Niger: Erosion Control Tahoua and Tillabéry, Phase III

Ex-post evaluation

OECD sector	31130 – Agricultural land resources	
BMZ project ID	1996 65 696	
Project-executing agency	Ministère du Développement Agricole[1]	
Consultant	GTZ (third-party business)	
Year of ex-post evaluation	**2005**	
	Project appraisal (planned)	**Ex-post evaluation (actual)**
Start of implementation	3rd quarter 1997	1st quarter 1998
Period of implementation	Approx. 25 months	42 months
Investment costs	EUR 5.62 million	EUR 5.62 million
Counterpart contribution	EUR 1.28 million	EUR 1.28 million
Financing, of which Financial Cooperation (FC) funds	EUR 4.34 million	EUR 4.34 million
Other institutions/donors involved	GTZ, DED	GTZ, DED
Performance rating	2	
• Significance/Relevance	2	
• Effectiveness	2	
• Efficiency	3	

Brief Description, Overall Objective and Programme Objectives with Indicators

The project, Erosion Control Tahoua and Tillabéry, largely comprised the implementation of mechanical and biological erosion control measures on forest and pasture land aimed at conserving or restoring the agro-sylvopastoral production base in the two programme regions. The open-ended FC programme was carried out in cooperation with GTZ with the participation of DED as of 1991.

The overall objective of Phase III was to improve the conditions of life for the population in the respective programme regions. The programme objective was the conservation or restoration of the agro-sylvopastoral production base.

Programme Design/Major Deviations from Original Programme Planning and Main Causes

At project appraisal, the project region was considered vulnerable to ecological hazards and had a high population growth. The growing pressure of use (shorter fallow periods, overgrazing, fuelwood overexploitation, farming of unsuitable land) had caused considerable degradation.

[1] Current designation after administrative reform

The target group was the rural population in the two programme regions and encompassed in the Tahoua District (total area of approx. 9,500 km²) an intervention area of approx. 1,000 km² as well as four districts in the northern part of the Tillabéry Department measuring almost 70,000 km². These lie in an agroecological transition zone with a long-term average rainfall of about 350 mm. Rainfed cropping is therefore carried out in the southern zones, but with a high risk of crop failure, while the northern parts are only suitable for transhumant use as arid rangeland. The bulk of the rural population in the programme regions lived below the poverty line (UNDP Poverty Assessment). The reason was chronic food shortage partly due to the destruction of the natural bush savanna and erosion resulting in declining productivity per hectare and even renders pastoral and agricultural soils infertile. Use conflicts with nomadic livestock herders exacerbated these problems.

The aim was to halt these degradation processes using appropriate mechanical and biological erosion control measures. Above all, these included laying out stone rows and plant troughs on arable land for enhancing rainwater infiltration supplemented by additional cultivation measures (mulching and application of organic fertilizer) to raise soil productivity. The rangeland was regenerated by erecting contour and crescent dams so as to be able to plant trees and bushes and sow grass seed. Without these investment measures, the degradation and karstification would have continued. The programme was implemented as a cooperative effort in the intervention zones between two TC projects (Rural Development in Tahoua District and Integrated Resource Conservation in North Tillabéry), which enabled a broad-impact, participatory implementation approach. In technical terms, the investment measures were largely implemented as planned. By adjusting the project design during implementation (closer target-group participation and more emphasis on private areas of arable land) considerable funds could be saved and yield per hectare raised by a considerable margin.

	Programme target at project appraisal	Actual area in Tahoua at final inspection and final evaluation (PDRT)	Actual area in Tillabéry at final inspection and final evaluation (PASP)	Total actual area at final inspection and final evaluation
Phase III[2]	42,000 hectares	34,173 hectares	101,237 hectares	135,410 hectares

The upkeep requirements on the arable land decline over time as soil re-depositions and can be performed as part of normal cultivation measures with little additional effort.

Total costs kept to the estimates at project appraisal: EUR 5.62 million (incl. a counterpart contribution of EUR 1.28 million). A small amount of residual funds - EUR 2,482 - will be used in the sequel project, PMAE IV. Should problems arise in the allocation of residual funds, which we do not anticipate at present, KfW will prepare a separate report. The counterpart contribution was made as planned in the form of work inputs by the user groups in executing the physical measures. The FC consulting costs made up 14% of the total. The proper use of the reserve funds as intended was audited by independent auditors and sample checks were made by the expert consultants at final inspection with no indications of misallocation.

Niger is a partner country of German development cooperation with priority attached to poverty reduction in rural areas. The project therefore still fits in well with the development-policy priority

[2] The table shows the updated figures from the final evaluation for Phases I and II, which also included a partial final evaluation of the Tahoua programme area.

even after the priority shift (previously: rural development/resource conservation).

