

Ex-post evaluation

Labour-based Road Construction Phase V, Namibia

Title	Labour-based Road Construction Phase V
Sector and CRS code	Road transport (21020)
BMZ number	2011 65 703
Commissioned by	Federal Ministry for Economic Cooperation and Development
Recipient and executing agency	National Planning Commission (recipient), Roads Authority (implementing agency)
FC financing volume and instrument	EUR 10 million; budgetary grant
Project duration	2012-2022
Reporting year	2025
Year of random sample	2024

Project objectives and implementation

The outcome-level objective underlying the ex-post evaluation was for the predominantly poor rural population to have year-round access to health, education and administrative facilities, as well as to labour, sales and procurement markets. At the overarching impact level, the objective was to improve the socio-economic situation of the target group in the central northern regions of Namibia (Omusati, Oshana, Ohangwena and Oshikoto) would be improved and poverty reduced.

A total of three district roads with a total length of around 150 km and 40 km of access roads were built as part of the project.

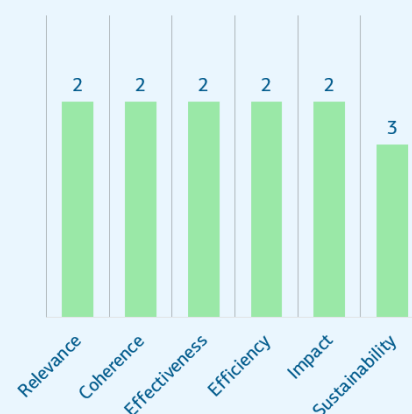
Key findings

The following aspects were crucial to the overall success of the project:

- The project addressed a key bottleneck, namely inadequate access to socio-economic facilities, and was conceptually suited to helping solve the core problem.
- The roads are in acceptable condition and are used intensively in the local context. They ensure year-round access to schools, health and administrative facilities, as well as to labour, sales and procurement markets.
- The individual benefits for beneficiaries and the overall internal rate of return are considered to be high.
- The socio-economic situation remains challenging. The development of economic activities and household incomes appears to be lower than in comparable rural road construction projects. Nevertheless, the district roads contribute to the mobility and access to socio-economic infrastructure that are fundamental to the target group and are a basic prerequisite for improving living conditions and reducing poverty.
- Despite an inadequate maintenance budget, it can be assumed that the Roads Authority will continue to do the minimum necessary to maintain the roads, as it has done in the past. Access to socio-economic facilities and the resulting impact of the project will continue, but probably to a lesser extent.

Overall rating

Successful



1: very successful – 6: completely unsuccessful

Conclusions

- Rural roads contribute to the fundamental mobility and connectivity of the target group to socio-economic facilities and services and are therefore a central, irreplaceable key to improving socio-economic living conditions and inclusive development in rural areas.
- The impact of connecting health facilities is particularly significant, as this makes a direct, fundamental difference to the lives and health of the target group.
- Common impact chains of rural road construction with regard to socio-economic changes can vary greatly despite similar contexts and must be questioned in the design phase.

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Abbreviations

BMZ	Federal Ministry for Economic Cooperation and Development
DAC	Development Assistance Committee
EPE	ex-post evaluation
EZ	Development cooperation
EUR	Euro
FC	Financial cooperation
FC E	FC Evaluation
GIZ	German Society for International Cooperation
HDM4	Highway Development and Management Model, Version 4
IRI	International Roughness Indicator
NAD	Namibian dollar
OECD	Organisation for Economic Co-operation and Development
PA	Project appraisal
PCR	Project completion report
PV	Programme proposal
RMS	Road Management System
SDG	Sustainable Development Goal
SME	Small and medium-sized enterprises
SWAp	Sector Wide Approach
TC	Technical cooperation
USD	US dollar

Overview

General conditions and classification of the project

After Namibia gained independence from South Africa (1990), the transport sector became an integral part of German-Namibian cooperation in the early years. From 2002 onwards, the transport sector became a focal point of cooperation.

