

Ex post evaluation – Cambodia



Sector: Road transport (CRS code: 21020)
Programme/Project: Rural Infrastructure Programme – Phase III (RIP III), BMZ No. 2011 65 539*
Implementing agency: Ministry of Rural Development (MRD)



Ex post evaluation report: 2020

All figures in EUR million	Planned	Actual
Investment costs (total)	4.40	4.71
Counterpart contribution	0.40	0.40
Funding	4.00	4.31**
of which BMZ budget funds	4.00	4.31**

*) Random sample 2018

**) Including residual funds from the “Flood damage repair on rural infrastructure (FRR1)” programme and “Rural Infrastructure Programme – Phase II”

Summary: The RIP III programme specified above includes the development and rehabilitation of rural roads as well as markets in the provinces of Kampong Cham and Kampong Chhnang. Six road sections with a total length of 39 km and two markets in Kampong Cham province were constructed. The programme follows on from two previous phases (RIP I and RIP II) and was expanded to include a further phase.

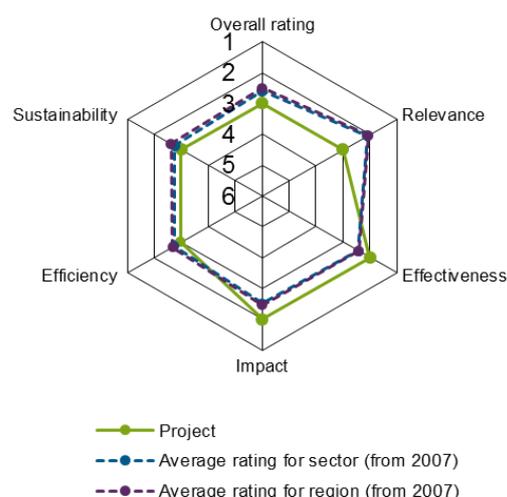
Development objectives: The objective underlying the ex post evaluation at outcome level was the use of improved social and economic infrastructure, adapted to climate change and with year-round access, as well as the use of the improved opportunities for the sale of rural products. This was intended to contribute to improving the socio-economic living conditions and resilience of the rural population in the programme regions with regard to climate change (objective at impact level).

Target group: Residents/households in the catchment area of the programme roads and rehabilitated markets.

Overall rating: 3

Rationale: The rehabilitation of rural roads targeted a relevant barrier to socio-economic development in rural Cambodia. It is plausible that the use of rehabilitated roads has resulted in the improved sale of agricultural products and increased use of social infrastructure, as well as providing economic impetus for local agriculture. The construction standard also contributed to the population's resilience to climate change. However, after a few years some roads are not in a good condition because the building standard is not appropriate for the volume of traffic, because of possible construction defects and/or the absence of routine maintenance, while the sustainability of the above-mentioned effects is reduced under certain circumstances. German DC has been working intensively with other donors for years to improve the national system of maintenance. There is still a need for further improvements and an increase in the maintenance budget. The investment in market infrastructure is viewed critically. Only one of the two markets is used in line with its capacity. Neither of the markets has yet to improve the opportunities to sell local agricultural produce. This suggests that the selection process needs to be improved. The evaluation of the previous programmes already stated that markets need to be better integrated into the overall concept.

Highlights: The effects, most significantly on the volume of traffic and the reduction in travel time and operating costs, are notable. However, these are likely to decrease again if the road conditions continue to deteriorate.



Rating according to DAC criteria

Overall rating: 3

Ratings:

Relevance	3
Effectiveness	2
Efficiency	3
Impact	2
Sustainability	3

Relevance

At the time of the programme appraisal (PA) in 2013, one of the central barriers to socio-economic development in rural Cambodia was the poor road network, especially in remote regions. Roads and bridges were inadequate or missing. During the rainy season in particular, many roads were flooded, entire regions were temporarily unreachable and basic mobility needs (access to markets, schools, healthcare facilities) could not be met or could only be met at a high cost. The core problem was correctly identified, the impact logic was plausible (improved year-round access to markets, schools and health facilities leads to multidimensional improvements in living conditions in terms of education, health and income) and the concept of investing in rural transport infrastructure made an appropriate contribution to solving the core problem. The project remains relevant from the current perspective.

