KFW

Ex post evaluation – Burkina Faso

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Sector: Agriculture (CRS-Code: 31130)

Project: "Valorization of floodplains" (Inwertsetzung von Talauen), BMZ no. 2003 66 187 (A*) and "Valorization of floodplains and promotion of the market development of agriculture" (Inwertsetzung von Talauen und Förderung der marktwirtschaftlichen Entwicklung der Landwirtschaft), BMZ no. 2008 66 418 (B, Phase II), follow-up phases III and IV, BMZ no. 2008 66 384 (C) and 2011 65 315 (D) **Implementing Agency:** Ministry of Agriculture, Hydraulic Resources, Sanitation and Food Security and Agricultural and Commercial Bank of Burkina (BACB, absorbed by ECOBANK in 2009)

Ex post evaluation report: 2019

All figures in EUR million	Phase A		Phase B		Phase C		Phase D	
	(Plan)	(Act.)	(Plan)	(Act.)	(Plan)	(Act.)	(Plan)	(Act.)
Investment costs (total)	5.50	4.32	6.45	9.71	7.65	7.50	5.15	4.42
Counterpart contri- bution	0.54**	0.52	0.54**	1.28	0.15**	1.01**	0.15**	1.01**
Funding	4.96	3.80	5.91	8.44	7.50	7.50	5.00	4.42
of which BMZ funds	4.96	3.80	5.91	8.44	7.50	7.50	5.00	4.42



*) Random sample 2017, ** The contribution of the beneficiaries was reported in an aggregated form for phases I and II and for phases III and IV, thus the evaluator split the amounts respectively.

Summary: Floodplains have considerable potential for rice production, off-season vegetable cultivation and livestock rearing in Burkina Faso. The lowlands development program in the South-west region and Sissili ("Programme d'aménagement des bas fonds dans le Sud-Ouest et la Sissili" - PABSO) was designed to contribute to improving food security and reducing poverty in rural areas through better exploitation of this agricultural potential. The program was implemented in four phases. It constructed field embankments that allow water regulation in the rainy season and restore groundwater levels to improve rice and vegetable production. Furthermore, the program established and strengthened small-scale farmers' organisations, built agro-processing and market-oriented infrastructure and facilitated beneficiaries' financial inclusion.

Objectives: The program objectives on the outcome level were to (i) increase production of agricultural products by the valorisation of floodplains, (ii) add value to market products through further processing of agricultural outputs, (iii) improve commercialization of agricultural products, and (iv) create formal job opportunities in production and commercialization of agricultural products. The overarching development objective (impact level) was to increase household incomes and to improve nutrition security of the beneficiaries.

Target group: The program targeted the rural population in five provinces of Burkina Faso: Bougouriba, loba, Noumbiel, and Poni in the South-west and Sissili in the center-west, where the poverty incidence is higher than the national average.

Overall rating: 3 (Phases A, B, C and D)

Rationale: The program induced positive results on beneficiary households' production and income, thereby contributing to food and nutrition security in the project areas. For the valorisation of floodplains to persist, however, a regular technical advisory service is needed to tackle management and maintenance knowledge gaps.

Highlights: The participatory approach of the program that involved not only the endusers but also key stakeholders in the target regions set the prerequisite for promoting economically viable value chain partnerships and was a success factor for the achievement of the overarching development objective.



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Rating according to DAC criteria

Overall rating: 3 (all phases)

Sub-rating:

	all phases
Relevance	2
Effectiveness	3
Efficiency	3
Impact	2
Sustainability	3

Overall context

The different phases of the program had the same intended development results (outcomes and impact), implementation approach and intervention area. They were implemented in different departments (cf. Figure 1) in the south-west of the country, and Sissili in the center-west. Phase I "Valorization of floodplains" was implemented from 2006 to 2009 (provinces Sissili, Ioba, Poni, Bougouriba), Phase II "Valorization of floodplains and promotion of the market development of agriculture" from 2009 until 2012 (Bougouriba, Ioba, Sissili) and Phases III and IV were implemented as follow-up phases between 2013 and 2016 (Bougouriba 2013-2014, Ioba 2013-2016, Noumbiel 2013-2016, Poni 2014-2016, Sissili 2013-2016). Given that the interventions of the individual phases cannot be separated geographically, the impacts of the phases are difficult to isolate. Hence, the phases were evaluated jointly in one evaluation report, resulting in identical ratings by OECD criterion for all projects.





