

Ex-post evaluation

Rural Infrastructure Programme IV and V, Cambodia

Title	Rural Infrastructure Programme Phases IV and V		
Sector and CRS code	Transport and communication (CRS code: 21020)		
Project number	Phase IV: 2013 65 303, Phase V: 2015 67 536, Basic and advanced training measure: 1930 05 295		
Commissioned by	BMZ		
Recipient/Executing agency	Ministry of Economy and Finance/Ministry of Rural Development		
Project volume/Financing instrument	Phase IV: EUR 11 million, Phase V: EUR 9 million, Basic and advanced training measure: EUR 0.8 million/FC grants		
Project duration	Phase IV: 2015 (financing agreement) to 2021 (final inspection) Phase V: 2016 (financing agreement) to 2021 (final inspection)		
Reporting year	2024	Year of random sample	2023 (both projects)

Objectives and project outline

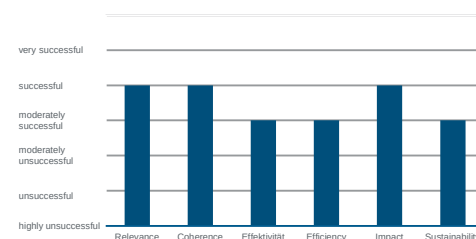
The objective at outcome level was the year-round and efficient use of the developed rural roads. The objective at impact level was to contribute to improving the socio-economic living conditions of the rural population in the catchment areas of the financed infrastructure. In line with the original design, approximately 170 km of rural roads were developed in four provinces in accordance with the respective requirements resulting from usage intensity and climatic loads. The accompanying basic and advanced training measure strengthened the executing agency's capacities with regard to project implementation and road operation.

Key findings

The programme was successful in terms of developmental effectiveness but its sustainability is at considerable risk. The project was evaluated as "moderately successful" for the following reasons:

- The poor rural road network is one of the central barriers to socio-economic development in rural regions of Cambodia.
- By developing the rural transport infrastructure, this relevant constraint on the socio-economic development of the target group in the project regions was reduced and the basis for improving income, health and education was laid.
- The provided infrastructure is heavily utilised. Transaction costs for the transport of goods and people have decreased. However, the increasing degradation of infrastructure has already reversed certain efficiency gains when it comes to driving times and vehicle operating costs.
- Rural roads are highly relevant for economic development, as efficient market connections lead to increased productivity and prosperity.
- Although the financial, organisational and technical capacities for managing rural roads have increased continuously, these are still insufficient overall and jeopardise the project's sustainability. Own efforts and continuous donor support in tandem with the expected economic growth give hope for better maintenance capacities.

Overall rating:
moderately successful



Conclusions

- The heavy load on infrastructure within settlements requires a higher design standard.
- Extreme weather events place high demands on the design standard, maintenance and expertise of the construction industry. Climate-resilient construction leads to higher construction and maintenance costs. However, funds to cover these costs are scarce. Therefore the use of asphalt versus gravel roads should be weighed up on a context-specific basis and decisions made on a case-by-case basis are more appropriate than a one-size-fits-all standard approach.
- In order to secure the financing of construction and maintenance, in addition to budget allocations, other sources of financing for the road sector are required, such as a road fund financed via tolls or fuel charges.

Ex-post evaluation – Rating according to OECD-DAC criteria

Overview of sub-ratings:

Relevance	2
Coherence	2
Effectiveness	3
Efficiency	3
Impact	2
Sustainability	3
Overall rating:	3

The fourth and fifth phases of the *Rural Infrastructure Programme* (RIP) were jointly assessed in a preliminary appraisal. Therefore, they are designed identically and were implemented together. Ex-post data collection and preparation after completion took place across all phases. Against this background, both phases underwent comprehensive evaluation. For the sake of clarity and legibility, the two phases are referred to as one programme in this ex-post evaluation (EPE).

Overall context

At the time of the project appraisal (PA) in 2015, there had already been German-Cambodian cooperation in the field of rural road construction for more than ten years with the *Ministry of Rural Development* (MRD) being the project executing agency responsible for rural roads. The programme built on the long-standing commitment of financial cooperation (FC) and financed the further expansion of the rural road network.

Project Summary

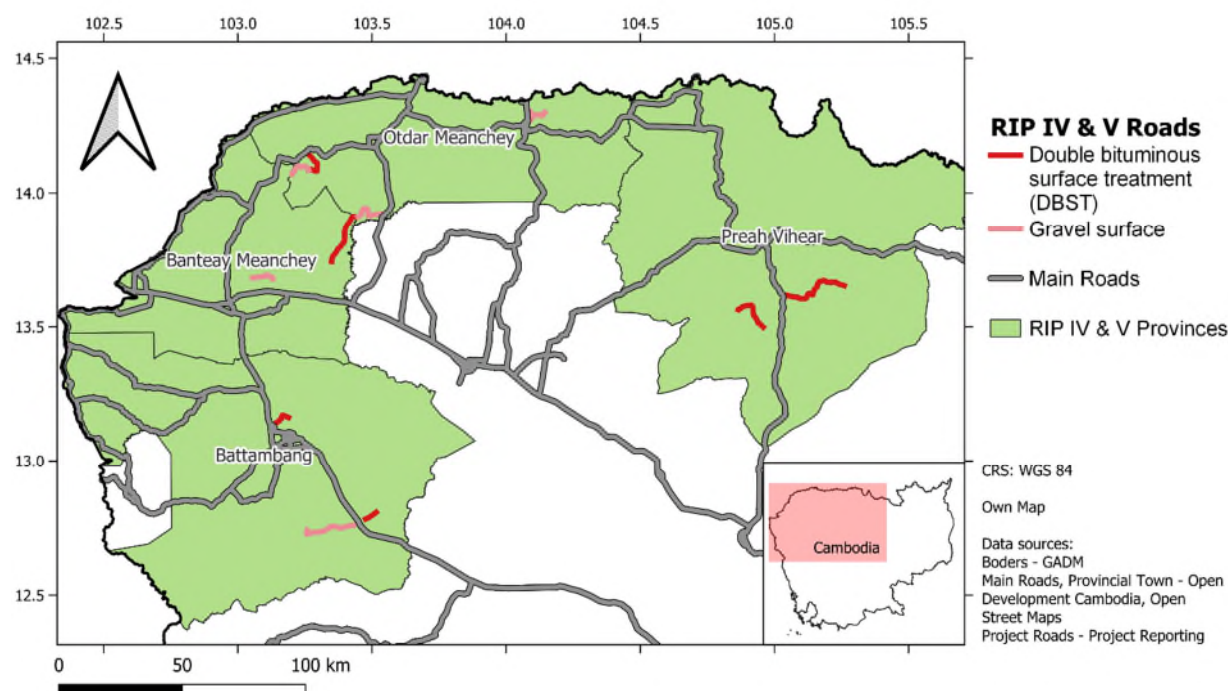
In order to improve the socio-economic living conditions of the impoverished and vulnerable rural population, within the framework of RIP IV and V, existing unpaved rural roads in the Cambodian provinces of Battambang, Preah Vihear, Oddar Meanchey and Banteay Meanchey with a total length of close to 170 km were developed for more intensive and year-round use. The design of the implemented rural roads included bitumen surfaces and robust drainage as well as larger and reinforced culverts and bridges, with the aim to improve resistance to the increasingly demanding climatic conditions. Accompanying training measures which aimed to consolidate the management and technical capacities of the project executing agency MRD were financed through funds of a basic and advanced training measure.

The project's target group was the rural population in the catchment areas around the roads to be upgraded and comprised 94 villages with around 82,000 inhabitants from around 17,300 households.