In the absence of adequate markets in the catchment area for producers of local agricultural products, the programme proposal (PP) recognised a further barrier to their socio-economic development beyond the inadequate road network. In retrospect, however, investing in market infrastructure to contribute to this objective does not seem sufficient: firstly, the large markets in Cambodia do not typically generate their main turnover from products that originate from the local catchment area of the markets, but rather from products that are mostly sourced overseas. Traditionally, the main products cultivated in the programme region (above all rice, but also rubber and cashews) are sold directly from the farms via merchants. In some cases, the paddy rice is also taken directly to large rice mills, where the rice is sold on to exporters and wholesalers. Rice, rubber and cashews are not traded or are only traded for local consumption at local markets. There are arguments that, in theory, it is more advantageous for small farmers to sell their produce at markets than directly from the farm because they can achieve better prices due to the higher number of buyers and greater transparency at the market. On the other hand, however, small farmers would then have to pay for transport to the market themselves. Consequently, the assumption that traditional supply chains are broken down simply by the construction of market infrastructure is considered very optimistic and it is therefore unlikely that the results chain assumed in the PA (local products traded at markets contribute to an increase in household income and thus contribute to socio-economic development) will have an effect.

A common argument for programmes that encompass markets as well as rural roads, is that rural roads are intended to improve access to markets. However, this only applies if the markets targeted by the programmes are actually in the catchment area of the improved roads and this is taken into account when selecting the markets. From an evaluation perspective, the project concept was unclear with regard to the identification of suitable locations when selecting the markets: unlike for rural roads, the PP does not provide any information on the selection criteria or aspects to be taken into account by the feasibility study, such as the number of people in the catchment area, competition from existing markets or spatial correlation with the improved roads or when or how these should be defined. Furthermore, the PP does not contain any information on an intended operating or maintenance concept for the markets. Hence there is potential for improvement both in the selection process and in the operating and maintenance concept (see Sustainability). The evaluation of the previous programmes already indicated that the operation of the markets built in these phases was not part of the project design and expressed the criticism that markets need to be better integrated into the overall concept.

The programme was embedded in Cambodia's national strategy: the barriers to development were reflected in the Cambodian government's national development plan relevant at that time, which explicitly defined the development of rural roads and their resilience to climate change as an objective. Another key objective of the rural development plan was the commercialisation and diversification of agriculture.

At the time of the PA, German DC had practically been the only donor with multi-phase rural road rehabilitation programmes for 10 years, some of which included the construction of markets. This programme was also a follow-up phase and thus met the goals of German DC. RIP III was also part of the DC Regional Economic Development programme. In addition to FC, at the time of the project appraisal the Asian Development Bank (ADB) and the World Bank were primarily active in the rural roads sector. Donor activity was coordinated with them. The lack of donor coordination criticised in the preliminary phases of the project when setting up a monitoring system was taken into account by FC, which temporarily suspended establishing a monitoring system – so as not to continue operating parallel structures to the ADB system.

Despite the correct identification of the core problem and the high degree of relevance of the investment in road infrastructure, the relevance is rated as satisfactory in light of the (ongoing) weaknesses presented in the concepts for the markets.

Relevance rating: 3

Effectiveness

The objective underlying the ex post evaluation (EPE) at the outcome level was the use of the improved social and economic infrastructure, adapted to climate change and with year-round access, as well as the use of the improved opportunities for the sale of local agricultural products. The target achievement is assessed using the following indicators:

Indicator	Status PA (2013)	Target value PA	Ex post evaluation
(1) Traffic volumes on the roads covered by the programme after the end of the project: - Average number of vehicles per day - Average number of passenger car units per day	1,333 591	+20%	2,345 (2015) (+76%) 1,188 (2015) (+101%)
(2) Year-round trafficability after project end	No	Yes	Yes
(3) Use of the market infrastructure by the same number of or more vendors after project end.	n.a. ¹⁾	Yes/no	Pnomn Market is hardly used; Peam Chilean Market is used, but barely to sell local agricultural produce

1) At the project appraisal, no indicator was defined for the use of market infrastructure and no utilisation figures were available.