The first FC-financed projects in the transport sector were launched in 1994. The commitment included the expansion and repair of the main road network. The first project in the area of "Labour-based Road Construction Phase I" was initiated in 1996. The focus was on the densely populated central north of Namibia. The ex-post-evaluated project "Labour-based Road Construction phase V" is a follow-up programme in line with the labour-based road construction approach and the former development cooperation programme for transport.

In 2019, it was decided to phase out German-Namibian cooperation in the transport sector. With the completion of the final phase of labour-based road construction (Phase VI), which was still being implemented at the time of the ex-post evaluation (2025), and the road maintenance and rehabilitation project, which is also still ongoing, cooperation in the transport sector will come to an end after more than 30 years.

The target regions of the programme are located in central northern Namibia, which was and remains the most densely populated area of the country. This is also where the Cuvelai drainage system is located, an area that poses major challenges for the construction and maintenance of infrastructure due to its natural conditions and had to be taken into account in the context of the programme. The Cuvelai drainage system is a flat, seasonal inland water system in north-central Namibia covering an area of almost 168,000 km². It consists of hundreds of natural channels/watercourses (Oshana/lishana) that transport water in a north-south direction from the southern Angolan highlands to the Etosha Pan, where it collects in seasonal wetlands during the rainy season and drains very slowly over several months. The system is known for causing periodic flooding. The amount of water varies greatly from year to year. Estimates of the extent of flooding are available for 68 of the last 81 years (period from 1941 to 2021). In these 68 years for which data is available, there were 11 years with severe flooding, 20 years with moderate flooding, 14 years with minor flooding and 23 years without significant flooding.¹

Brief description

In order to improve the socio-economic situation of the target group in the central northern regions of Namibia (Omusati, Oshana, Ohangwena and Oshikoto) and reduce poverty, the project constructed three district roads with a total length of around 150 km and 40 km of access roads, along which 29 schools and 8 health facilities are located.

Breakdown of total costs

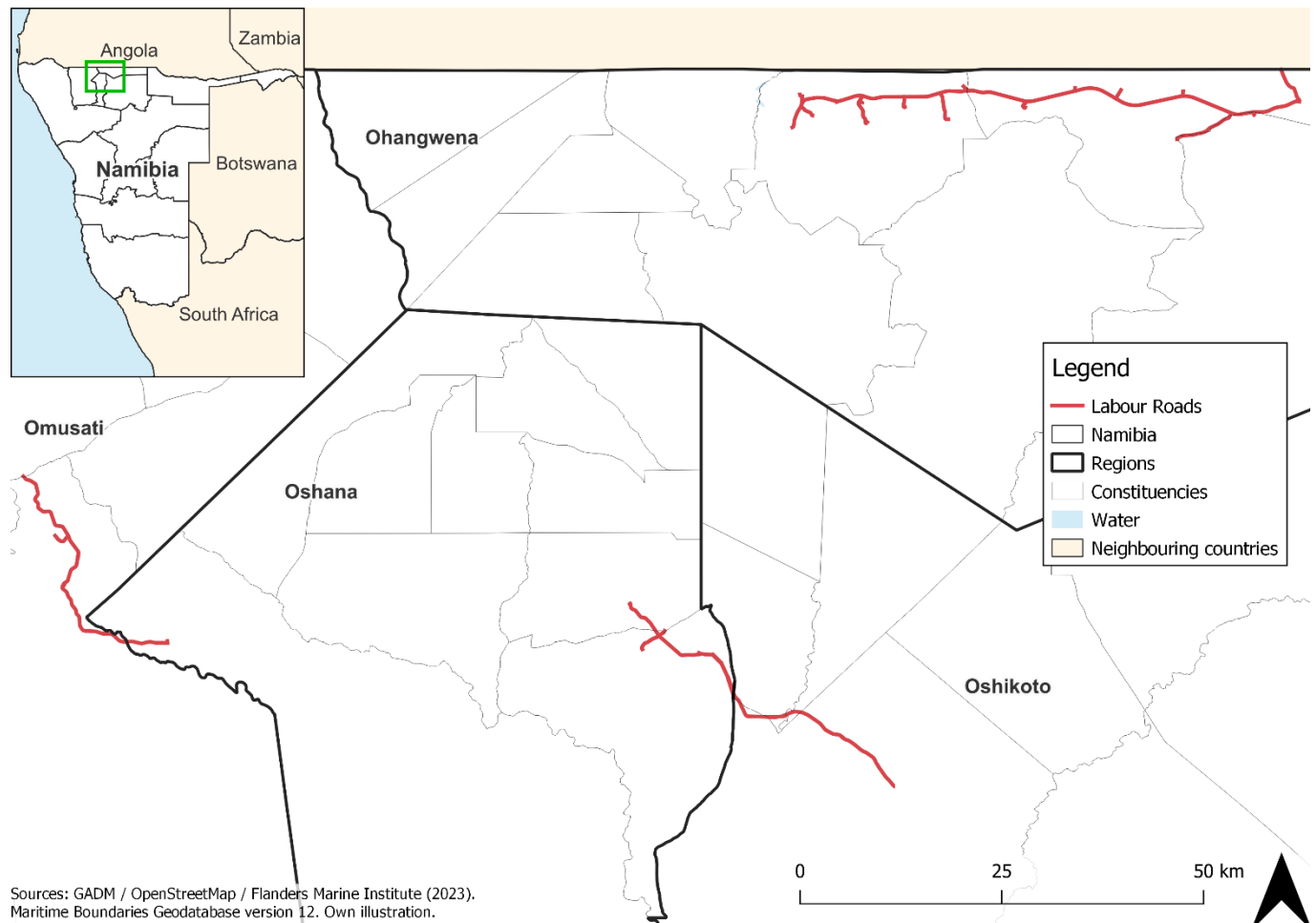
	(Plan)	(Actual) ²
Investment costs (total) in million EUR (NAD)	23.05 EUR (NAD 230.5 million)	19.75 EUR (NAD 306.24 million)
Own contribution in million EUR (NAD)	13.05 (130.5 million NAD)	9.95 (NAD 154.23 million)
External financing in million EUR (NAD)	10.00 (100 million NAD)	9.80 (NAD 152.01 million)
of which BMZ funds in million EUR (NAD)	10.00 (100 million NAD)	9.80 (NAD 152.01 million)