Relevance

Agriculture is still a very important source of income and food security for the target group. The target regions have a considerable potential for floodplain development, but less than 5 % of the existing potential was developed and agriculturally managed at the project start.

The program matched the beneficiaries' most urgent needs with regard to strengthening their nutritional and economic security, as the measures allowed to diversify upland crop production with lowland rice and off-season vegetables. By construction of embankments and water management infrastructure, the soils are better flooded and supplied with water and sediment. As a result, soil degradation is reduced and both the areas suitable for cultivation and production increase during the rainy season. The rehabilitated soils allow for additional off-season (dry season) cultivation and thus for an intensified production. The four phases of the intervention tackled all known constraints to improving agricultural incomes - production, post-harvest processing, marketing, finance, technical knowledge - in an integrated way. Therefore, the program design was suitable to reach the intended results of increasing household incomes and improving nutrition security of the beneficiaries. The result chain is assessed as convincing.

The promoted so-called "contour bunds system" is a low-cost soil and water conservation method for floodplains that was generally well accepted by the beneficiaries and suitable for their low technical capacities. The design of the system built upon lessons learned from the Small Dams Project in the Southwest of Burkina Faso (PEBASO) and involved the end-users of the developed floodplains in the implementation, management, and maintenance of the systems. Accordingly, the technical design is assessed as well suited.

The design of the program fitted in with policies, strategies and action plans of the agricultural sector of Burkina Faso. More precisely, the program contributed to the realisation of the objectives of the Rural Development Strategy (SDR, 2003-2015), the National Rural Sector Program (PNSR, 2011-2015) and the Accelerated Growth and Sustainable Development Strategy (SCADD, 2011-2015), which replaced the Poverty Reduction Strategy Paper (PRSP, 2000-2010). The program also was in line with the current priorities defined in the National Economic and Social Development Plan (PNDES, 2016-2020) and the Second National Rural Sector Program (PNSR, 2016-2020), which, like the previous policy instruments, focus on floodplain development and their agricultural valorisation to support growth, poverty reduction and food security. An alternative approach could have been to maximize production by modernising the agricultural sector as a driver for the country's development and targeting larger and commercially oriented production units and supporting contract farming. Against the background of the national strategies and their focus on direct poverty reduction, the chosen approach to target smaller production units of poor smallholders is justified, but should be questioned regularly in the future.

The program carried out an environmental impact study to identify environmental risks and respective recommendations for risk mitigation, prior to the development of each floodplain. It thus aligned with the basic environmental protection principles established in the national Environmental Code (Act No. 006-2013/AN). Furthermore, hydro-agricultural infrastructure development is a priority in the national policy for adaptation to climate change. By allowing regulation of the annual floodings and by using them to stabilize agricultural production, developed floodplains are suitable in regions with increasing rainfall variability and are thus a relevant measure for adaptation to climate change. In addition, the program integrated gendersensitive perspectives to guarantee access to plots in the developed floodplains for both men and women, thus reflecting the National Policy to combat gender-based discrimination that affects economic, social and cultural rights. The program aligned also with the priorities of the Federal Republic of Germany cooperation with Burkina Faso on agricultural value chains promotion, poverty reduction and sustainable development as well as corresponding sector strategies of BMZ.

Given that the project concept addressed relevant development bottlenecks of smallholders, the needs of the beneficiaries and the strategies of the Governments of Burkina Faso and Germany, the relevance is rated as "good".