The increase in traffic volumes on the roads covered by the programme clearly shows that the roads are usable and actually used. Shortly after the end of the programme in 2015, the increase was already much higher than the target value. An external impact assessment (2017) concluded that it was not possible to determine the increase in traffic volume for all roads due to inconsistencies at the baseline. The traffic counts carried out in the impact assessment exemplify the attainment of the target values.

The technical design ensures year-round trafficability. According to the final inspection, the technical design took aspects of climate adaptation into account so that the roads can still be driven on, even in extreme floods (most importantly by raising dams more than 1 m above the flood level, with drainage and

erosion control). The significance of the construction standard for year-round passability was confirmed by an impact assessment. It remains unclear as to how this standard is to be evaluated for roads in the context of the long-term climate projections for Cambodia.

The use of the markets is viewed critically. In this case, only one of the two markets is used to its full capacity. The other market is hardly used at all. The well-used market increased its capacity by 36%, from 188 market stalls before the start of the programme to 255 stalls after the rehabilitation, which were also well occupied when an external impact assessment was conducted in 2016. Due to a lack of data, it is not possible to identify where these additional vendors previously sold their goods and whether there have been detrimental effects for other markets or vendors in the area. The 2016 assessment merely states that there were no other markets within a radius of 25 km. Regarding the market that is hardly used today, the programme documentation indicates that the market that existed before attracted more customers and thus vendors. The reason for the possible decline in customers cannot be determined conclusively. As a side note, it is reported that there are several markets in the area, wholesalers have settled in the vicinity and the number of visits from merchants to the villages has increased so it is no longer necessary to visit the market.

Considering that all-year-round access to social and economic infrastructure was the main focus of the programme and given the very good effectiveness of investments in road infrastructure, the overall effectiveness is still rated as good despite the unsatisfactory use of the markets.

Effectiveness rating: 2

Efficiency

The total costs of the programme amounted to EUR 4.71 million and were thus slightly above the estimated EUR 4.4 million. The costs of rehabilitating roads and building markets were higher than planned. The latter accounted for almost 20% of the total construction costs. The final inspection attributed the increased construction costs to the expansion of one of the markets and the extension of one of the road sections to connect additional villages. Furthermore, the strong devaluation of the euro during the project period from USD 1.30 per EUR to USD 1.12 per EUR corresponded to a cost increase of approximately 16% for contracts concluded in dollars. The above-mentioned cost increases were offset by a somewhat lower number of kilometres (38.8 instead of 43 km), reserves in the project budget, and cost savings for ongoing implementation costs, vehicles and equipment, as well as by the transfer of residual funds from previous phases.

The specific investment cost per km of rehabilitated road was 80,000 EUR/km¹ (89,715 USD/km) and thus almost 9% above the engineer's originally estimated costs and a good 23% above the estimated specific costs in the PP. At EUR 340,000 and EUR 400,000, the costs per market building were approximately 10% higher than the cost estimated by the engineer and the estimated costs in the PP. This cost increase can be ascribed primarily to the little-used market. The specific costs for the roads were therefore higher than planned – also compared to previous projects. According to the final inspection, this is due to the climate-adapted and thus high building standard with many bridges and culverts, as well as higher road embankments and erosion control. According to the final inspection of the previously implemented project “Flood damage repair of rural infrastructure” (FRR1), costs also increased due to the labour shortage and thus the increase in the cost of workers in Cambodia as a result of labour migrations to neighbouring countries as well as exchange rate fluctuations. This argumentation appears plausible.