Breakdown of total costs

		RIP IV (planned)	RIP IV (actual)	RIP V (planned)	RIP V (actual)	Training Measure (planned)	Training Measure (actual)
Investment costs (total)		12.1	12.1	9.9	9.9	0.8	0.8
EUR million							
Counterpart contribution	EUR million	1.1	1.1	0.9	0.9	0	0
Financing	EUR million	11.0	11.0	9	9	0.8	0.8
<i>Of which BMZ funds</i>	<i>EUR million</i>	<i>11.0</i>	<i>11.0</i>	<i>9</i>	<i>9</i>	<i>0.8</i>	<i>0.8</i>

Map: Project provinces and financed road sections



Rating according to OECD-DAC criteria

Relevance

Alignment with policies and priorities

The objective of the project was in line with the targets of the Millennium Development Goals in place at the time of the project appraisal as well as the current 2030 Agenda (see *Contributions to the 2030 Agenda*) and the German development cooperation (DC) priority of promoting sustainable economic development in Asia. This is set out in the position paper "The BMZ's New Asia Policy – Using Asia's Dynamism" from 2015. It highlights the importance of improving living conditions, building infrastructure and increasing productivity in rural areas for the inclusiveness of dynamic economic development in Asia.

The programme was consistently in line with the objective of the sector strategy for the Cambodian-German DC for rural development adopted in November 2014 and was a relevant component of the DC priority area "Rural Development", in which the development of transport routes played a central role. Furthermore, the programme's target and measures were consistent with the DC programme at that time "Regional economic development". (The objective of the DC programme was to increase income for the poor rural population, particularly women, for people to actively participate in local sustainable economic development.) The DC programme was based on the 2011 bilateral priority area strategy paper "Rural Development".

The development of transport infrastructure financed by the programme was and remains part of Cambodia's national rural development strategy,¹ which is based on the government's overarching development strategy² and the associated implementation plan.³ The rural development strategy prioritises the development of overland transport and/or rural roads to increase productivity in rural areas and economic development in general. For rural roads, the explicit plan was to replace natural or gravel roads with paved roads and to improve road maintenance. These

¹ Rural Development Policy Strategy and Rural Development Policy and Action Plan 2014–2018, 2019–2023

² Rectangular Strategy for Growth, Employment, Equity and Efficiency, Phase III (2013) and Phase IV (2018)

³ National Strategic Development Plan (NSDP) 2014–2018, 2019–2023

objectives are also reflected in the MRD's current rural development strategy.⁴ One of this strategy's four focus programmes places particular emphasis on the development and management of the rural road network. The road development also supported the partner country's goals of increasing the infrastructure's climate resilience, which are set out in the Cambodian *Nationally Determined Contribution* (NDC).

With regard to the quality characteristics, gender equality and alleviating poverty (see below) were taken into account in the project appraisal and an environmental and climate impact assessment was carried out.

Alignment with needs and capacities of persons concerned

At the time of the appraisal in 2015, the poor rural road network remained one of the central barriers to socio-economic development in rural regions of Cambodia. This also affected the project provinces, which had previously experienced very little benefit from rural road development projects and which had a population that was poorer than average (see *Impact – contribution to overarching (intended) developmental changes*). The existing roads were insufficiently accessible for motorbikes and cars. During the wet season, they were impassable at times as the surfaces became too soft and due to excessively high water levels at river crossings. This problem becomes even more serious with the increase in climate change-related extreme weather events predicted and taken into account in the appraisal. As a result, market access for smallholders involved a great deal of effort and was a significant obstacle to development for the region. The population in the target regions also had very limited access to social infrastructure, such as schools and healthcare facilities. They likewise had limited access to public services. It was very uncommon for women to use motorised individual transport. According to the EPE, the core problem, namely the poor road network and the effects arising from this, was correctly identified. The programme consequently addressed the development of rural roads with the aim of improving the target group's socio-economic development and living conditions. A transparent selection process was planned for the selection of locations in the programme provinces. Selection criteria included particularly high poverty rates, a low level of development and poor rural infrastructure. Gender impact potential with regard to year-round and cost-effective access to healthcare facilities and secondary schools as well as income opportunities was taken into account. No further gender impact potential can be identified ex-post due to a different conceptual design. The capacities of the executing agency MRD were adequately taken into account (see below).

Suitability of project concept

The following theory of change was assumed for the programme in the appraisal, which was plausible at the time and remains so today: Improvement of road infrastructure in rural areas → Reduction of transaction costs and times → Better transport and marketing opportunities as well as year-round access to employment and income opportunities in addition to public services, education and health → Improvement of socio-economic living conditions (income, poverty reduction, education and health). These interactions between impacts pursue a holistic approach to sustainable development, as they take into account not only economic but also social development and the increasing challenges posed to the rural road network by climate change. The impact assumptions were presented transparently in the appraisal. The target system and the corresponding indicators were clear and appropriate overall (see *Annex 1*).

The assumed theory of change from the complementary basic and advanced training measure is: Provision of formal and on-the-job training as well as laboratory equipment → Improvement in the capacities of the executing agency at national, provincial and district level → Improvement of road management. This interaction between effects was and still is plausible. The institutional capacities in the Cambodian road sector, which remained weak at the time of the appraisal (2015), were a key limiting factor in developing, expanding and maintaining the road network effectively. The complementary basic and advanced training measure aimed to reduce these limitations. In addition to capacities, the provision of sufficient funds remains central to improving road management. With this in mind, as part of the programme, the Cambodian government undertook to provide a minimum contribution of USD 3.3 million per year for the financing of road maintenance measures in the 12 provinces benefiting from FC projects (RIP/TRIP) over the term of the project. The conceptual aim of these funds was to take into account the increasing maintenance requirements due to network expansion and to ensure the maintenance of the rural roads already developed with FC financing up to that point. However, this is only plausible if they are additionally allocated funds that go beyond budgets already provided (see *Efficiency – Allocation efficiency*).

⁴ Rural Development Policy, 2019–2023

This funding was intended to consider the increasing need for maintenance arising from the further development of the rural road network and to ensure the maintenance of the rural roads already developed with FC financing. Whether these funds should be made available in addition to the planned budgets has not been explicitly clarified.

From today's perspective and from the perspective at the time, the programme's design, including its technical, organisational and financial structure, is considered suitable for helping to solve the described core problem and to achieve the DC programme objective. The capacities of the partner government, project executing agency and target group, which were weak at the time of the appraisal, were assessed realistically and taken into account in the design. Furthermore, the project concept was geared towards the limited capacities of the executing agency, as it included financing from international consulting services to support the executing agency during implementation, along with an accompanying basic and advanced training measure for capacity development. The basic and advanced training measure took adequate account of the capacities and was designed to strengthen them for the implementation and sustainable management of the financed infrastructure. However, in retrospect, the assessment of the potential for further development of the executing agency's capacities was too optimistic. The executing agency's personnel, technical and financial capacities have not increased to the necessary extent. In retrospect, it also seems sensible to place greater emphasis on the expansion of maintenance capacities (see *Sustainability – Capacities of persons concerned/Contribution to support for sustainable capacities*).

At the request of the Cambodian government, an MRD-financed project implementation unit within the Ministry was again commissioned to implement the programme. This was already criticised in the evaluation of previous project phases (RIP I and II), as this unit was insufficiently integrated into MRD structures and therefore realisation of a connection between project implementation and operating phases becomes weak.

Reaction to changes/adaptability

The originally planned construction of a market in Preah Vihear was removed from the scope of the project in consultation with the Cambodian partners. The background was increasing doubts about the developmental effectiveness of the market improvements in the previous FC projects. An evaluation of the markets financed by the FC carried out in previous phases within the scope of RIP IV and the ex-post evaluation of RIP phases I and II revealed conceptual (position and integration into the project concept) as well as operational (implementation and operational management) weaknesses in some markets. Against this background, this institutional learning is rated positively.

Rating summary:

Through the (climate-resilient) development of rural roads based on plausible impact assumptions, the project addressed a central obstacle to development and therefore the key needs of the target group: an improvement of their socio-economic living situation by connecting producers and the general population to goods and services markets as well as public services. The project strategy aligns with the local, national and supra-regional development strategies of the Cambodian government and its development partners. With regard to institutional learning, the fact that the experiences from previous projects with regard to the construction of markets have been incorporated is to be assessed positively. With the conceptual retention of a separate project implementation unit, the project executing agency missed out on the opportunity to link project implementation and maintenance more closely. In the overall view, the relevance of the programme fully meets expectations and is considered successful.