Relevance rating: 2 (Phases A, B, C and D)



Effectiveness

The objectives on the outcome level of the program were to (i) increase production of agricultural products by the valorisation of floodplains, (ii) add value to agricultural products through processing, (iii) to improve commercialization of agricultural products and (iv) to create jobs.

The implementation of the program increased lowland rice cultivation area and yield in the target regions. In the first and second phases (2006 to 2012), the program developed 1,226.8 ha on 56 floodplains including 1,205.3 ha for rice production and 21.5 ha for vegetable gardens. 22 vegetable gardens were developed, thus substantially exceeding the number of five vegetable gardens planned at project appraisal. The target number of floodplains (40) was exceeded by 40 % (56 developed) while the developed area was 2 % higher than expected (1,200 ha). Several sites registered increases in the developed area but others recorded decreases over time. After the end of the second phase, the valorised area (net area, i.e. those parts of the area covered with contour bunds that is actually under cultivation) declined by 12 % during the growing season 2014-2015 as compared to the year 2012. Despite the decline, the average valorised area in the developed floodplains was satisfactory, amounting to 81 % of the developed area over 2008-2015. In phases III and IV of the program, 1,297 ha floodplains were developed on 47 sites exceeding the target of 1,250 ha by 4 % and the valorised area reached 82 % of the developed area. During this time, a small amount of producers abandoned their plots and their program spots were quickly assigned to other producers under the supervision of the program team and monitoring committee. The few cases of abandonment without further valorisation resulted from land tenure issues and spiritual preferences attached to the utilization of the areas, which had not been articulated during the participatory planning process beforehand. 13 vegetable gardens with a total area of 8 ha were developed in Phases III and IV (80 % of the planned 10 ha). In addition, 45 of the planned 50 storage facilities were constructed.





The program resulted in a total production increase of paddy rice by 34 % between 2008 and 2012 and by 56 % until the final project inspection report in 2015. Between 2008 and 2015, the average paddy yield was 3.6 t/ha and reached 4.1 t/ha in 2016. This productivity performance exceeded the target result (3.5 t/ha) by 17 % but yields decreased again to 3.6 t/ha in 2016-2017, after the end of Phase IV. The increases in paddy rice yield are very likely the result of improved soil and water conservation methods in the floodplains, improved access to government-subsidized fertilizers, a nearby advisory system developed by the program and the high intrinsic motivation of the beneficiaries to improve production.

Indicator **Status PA** Targets Status final pro-Ex post ject inspection evaluation (2006)(2013) (1) Area of valorised floodplains 0 1.200 1.205.3 Almost (ha) achieved: 1,060.7* (2) Yields (t/ha) 1.7 Increase Achieved: 2.2 3.4* (3) Proportion of the production 0.36 % Increase 0.22 % No data (rice) processed by beneficiary (3.69 kg) (4.57 kg) available. households in % Not achieved at final inspection in 2013. >30 (4) Commercialized share of pro-65.98 64.16 Achieved: duction (rice) by beneficiary 51.0** households (%)

Table 1: Outcome level indicators for the phases I and II of the program

*2014-2015, Source: General Direction for Studies and Sectorial Statistics (DGESS); ** Estimation of 2018; n.a.: not available

ndicator	Status PA (2012)	Targets	Status final inspection (2016)	Ex post evaluation
(1) Area of valorised floodplains (ha)	0	1,250	1,284.0	Almost achieved: 1,037.6*
(2) Yields (t/ha)	1.2	3.5	4.1	Achieved: 3.6*
(3) Proportion of the production pro- cessed by beneficiary households (%).	0	In- crease	0.9	Achieved: G6: 0.55 (6.93 kg) G7: 1.46 (12.09 kg) G8: 0.39 (2.10 kg)***

