

RESTORING ECOLOGICAL BALANCE AND BOLSTERING SOCIAL AND ECONOMIC DEVELOPMENT IN NIGER



Location: Keita Department, Niger

Since 1984 the Keita Rural Development Project has focused on restoring the area's ecological balance and pursuing social and economic development. The project was critical in stemming ecosystem degradation resulting from climate change and human activities while improving livelihoods and increasing food production.

CHALLENGE

Located in the center of Niger, Keita Department is a 4,860 sq km plateau with rocky slopes and valleys forming a complex system of watersheds subject to strong winds and water erosion. Plateau slopes covered by forests in 1962 were completely deforested by 1984. As in other Sahelian nations, droughts experienced by Niger in the 1980s exacerbated the country's difficult social and economic situation. Droughts, damaging farming practices, and a rapidly increasing population led to a widespread crisis. With meager agriculture investments and no credit systems or dynamic marketing networks, Niger had to import more cereals to meet national requirements even though agriculture and livestock accounted for 80 percent of the country's livelihood.

RESPONSE

The Integrated Rural Development Project in the Ader Doutchi Maggia, Niger (PDR-ADM) was launched in 1984. Frequently referred to as the Keita Rural Development Project, its goal was to increase food security in the entire Keita District and improve livelihood conditions by restoring the area's ecological balance and pursuing social and economic development.

From its inception, the project used a systemic territorial methodology, stemming from the concept of Basic Land Unit (Unité Territoriale Élémentaire, UTE), which tackles catchment basins as a whole, from upstream to downstream. Landscape features were analyzed through aerial photographs, and efforts were made to improve technical solutions, allowing the implementation of soil and water conservation measures to be targeted to the optimal physical scale and location. While respecting environmental priorities, UTEs with higher population pressure were the first targeted for intervention. The project also emphasized social and economic components as part of a comprehensive sustainable development program. As such, income-generating and entrepreneurial activities around agriculture and soil conservation were encouraged. There was also massive construction of wells, schools, and health clinics—almost 1,000 wells and buildings.

During Phase I (1984-1991), the project covered about 5,000 sq km, home to approximately 160,000 people. To improve water resources and soil quality and develop basin slopes, a series of activities were undertaken: the plateau and abandoned valley land were reclaimed for agricultural and pastoral purposes; the slopes, the banks of the *koris* (small intermittent streams),



Woman carrying millet. © Samuel Hauenstein Swan

and dunes were reforested; wind breaks and forest areas were created; and the water flow in the *koris* was controlled by consolidating banks and small dams. In addition, about 1,300 hectares (ha) of sand dunes were fixed, about 1,400km of stream banks were stabilized, 40 small and two major dams were built, and more than 300 km of rural roads were constructed.

Table 1: The Main Interventions of PDR-ADM from 1984 to 2003¹

Reclamation and improvement of agricultural and pasture lands, reforestation and dune fixation	34,483 ha
Trees planted	18,000,000
Road construction	313 km
Drilled wells	5
Excavated wells	708
Rural buildings (area)	28,000 m ²
Small dams	40
Dams	2

During Phase II (1991-1996), the intervention area expanded to include the Bouza and Abalak districts—a total of 12,000 sq km and 286,000 people. Main activities included:

- Utilizing restored land with appropriate sustainable cultivation techniques, based on conserving the plants-water-soil balance, which allows increased agricultural and animal production

- Introducing forage alternatives to grass, improving the veterinary infrastructures, and providing knowledge to improve animal production
- Initiating anti-erosion land management, to perform activities such as the rehabilitation of desertified lands for agricultural and forestry use. All anti-erosion activities were carried out through the food-for-work payment system (the workforce was comprised mainly of women), with food-rations provided by the World Food Programme
- Consolidating dunes, stream control, and forestation to improve water run-off control
- Disseminating appropriate agricultural inputs and establishing demonstration fields to introduce innovative agricultural techniques and crops
- Developing basic infrastructure and small irrigation units
- Offering technical, logistical, and financial support for agricultural activities through local assistance services
- Strengthening credit systems and marketing infrastructures for agricultural production
- Strengthening community institutions by directly involving them in the management of equipment and revolving funds, as well as restored communal natural resources

