

Water, Earth, Greenery.

WEGOUBRI, the Sahelian bocage

Integrating environmental conservation into the sahelian agriculture in Burkina Faso.

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The action of the NGO TERRE VERTE (*Green Earth*) in Burkina Faso is to create bocage landscapes. Those are called wégoubri in Moore, a local language. This new rural development concept was first and successfully developed in the 90s, at the pilot farm of Guiè, and has since been replicated in the pilot farms of Filly, Goema and Barga.

The degradation of the Sahel¹ environment has dramatically escalated during the last decades, endangering rural populations. In addition, damages caused by the on-going traditional practice of extensive agriculture have worsened the matter. Creating bocage landscapes in rural areas helps solve the problem.

Using a holistic approach that encompasses applied research, training and direct support to the farmers, the pilot farm succeeds in integrating environmental conservation principles in agricultural methods. Six technical teams supervised by a director run the pilot farm. It is the kingpin that helps the farmer implement the bocage concept.

The concept is based on the creation of bocage areas in co-ownership, including individual and common plots. Its management is organized through a land beneficiaries' group. The result is a fully restored environment where agriculture is no longer synonymous with erosion, where cattle breeding is no longer synonymous with overgrazing, and where trees and shrubs are harmoniously integrated in the environment.

The increase in agricultural yields obtained after only a few years of soil restoration demonstrates the economic viability of the concept. It is the only solution to restore millions of deteriorated hectares of land across the Sahel.

¹ Sahel: The Sahel is the ecoclimatic and biogeographic zone of transition in Africa between the Sahara Desert to the north and the Sudanian Savanna to the south. Having a semi-arid climate, it stretches across the south-central latitudes of Northern Africa between the Atlantic Ocean and the Red Sea. (Wikipedia)

NGO TERRE VERTE (*GREEN EARTH*)

The NGO TERRE VERTE was founded in France in 1989 with the goal to support the pilot farm of Guiè, created in Burkina Faso the same year. Since then, Guiè's farm has developed a new concept of restoration for Sahel's degraded lands based on bocages. That method has been implemented by TERRE VERTE (*located in Burkina Faso since 2001*) in other Burkinabe pilot farms, like Filly and Barga in the Yatenga province, and Goèma in the Sanmatenga province. The aim of TERRE VERTE is to create islands of operational skills in the heart of the Sahel countryside.

These **pilot farms** do not operate in a vacuum: their primary purpose is to restore and develop rural areas, then to introduce sustainable agricultural techniques, and lastly to be service providers to farming communities (*mechanized work, gathering and marketing of products, etc.*). In a nutshell their primary goal is the restoration and the sustainable management of the rural land.

The farms belong to the village communities that TERRE VERTE assists through technical, material and financial support, so that they can integrate all the components of rural development, and rise up to their own challenges, while keeping with the course of the present world.

Bocage in the Sahel

Bocage is defined as a rural landscape made of meadows and/or fields surrounded by hedges and woodland. Bocage is a balanced environment created by man where trees, crops and livestock are connected, and where man and nature live in harmony.

In the Sahel the primary purpose of bocage is to keep the rainfall water where it falls, thanks to small dykes, ponds and hedges so as to mitigate the erosive action of monsoon rains and to maintain biodiversity in an extremely fragile environment.

Following the example of irrigated plots, we have created and developed a new concept in the area of Guiè in Burkina Faso: the **bocage area**, to solve the problems related to extensive agriculture (*overgrazing, erosion and fires*). A bocage area (*Wégoubri*) means land consolidation, from the request of local owners gathered in **landowners' groups** to plan individual plots and, by doing so, to bring environmental improvements.



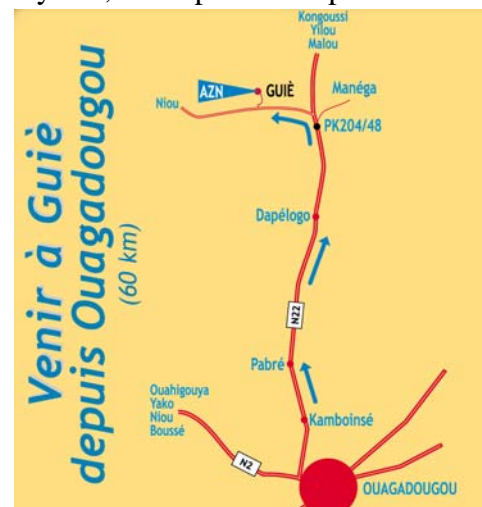
Aerial views of the bocage area of Tankouri in Guiè.