Table 2: Outcome level indicators for the phases III and IV of the program



(4) Commercialized share of produc- tion by beneficiary households (%)	28.0	> 40	45.8	Achieved: 51.0**
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* Data of 2017, ** Estimation of 2018, *** Source: Impact Study by a consultant contract by MAAH (2016, financed by KfW) at 26 sites with 765 households in Leo and Diébougou, G6: floodplain development in 2013, G7: 2014, G8: 2015

In order to estimate and visualise the development of crop productivity of the land under concern, satellite data was used. An assessment of the Normalised Difference Vegetation Index (NDVI) for rice cultivation areas was based on data derived from satellite images to quantify the differences between areas that were subject to the intervention (program) and so-called control areas that have similar characteristics (e.g. with regard to agricultural production, socio-economic aspects of households), but that were not part of the intervention itself. The NDVI expresses the vigour and vitality of green vegetation and can be used as a substitute indicator for active cropland with higher vegetation productivity than barren or fallow land. The analysis took into account rainfall data of the time period under concern by including an estimate of the rain use efficiency, one important factor that determines crop productivity of land. The analysis looked at the differences between the intervention and control areas and the different points in time - before and after the intervention. The results were visualized in graphs and a map (cf. Figures 3-5). The results indicate a rice production increase in program intervention and control areas. The increase of cultivated areas (Figure 3) in intervention departments is about 10 percentage points higher (statistically significant). The spatial pattern of changes in land productivity indicates an improvement of productivity in most of both intervention and control areas, especially in the southern departments (cf. Figure 5).



GPP (MOD17A2H) and Terra MODIS NPP (MOD17A3H), NASA, for GPP and NPP, ACMA, USGS for Annual crop maps, based on classification of MODIS 250m 16-day composite EVI product (MYD13), Global Food Security-support Analysis Data (GFSAD) Cropland Extent, USGS, Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS) for the rainfall dataset

It has to be noted that the positive effects on vegetation density cannot be attributed to the program alone because of the difficulties to filter out other effects, e.g. other donor interventions such as the Rain-fed Rice Program, Small-scale Irrigation and Water Management Program, and the Agricultural Intensification Project through Water Control in the target and control areas. Nevertheless, the map (Figure 5) is helpful to visualize where land productivity has improved between 2004 and 2014 and where a degradation process took place.

It had been planned at program start to expand the secondary road network. However, the program did not lead to an extension of the existing road network per se. A geospatial analysis of the existing road



network in the target regions revealed that only little extension took actually place. According to datasets obtained from the National Institute of Statistics and Demography (INSD, 2006, 2009, and 2016), the national, regional, and departmental road network decreased marginally from 1,107.1 to 1,097.8 km between 2006 and 2014 in the south-west region and increased slightly from 1,544.5 to 1,569.0 km in the centre-west region during the same time period. However, the construction of simple bridges financed by the program facilitated the transport of people, agricultural products and other goods to markets. At the ex-post evaluation, the visited warehouses and crossing structures were in acceptable conditions.

At the time of evaluation, the beneficiaries used on average 49 % of their rice production for their own consumption and commercialized the surplus to generate income at the time of evaluation. The share of production commercialized by the beneficiary households was higher than the intended changes (Tables 1 and 2), as a result of the high increases in paddy rice production. However, in dry spells, some households still keep 100 % of their production for subsistence reasons.



The construction of warehouses by the program induced collective acquisition and storage of inputs, improved considerably the quality and quantity of cereal storage and stimulated bulk marketing of outputs. A total of 67 warehouses (20-60 t capacity) were constructed, specifically 22 during the first and second phases and 45 in the third phase. The beneficiaries were organized and trained within the program to sell their products to a group of female rice steamers, agro-processers and bulk buyers. This contributed to the establishment of more agricultural entrepreneurship in the target region and the improvement of the



commercialization of agricultural output. However, according to project participants, some producers still prefer to sell their products to middlemen and consumers in the local market.