Phase III (1996-1999) was predominantly focused on developing the fragile pastoral zone in the Abalak district north of Keita, an area crucial to sustaining the ecological, social, and economic progress obtained in Keita and Bouza districts. 2000-2001 hand-over phase concluded outstanding works, gradually reducing the project structure

and strengthening the involvement of local communities in order to sustain achievements.

RESULTS

Budgeted at more than \$100 million, the Keita project’s unusually high costs have garnered criticism. But the price tag is warranted, as noted by researchers, as more than 20 years of soil conservation and land reclamation interventions have made of Keita an open-air laboratory where it is possible to carry out studies on the impacts of actions against desertification.²

In addition, a scientific evaluation demonstrated that the Keita project was integral to stemming further degradation of the ecosystem due to climate change and human activities while improving the region’s biophysical and socioeconomic well-being. More specifically, the project accomplished the following:

- The project increased incomes by more than \$6 million per year during the 15-year period 1984-1999, of which 42 percent was derived from livestock, 25 percent from vegetables, 22 percent from cereals, and 11 percent from wood.³
- Land degradation and desertification were halted, and large surfaces were recovered. Desertification control was based on the strategic planting of trees—almost 18 million in total.⁴
- A study on the change in land cover shows that between 1984 and 2002 woodlands increased more than 300 percent (10,000 ha in 1984 to 45,000 ha in 2002) against a 30 percent reduction in the shrubby steppes. In 2003, the project area produced about 40,000 tons of wood compared to 1984 production of about 17,000 tons, increasing 133 percent. The availability of leaf biomass increased by about 57 percent between 1984 and 2002.⁵

Table 2: Type of land cover in hectares from 1984 to 2002

	1984	2002	Variation
Woodlands	10,876	45,542	+319%
Shrub lands	95,950	67,422	-30%
Grasslands	60,277	17,417	-71%
Rainfed croplands	84,102	150,730	+79%
Irrigated croplands	968	1,006	+4%
Bare	144,998	124,196	-14%
Dunes	32,441	21,847	-33%

The project was called “Projet Intégré Keita (PIK),” “Projet de Développement Rural de l’Ader-Doutchi-Maggia (PDR-ADM),” and finally, “Projet de Développement Local de l’Ader-Doutchi-Maggia (PDL-ADM).” It is popularly known as “the Keita Project.” It was financed by the Italian government, implemented by the Food and Agriculture Organization (FAO) until 1999 and then by the United Nations Office for Project Service, with support from the World Food Programme and the NGO COSPE. From 1984 to 1999, the total project cost was \$63 million, plus 12 million food rations.



Village granaries in Keita. © Samuel Hauenstein Swan

- The project increased the availability of croplands and agricultural surfaces by about 80 percent. This was mostly achieved by substituting large grassland areas, which decreased by about 70 percent, and encouraging Keita Project-led land reclamation interventions.
- Productive capacity was restored on 20,000 ha of seriously degraded land, of which 9,300 ha were used for cropping and the rest for silvopastoralism.⁶
- Cereal production grew from 39,000 to 55,000 tons, with a global value of 4.9 billion FCFA (over \$9 million).
- The productive structure of the area also underwent change. The traditional agro pastoral system, once based on rain fed millet and nomadic flocks, was diversified. Cash crops such as sesame and onions were integrated with cereals; irrigation became more diffused; fish farming was introduced in the reservoirs; and the commercialization of non-timber forest products (Arabic gum, leaves, fruits) from tree plantations increased.