Relevance: 2

Coherence

Internal coherence

The project was implemented in the DC focus area "Rural Development" as part of the DC programme "Regional Economic Development" in parallel with the TC measure "Regional Economic Development". The FC was responsible for coordinating the main focus areas. The German commitment pursued the approach of integrated rural development and included in particular the promotion of value chains, measures to increase agricultural productivity and production, the qualification of local self-government bodies, the promotion of dialogue and cooperation between the state, the private sector and civil society, in particular with regard to the economic development of rural areas as well as climate-resilient and poverty-oriented investments in rural infrastructure. The project made a

relevant contribution to the latter. The programme's measures were complemented by the TC's involvement in the provinces of Oddar Meanchey and Banteay Meanchey. There were synergies with the promotion of agriculture and administrative capacity. In addition to the development of rural roads, two village roads and two village markets were rehabilitated as small measures as part of the FC programme (no new construction), which supplemented the TC activities in the relevant communities. Even though there was no complete overlap between the project provinces, the internal coherence is rated as good, as the measures were complementary in terms of content, some were implemented in the same target regions and as well aligned in terms of content. The division of tasks and co-ordination were expedient and corresponded to the implementing organisations' respective roles.

The programme was also consistent with the international norms to which German DC is committed. In terms of unintended environmental and social impacts, the promotion of women, poverty relevance and risk management are of particular note here. The programme contributes to adaptation to the impacts of climate change through the climate-resilient design of roads. It has therefore provided a contribution to the German Federal Government fulfilling its pledge to providing climate finance, which it made following the 2015 Paris Agreement on climate change. At the same time, however, the development of roads for private motorised transport (usually with a combustion engine in the local context) – which forms the basis for the intended positive developmental impacts – is counter to international efforts to reduce greenhouse gas emissions.

External coherence

The programme supported the Cambodian government's own efforts to expand the rural road network. These efforts are also reflected in the partner country's counterpart contribution to the investment costs. The programme was implemented by the executing agency MRD, with which there had already been cooperation in the field of rural road construction spanning more than ten years at the time of the project appraisal (2015).

The World Bank financed the development of rural routes within the scope of comprehensive rural economic development programmes. Since 2009, the Asian Development Bank (ADB) has implemented several programmes for the development and management of rural roads. The second phase of the ADB programme, with a term until 2020 and a financial volume of USD 118 million, was carried out at the same time as the project evaluated here. Where there was provincial overlap with the FC project (in Battambang and Banteay Meanchey), the selection of measures was coordinated accordingly. The “*Rural Road Asset Management Output (RRAMO)*” project, which started in 2012 and was financed by the ADB, supported the MRD in the further development of a database into a *Rural Roads Asset Management System (RRAMS)*, which is to be used for the prioritisation and planning of maintenance financing. The FC discontinued its support for the development of a road management system that it initiated in the previous phases in favour of RRAMS in order to avoid competition between the incompatible systems and to contribute to donor harmonisation as well as to the use/establishment of a system for road condition monitoring and planning of construction measures.

In addition to Japan and Korea, Germany was a leading bilateral development partner in rural road financing in Cambodia while the programme was being implemented. There were also numerous rural (economic) development programmes (e.g. from the *International Fund for Agricultural Development – IFAD*), which also financed road development and the connection of producers to markets. China is an important bilateral donor for Cambodia and, in addition to several national roads, also financed rural development projects with a focus area of electrification and water supply, in some cases in the same provinces as those in which this programme was involved. At the same time as the EPE (2023), a project financed by the *Asian Infrastructure Investment Bank (AIIB)* with a focus area of the development of rural roads began, which is also implemented by the MRD and is similar in design to the programme evaluated here. Overall, there was good complementarity with other donor projects, especially in the rural transport sector, but also the above-mentioned commitment in the area of rural economic development. Donor co-ordination was not formalised in the rural transport sector up to the time of the EPE (2023), but took place between individual donors as required and as part of the overarching coordination for infrastructure and rural development carried out by the MRD.

Rating summary:

Coherence with both the German DC and other development programmes was good due to the fact that the measures carried out were complementary in terms of the areas in which they were carried out and their content. The project also supported the partner country's own efforts with regard to the implementation of the development strategies presented under Relevance.

Coherence: 2

Effectiveness

Achievement of (intended) goals

The objective adjusted as part of the EPE was the year-round and efficient use of the developed rural roads.

The achievement of the targets at outcome level can be summarised as follows:

Indicator	Status Baseline (2016)	Target value PA/EPE	Actual value after completion (2019/2020) ¹⁾	Actual value at EPE (2023)
(1) Year-round passability	No	Yes (EPE)	Yes	Yes Achieved
(2) Average specific travel times on project roads (motorbike) (Change in %)	3.6 min/km ²⁾	-30 % ³⁾ (EPE)	-38 % ³⁾ (2.2 min/km) ¹⁾	-24 % ³⁾ (2.9 min/km) ¹⁾ Not achieved
(3) Average specific vehicle operating costs on project roads (motorbike, 2018 prices)	USD 0.073/km ²⁾	-30 % ³⁾ (EPE)	-42 % ³⁾ (USD 0.041/km ¹⁾)	-19 % ³⁾ (0.058 USD/km) ¹⁾ Not achieved
(4) Average daily traffic volume on project roads	25,648 motorised vehicles/day	+20 % ³⁾ (PA)	-12 % ³⁾ (24,332 motorised vehicles/day)	+2 % ³⁾ (27,415 motorised vehicles/day) Not achieved

¹⁾ Values were collected before the COVID-19 pandemic

²⁾ Average of all project roads

³⁾ Average change on project roads. In contrast to the change in average values, this calculation method is less susceptible to producing extreme values.

Contribution to goal achievement

As part of the programme, 12 road sections with a total length of 171.3 km were developed in the four provinces of Battambang, Preah Vihear, Oddar Meanchey and Banteay Meanchey and equipped with bridges and culverts. A total of 25 % of the above total length was turned into gravel roads and 75 % was given double bituminous treatment. Furthermore, an additional road section of 6.4 km was financed from residual funds of the phases considered here, the tender for which and implementation of which took place in the subsequent phase RIP VI. At the time of the EPE, they were generally passable all year round ([indicator 1](#)). However, some sections of road were damaged by flooding after completion and were therefore unusable until they were restored.

In addition to sustainable and year-round use of the roads, the development was also intended to enable time- and cost-efficient transport on the roads. The corresponding programme indicators refer to travel times ([indicator 2](#)) and average specific vehicle operating costs for motorbikes ([indicator 3](#)), which are still by far the most frequent vehicle for private transport in the target regions. The results allow conclusions to be drawn regarding the costs and time required for transport with other motorised vehicles, which also correlate with the road condition. As part of the EPE, the target level of both indicators was raised from 20 % proposed in the appraisal to 30 % as the original target value is considered to be too conservative and a higher proportion of roads (75 % instead of 50 % originally) were developed to a higher standard (asphalted roads) over the course of the programme. This resulted in higher average speeds and lower vehicle operating costs. After completion of the roads, the indicator for measuring the specific travel times was achieved ([indicator 2](#)). However, at the time of the EPE the specific travel times and average travel speeds on several road sections are significantly affected by the deterioration of the road surface compared to the condition after completion. As a result, the indicator target value has not been achieved. Similarly, the

reductions in vehicle operating costs (*indicator 3*)⁵ expected following the development of the roads could only be identified after completion of the programme and no longer at the time of the EPE. The relative improvements resulting from the road development have more than halved since completion. This was confirmed anecdotally by road users during the project visits, who complained about the fact that travel times and fuel consumption were increasing again.