The promotion of rice processing units supported viable agricultural value chains and improved a household-based processing scheme. The latter was associated with very low processing rates because the producers relied on a less productive traditional method. The rice processing in larger units was mainly conducted by agro-processors and women rice steamer groups, e.g. the women rice steamer group of Léo and Legmoin (potential demand: 200-500 t/year) as well as the Mini rice mill of Gaoua (1000 t/year capacity). At the final inspection of phases III and IV in 2016 by KfW, the rice processing unit in Léo was limited in its functionality, mainly by insufficient consideration of electricity and water supply in the technical planning. The shortcomings were addressed in a subsequent KfW financed project in the agricultural sector (PIGO II). The rice processing unit in Léo was visited during evaluation and the interviewed women cooperatives there as well as the group working at the Legmoin processing unit stated that both processing units were now in use. Overall, the average processed share of rice production by the target group remained very low (<1 %), likely in part because only a small sub-group of the target group used the rice processing units.

The program phases III and IV supported the beneficiaries' access to financial markets through capacity building and linkage of the beneficiaries to financial institutions. Data collected during the implementation of this component showed that credits for the purchase of production inputs amounted to 339.2 million FCFA (0.518 million EUR) in 2016. Furthermore, warrantage credit¹ amounted to 10.7 million FCFA (16.000 EUR) and credit for processing (steaming) to 15.2 million FCFA (23,000 EUR). The total number of credits disbursed was 2,805. Despite a relatively high interest rate of 2 % per month on a declining balance, these credits were repaid at 100 %. This excellent achievement was boosted by the existence of a local market for paddy and processed rice.

The organization of the producers also eased the solidarity (group) lending approach developed by the main financial institution (Première Agence de Microfinance, PAMF). Similarly, the storage in warehouses for bulk selling allowed the collective financing mechanism to be implemented, as it enabled farmers' co-operatives to make bulk storage of their harvest and use it as collateral to obtain a credit. The collective purchase of inputs and maintenance of the infrastructures were organized by the beneficiaries with the initial working capital. The financial inclusion of producers is however still a bottleneck for sustainable agricultural production in the target regions. Many producer organizations failed to reconstitute the working capital, to secure access to credit and to maintain the developed floodplains because the payment system of water royalties was not effective. At the ex-post evaluation, many developed floodplains showed degradation of the contour bunds and ditches.

The development and valorisation of the floodplains did not result in increased formal jobs creation per se in the region, but increased certainly the number of active persons in the beneficiary households for rice or vegetable production in the floodplains. Household surveys do not indicate that this effect would reduce other income from wage labour.

The substantial increases in cultivation area and production compared to the status at program start and the effective use of constructed warehouses are assessed very positively. Shortcomings are the decrease of cultivated areas between final inspection and ex-post evaluation, the low rice processing rates and lack of the originally planned construction of secondary roads. Overall, the program's effectiveness is found to be below expectations, but with positive results dominating and thus "satisfactory".

Effectiveness rating: 3 (Phases A, B, C and D)

Efficiency

The nominal cost per ha of the developed floodplains ranged from 2.3 to 5.7 million FCFA (3,000 - 9,000 EUR), reaching 4.0 million FCFA (6,000 EUR) on average during the first and second phases. However, the cost was relatively lower during the third phase of the program, amounting to an average of 2.7 million

¹ In the warrantage system or inventory credit system, farmers' cooperatives, rather than selling their harvest product (e.g. paddy rice) at once, make bulk storage and use it as collateral to obtain credit from a bank or microfinance institutions. It is a type of lending, while input or processing credits describe the type of use of credit funds.



FCFA/ha (4,000 EUR/ha). These costs are considerably higher than the national average of 2.5 million FCFA/ha.