Key Results of Impact Analysis and Performance Rating

The project objective was the protection of natural resources against wind and water erosion to conserve or restore the agro-sylvopastoral production base. The project objective indicator was: Three years after completion of the construction works and the plantations, the protective installations on two-thirds of the project land area and 70% of the planted material has survived and is thriving. The project objective remains adequate in hindsight. Between 80% and 100% of the protective measures actually function and the growth target was also generally met. Other target indicators defined at project appraisal pertain to land targets and are in hindsight more outcomes than target indicators (and have been exceeded by a considerable margin). Another indicator of project objective achievement is that according to satellite image evaluations the tree population on the project land is approximately three times larger than on areas where no measures were taken. Altogether, we consider the project objectives to have been met to a satisfactory degree.

The overall objective was to improve the conditions of life for the population in the respective programme regions. An overall objective indicator was not set at project appraisal, but we can estimate the overall objective achievement based on the following considerations: Since agriculture in the region is heavily geared to subsistence, the rise in agricultural production can serve as a proxy indicator for an improvement in the conditions of life. Evaluations under the monitoring system established as part of the project show that depending on type of use there has been a 68%-340% increase in productivity on the project land as compared with areas where no intervention was made (see below).

Target-group impacts:

The local population in the project area primarily use the natural resources as arable and pastoral land and for gathering fuelwood. The project impacts impinge on all three of these areas, although the income is non-monetary due to the high reliance on subsistence production.

Income effect in agriculture: This is largely discernible in millet, the staple foodstuff of the region. The mean average increase in yield as a result of the physical measures was determined at 68%, as the now broadly established use of organic matter raised the average yield from 147 kg/hectare to 200-285 kg/hectare. The net income for the most frequent stone rows and plant troughs reached FCFA 20,000-27,000 per ha/year (with application of fertilizer). Combined measures raised these net earnings slightly. Although statistics on the distribution of farm-size classes are lacking for the region, the additional earnings from the cultivation of a hectare of millet amounts to approx. 10% of family income amongst the poor and very poor sections of the population. Pay for farm labour amounts to a daily income of FCFA 1,500-2,700, 2-3 times the average daily wage.

Income effect on rangeland: Sowing grass seed and planting bushes and trees on common land largely makes a contribution to target group supply. The increase in productivity for grass is particularly pronounced (340%), with the mean yield of 470 kg of dry mass per hectare equalling about 3/4 of annual needs for a sheep, which reduces the land/animal ratio from 4.5 to 1.4 hectares. The increase in tree density differed at the two locations from 70 to 150 (Tillabéry) and 250 (Tahoua) respectively.

The project area lies in a region with low and highly variable rainfall with resultant effects on the agricultural yield and the supply of the population. The effect on yield cited above is thus only an average figure over several years. The project measures carried out reduce surface water runoff and provide more infiltrated water for plants. In practice, this can be expected to reduce harvest

shortfalls and above all the number of years with total harvest loss.

The target-group promotion activities were aimed at helping the population to help themselves in the sustainable rehabilitation and use of natural resources.

Ecological impacts:

The satellite image evaluation on vegetation development during the 70s, 80s and end of the 90s in the programme region shows that in the two areas in the programme environment the process of degradation has continued, partly due to heavy pressure of use. Programme measures were carried out in the three project phases on 4% (Tillabéry) and 22% (Tahoua) of the respective programme region. The extensive comparative data shows that despite the favourable rainfalls in recent years vegetation has only improved where programme measures have been carried out. The rehabilitation measures for the forest glades in particular are clearly discernible and easy to quantify.

The programme was mainly geared to rehabilitating degraded pastureland and restoring and conserving arable land. There have been no adverse effects through increased wind erosion on the newly worked areas.

Cost-benefit assessment:

Based on the net earnings recorded, we can assess the overall impacts on arable and common land. For Phase III, additional annual net earnings amount to between EUR 2.24 and EUR 5.77 million (depending on rainfall level in the year under review), EUR 0.48-0.90 million of which in Tahoua and EUR 1.77-4.87 million in Tillabéry. This income must be balanced against an FC outlay in this phase of EUR 4.34 million (EUR 1.67 million of which in Tahoua and EUR 2.67 million in Tillabéry).

The arithmetic FC costs in Tillabéry for this amount to EUR 26.4 per hectare. The prime costs on final evaluation in Tahoua for sylvopastoral erosion control measures were specified at EUR 359/hectare and for erosion control on forest pastureland at EUR 86/hectare (the reason for the large difference being the much more costly measures in Tahoua). The respective prime costs were kept below the estimates at project appraisal. Overall, the cost-benefit ratio is favourable.