The clearly declining positive effects identified for the above-mentioned efficiency indicators compared to the post-completion values (final inspection) reflects the deteriorating condition of the road surfaces since completion, which was observed to varying degrees during the site visits carried out as part of the EPE for the majority of the road sections. Depending on the road section, the deteriorating condition of the road surfaces is due to various/a combination of factors such as a lack of resilience with regard to heavy rainfall/floods, inadequate construction quality, lack of maintenance (see *Sustainability – Durability of effects over time*) and excessive axle loads, but is also due to unregulated development and land use changes, which sometimes alter the drainage process and lead to water damages to the roads. It is not possible to measure the effects of these individual factors on the general road condition. However, it is plausible that regular and proper maintenance would have contributed to better results.

The average increase in traffic volume measured in the EPE (*indicator 4*) of 2 % is far below the target value of an increase of at least 20 %. The volume of traffic measured on one to two days per road section is of limited significance due to the assumed high variability (e.g. due to climatic and agricultural seasonality). The result of the traffic count does not align with the impressions recorded and reports on the ground. During the site visits, all respondents (road users, local administration representatives and local residents) reported a significant increase in traffic volume since completion.

At the same time, the MRD reported that the overall traffic volume since the end of the programme was below the expected developments due to intersecting crises. These include, in particular, the economic losses and adverse impacts caused by the COVID-19 pandemic as well as the reducing international economic integration due to the breakdown of alliances founded upon common interests. In Cambodia, these crises have manifested themselves in particular through a weakening of tourism and production. Cambodia had benefited from both in the two decades before. The project provinces were particularly affected by weaker demand for workers as well as for agricultural products from the economic centres and abroad, with corresponding effects on transport demand.

The aforementioned traffic counts as well as the impressions from interviews and site visits indicate that there has been a change in the use of transport, with an increase in motorised traffic and a decrease in pedestrians and cyclists. While the use of light commercial vehicles and automobiles has changed minimally, commercial truck transport seems to have increased sharply on most project roads. In addition, an increase in privately organised public transport such as shared taxis and the rental of vehicles was observed locally.

Although the target value for the traffic volume (*indicator 4*) has not been reached, the use of roads is nevertheless assessed as good overall based on the anecdotal evidence from the on-site interviews, traffic composition, on-site observations and the significant increase in vehicle ownership (see *Impact – Contribution to overarching developmental changes*).

Interviews confirmed that the number of women using motorised transport has increased significantly. In the traffic counts, women rode 28 % of motorbikes. In principle, equal access to the roads is guaranteed for all persons in the target groups. Against this background, the programme did not provide for any specific measures for particularly disadvantaged or vulnerable groups (including women).

The accompanying basic and advanced training measure included the following activities: 1.) Theoretical further training at the central and decentralised level of the project executing agency with regard to project implementation (procurement, supervision of works), adaptation to climate change and bioengineering, quality control and laboratory studies as well as road maintenance (in cooperation with the ADB/AFD RRIP-II project); 2.) “On-the-job” training of the responsible employees at project province level; 3.) Support of the MRD’s test laboratory; and 4.) Study trips outside Cambodia. Overall, we rate the basic and advanced training measure as moderately successful. While the executing agency’s capacities for project implementation have increased further, there are still significant

⁵ Calculated according to ADB specifications for Cambodia with updated prices from 2018 on the basis of the road roughness determined as part of the EPE in accordance with the World Bank’s specifications by driving on and observing the roads (International Roughness Index). This is used for documenting road surface quality and condition.

Asian Development Bank: Rural Improvement Project II. Economic and Financial Analysis. Report to the President. July 2014.

M. Sayers, T. Gillespie and W. Paterson: The World Bank Technical Paper Number 46, Guidelines for Conducting and Calibrating Road Roughness Measurements.

institutional and technical weaknesses in operation and maintenance (see *Sustainability – Capacities of persons concerned*).

In future, however, due to inadequate maintenance and the anticipated increase in climate damage, a further downturn in the positive effects can be expected (see *Sustainability – Capacities of persons concerned* and *Durability of effects over time*). The trend reversal has already been reflected in the aforementioned indicators 2 and 3 in the time between completion and the EPE (see *Effectiveness – Achievement of (intended) goals*).

Quality of implementation

The technical design of the roads is based on Cambodian standards for rural roads, with a high proportion of 75 % receiving double bituminous treatment⁶ to improve resistance to higher traffic volumes and rainfall. Sealing has been standard for rural roads in Cambodia since 2016. Due to the lack of data available, from the perspective of the EPE, it made sense that during the planning phase a design was chosen that constituted a sensible compromise between resilience to adverse climate impacts and cost efficiency. However, in practice, this compromise proved to be insufficient to prepare for the extreme weather events that occurred. In mid-2017, there was very heavy rainfall and unusually severe flooding, especially in the Preah Vihear province, which severely damaged some of the road sections of the programme that were under construction at the time. After the flooding, the road design in the programme was modified, which required additional work, led to additional costs and resulted in delays in the work on some of the road sections.

The contractors' quality of execution was sometimes problematic. The quality of the construction measures, which received subsequent improvements during the maintenance period, was considered acceptable to good overall within the scope of the final inspection and the visual inspection at the EPE did not reveal anything to the contrary in this regard. The EPE considers the quality of the management and implementation by the executing agency and implementation consultant to be expedient and effective overall.

Unintended effects (positive or negative)

In some target group interviews, a negative development in road safety (increase in accidents and a rise in through-traffic in neighbourhoods) was reported in connection with the road development. This underlines the need for road safety awareness and more stringent control by the traffic police. However, local representatives also reported an increase in road safety awareness on some road sections, e.g. helmets being worn and driving at a moderate speed. The overwhelming majority of the traffic signs and bumps put in place as part of the programme are still there and help to reduce speeds as well as the risk of accidents. To protect the population in the areas surrounding the roads, training measures were also carried out as part of the programme for both traffic safety and HIV/AIDS. However, these temporary measures can only have limited effectiveness and need to be complemented by continuous awareness-raising among the population in terms of road safety.

Rating summary:

Following these development measures, these rural roads can now be driven on all year round. The actual use of the financed infrastructure and whether it is above or below expectations could not be validated quantitatively in the EPE due to the absence of sound surveys. However, the anecdotal evidence from site visits and interviews suggests that the roads are used frequently and are helping to increase economic output. Furthermore, while transport times and costs have decreased, usage efficiency is suffering significantly from the deterioration of road conditions, which is set to continue without extensive rehabilitation. At the time of the EPE, the effectiveness is considered to be moderately successful.

Effectiveness: 3

Efficiency

Production efficiency

During the appraisal, the specific costs were estimated at EUR 60,000 to 70,000/km, assuming that only a small proportion (~20 % of road kilometres) would be asphalted. In the implementation phase, it was then decided to

⁶ Double Bituminous Treatment (DBST)

asphalt most of the road sections (~75 % of road kilometres). As a result, the specific investment costs most recently stood at around EUR 100,000/km and therefore within the scope of comparable projects in Cambodia and the region (see *Allocation efficiency*).

The tenders for the construction work were submitted nationally and in each case in one batch per road section. This required a higher level of supervision on the part of the executing agency and consultant. The associated reduction in quality (reduced efficiency) is justified by the fact that this type of tender strengthens national companies and therefore develops a local market, which is important for road maintenance.

Overall, the time it took to implement the programme increased by approximately one year, mainly due to problems with the construction companies. These related to various delays in the execution of the construction contracts as well as significant damage to infrastructure already built due to storms in 2017 (see *Effectiveness – Quality of implementation*). The delays are considered to be acceptable overall, taking into account the challenging framework conditions. In particular, the implementation of the construction measures in accordance with international standards by national companies took more time, but the capacity expansion justifies this.