The average cost of vegetable gardens amounted to 13.3 million FCFA/ha (20,000 EUR/ha) for a life cycle of about 10 years. Profitability of the valorisation of floodplains was given on a farmer's individual level, but less so from a societal (national economy) perspective, as investment costs were higher than cumulated returns from cultivation over the service life of the provided infrastructure. The average profit was 1.1 million FCFA /ha (2,000 EUR/ha/y) for vegetable gardens and 0.3 million FCFA /ha/y (500 EUR/ha/y) for rice production. The average cost of a warehouse was 13.0 million FCFA (19,000 EUR). Although there are no precise numbers available, the beneficiaries expressed the gained returns from warehouses in terms of harvest loss reduction and better prices through bulk marketing.

Summing up, production efficiency of floodplain development (cost per outcome) was low, but this low efficiency was to be expected given the pro-poor program approach that naturally limits returns to hydroagricultural investments. Firstly, there is a cost to designing infrastructure adjusted to low operation knowledge and maintenance requirements by the users and to providing technical assistance. Secondly, the program demonstrates the trade-offs between efficiency and involving marginalized groups: The share of parcels cultivated by women increased substantially during the program from 7 % in 2013 to 47 % in 2016 (Impact Study, 2016), but with an even smaller individual cultivation area than the already small average cultivation area per farmer in the program. According to data collected in 2016, women's rice cultivation area amounted to an average of 0.33 ha per participating woman on the areas targeted with interventions in 2014, 0.14 ha (2015) and 0.12 ha on areas targeted in 2016. Efficiencies of scale and market orientation (commercialization, income generation) are difficult to achieve on such small areas.

The program is likely to have contributed to nutrition security within the target group (cf. Impact). Alternative approaches to improving nutrition security (e.g. direct provision of food) would not have the same effects on empowerment, capacity building and duration of impacts. Technical alternatives with lower cost also exist in the target area. One such example is the Rainfed Rice Program technique, which only costs between 0.2 to 1 million FCFA/ha (300-2,000 EUR /ha). However, this technique requires a reconstruction every year and does not ensure good water control. Another more costly option is the construction of small-dams or reservoirs associated with irrigation perimeters. This technique allows advanced control of water management but remains more expensive with 10 to 15 million FCFA/ha (15,000 to 23,000 EUR/ha). Small damns offer great potential for crop diversification and optimal valorization of floodplains with potentially higher returns on investment. However, their realization must be context- and site-specific, taking into account geomorphological and socio-economic factors with larger plots to be attributed to the beneficiary to ensure good profitability. This would not have been in line with the multiple goals of the evaluated program (i.e. reducing food and nutrition insecurity for vulnerable households, creating job opportunities and improving producers' incomes). Thus, the chosen technology is considered adequate for this context.

Considering the specific program objectives with a pro-poor orientation, efficiency was satisfactory.

Efficiency rating: 3 (Phases A, B, C and D)

Impact

The intended impacts were to (i) increase household incomes through job creation in production and commercialization of agricultural products and (ii) improve nutrition security of the beneficiaries. The program increased the nominal income of beneficiary households (Tables 3 and 4). The nominal average income of beneficiary households was 473,868 FCFA (723.46 EUR) and 503,628 FCFA (768.89 EUR) at the start of the first two phases (2006) and the start of the third and fourth phase (2012), respectively. The real income of beneficiary households (i.e. inflation-adjusted income) increased by 13 % for the first two phases and 17 % for the third and fourth phase. These increases are acceptable, but lower than the target thresholds (at least 25 % increase targeted in the first two phases and 20 % for the third and fourth phase). Nominal increases were significantly higher (ca. 40 % in the first two phases and 22 % for the third and fourth phase) compared to inflation-adjusted income increases. In general, the increases in the household incomes match the statistics on poverty reduction in the target provinces from 2006 to 2014 (National Institute of Statistics and Demography, www.insd.bf). The only exception from the general trend in poverty reduction is the province of Sissili, where poverty incidences rose between 2006 and 2014 from



50.4 % to 51.7 %. The reduction in poverty incidences was -11.6 %, -12.3 %, -19.3 %, and -21.1 % for Poni, Bougouriba, Noumbiel, and loba, respectively. Developments on province level cannot be attributed directly to the program alone, as other factors influenced the developments as well.