Data collected on the three main interventions used for soil conservation and for an integrated management of the territory further confirmed the project's efficacy:

- Block plantation of trees (*banquette de plateau*) transformed the plateau from a marginal resource for breeding to a main resource with great potential. Data collected in 1996 and 2003 showed an increase of more than 90 percent in forage yields.
- Interventions on slopes (*plantation en tranchées* or trench planting) helped to strongly reduce or eliminate water erosion on arable lands. Planted trees represented a valuable resource for fire wood and goat feed and gave a net growth of production value of about 700 percent.
- Interventions on the *glacis* (*banquette de glacis* or bench terraces) enabled farmers to reclaim arable land previously subjected to desertification and abandoned. The *glacis* had a yearly production growth estimated to be about 1,400 percent, given the terraces weren't used and degraded since 1985. Besides agriculture, this comprised the highest amount of forage—about 70 percent—produced by trees (fruits and leaves); gums produced by Acacias were the second largest contribution, with a net increase of 1,000 percent each.
- 148 women's groups with more than 10,000 members formed the basis of a savings and credit association.
- A 2002 study of the Keita valley credited the project with sequestering approximately 132,000 tons of CO² per year. This showed that semi-arid regions *do* have the potential to provide much-needed carbon sequestration.



Banquette



Tranchée



Glacis

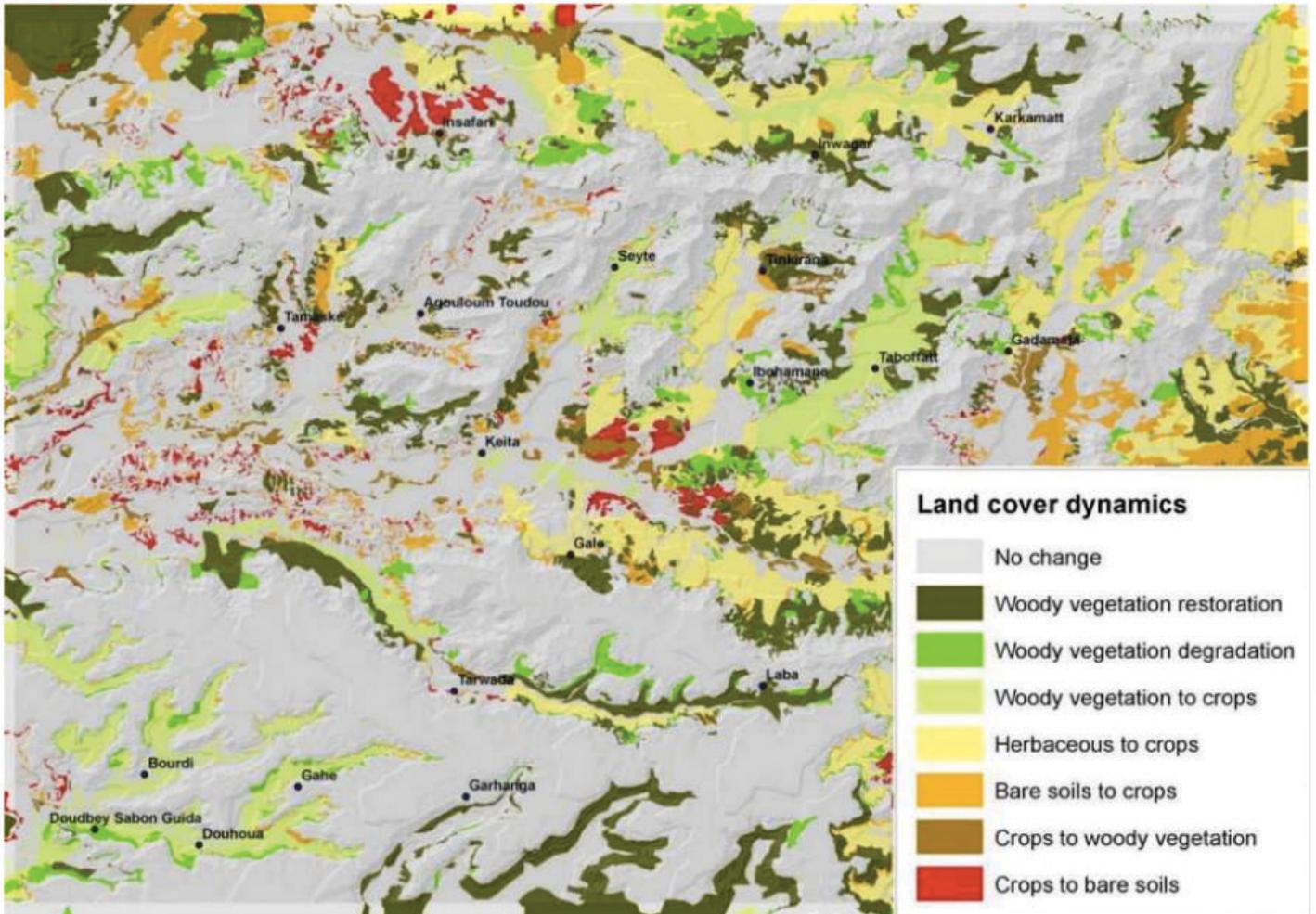
Three interventions against desertification: block plantation of trees (*banquette*), trench planting (*tranchée*), bench terraces (*glacis*). © Andrea Di Vecchia, Centro Città del Terzo Mondo