The costs for the implementation consultant increased due to the above-mentioned widening of the project's scope and extended duration (see *Efficiency – Allocation efficiency*). Nonetheless, the consulting services as a proportion of total costs were within the scope of and similar to comparable rural road construction projects. Both the implementation consultant's services and the basic and advanced training measure were tendered internationally to ensure both quality and cost-effectiveness.

Allocation efficiency

Road development was the most efficient alternative compared to other transport technologies (e.g. a train connection) for achieving the mobility goals for the sparsely populated rural areas pursued by the programme. The target regions were selected according to the expected effects based on the economic and social development potential. The selection of particularly underdeveloped regions resulted in an efficient allocation, as a particularly high marginal utility of the funds used was to be expected here.

The technical design of the developed roads was appropriate in terms of traffic volume and climatic requirements (see *Effectiveness – Quality of implementation*) and also maintained cost efficiency in specific areas (see *Efficiency – Production efficiency*).

With the decision to asphalt most of the roads, the Cambodian government's standard for rural roads in force since 2016 has been complied with. In addition, the resistance to higher traffic volumes and heavy rainfall has been improved. The development of the roads with sealed surfaces is in principle expedient and would be efficient with effective maintenance and control of the axle loads as well as corresponding maintenance capacities (see *Sustainability – Durability of effects over time*). However, a higher design standard (sealed surfaces) leads to higher consequential maintenance costs and is associated with higher requirements when it comes to technical capacities. The responsible local units are not yet sufficiently able to comply with these financially, organisationally and technically (see *Sustainability – Capacities of persons concerned*). Against this background, the decision not to provide all roads with sealed surfaces, but to cover less wear-prone road sections with gravel in view of the lower construction and maintenance costs is regarded as an efficient course of action.

Transaction costs in marketing local agricultural products and as well as for the use of schools and health services were reduced as a result of the year-round use and usability in addition to the improved road conditions (see *Impact – Contribution to overarching (intended) developmental changes*). This strengthened the economic and social participation of the target group as well as rural human capital. However, significantly declining trends can already be observed in the efficiency indicators of driving times and vehicle operating costs, with corresponding prospective effects on the aforementioned effects of transaction costs (see *Effectiveness – Contribution to goal achievement*).

In the financing agreement, it was agreed that the Cambodian government would provide an amount of USD 3.3 million annually for the maintenance of roads in the provinces benefiting from the FC programmes. However, only USD 2.2 million in 2016 and 2017 and USD 3.2 million in each year from 2018 to 2021 were provided and prioritised for FC-financed infrastructure. In the EPE, it was not possible to clarify conclusively whether these funds were provided in addition to the budgets planned for the respective provinces (see also *Relevance – Suitability of project concept*). Conditional use of the maintenance budget is considered inefficient – insofar as these funds are not made available in addition to the budget already planned for this purpose and independent of this

programme. Although the contractually agreed allocation of funds improves the sustainability of some roads built/developed within the framework of FC programmes, from a macroeconomic perspective, the funds have not necessarily been used where they would have brought the greatest added value in view of the overall shortage of funds. The mandatory provision of maintenance funds for provinces receiving FC grants was applicable until the end of the sixth phase of the RIP in 2021 and was not continued in the loan-financed follow-up programme RID4CAM. This is positive given the inefficiencies presented here.

In addition, implementation took place via the MRD's project implementation and therefore in parallel with the organisational unit actually responsible. This resulted in corresponding additional expenditure without a structure-forming effect (see *Sustainability – Capacities of persons concerned/Contribution to support for sustainable capacities*), which was contrary to the endeavours to build up sustainable maintenance capacities promoted by the basic and advanced training measure.

Rating summary:

The specific construction costs as well as the consulting costs were reasonable and enabled good production efficiency, whereas in some cases poor results led to a considerable need for improvement. The design standard was appropriate in terms of intensity of use and climatic requirements, but imposed higher financial and technical requirements on maintenance, which cannot currently be guaranteed by the responsible units. The year-round usability and (transaction-cost) efficient use of the roads led to significant and positive socio-economic effects. However, these effects are already declining. In addition, the inefficiently allocated and implemented (additional) maintenance budgets affected allocation efficiency. Overall, efficiency is only moderately successful against this background despite good production efficiency.

Efficiency: 3

Impact

Overarching (intended) developmental changes

From 2009 to 2019, Cambodia achieved significant economic growth of an average of 7 % annually due to macroeconomic stability, a good investment climate and openness to international trade. This also led to an improvement in living conditions. This trend was reversed with the COVID-19 pandemic, which led to a recession in 2020, with a downturn in economic growth of -3.1 %. The subsequent recovery remained below expectations, with annual economic growth standing at just over 5 % (2023). The reasons for this were the subsequent crises in the form of fiscal inflation control measures in the USA, which led to investment capital becoming more expensive in Cambodia, which is heavily dependent on the dollar, as well as the effects of the global geopolitical situation regarding trade and tourism. These led to the occurrence of already existing structural risks of the Cambodian economy, e.g. the dependence on a few export goods and markets.

The rural regions of Cambodia, where 75 % of its around 16.8 million inhabitants live, are characterised by difficult living conditions. While some of the more remote rural populations live on subsistence agriculture, market orientation in better-connected areas is progressing rapidly. In 2015, agriculture still contributed 27 % to gross domestic product (GDP). Since then, its share has fallen to 22 % (2022). In 2020, agriculture accounted for around 35 % of jobs in Cambodia and 22 % of GDP. Rice is grown on approximately 79 % of the arable land and generates 50 % of agriculture's share in GDP. While agriculture-related labour decreased from 58 % (2009) to 35 % (2019/20), coupled with corresponding migration from rural to urban areas, labour productivity in agriculture more than doubled. Overall, economic growth – including the increase in non-agricultural income opportunities and migrant workers transferring money to their families – had a positive impact on rural areas and helped to improve the living conditions there.

The national poverty rate in Cambodia fell from 26 % to 18 % nationwide and from 30 % to 23 % in rural areas between 2014 and 2019. According to the World Bank, this development was mainly attributable to the overall strong economic growth, with a negligible effect from targeted transfer measures such as social security systems. In the same period, access to electricity in rural areas increased from 48 % to 79 % and child mortality more than halved nationwide.

The average per capita income adjusted for purchasing power increased by around 2 % in the project provinces from around USD 6,900 in 2016 to around USD 7,000 in 2021. The proportion of impoverished households was 20 % nationwide at the time of the EPE (2023) and has therefore increased slightly again since 2019 due to the above-mentioned influences. The project provinces of Banteay Meanchey with 20 % and Oddar Meanchey with 19 % were close to this national average of 20 %, while Preah Vihear and Battambang both stood above this mark with 24 % and 31 % respectively. The poverty rates in the catchment areas of the project roads were 13 % to 20 % above the average values of the respective provinces.

Contribution to overarching (intended) developmental changes

The objective adapted as part of the EPE was to contribute to improving the socio-economic living conditions of the population in the catchment area of the rural roads.

Target achievement at the impact level can be summarised as follows:

Indicator	Status Baseline (2016)	Target value according to PA/EPE	Actual value after completion (2019/2020) ¹⁾	Actual value at EPE (2023)
(1) Average household income in the catchment areas of the project roads	USD 1,368 ²⁾	+15 % ²⁾ (PA)	+84 % ³⁾ (USD 2,377 ¹⁾ and ³⁾)	+498 % ³⁾ (USD 6,973 ¹⁾ and ³⁾) Achieved
(2) Percentage of the impoverished population in the catchment area of the project roads	25 % ²⁾	20 % ²⁾ (EPE)	20 % ²⁾	42 % ²⁾ Not achieved
(3) Motorised vehicles per household	0.86 ²⁾	+20 % ³⁾ (EPE)	+42 % ³⁾ (1.20 ¹⁾)	+66 % ³⁾ (1.63 ¹⁾) Achieved
(4) Volume of trade in agricultural products produced in the catchment area of the roads	USD 609 ²⁾	+30 % ³⁾ (EPE)	+143 % ³⁾ (USD 1,329 ¹⁾ and ³⁾)	+546 % ³⁾ (USD 3,308 ²⁾ and ⁴⁾) Achieved
(5) Percentage of young people enrolled in secondary schools (12–17 years)	39 % ²⁾	+10 percentage points ³⁾ (PA)	The school authorities did not have any official data at the time of the final inspection	+10 percentage points ³⁾ (52% ²⁾) Achieved

¹⁾ Values were collected before the COVID-19 pandemic

²⁾ Average of all project roads

³⁾ Average change on project roads. In contrast to the change in average values, this calculation method is less susceptible to producing extreme values.