The program likely contributed to the improvement of food and nutrition security in the target areas. According to the program datasets, the share of beneficiary households with at least 190 kg grains per person and year (i.e. a threshold for food security) increased by 18 % between 2006 and 2012 for the first and second phases and 23 % for the third and fourth phases. The statistics provided by the General Direction for Studies and Sectorial Statistics (DGESS, 2018) indicate also food security improvement in the target provinces. In the five program provinces the share of households with at least 190 kg grains per person and year reached 79 % in 2016, demonstrating a substantial satisfaction of cereal requirement in the households in the target regions. Differentiated by province, the share was 58 % of households in Noumbiel, 62 % in Poni, 69 % in Bougouriba, 78 % in Ioba, and 82 % in Sissili in 2016. According to a survey conducted within the program in 2016, beneficiary households asserted improvements, confirming a significant reduction in food shortage during dry season. For instance, in the agricultural period 2015-2016, 89.2 % of the beneficiary households realized a cereal stock from their production to ensure food security during the dry season and 57.6 % stated that this stock was sufficient to cover the household's nutrition needs during the entire dry period. It should be noted here that the availability of grains is used as a proxy for nutrition security, as defined at project start. According to the current state of the art, indicators for nutrition security should also take into account nutrition diversity and sufficiency of micronutrient intake. As no respective data is available, no conclusions can be drawn in this regard.

The program can be furthermore associated with several socio-economic co-benefits as reported by the beneficiaries. The general increases in incomes enabled the beneficiaries to complete houses under construction, purchase consumables such as bicycles and motorbikes or clothes for their children and themselves. Other beneficiaries paid school fees for their children, bought mobile phones for communication and were able to pay dowry or medical fees for their children and themselves. Part of the income was also used to finance agricultural production inputs (fertilizers and seeds) in the subsequent growing season. Rice by-products serve as fodder for the animals in the dry season, which furthermore improves agricultural productivity.

Indicator	Status PA (2006)	Targets	Status final inspection (2013)	Ex post evaluation
Average income of beneficiary households: inflation-adjusted val- ues with 2018 base in FCFA and (EUR) *	584,681 (892)	Increase by 25 %	662,875 (1,012)	No data available.
Share of beneficiary households with 190 kg grains (produced or bought) per person and year (%)	51	Increase	55	Achieved: 79**

Table 3: Impact level indicators for the phases I and II of the program

* Data obtained from DGESS. n.a.: not available

 Table 4: Impact level indicators for the phases III and IV of the program

Indicator	Status PA (2012)	Targets	Status final evaluation (2016)	Ex post evaluation
Average income of beneficiary households: inflation-adjusted val- ues with 2018 base in FCFA and	527,991 (806)	Increase by 20 %	616,093 (940)	No data available.



(Euros) *				
Share of beneficiary households with 190 kg grains (produced or bought) per person and year (%)	48.8	Increase by 25 %	60.0	Achieved: 79**

* Data obtained from DGESS. n.a.: not available

Apart from socio-economic impacts, the program also revealed some positive and some negative impacts on the environment. On the positive side, the development and management of floodplains generally improved water infiltration, increased the water table and reduced sedimentation. On the negative side, producers used recurrently non-approved pesticides to control weeds and pests in agricultural production. This practice could probably induce adverse effects on soil, water, and biodiversity in the floodplains. Furthermore, the development of hydraulic infrastructure changed the floodplains' land cover. Despite the recommendation to reconstitute the vegetation cover, reforestation of the banks of developed floodplains took place only partially.