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Context

Man, fauna and flora in the Sahel have long been accustomed to drought periods : this is one of the Sahel climate characteristics .However, since 40 years, the episodic aspect of this climate has become chronic. But Man is at the root cause of desertification,, provoking severe damages to the environment through bush fires, irrational logging, land degradation due to mining agriculture, overgrazing with stray animals. So inhabitants are affected by water scarcity, loss of flora and fauna, and impoverishment of rural areas.

Since 1989, with the support of TERRE VERTE, the pilot farm of Guiè has been dedicated to land restoration in this region, through several techniques leading to a new agricultural system by creating the bocage. With full liberty of action and long-term plans the pilot farm of Guiè has been able to develop and promote a concept of bocage in the Sahel (*wégoubri* in Moore language).



Methodology

Between 1990 and 1995 the pilot farm has been established in the region of Guiè ; to solve the problems related to environmental deterioration we have experienced a new approach : leading integrated actions on all aspects of the relationship between man and his environment. The research was conducted in three directions : testing new techniques, training and direct support to farmers.

➤ So to experiment new techniques we started with the traditional methods already used in the region (*small dykes*), and we enriched them with techniques of bocage (*ponds and quickset hedges*) The techniques were developed and improved by our own research : thus vegetation degradation due to stray livestock was controlled by fitting wire netting, and a permanent fence was made possible by developing a system of **mixed hedge** (*see photo*), a fence combining wire netting with a quickset hedge of *Cassia sieberiana*, *Combretum micranthum* and *Diospyros mespiliformis*.



➤ Training people to use these new techniques has been carried out in 2 ways: young apprentices invited to work on the farm and training courses for adults on their own farms. For our technicians and some model farmers we are also in favor of exploring other agricultural and environmental experiences in Burkina Faso, in neighboring countries and even as far as Europe where can be found old bocage areas, full of examples - genuine books respectful to the environment.

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➤ The third direction aims at developing sustainable agriculture through **direct support to farmers**, mainly for extending bocage areas. So we have set a work planning system that begins with the study of the site to be developed. Once the project is worked out the beneficiaries clear the tracks for land surveying, carried out by our technicians. The site itself is managed on the principle of intensive labour investment program. This system involves rural people in major projects usually entrusted to mechanized companies (*small dykes, ponds*). Workers on contract trusted with various tasks – of heavy work- do precision work while gaining expertise as elaborate as expected, in consideration of the compensation. Moreover this choice stimulates social and economic development of the region, as all the components of the more active part of the population (*youth, men, women*) are associated in the works. Once finished the bocage area is managed by a **land owners' groups** whose purposes are the proper maintenance of the commons and the respect of the three basic rules of preservation in the Sahel environment: livestock, fire and logging control.

These three work directions are to be found in the new farms created in other provinces in Burkina Faso (*Filly, Barga and Goèma*) So we can define a model organization of any pilot farm where three research directions are organized around **six sections** or work teams supervised by a manager. **These six sections are:**

S e c t i o n s	M i s s i o n s
Tree nursery 	<ul style="list-style-type: none"> to experiment new plants and new horticultural techniques to produce the necessary plants for the bocage to save rare species.
Breeding 	<ul style="list-style-type: none"> to test rational grazing (<i>grassland and fallow control; hay and silage making</i>) to develop better herd management
technical supervision 	<ul style="list-style-type: none"> to train adults in field-schools² to organize the annual agricultural competition (<i>Ruralies</i>) to bring technical support to farmers in using bocage areas. to develop new skills in rural areas.
Farming equipment 	<ul style="list-style-type: none"> to bring logistical support to the pilot farm to develop clearly defined mechanization so as to facilitate the most arduous tasks in agriculture
land developpement unit 	<ul style="list-style-type: none"> Ensure the realization of bocage perimeters, rain gardens and rural roads bordered with trees: site studies, surveying, supervision of works, setting of wire-netting, planting trees and shrubs.
Maintenance of bocage 	<ul style="list-style-type: none"> to develop expertise in environmental management (<i>trees upkeeping and pruning</i>) to keep hedges and road trees in good condition.

² Youth basic training is done in the pilot farm of Guiè and internship in other farms (*see box*).