Table 1: Breakdown of costs

¹ <https://atlasofnamibia.online/chapter-4/the-cuvelai>; J. Mendelsohn and B. Weber (2011): *The Cuvelai Basin, its water and its people in Angola and Namibia*

² In the project report, total costs and financing, apart from FC funds, were only reported in NAD. With regard to the illustration of the own contribution and consequently the total costs in EUR, it should be noted that an exchange rate of 1 EUR = 10 NAD was used during the appraisal of the project. The exchange rate derived from the PCR's information on FC financing in EUR and NAD is used as an approximation for calculating the own contribution in EUR. The lower actual values of the investment costs in EUR result from the devaluation of the NAD. During the disbursement period (2013-2022), the exchange rate changed significantly and stood at 1 EUR = 17 NAD in 2022 (see [historical exchange rates since 1953 with graph](#)).

Map of the project region



Sources: GADM / OpenStreetMap / Flanders Marine Institute (2023).
Maritime Boundaries Geodatabase version 12. Own illustration.

Figure1 : Location map

Source: own illustration, see legend on the map

Strengths and weaknesses of the project

The strengths include in particular:

- In the context of the project, roads are the only way to ensure year-round access to education, health and public services, as well as to labour, sales and procurement markets, thereby enabling inclusive participation in social life. This has created the basic conditions for improving living conditions, developing human capital and diversifying sources of income in rural areas.
- Access to health facilities is particularly important. Year-round accessibility to health facilities enables people to seek healthcare services and facilitates the transport of patients, medicines and blood samples, thus making a direct and fundamental difference to the lives and health of the target group. Women and children benefit particularly from this, as they make up the majority of users of health facilities.
- In line with previous projects, the established approach of labour-based road construction was continued, thereby promoting capacity building and professionalisation in the Namibian construction industry as well as temporary employment.