However, the meaningfulness of the indicator (specific costs per km) is limited in terms of the efficiency of the project: the characteristics of the road sections are very different (bitumen surface due to high use or the need for several bridges) and it is precisely these characteristics that significantly drive costs up. When comparing the investment costs for each rehabilitated road section, it becomes apparent that the construction of bridges in particular correlates with higher investment costs. The number of culverts or the proportion of bituminised sections does not clearly correlate with higher investment costs. Under RIP III,

¹ Average exchange rate over the project term: USD 1.1277 per EUR. The final inspection indicates a value of 84,000 EUR/km because it was drawn up before the implementation consultant submitted their final report and was therefore calculated on the basis of preliminary figures.

only around 13% of the roads were bituminised. Almost 50% of the roads were bituminised under the previous FRR1 programme – with only 11% higher specific costs (100,000 USD/km) compared to RIP III (89,715 USD/km). Construction adapted to climate change was also implemented here. When comparing the determining factors of the investment costs for RIP III with those of the FRR1 programme, it is evident that the specific costs per km in RIP III were driven by bridges and in FRR1 primarily by bituminous roads. In an ADB project from 2010-2015, road construction investments with 100% bituminous surfacing achieved average specific costs of well under USD 100,000/km. However, due to a lack of details for calculating these figures, they are only suitable for comparison to a limited extent. Overall, production efficiency seems appropriate.

Allocation efficiency with regard to rehabilitated roads is considered very good due to the greatly increased use and reduced travel times and costs (see the chapters on “Effectiveness” and “Impact”). The use of roads led to lower transaction costs in the marketing of local agricultural products, as well as in the provision and use of services, which in turn should have favoured economic impulses, school attendance and the use of health infrastructure (see chapter on “Impact”). Furthermore, the construction standard contributes to year-round passability in the current climate. Given the 15-year useful life of the roads, it can be assumed that this will also contribute to the rural population's resilience to climate change during this period (see also “Effectiveness”). However, with regard to the aforementioned positive effects, one road section is clearly negative. The selection process was clearly unable to fully ensure in the project that only road sections with the highest overall social benefit were actually selected, as argued in the PP. In terms of markets, the selection process failed to achieve its objective. One market is not used, while at the other market, barely any local agricultural products are traded – contrary to the intention. The allocation efficiency of the markets is unsatisfactory, as they play only a marginal role in achieving the intended target (see Impact).

Despite the very good allocation efficiency of the roads, the overall efficiency is rated as satisfactory given the unsatisfactory allocation efficiency of the markets.

Efficiency rating: 3

Impact

The objective at impact level on which the EPE was based was to contribute to improving the socio-economic living conditions and the resilience of rural populations in the programme regions with regard to climate change. Reports from the implementation consultant and an external impact assessment are primarily used to determine the target achievement as part of the EPE. However, these studies do not contain any valid data to estimate the comparative situation that would have happened without the intervention. Particularly in a country like Cambodia, where the average income of the rural population has more than doubled since 2012, it is extremely difficult to make a final assessment without comparing it to a similar region that has no rehabilitated roads and markets.

The following indicators are used to assess target achievement:

Indicator	Status PA	Target value PA	Ex post evaluation
1) Average travel times on the roads covered by the programme (min/km by motorcycle)	4.3	-20%;	2.1 (2015): -51% 2.9 (2017): -33%
2) Average vehicle operating costs on the roads covered by the programme (KHR/km)	464	-20%	248 (2015): -47% 290 (2017): -38%
3) Household income in the catchment areas after project end (in thousand KHR)	1,155	+15%	2,316 (2015): +101%

4) Share of the population living in poverty (national poverty line)	25.7%	Reduction	20.8% (2016)
5) Relative attendance at secondary schools	33%	Increase to above the province average	40% (2016): +20% Avg. increase in the province (2012-2016): 13.8%
6) Use of healthcare infrastructure by households (number of visits to health units per day)	1,116	Increase	1,369 (2015): +23%
7) Price of rice sold directly from farms in the catchment areas of the roads (KHR/kg)	700	Increase	1,105 (2017): +58%*

* By comparison, the inflation rate between 2013 and 2017 was 12%.