⁴⁾ In baseline prices adjusted for inflation based on the Cambodian consumer price index.

Household income in the catchment areas of the project roads increased by an average of 498 % (indicator 1), with previously very underdeveloped and poorly connected regions experiencing a particularly strong increase. The project has made a decisive contribution in this respect by improving connections to goods and labour markets. The development of rural routes has led to a significant upswing in market production and marketing of agricultural products in the catchment areas. Agricultural products were being produced for the market even before the roads were developed, but to a lesser extent in view of the previously high transport costs. The volume of trade in agricultural products has increased more than fivefold (indicator 4). Network effects play a major role here, as all developed roads are connected to major supra-regional roads and some are connected to transnational roads. This enables supra-regional trade and international trade with neighbouring Thailand. Agricultural products have been brought to collection points by farmers or collected directly in the communities since the roads were developed. The number of sellers has more than doubled since the baseline, with increasing competition generated from buyers and lower transport costs leading to better purchase prices for producers. In the catchment area of the roads, the range of goods offered by travelling sellers and at the markets has also increased. A number of new private and

agricultural building projects were also observed during the field visit.

Households run by women recorded higher average income growth than households run by men. This suggests a reduction in income inequality. In 2016, the average income of households run by women stood at 65 % of the overall average household income. However, by 2023, this figure had risen to 82 %.

Additionally, the proportion of the poor population in the catchment area of the project roads ([indicator 2](#)) had fallen as expected by the time of the final inspection. However, for 2023, the national poverty register (IDPoor) shows a sharp increase in poverty in the catchment area. These values must be questioned taking into account the sharp increase in income in the catchment area of the project roads ([indicator 1](#)). Several factors may have played a role in the development of the figures from the poverty register. Some of these are actual changes in the target group's economic situation due to the regional downturn in growth rates and the COVID-19 pandemic. In particular, the return of migrant workers came into play: migrant workers would often transfer money earned from higher-paying jobs back to their home communities. When they returned, they did not have any source of income at all. Other plausible reasons are related to amendments in Cambodian poverty reduction policy that have created incentives for people to ensure that they are on the poverty register. This ensures that they receive more transfer payments to help mitigate the effects of the recession. In contrast, both vehicle ownership as an indicator of economic well-being ([indicator 3](#)) and household income ([indicator 1](#)) have increased significantly. The field visits and interviews as part of the EPE confirmed the impression that the residents benefited from the improved living conditions and incomes, but the increases in wealth were probably unequal. In particular, the business category of the target group, which includes large-scale farmers and sellers, seems to benefit disproportionately from the market integration.

It seems plausible that the programme contributed to non-agricultural rural development through increasing use of educational opportunities ([indicator 5](#)) and the expansion of professional employment opportunities outside agriculture. In the interviews and focus group discussions, it became clear that the improvement of the rural project roads made it possible to utilise further education offers and to commute to neighbouring cities. The proportion of young people enrolled in secondary schools as pupils has increased by an average of 10 percentage points compared to the base case. This means that the indicator target value was achieved. In view of the fact that the data from 2021/2022 used in the context of the EPE still includes the effects of school closures during the COVID-19 pandemic, the proportion is obviously likely to have been higher since the end of the COVID-19 pandemic. However, it is not just roads that influence secondary school attendance: other factors include appropriate remote education offers and a good education dividend on the labour market.

Social services (health and education) have become more accessible to end users, including women and vulnerable groups. Visits to hospital wards and the availability of hospitals have improved significantly and hospital access is now guaranteed all year round. In particular, medical care during pregnancy and childbirth has improved. Public safety in the villages has increased because the police are now able to access them quicker and citizens can now make better use of public services. This was evident from the interviews and focus group discussions during the EPE.

There has been a significant increase in the number of women using motorised road transport (see *Effectiveness – Contribution to goal achievement*). It has been reported that this is due to the increase in vehicles, improvement in road condition and general safety. These factors, according to anecdotal reports, enable greater independence and participation in the economy. In the on-site surveys, it also became clear that the programme improves public and domestic safety, which benefits women in particular, as police have better access to neighbourhoods.

Since connections to effective transport infrastructure are key to the development of rural areas and cannot be substituted, it can be assumed that the developmental impacts mentioned above would not have arisen without the programme. This was also evident in the level of development of neighbourhoods without appropriately developed roads during the EPE. The programme made no significant contribution to structural or institutional changes (e.g. in organisations, systems or rules and regulations) but it was not the programme's aim to contribute to such changes. However, the programme was designed in such a way that it was complementary to other FC-financed phases of rural road network development as well as projects carried out by other donors and can be connected with other projects.

Contribution to overarching (unintended) developmental changes

No unintended developmental changes were identified during the EPE. While human trafficking is a relevant problem in Cambodia, the development of existing rural roads is not likely to make a significant contribution to this, as it does not open up new areas for road traffic and human trafficking does not require regular road travel. As a result,

the reduced transaction costs brought about as a result of road development would not make significant contribution to further exacerbating this issue.

Rating summary:

The indicator target values with regard to household income, vehicles per household and volumes in trade of agricultural products produced in the catchment areas of the project roads were already exceeded at the end of the project and also at the time of the EPE. This suggests an improved income situation for households. In contradiction to this, the proportion of poor population that had decreased by the time the programme was completed, had increased again by the time of the EPE. This is probably linked to declining growth rates, increased registration in the poverty register for transfer payments and the return of migrant workers in the context of the COVID-19 pandemic. Unequal advantages from economic integration cannot be ruled out either. However, the increased household income and number of vehicles per household in particular suggest that a significant proportion of the target group has improved their economic situation. In the future, further positive effects can also be expected from the fact that use of social services (health and education) is now possible. Overall, the overarching developmental impact is still considered successful.

Impact: 2

Sustainability

Capacities of persons concerned

At the time of the EPE, the network of rural roads in Cambodia covers a total length of around 48,000 km. The *Department of Rural Roads* (DRR) of the MRD and the *Provincial Departments of Rural Development* (PDRDs) are responsible for maintenance at national level. The processes are highly centralised at national level and the PDRDs have little autonomy. The budget for maintenance of rural roads is allocated directly from the national budget. The MRD does not have any other dedicated sources of financing for this, such as a Road Fund, to which fuel duties or usage fees, for example, make a direct contribution.

The budget allocated to the MRD for rural road maintenance increased from USD 0.25 million in 2006 to USD 19.7 million in 2017 in parallel with the expansion of infrastructure. The budget increased again to USD 25 million by 2020. In the following years, allocations stagnated before growing to around USD 28 million in 2023. This means that in the year of the EPE, USD 580 per kilometre was calculated to be available for maintenance for the rural road network. Since 2017, an average of around 55 % of the above-mentioned total budget has been used for periodic maintenance (including the renewal of road surfaces) and 35 % for routine maintenance (filling potholes, repairing damage, clearing out culverts, etc.), while the rest has been used for emergency measures. The most recent maintenance work involved roughly 3,000 km of gravel roads and 1,300 km of asphalted roads. Asphalted roads require periodic maintenance every five to seven years, while maintenance on gravel roads must take place every three to five years. Both road types require annual routine maintenance. As a result, it can be calculated from this information that the scope of maintenance carried out is insufficient for the rural road network. The approximate specific costs for maintenance calculated from the budgets and stretches of road that were maintained were around USD 6,400 per km on average between 2017 and 2023. This is less than half of the specific costs incurred for the maintenance works that were carried out as part of the RIP projects, which are described below (see next paragraph). It can be deduced from this that the maintenance works carried out were not comprehensive, but instead tended to be limited, needs-oriented measures.