It is very likely that the program contributed to the achievement of the overarching development impact objectives. The participatory approach of the program was especially important to achieve the results. Participation involved not only the end-users, but also a research institution (Institute of Environment and Agricultural Research, INERA), decentralized institutions of the government, and private actors such as financial institutions, input salesmen, and agro-processors.

Overall, the achievement of the overarching development objectives is assessed as "good" due to the positive impacts on nutrition security.

Impact rating: 2 (Phases A, B, C and D)

Sustainability

The program produced significant outcomes and positive impacts on the beneficiary households' production, income, as well as food and nutrition security. The business relationship initiated between producers, input suppliers, agro-processors and microfinance institutions on the one hand and the motivation of the beneficiaries on the other indicate that the impact could persist in the future. However, appropriate measures are needed to maintain the key outcomes in the upcoming years. The sustainability of the results are threatened by the low mobilization of water royalties, degradation of the contour bunds and ditches, lack of regular maintenance of the infrastructures and technical and organizational mismanagement of the beneficiaries' groups.

The beneficiaries need further technical and organizational skills to operate as a cooperative enterprise in a business model such as contract farming and "warrantage" in the value chain. The shift to a cooperative enterprise is a requirement for the beneficiaries to become part of a process of production decisions guided by profitability (cost vs. profit), market information (demand, supply and price) and cooperation with service suppliers in the value chain to achieve a sustainable increase of production and incomes. The latter needs to be supported by relatively larger production areas for the beneficiaries that exceed the current level of 0.12-0.25 ha attributed to each beneficiary. Any follow-up actions and new programs must support the rehabilitation of the old floodplains (developed in first and second phase), adopt a context-and site-specific development to ensure better water control, continue to invest in the organization of the producers and women of rice steaming plants, facilitate the process of a shift of the existing groups to cooperatives and promote economically viable value chain partnerships.

Some environmental risks that may limit the sustainability of positive impacts were identified in the section "Impact".

Due to the established structures and the commitment by the beneficiaries, the overall sustainability is assessed as "satisfactory".

Sustainability rating: 3 (Phases A, B, C and D)



Notes on the methods used to evaluate project success (project rating)

Projects are evaluated on a six-point scale, the criteria being **relevance**, **effectiveness**, **efficiency** and **overarching developmental impact**. The ratings are also used to arrive at a **final assessment** of a project's overall developmental efficacy. The scale is as follows:

Level 1	Very good result that clearly exceeds expectations
Level 2	Good result, fully in line with expectations and without any significant shortcomings
Level 3	Satisfactory result – project falls short of expectations but the positive results dominate
Level 4	Unsatisfactory result – significantly below expectations, with negative results dominating despite discernible positive results
Level 5	Clearly inadequate result – despite some positive partial results, the negative results clearly dominate
Level 6	The project has no impact or the situation has actually deteriorated

Rating levels 1-3 denote a positive assessment or successful project while rating levels 4-6 denote a negative assessment.

Sustainability is evaluated according to the following four-point scale:

Sustainability level 1 (very good sustainability): The developmental efficacy of the project (positive to date) is very likely to continue undiminished or even increase.

Sustainability level 2 (good sustainability): The developmental efficacy of the project (positive to date) is very likely to decline only minimally but remain positive overall. (This is what can normally be expected).

Sustainability level 3 (satisfactory sustainability): The developmental efficacy of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

Sustainability level 4 (inadequate sustainability): The developmental efficacy of the project is inadequate up to the time of the ex post evaluation and is very unlikely to improve. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The **overall rating** on the six-point scale is compiled from a weighting of all five individual criteria as appropriate to the project in question. Rating levels 1-3 of the overall rating denote a "successful" project while rating levels 4-6 denote an "unsuccessful" project. It should be noted that a project can generally be considered developmentally "successful" only if the achievement of the project objective ("effectiveness"), the impact on the overall objective ("overarching developmental impact") and the sustainability are rated at least "satisfactory" (level 3).