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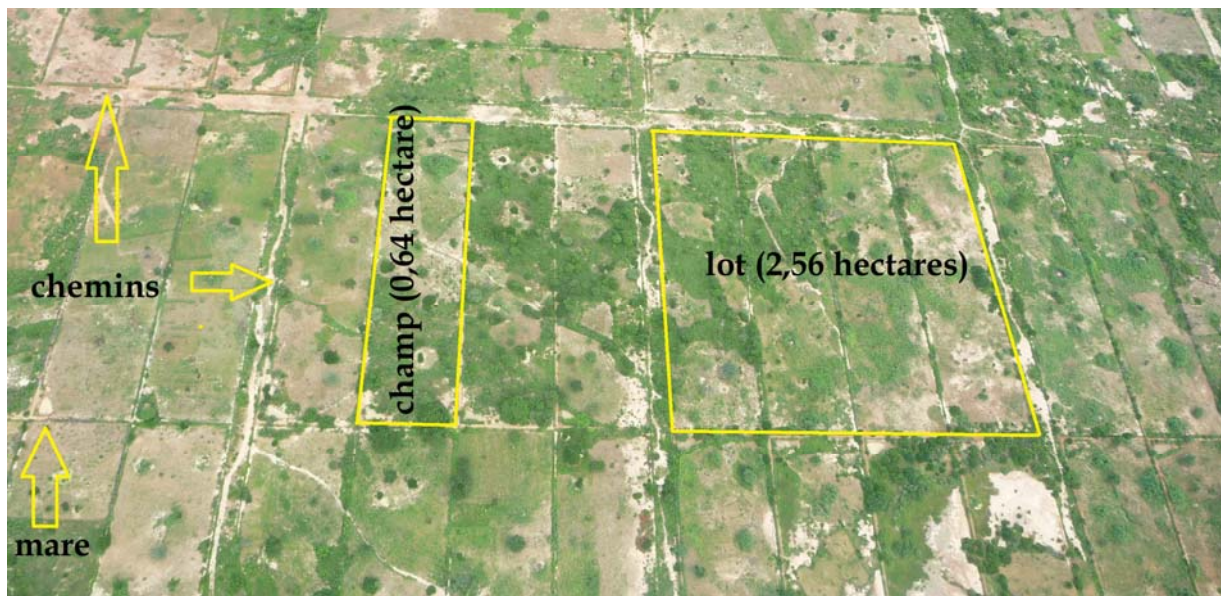
Bocage areas: the concept

Bocage areas are managed on the basis of **informal co-ownership** organized within the **landowners' groups**, including individual and common plots. This status is informal due to the fact that the insertion of the plots in the cadastre is laborious and too expensive for farmers.

Common facilities are the foundations of the bocage area, they are from outside to inside:

1. The **firebreak** (*10 to 20 meters large*) around the whole area protects it against the risks of fire, present all the time in the savannah.
2. The **mixed fence** blocks the road to stray animals: it consists of wire netting inserted between 2 rows of shrubs.
3. **Openings** give access to the site: 4 doors allow cyclists and pedestrians to get in. A main gate is for livestock and tractors.
4. The major and secondary **roads** are used to access each field.
5. A **bulli** (*a large pond*) keeps water from the surrounding roads for livestock to drink.
6. Sometimes some **related facilities** (*diversion canal, bullis*) are necessary for the protection of the site upstream against runoff coming from undeveloped areas.

Individual plots enjoy all the benefits that the common facilities provide in the improvement in agriculture and cattle breeding, while preserving private property-much appreciated by farmers.



Each **owner** is given an allotment of **2.56 hectares** (*160 m X 160 m*) divided into **4 fields** (*0.64 hectare each: 160 m X 40 m*). This allows him/her to adapt to the various slopes of the land, by pivoting the fields inside the square allotment.

Each field can be reached by a path lined with a double protection: a **small dyke** with a **hedge**. At the lowest point of the field a small infiltration pond (*called banka in Moore language*) is dug to collect the excess water of the field.

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This allows to keep all the rainwater without erosion. We even recover water from the pathways. Farmers then have at their disposal an excellent working framework, ensuring good returns and lasting production.

Trees are planted along the axis of the field and **shrubs** in the quickset hedges so that farming tasks using horse-drawn or mechanized tools are not hindered.

The zaï farming method (*see box*) allows to regenerate soils before preserving them with **crop rotation**, including **grazed fallow land** with an electric fence, together with livestock grazing in fields after the harvest thanks to a solar electric fence adapted to the dry season (*two wires stretched 8-12 inches apart: one of which plays the role of earth, the other being live*).



Dry season grazing.

