

Regenerative agricultural entrepreneurship and education along the Petite Côte, Senegal

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On a map, Senegal's Petite Côte ("Little Coast") stretches southeast from Dakar, forming a smooth arc from the underside of the Cap-Vert peninsula to the dense islands in the mouth of the Sine-Saloum river delta. This several hundred kilometre smooth stretch of white sandy beach has attracted beachgoers and tourists since colonial days.

The increase in tourism over the past decades has been, as always, a double-edged sword, providing economic opportunity for some of the local population, while draining rural villages of a much-needed workforce. This outmigration of mostly young men from farm to city is commonplace not only in developing nations such as Senegal, but also in farming communities in developed countries, including the United States. One of the central goals of sustainable agriculture is to revitalise rural

their plot, then dipped the can into the spring. If it could kill everything in the spring, imagine what it could do to the producers and the consumers!"

Farming and promoting community development

El-Hadji went on to study tropical agroecology in Montpellier, France. Well-prepared to work for the government or an NGO, he decided instead to become a farmer, and purchased four hectares of land for a good price in Ndiemene, 25 km south of Mbour in 1993. "My family was furious. You don't go to school and then go back to the farm. But I farmed and sent my father money just as if I was working in an office."

His goal in starting the farm was threefold - to make money himself as a farmer, to educate local farmers about sustainable farming practices to revitalise the soil, and to advocate community development through initiating an organic market. Additionally, agritourism by Europeans eager to learn about community development, sustainable agriculture, and Senegalese culture is a central function in his multi-faceted approach to developing his farm.

El-Hadji also chose this arid region because the problems affecting Senegalese agriculture were more "visible" here than in the lush south — soil degradation, outmigration, and infrequent and variable rainfall. The land he bought was typical of the land of the Petite Côte - exhausted soils, eroded by wind and rain and continuous cultivation. He improved the land with generous applications of organic matter (manure, compost, leaf litter and prunings from the nitrogen-fixing *Leucaena* trees he uses as windbreaks). Additionally he emphasised the traditional practice of intercropping legumes such as cowpea (*Vigna unguiculata*) and pigeon pea (*Cajanus cajan*, known as *poix d'Angole* in Senegal) into millet and peanut rotations. In his market garden area, he intensified these same practices; he also increased vegetable crop diversity and used biopesticides such as neem to control pests. Working with local farmers and women's groups, El-Hadji has addressed these issues by promoting regenerative agricultural techniques such as cover cropping with pigeon pea and integrating *Leucaena* to provide animal fodder, fix nitrogen, and slow down erosion in their millet fields and vegetable gardens.

El-Hadji invites people to his farm to show them on a field-scale how to manage the sandy soil in a manner that reduces erosion. By ploughing along contours, intercropping with legumes, and planting nitrogen-fixing agroforestry species, he has improved soil productivity. "The problem here is not that the soils are poor, but that they are sandy and demand a certain method of farming." Erosion is a considerable problem here, leading to lower productivity, one factor in causing some farmers to abandon farming for urban jobs. El-Hadji hopes that by helping farmers improve soil management, they will have the option to stay on their farms. After three years of experimenting and providing trainings at the farm, many of the participating farmers began implementing what they had learned in their own fields. "Everyone is a producer here!" says El-Hadji. The rainy season lasts from July to September, during which time millet is intercropped with cowpea. Rice is also common.



The coconut nursery at the Association Panafricaine Jardins d'Afrique, promoting the integration of trees and agriculture as the basis for sustainability.

areas, to protect rural livelihoods not only through environmentally sound techniques, but also by providing real economic opportunity for rural populations. Two men in Mbour, the economic centre of the Petite Côte, are playing a central part in promoting this model of agricultural sustainability through their entrepreneurship and educational activities.

In the early 1980s, when they were university students in Dakar, Gora Ndiaye and El-Hadji Hane began gardening in the vacant areas that are home to the majority of Senegal's urban agriculture. Troubled by the excessive use of pesticides in the city's gardens, they formed the *Association des Agriculteurs Naturalistes du Senegal*, known as AGRINAT, in 1986, an organisation promoting organic agriculture and pesticide awareness. El-Hadji remembers "The turning point came one day when we found that all the fish and frogs in the spring were dead. Someone had mixed pesticide in the watering can, watered

When the rainy season stops, however, labour shortages plague agricultural production along the Petit Côte, as in so many rural areas in Senegal. The men leave the fields to go and fish or work in the cities. "In some cases, there is no one left to work in the village but women and old men." Helping these women improve horticultural production and marketing has been one of El-Hadji's primary goals.

The gardening season begins in October and November, at which time the local women's group that El-Hadji works with begins farming the half hectare market garden located on his farm. Currently there are 15 women from Ndiémene who have plots in the garden. The garden is not only for the production of vegetables for sales in Mbour and Dakar, but also a forum for training farmers about organic production. At least a hundred farmers, mostly women, from four other nearby villages are active on the farm.