Altogether, the measures could only be implemented with the combined input of TC, FC, food aid and DED advice. Total funds allocated for this (including contributions by the target group and partners) amounted to EUR 184 per hectare.

Performance rating:

Altogether, applying the criteria relevance/significance, effectiveness and efficiency, we judge the developmental impacts of the project as follows:

The programme objective of restoring the agricultural and sylvopastoral production base by conserving natural resources was reached (see above). Most of the protective installations still function. The tree population on project land has increased considerably. We therefore assess the effectiveness of the project as satisfactory altogether (Subrating 2).

By rehabilitating the agricultural and pastoral land and reducing degradation processes, the basic conditions of life for a considerable part of the population in the project region have been secured or improved (overall objective). Besides the rise in average yield per hectare, this security also entails reduced vulnerability to prolonged dry spells (by increasing the water available for plants). Altogether, we therefore assess the relevance and significance of the

project as satisfactory (Subrating 2)

Altogether, we gauge the unit costs of the protective measures (production efficiency) as adequate, particularly as yield per hectare was increased considerably by adjusting the implementation design. The cost-benefit ratio (allocative efficiency), also including the TC costs, can rate as sufficient. Altogether, we therefore judge the efficiency of the project to be sufficient (Subrating 3).

Weighing up the subratings under the above key categories, we attest the project **satisfactory developmental efficacy** overall (Rating 2).

As the upkeep of the measures is largely carried out as part of normal cultivation activities and the project measures are held in high regard by the target group, the sustainability risks are relatively low.

The project involved the local population, including an above-average number of women, in implementing the measures and paid them (mostly with food). As land is farmed by women's groups and women have a greater say in village committees, gender equality has been strengthened. The programme mainly sought to rehabilitate degraded arable and pastoral land and thus improve the environment. As no adverse side-effects (such as wind erosion) resulted, the programme has had a beneficial effect on the environment. Moreover, it was geared to target group self-organization and the autonomous upkeep of the investments. Owing to the high participation, the measures have contributed in effect to the participatory development of the target group, poor people for the most part.

General Conclusions and Recommendations

As a rule, agricultural resource conservation measures have a particularly good chance of gaining acceptance amongst the local population on privately used land and can significantly raise profitability and the chances of applying other measures to raise production (mulch, fertilizer).

In a subsistence-type agrarian society and in fragile agro-ecological zones, target groups are frequently unable to fully finance erosion control measures on their own so that initial investments require external support. Paying for work in erosion control measures with food aid can be a useful supplement to investments aimed at reducing poverty, provided care is taken to ensure that this does not impair the sustainability of the interventions.

In suitable cases, the introduction of a monitoring system in the project executing agency at a localized level could provide the main project information for steering purposes. If it is unrealistic to expect a sustainable operation of this system, specific individual studies should be conducted to ascertain the efficacy at target-group level to assure cost effectiveness.

Key

Developmentally successful: Ratings 1 to 3	
Rating 1	**Very high or high degree of developmental efficacy**
Rating 2	**Satisfactory developmental efficacy**
Rating 3	**Overall sufficient degree of developmental efficacy**
Developmental failures: Ratings 4 to 6	
Rating 4	**Overall slightly insufficient degree of developmental efficacy**
Rating 5	**Clearly insufficient degree of developmental efficacy**
Rating 6	**The project is a total failure**

Criteria for Evaluating Project Success

The evaluation of the developmental efficacy of a project and its classification during the ex-post evaluation into one of the various levels of success described in more detail below concentrate on the following fundamental questions:

- Are the **project objectives** reached to a sufficient degree (aspect of project **effectiveness**)?
- Does the project generate sufficient **significant developmental effects** (project **relevance** and **significance** measured by the achievement of the overall development-policy objective defined beforehand and its effects in political, institutional, socio-economic and socio-cultural as well as ecological terms)?
- Are the **funds/expenses** that were and are being employed/incurred to reach the objectives **appropriate** and how can the project's microeconomic and macroeconomic impact be measured (aspect of **efficiency** of the project conception)?
- To the extent that undesired **(side) effects** occur, are these tolerable?

We do not treat **sustainability**, a key aspect to consider for project evaluation, as a separate category of evaluation but instead as a cross-cutting element of all four fundamental questions on project success. A project is sustainable if the project-executing agency and/or the target group are able to continue to use the project facilities that have been built for a period of time that is, overall, adequate in economic terms, or to carry on with the project activities on their own and generate positive results after the financial, organisational and/or technical support has come to an end.