As a simple before/after comparison, the indicators above can be used to determine that the programme consistently achieves the target values. Roads that can be driven year-round have not only facilitated access to economic and social facilities and thus made a multidimensional contribution to improving living conditions, they have also increased the resilience of the rural population in terms of climate change (see chapters on “Effectiveness” and “Efficiency”).

Improvements to the average driving times and average vehicle operating costs can be clearly attributed to the programme. Here, the project exceeded its targets. However, the indicators for some of the roads had already deteriorated by the time the external impact assessment was conducted (2017) compared to the condition immediately after the rehabilitation (2015). That said, the target achievement can only be maintained in the long term if appropriate maintenance takes place (see Sustainability).

The increase in household income in the catchment areas of the roads of more than 100% just two years after the start of the project was documented by the implementation consultant and is remarkable. The increase is higher than the increase in average household income in rural Cambodia, which rose by a good 40% over the same period. However, the meaningfulness of the project data collected immediately after the end of the project is limited, as the value is based on a very small number of household interviews and therefore cannot perhaps be considered representative. Furthermore, in the absence of a reference group, the net effects cannot be quantified and therefore a conclusive assessment cannot be made as to whether the increase is thus above the average trend in rural regions. On the other hand, an external impact assessment based on qualitative surveys carried out in the catchment areas of the programme also concludes that significant increases in income are realistic.

The qualitative surveys in the external impact assessment illustrate that access to paid work in factories has improved in particular, which in turn has also triggered an investment and productivity boost in local agriculture. Wage income was reinvested in local agriculture, resulting in increased mechanisation of processes and increased use of agricultural production resources. Given the basic labour shortage in rural Cambodia, and in particular the pull factor that better roads also encourage young people to work outside their village, the greater use of capital in agriculture seems positive.

Furthermore, the number of rice merchants who visit the villages directly has increased significantly. The external impact assessment attributed the increase in the price of rice that is sold directly from farms to this factor (see indicator 7). This is plausible partly because better access makes it easier for merchants to visit the villages. On the other hand, the national rice sector has also changed significantly throughout the country since the end of the 2000s. Thanks to positive export conditions, national promotional programmes as well as rising world market prices, national rice production and above all rice exports have

grown substantially. This could also have prompted merchants to step up their efforts to buy rice directly from small producers. As there is no data on ex-farm prices for rice in other rural regions of Cambodia, it is not clear whether the increase in prices is actually due to RIP III. However, improved access to the villages is likely to have contributed significantly to the programme's catchment areas benefiting from positive national and international market developments.

The targets for attendance at secondary schools and the use of healthcare services after the end of the project were attained. This is also supported by anecdotal evidence from the impact assessment, which indicates that the safer use of roads as well as shorter travel times made an important contribution to teaching at secondary schools – especially for girls on many roads. The use of healthcare facilities, in particular by women, has also increased on average.

According to the project reports, the power grid was also expanded parallel to the rehabilitation of the roads in two of the six road sections. Yet because this information was not collected systematically, it is not possible to analyse the extent to which complementary infrastructure is responsible for some of the impacts.

Since the markets are not significant for the sale of local agricultural produce (see Relevance), the investment in the markets does not play a role in achieving the impact objectives. However, it is obvious that the well-used market has made a positive contribution by improving public access to consumer goods and by improving agricultural input. However, there is a lack of reliable data to this effect.

Overall, the external impact assessment clearly rated the impact positively and also underpins this with qualitative surveys. The EPE considers this to be plausible. Satellite imagery showing the settlement structure and farmland also suggests that the region has developed positively over the timeframe of the project. The impact is therefore assessed as good.

Impact rating: 2

Sustainability

The Ministry of Rural Development (MRD) and its local entities at provincial level are responsible for the operation and maintenance of the rural road network. After the inventory and budgeting programme (RO-MAPS) introduced by FC in previous phases was suspended by the MRD, a new monitoring and maintenance system (RRAMS) currently being set up and promoted by the ADB is supported in subsequent projects, primarily through (further) training measures.