So far, there has been no routine maintenance of the asphalted roads implemented as part of the programme, with the exception of three roads mentioned below. Road maintenance is largely the responsibility of the PDRDs. However, from an organisational technical perspective, the PDRDs and the MRD are not yet in a position to carry out comprehensive maintenance works and do not have the necessary budget in view of the shortage of funds described above. Most of the repair works carried out were limited in scope and some of these were carried out by neighbouring municipalities and with the financial contribution of commercial road users. Three roads, however, received periodic maintenance required for gravel roads over a total length of 45.1 km in 2021 (around three years after their completion) within the scope of the above-mentioned, contractually agreed provision of funds. This is in line with an appropriate road renewal cycle, taking into account local weather and usage conditions, to prevent further degradation. The specific costs for periodic maintenance of gravel roads were estimated at around EUR 14,000/km, while for asphalted sections, which only accounted for 1.5 km of the roads, they were estimated at

USD 130,000/km. This work was not carried out by the above-mentioned maintenance structures, i.e. the *Department of Rural Roads* (DRR), which is responsible for carrying out maintenance works, but rather by the project implementation unit.

Although the executing agency's implementation and management capacities have continuously increased, there is still significant room for improvement with regard to maintenance and the increased integration of the implementation and maintenance units (see *Sustainability – Contribution to support for sustainable capacities*). The executing agency's efforts and the continuous donor support⁷ give rise to hope for an improvement in maintenance capacities, even if this will take place slowly. Having said this, the improvement process must be accelerated to keep pace with the development of the rural road network.

Management of the rural roads, including monitoring of their condition and the appropriate, efficient planning of funds, has so far posed a major problem for sustainability. The RRAMS system established for this purpose is ready for operation and can potentially be used as a basis for systematic road maintenance planning and budgeting. However, data collection for this is costly and difficult. The system is therefore currently being supported by several donor-financed development projects, such as the ongoing FC project RID4CAM, in their respective project regions.

Contribution to support for sustainable capacities

As part of the basic and advanced training measure, the project worked on capacity building to ensure the sustainability of the infrastructure. Education and on-the-job training for design, contract management and supervision of work were carried out for the MRD and the PDRDs. In addition, vehicles for road inspection were purchased, which continue to be used. It can be assumed that these measures have had a positive impact on technical capacities, especially in terms of implementation capacities. However, the EPE showed that the project implementation and road maintenance are (too) separated from each other. It is plausible that the implementation structure in the form of a project implementation unit, which is decoupled from operations, also contributed to this (see *Relevance – Suitability of project concept*). Ultimately, the scope of such a basic and advanced training measure is too limited to compensate for the significant capacity deficits.

Durability of effects over time

The condition of the roads that were newly developed as part of the project is good to moderate and in some cases poor. Damages from intensive road use as well as ground and surface water were found on several sections. These issues led to the declining trends in driving time savings and vehicle operating costs mentioned under Effectiveness. Damage and the resulting limited possibility were particularly pronounced on road sections in Banteay Meanchey and Battambang, which are exposed to heavy flooding during the wet season due to their topography, as well as on a road section in Preah Vihear, which was used as an access route for a dam construction site. In addition, the road sections in urban areas are mostly heavily degraded. This is likely to be attributable primarily to the high intensity of use within urban areas, but also to construction activities and solid waste, which have a negative impact on water drainage.

The design of the implemented rural roads (e.g. bitumen surfaces, concrete drains, larger, reinforced culverts/bridges), which are more resistant to the increasingly challenging climatic conditions, has helped to ensure that these roads are passable all year-round and has boosted resilience to climate-related degradation, as intended. However, extraordinarily heavy rainfall incidences and flooding have already led to significant damage in some cases, which could not have been prevented by the climate-adapted designs.

A control of axle loads and thereby the avoidance of premature degradation of the road surfaces is not guaranteed across the board. The height and width limitations in place on some roads (outside the scope of the programme) were not effective in preventing overloading, as they were not suitable for the transport of rural goods and were therefore dismantled. The efforts of the Cambodian state to increase weight checks (e.g. through mobile weighing systems) are to be rated positively and should further be expanded.

With regard to fiscal leeway and budget allocation, it should be noted that the macroeconomic risks have decreased in Cambodia. Unless further unexpected shocks occur, economic growth can be expected to stabilise. The forecast for the coming years is just above 6 %. The tourism sector, which is important for Cambodia and which collapsed during the COVID-19 pandemic, is also showing signs of recovery, which is likely to increase demand for

⁷ The FC plans to address the deficits in maintenance in a targeted manner in a new programme.

food and workers. Overall, this creates a good environment for the continuation of the developmental impacts of the programme, whose target regions are largely dependent on food production and payment transfers from migrant workers.

Climate change and the predicted increasing frequency and severity of extreme weather events pose a medium- to long-term risk to the programme's impacts – in terms of both infrastructure and agricultural-based development. Although the roads are significantly more resilient to extreme weather events after the development works implemented by the programme, the current challenges with regard to maintenance are exacerbated by climate change. In addition, increasing heat stress without adjustment measures could reduce the agricultural yields on which the project regions depend. Increasing extreme weather events therefore pose a threat to rural infrastructure and, in particular, the road network and require additional funds for climate-resilient development as well as more comprehensive preventive road maintenance.

At the time of the EPE, the sustainability of the objectives achieved at outcome level already exhibited highly negative trends in the aspects of year-round passability, travel times and vehicle operating costs. With further degradation of the roads, this will probably also have a negative impact on the socio-economic effects (impact) – such as secondary school attendance, market access and the economic efficiency of market production. Nevertheless, it is expected that there will be continued access to economic and social (basic) services at least in the immediate vicinity of the roads, but their use will be associated with higher transport times and costs.

As things stand, the impacts could only be sustained by comprehensive rehabilitation (major restoration measures that go beyond periodic maintenance) of the roads. This is likely to take place through further development projects and will therefore use up scarce financial resources for international cooperation as well as resources of the Cambodian state, which could otherwise be used to achieve new development policy effects.

Rating summary:

In summary, the financial, organisational and technical capacities for the sustainable operation of rural roads are still too weak to counteract the degradations caused by climatic conditions and the intensity of use of a growing road network. The sustainability of the developmental impacts is therefore structurally at risk. The RRAMS road management system has now been successfully commissioned, checks of axle loads are increasing, the maintenance budget has recently been expanded in the wake of the economic recovery and there is ongoing international cooperation in the area of rural roads. All of these factors give grounds for optimism. Although the capacities are not yet sufficient to permanently maintain the status achieved at the end of the project and therefore ensure that the impacts continue over the long term, taking into account the aforementioned positive developments, overall sustainability is rated as moderately successful.

Sustainability: 3

Overall rating:

The development of the rural transport infrastructure effectively eliminated a relevant bottleneck in the target group's socio-economic development and laid the foundations for the positive impacts at the socio-economic level (income situation, health and education) in an effective way. The programme was therefore highly relevant to rural development in particularly weak regions of Cambodia and also promoted economic and social participation, including for women.

Due to the overall significant infrastructure development as well as the problematic macroeconomic and associated fiscal conditions in recent years, the financing of road maintenance remains insufficient. This also applies to the organisational and technical capacities needed for the maintenance of rural roads. As a result, the sustainability of the financed infrastructure is jeopardised, which is expected to negatively affect the impacts of the programme in the future. However, a complete reversal of the impacts is not expected, even in the event of severe degradation, due to the programme's structural effects on the commercialisation of agriculture as well as improved economic and public infrastructure. The following factors also give grounds for optimism regarding an improvement in maintenance capacities: the expected economic recovery with good growth prospects, the partners' own (albeit insufficient) efforts, as well as the continuous and comprehensive donor support for the rural transport sector.