Spreading the concept

Through this work we can reshape the countryside, create a new and more pleasant landscape, ensure more important and diversified productions. In our experimental plots, located in the heart of the bocage area of Guiè/ Tankouri we have succeeded- after a four years' rotation- in obtaining yields amounting to 27 quintals in sorghum production in 2006 and 32 quintals in 2007, which is twice or three times as much as the yields achieved by the best farmers of the region. This demonstrates the validity of our concept. In fact the development of a bocage area approximately costs 600 Euros per hectare and the increase in sorghum yields has improved its value up to 150-300 Euros/ hectare; however 50 Euros have to be deducted for zaï mechanization. If one also takes into account the need for farmer to increase his/her available revenues he/she could earn every year 100 Euros per hectare cultivated with cereals in order to pay back a loan that would have allowed him/her to finance this bocage area. On another side, secondary crops such as sesame, groundnuts, beans, etc. can provide other revenues for the farmer so that he can improve his reimbursement capacities.

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But for the moment such a financial arrangement can not be envisaged: farmers' mentalities are not ready for this approach, being much accustomed to direct and free assistance and not enough convinced of the success of the new approach. So we continue to create new areas and train beneficiaries in their management, as well as actively demonstrating how efficient and profitable they are. At the moment 807 hectares have been arranged for the benefit of 277 families:

Provinces	Villages	developed sites	Year(s) of the site	Total area (ha)	Number of beneficiaries Families
Oubritenga	Guiè	Kankamsin	1995	2	4
		Zemstaaba	1996/1997	8	4
		Tankouri	1998/2000	100	23
	Cissé-Yargho	Taag-Banka	2008/2009	146	55
Kourwéogo	Douré	Boangb-Wéogo	2004/2005	133	48
	Doanghin	Rimpintanga	2005/2006	113	42
Yatenga	Filly	Manegrewayan	2008	23	9
		Zamtaoko	2009	86	36
		Gourbaré	2014	66	29
Sanmatenga	Goèma	Neerwaya	2010	130	27
TOTALS				807	277

Prospects

To be successful, any action in the environmental domain needs to be a long-term project, confined to a limited space, thus allowing for a deeper understanding of the issues and for a better implementation of the solutions. That is what we are striving to do in our sahelian pilot farms, to create what we like to call the "The new rural deal".



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The “**Centre de Formation des Aménageurs Ruraux**” (**CFAR/Training Center for Rural Planners**), was created in 2008 within the pilot farm of Guïè to meet the growing need of skilled workers in the innovative work we are developing.



In addition to taking part in the farm’s activities, the CFAR provides our young with the theoretical training they need to be ready for the fight for land aggradation.

The training course is opened to motivated young people, boys and girls, willing to resist desertification and wishing to be trained and empowered to face the challenge. The objective of the training is to provide the **knowledge and expertise** required, mainly in the development and maintenance of bocage in sahelian rural areas, and to enable young people to actively participate into agro-forestry and pastoral development.

Training content:

- Study and aggradation of degraded areas,
- Study and realization of rural roads,
- Study and realization of bullis,
- Agroecology
- Ecological breeding,
- Forest nursery and reforestation,
- Rural crafts,
- General culture.



It is a residential course (*boarding school*) ; duration of 3 years, including 8 months spent in other pilot farms as practice areas.

After undergoing a final exam, students get a certificate, stating their qualifications for rural planning jobs.

For more information, contact us at: cfar@azn-guie-burkina.org

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Zaï is a traditional technique in cereal farming, originated from the north-western region of Burkina Faso (Yatenga). It is a technique consisting in concentrating water and nutrients around the cultivated plant: practically speaking it is done by digging holes 30 cm wide and 15-20 cm deep during the dry season. **Ripe compost** is deposited in the hole and covered with a small amount of soil; on the edge of it the cereal (*millet, sorghum or maize*) will be sown as soon as May-June rains start (*often insufficient*).

By **precisely concentrating water and compost**, this technique ensures proper rooting of the plants so that they will take full advantage of the monsoon and are enabled to resist drought. The only obstacle to the development of Zaï is the lack of compost. (*The rational practice of livestock breeding could resolve this problem*).



This technique allows to recover deteriorated lands and to bring in a good harvest, starting even in the first year. It also ensures enough food supply, no matter the rainfall level. In 2001 we got good results only with 428 millimeters of rainfall.

TERRE VERTE promotes this technology in the pilot farms. In Guiè, since 2002 a farming competition of the most beautiful zaï field is held annually in November, between farmers of the ten AZN villages members, during the event called Ruralies.