Women working in Keita Project's intervention area.
© Samuel Hauenstein Swan

- As Keita became a field for scientific study, ideas emerged to launch a “Keita Lab” initiative in 2006 and various propositions were made to establish a research center with

endorsement of some European and Nigerien universities, with the objective to spread environmental education and awareness in the region.⁷



MHAC Land cover dynamics in Keita from 1984 to 2002. © Andrea Di Vecchia, Centro Città del Terzo Mondo

FOR MORE INFORMATION

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This case study was produced by the Oakland Institute. It is copublished by the Oakland Institute and the Alliance for Food Sovereignty in Africa (AFSA). A full set of case studies can be found at www.oaklandinstitute.org and www.afsafrica.org.

ENDNOTES

- 1 Di Vecchia, A., Pini, G., Sorani F. and V. Tarchiani. *Keita Niger: The Impact on Environment and Livelihood Status of 20 Years Fight Against Desertification Actions*. Working Paper n°26, Centro Citta del Terzo Mondo, 2007. <http://areeweb.polito.it/ricerca/cctm/wp/WP26.pdf> (accessed September 23, 2014).
- 2 *Ibid.*
- 3 Reij, Chris and David Steeds. *Success Stories in Africa's Drylands: Supporting Advocates and Answering Skeptics*. Center for International Cooperation, 2003. <http://www.drylands-group.org/noop/page.php?p=Articles/803.html&d=1> (accessed September 23, 2014).
- 4 Palombi, Lucia. *Towards the Local Ownership of Rural Development Projects: the Evolution of the Keita Project*. First Interdisciplinary Course on the UN Millennium Development Goals, University of Rome, 2008. http://w3.uniroma1.it/sapienzamillenniumcourse/Lucia%20Palombi/MillenniumDevelopmentGoals_Keita_Palombi_ArticleOctober2008.pdf (accessed September 23, 2014).
- 5 Tarchiani, V., Di Vecchia, A., Genesio, L. and F. Sorani. *Monitoring Drylands Ecosystem Dynamics for Sustainable Development Policies: The Keita Experience*. in *The Future of Drylands*, International Scientific Conference on Desertification and Drylands Research jointly published with UNESCO, Paris, 2008.
- 6 Reij, Chris and David Steeds. *Op. Cit.*
- 7 Coopération Italienne au Développement. *Best Practices*. "Projet Keita: où l'homme a arrêté le désert." (undated). http://www.abidjan.cooperazione.esteri.it/utlabidjan/FR/best_practices/keita.html (accessed October 30, 2014).

FRONT PAGE PHOTO:

Woman sifting millet. © Samuel Hauenstein Swan