Their primary products are onions, cabbage, peppers, lettuce, and eggplant. Tomato production, however, has been limited due to a seed-borne disease widespread throughout Senegal. For pest control, they use a home-brewed bio-pesticide made from neem seeds, but El-Hadji says that he is trying to get people to understand that having healthy soil is the most important way to manage pest and disease.

The women's group sells their produce in Mbour and Dakar, where the high quality of their organic onions is becoming famous. "Our onions, you can keep them for a year. The others, they rot. Everyone now knows that organic onions last longer. We just want to interest people in what we're doing. Everyone says that the quality is high. The cabbage, you can smell the flavour."

Most importantly perhaps, El-Hadji has helped the local population take responsibility for stewardship of their land. "They realise that thirty years ago this was all forest with lots of wild animals. Now people are starting to understand that the environment is being degraded, that they must take charge of it. If someone else does it for them, it won't last. 'We must do this ourselves' is what they say now."

The activities of the farmers' groups, as well as El-Hadji's prominent role in the International Federation of Organic Agriculture Movements (he served 7 years on the IFOAM World Board), have attracted visitors from around the world. Every year, El-Hadji hosts several European interns on his farm. "Now my father is happy. The farm is always full of *toubabs* (white people) from Europe. He's happy that my name is well-known. He decided in the end that I'd made a good choice."

Planting palms for sustainability

Up the road, off a sandy street in a residential neighborhood of Mbour, El-Hadji's old partner Gora Ndiaye is surrounded by thousands of baby coconut palms in the nursery of his business, the *Association Panafricaine Jardins d'Afrique* (APJA). Tiny palm shoots sprout from coconuts half-buried in the sandy soil. Gora shares El-Hadji's vision of enhancing the sustainability of Senegalese agriculture and making agriculture profitable for the local population. His work revolves around promoting the integration of palm trees into both the natural and agricultural ecosystems of the Petite Côte. "Legumes fix nitrogen in the soil. By integrating trees and agriculture, we can create a microclimate that is favourable to the growth of legumes. The coconut palm helps to do this."

Gora Ndiaye embarked on his project with similar goals to El-Hadji - to make a living, and to educate and rehabilitate the environment at the same time. His research and experimentation

is much more focused than El-Hadji's holistic system approach - while this nursery sells all sorts of trees and shrubs, Gora's primary focus is on palm trees. His research involves integrating legume cover crops to create a sort of agro-sylvicultural system, as well as using palms for dune stabilization. Both men's experience as agriculture students led them to incorporate agronomic research or experimentation into their endeavours. Rather than pursuing jobs with the government or aid agencies as technical researchers or bureaucrats, both men were drawn to working the land and making a living doing so, a living that compares to what they left when they left the city.

In 1994 Gora began the first phase of his project, working with farmers to integrate palms into their gardens. He quickly realised that he needed some technical assistance when many of their young Grand West African palms were ravaged by beetles and a fungus. Gora met a palm specialist from Benin who invited him to his country to learn more. Both in Benin and in Côte d'Ivoire, Gora learned new germination methods and identified resistant varieties of palm that he has since used in Senegal, improving his production a hundred-fold. His business has been selling coconut, oil, and date palms, as well as the related *ronier* or borassus palm (*Borassus aethiopum*) to customers since then. Selling for a hefty 5,000 CFA francs each, roughly ten US dollars, the young trees are a good source of revenue, particularly in this area popular with tourists, where there is a high demand from hotel and home owners. The investment is worth it, Gora maintains: "Coconut palms may take four years to fully develop, but they will produce for fifty years."

In addition to selling palms, the *Association Panafricaine Jardins d'Afrique* has been involved with dune stabilization along the Petite Côte. In 2001 they received a US\$ 50 000 grant from the United Nations Development Programme to train the local population to grow palms as a means of stopping dune erosion. An hour to the south, in the village of Samba Dia, fences of palm fronds now indicate the extent to which these important trees are integrated into the farming systems and daily lives of farmers along the Petite Côte. The organisation recently purchased a 3.5 hectare plot here where they continue to experiment with palm varieties and integration with field crops. They have planted more than 300 coconut palms at this new experimental farm, watered by a 6.5 metre deep well. Additionally, they have constructed a classroom for training and a small lodge for guests.

While Gora Ndiaye and El-Hadji Hane have taken slightly different paths towards promoting the transition towards a more sustainable agriculture, education is central to both of their activities. Both are proud of their successes, but are also well aware of the obstacles that lay ahead, such as a lack of water or a lack of an organic marketing infrastructure. Nevertheless, their deep-seated belief in promoting a socially-equitable and environmentally sound agriculture keeps them both motivated. "We just want to interest people in what we're doing," El-Hadji says. "The first step is to show them that we must approach things in a holistic manner." ■

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