on the “Lettre”, this financing is organized with respect to the « Cadre de dépense sectorielle à moyenne terme pour le domaine de l’environnement » (CDS-MT). This is through the Ministry of the Environment and Nature Protection and frames the programs and specific projects where the financing will be directed. It is a three-year program, years 5, 6, and 7 of this new approach (2005-2007).

List of Contacts:

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CSE – Assize Touré and Amadou Moctar Dièye

Eaux et Forêts – Matar Cissé

Institut des Sciences Environnementales (ISE)-UCAD – Henri Lo

ISRA/CDH – Abdourahmane Tamba, Aziz Mbaye, and Tanou Babagallé Ba

Projet de Gestion Intégrée des Ecosystèmes (PGIES) – Adama Ly

Senagrosol – Mamadou Daffé and Soukèye Thiongane

USAID – Peter Trenchard, Aminata Badiane, sociologist Diallo, and DG person

Woula Nafaa – Malcolm Marks, Baidy Ba and Abdou Sene