The annual national financing budget for maintenance has increased steadily and notably in recent years: from USD 0.25 million to USD 22.1 million in the period between 2006 and 2019 alone. Despite the significant improvements to the maintenance budget, however, it can still be assumed that - as stated in the PP - the maintenance requirement continues to exceed the available financing, and thus maintenance in line with the requirement is still not guaranteed. This challenge is expected to persist and is likely to reduce the programme's positive impact. Nevertheless, it can be assumed that the roads will continue to fulfil their purpose and are thus likely to have a positive effect.

According to the final inspection, the overall construction quality was very good. The final inspection highlighted the quality of the building material used with regard to the load-bearing capacity of the road and how the road embankment was successfully planted with trees. In terms of the sustainability of the project roads themselves, this can be assessed as positive.

However, since completion (2014/2015) only sporadic maintenance activities have been carried out. According to the authors, by 2017 no maintenance activities had been carried out on the roads covered by the RIP III programme that were evaluated in the external impact assessment (2017). According to the impact assessment, substantial quality deficiencies were identified in three out of six road sections just two years after completion. In one case, this was attributed to the construction standard being too low. In two other cases, the construction standard was appropriate for use, but the roads were in very poor condition in 2017. This could be due to structural defects. However, the poor condition of the roads can also be evidence that the risk identified in the final inspection (2015) – that the maintenance budget is predominantly used for periodic rather than routine maintenance – has materialised. According to the MRD, three of the roads covered by the programme were repaired in 2018, 2019 and 2020. Whether the scope and

quality were sufficient cannot be assessed due to a lack of data, and no on-site checks can currently be carried out due to the coronavirus pandemic. The evaluation of satellite and Street View images suggests an additional need for maintenance on the roads financed by the programme.

Together with other donors, FC worked hard to improve the outstanding deficits in the areas of inventory, budgeting and maintenance of road infrastructure through support measures: comprehensive (on/off-the-job) training on road construction and maintenance was carried out as part of the FC commitment with the aim of strengthening skills, management and maintenance capacities at both a central and local level as well as strengthening the execution of construction work. This is also to be continued in subsequent phases, and supplemented by the maintenance of bitumen roads, continued support from a test laboratory as well as maintenance contracts on a pilot-project-like basis. According to FC project management, considerable progress has also been made in recent years with regard to introducing the new RRAMS monitoring and maintenance system, which will soon be put into operation. A system such as this would represent an important step towards creating transparency in budgeting, maintenance and the sustainability of the investment. Any training taking place in the future should be coordinated with RRAMS.

As in previous projects, the programme was implemented by a central project management unit (PMU) in the MRD and by local project implementation units. As already noted in the evaluation of the previous phases, this led, on the one hand, to efficient implementation and the preservation of generated know-how due to comparatively low staff turnover. Yet on the other hand, since the PMUs are not integrated into MRD processes, the transfer of knowledge to the Ministry is potentially less extensive. This can be counterproductive with regard to the establishment of long-term structures and thus sustainability, unless the PMUs are better integrated into the processes of the Ministry in the future.

Local market committees, which are financed via usage fees, are responsible for the operation and maintenance of the markets. Maintenance measures are not recorded centrally and there is no formalised exchange of information between the MRD and the market committees. However, an external impact assessment from 2016 confirms that the well-functioning market successfully schedules and implements maintenance measures. However, the assessment also illustrates, based on the example of other markets financed by other FC projects, that in some cases the fact that a local market committee bears responsibility does not guarantee that maintenance takes place, even under heavy use. Maintenance of the markets is therefore not systematically ensured, but depends on individual personalities and local structures.

The development of rural infrastructure is still a clear focus of the Cambodian government today (see Relevance); this focus involves other donors in the sector. The significant increase in the maintenance budget mentioned above and the measures taken in the area of maintenance through further follow-up phases offer the opportunity to work towards further improvements in the area of maintenance.

Given the progress already made in terms of maintenance capacities, the significant increase in the maintenance budget and the continued intensive efforts in the areas of inventory, budgeting and maintenance, sustainability is considered just satisfactory, despite the shortcomings stated above.

Sustainability rating: 3

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

Projects (and programmes) 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).