Despite the fact that relevance, coherence and overarching developmental impact are evaluated as successful, the programme is only rated as moderately successful overall due to its limited effectiveness and efficiency as well as the limited success in the area of sustainability seen so far. This can be expected to lead to a deterioration of results at outcome and impact level if no significant improvements are made.

Contributions to Agenda 2030

With the improved road connection (SDG 9: Industry, innovation and infrastructure), it was possible to achieve an increase in income and an improvement in living conditions through market integration of the target group. As a result, the project contributed to the achievement of SDG 1 (No poverty) despite the increase in poverty rates shown, as it can be assumed that the poverty situation would have been even worse without the road development – even if income increases are probably very unevenly distributed. Indirectly, it contributed to better health care (SDG 3: Good health and well-being) and better education (SDG 4: Quality education). The increased numbers of women using motorised transport as well as the resulting access to public services and social participation that they enjoy corresponds to a contribution to SDG 5 (Gender equality). In its design and implementation, the programme made use of existing systems, pursued a holistic approach to sustainable development and contributed to the target group's resilience.

Project specific strengths/weaknesses and general conclusions/lessons learned

The programme had the following **strengths** in particular:

- The results of the EPE confirm the very high relevance of the rural transport sector for increasing productivity and marketing opportunities in agriculture as well as the induced increase in income and improvement of living conditions.
- The network effects with regional and international commerce as well as with larger cities offer new marketing and income opportunities for the target group.
- Income growth was above average for households headed by women and the number of women using motorised transport increased.
- The improvement of living conditions through education, health and public services (including safety) enables the further growth of human capital in rural areas and the diversification of income sources.

The programme had the following **weaknesses** in particular:

- The traffic counting methodology used here does not allow to make reliable statements about the project indicator traffic volume, as the survey period (one to a few days) is too short. The recorded traffic volumes, which only changed slightly, did not align with the anecdotal evidence and the sharp increase in vehicle ownership.
- Despite intensive support, both within the scope of the project and from parallel measures, the capacity development for the maintenance of rural roads was insufficient from the outset.
- The establishment of a project implementation unit allows effective project implementation but is not tightly linked to the MRD's institutional structures, which limits the potential for capacity-building and entails a decoupling of implementation and maintenance.
- The increase in extreme weather events requires a higher standard of road construction (paving). This is accompanied by higher construction and maintenance costs as well as higher technical and organisational requirements for the award of contracts, supervision of works and maintenance, which the responsible authorities have so far insufficiently met.

General conclusions and lessons learned:

- The traffic counting methodology needs to be improved. Recording of the actual status could be improved in such a way, for example by using automatic *low-cost traffic counters*, that measurements could be made over longer periods of time and thereby record the variability. In addition, movement data (e.g. from mobile phone or data providers) could be used to further triangulate the results at the counting points and to record changes in the traffic around the project roads.
- The number of motorised vehicles per household gives a good indication of both the development of economic activity and income as well as the use of roads. This is an important proxy indicator that may compensate for inflation effects on household income and methodological problems with traffic counts.
- The degradation of road sections in neighbourhoods described under Sustainability is a good reason for a higher design standard in such areas. Instead of asphalted surfaces, concrete surfaces could be used here, as is already common in Cambodia outside the scope of this project.
- In order to finance maintenance, it seems expedient to set up other dedicated sources of financing, such as a *road fund*, in addition to budget allocations. Transport-related sources such as tolls or fuel charges could contribute directly to such sources. This would provide more funds for maintenance. Additionally, the road sector would become less susceptible to fiscal constraints.
- Extreme weather events place particularly high demands on design standards and maintenance.
- The increase in climate resilience and the efficiency of the use of funds must be weighed against each other in the design, as a higher design standard leads to higher construction costs, but also to higher consequential costs for maintenance and requires higher levels of expertise.
- With a view to maximising developmental impacts, it seems expedient, in view of the scarce funds as well as the higher technical and financial requirements that the use of asphalted roads is weighed up against the use of gravel roads in the development of the rural road network on a case-by-case basis taking into account (changing) climatic conditions and not follow a one-size-fits-all standard.
- With the forecast and, in some cases, already occurring increase in extreme rain fall due to climate change, Cambodia is facing particular challenges when it comes to adapting the road network. The climate-adapted expansion of transport infrastructure in partner countries particularly affected by climate change is an important task for DC, which needs appropriate funding.
- Insofar as project-related implementation units are essential, there is a need for better integration of implementation and maintenance at central level and at the level of the provincial units in order to in turn strengthen integration within the responsible ministry and the interaction between implementation and maintenance of the roads. Stronger interlinking or integration would also result in synergies in capacity building.

Evaluation approach and methodology

Ex-post evaluation methodology

Ex-post evaluations follow the approach of a rapid appraisal, i.e. a data-supported, qualitative contribution analysis resulting in an expert opinion. Effects are attributed to the project considering plausibilities, based on thorough analysis of documents, facts and impressions. This includes – if possible – the use of advanced technology (e.g. satellite imagery, online interviews, geocoding). There is a follow-up on possible conflicting information, attempting to eliminate inconsistencies and to base the rating on information that – to the extent possible – has been confirmed through different sources (triangulation).

Documents:

Project reporting by the project executing agency, impact monitoring of the project, strategies and policies of the partner government, project documents from other donors (in particular ADB and World Bank), economic analyses, secondary specialist literature, context-, country- and sector analyses, and ex-post evaluations of previous programmes.

Data sources and tools for analysis:

The project executing agency's reports on budgets as well as maintenance and emergency measures, databases, on-site data collection and impact studies, GPS and speed data, satellite images and geodata.

Interview partners:

Project executing agency, target group, other development organisations, local and regional administrations

The analysis of project effects is based on the theory of change defined at project appraisal and documented within the impact matrix, which may be updated for the purposes of the evaluation. The evaluation report argues which factors contributed to the observed effects and why – as well as the probable extent of the project's contribution (contribution analysis). The context of the project is taken into account concerning its influence on the results. The conclusions are put into perspective regarding the availability and accuracy of the available data. The framework of the evaluation is established by the evaluation conception.

This method provides a balance between cost and usefulness, generating evaluation findings with appropriate effort and expense. Also, it allows for a systematic success rating across the FC projects. Thus, an isolated ex-post evaluation cannot fulfil the requirements of a scientific assessment in the sense of a strict causality analysis.

The following aspects caused limitations for the evaluation:

- There was not enough detailed information on the maintenance work carried out on the roads as requested by the project executing agency. Additionally, this information was provided exclusively for the periodic measures implemented via the project management unit.
- The executing agency also requested a breakdown of the maintenance budget by project province; again, this was not provided.

Rating methodology

To evaluate the programme according to OECD-DAC criteria, a six-step scale is used for all criteria except for the sustainability criterion. The scale is as follows:

- Level 1** very successful: result that significantly exceeds expectations
- Level 2** successful: fully in line with expectations and without any significant shortcomings
- Level 3** moderately successful: project falls short of expectations but the positive results dominate
- Level 4** moderately unsuccessful: significantly below expectations, with negative results dominating despite discernible positive results
- Level 5** unsuccessful: despite some positive partial results, the negative results clearly dominate
- Level 6** highly unsuccessful: the project has no impact or the situation has actually deteriorated

The overall rating on the six-point scale is compiled from a weighting of all six 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 ("Impact") and the sustainability are rated at least "moderately successful" (level 3).

The annex to this report is available upon request (german only).

About this publication

Responsible:

FC E
Evaluation unit of KfW Development Bank
FZ-Evaluierung@kfw.de

Maps or other cartographic displays are solely for information purposes and do not equate legal recognition of borders or territories. KfW assumes no liability for the accuracy, currentness or completeness of maps provided. Any liability is excluded for damages resulting directly or indirectly from their use.

KfW Group
Palmengartenstrasse 5–9
60325 Frankfurt am Main, Germany