The weaknesses include in particular:

- In rural road construction projects in similar contexts, the following effects can often be observed: falling transport costs, expansion of transport services, a change in the means of transport, a shift from subsistence farming to commercial agriculture, visits to or holding of markets, direct purchase of agricultural products by traders from farms, and increased settlement density near roads. These effects are usually accompanied by an expansion of economic activities and an increase in income, which have a positive impact on household income and poverty. In retrospect, it became apparent that these changes, which frequently occur in similar contexts, were not observed or only to a limited extent in the project's catchment area.
- Funding for the maintenance of the Namibian road network has declined over the past decade. Politically, preference has been/is being given to the construction and/or sealing of roads, and despite the increased financing requirements, there has been a reluctance to raise road user charges. As no agreements were reached with the Namibian partners on the provision of maintenance funds, the project was unable to influence this development. With the expiry of cooperation in the road sector, the opportunities to influence these developments no longer exist.
- There are no systematic and coherent standard layouts for sub-components (e.g. culvert protection measures and access roads). Reporting and documentation of the measures implemented and their design were incomplete.
- With a view to maintaining the capacity built up in Namibia's construction industry, which has been promoted over decades by multi-phase FC-financed projects involving labour-based road construction, the expiry of FC's involvement in Namibia's road sector has revealed a high degree of dependence on the continuation of labour-based road construction (gravel roads) from Namibia's own resources and on the provision of sufficient funds for the maintenance of gravel roads. At the time of implementation, the expiry of cooperation in the road sector was not yet foreseeable, but it would have been sensible to take a forward-looking approach to maintaining the capacities that had been created and future applications.

General conclusions/lessons learned

- Rural (district) roads contribute to the target group's fundamental mobility and connection to the higher-level road network and enable year-round access to socio-economic infrastructure as well as goods and services. They are a central, irreplaceable key to the development of rural areas and create the basic conditions for improving socio-economic living conditions and rural development. The impact of connecting health facilities is particularly significant, as this makes a direct, fundamental difference to the lives and health of the target group.
- Common impact chains in rural road construction projects with regard to socio-economic changes can vary greatly despite similar contexts and must be questioned in the design phase.
- In an environment of tight budgets, the use of a maintenance management system (RMS) plays an even more important role in ensuring the efficient use of funds, as do increases in road user charges and differentiated road classification.
- The standardisation of designs/layouts and services provided by contractors and consultants, as well as their enforcement, is crucial for quality assurance.

Rating according to OECD DAC criteria

Relevance

1. Alignment with policies and priorities

The project's objectives were in line with the Millennium Development Goals (MDGs) that were valid at the time of the appraisal (2011) (in particular MDG 1: Eradicate extreme poverty and hunger, MDG 2: Primary education for all, MDG 3 and MDG 4: Reduce child mortality, and MDG 5: Improve maternal health) and the BMZ's 2015 Action Programme, which focused on the implementation of the MDGs. A contribution to this was attributed to the improvement of rural infrastructure, especially roads and streets, as these facilitate access to markets, education and health services. The project was also in line with the BMZ's development policy concept "Creating opportunities – developing the future" (2011). Within this concept, infrastructure, including transport, was considered an essential starting point for poverty reduction and economic development. From today's perspective, the objective remains in line with the current Agenda 2030 (see contributions to Agenda 2030) and corresponds to the objectives of the German Federal Government both then and now.

The expansion of transport infrastructure promoted by the project was and continues to be part of Namibia's national policies and priorities: the third National Development Plan (NDP III), adopted in 2008, shows that at the time of the project appraisal (2011), the expansion of the road network in disadvantaged regions was a high political priority. The sectoral objectives set out in the plan included reducing regional infrastructure disparities, improving access to social services and enhancing economic opportunities. In the current NDP VI (covering the period 2025/26 to 2029/30), the transport sector continues to be regarded as a key area for the implementation of the NDP (particularly for the areas of economic growth, human development and good governance).

2. Alignment with the needs and capacities of stakeholders and beneficiaries

At the time of the project appraisal (2011), a large part of the rural population in the most densely populated north of Namibia lived without year-round access to the road network and was therefore cut off from schools, health stations, administrative facilities and markets, especially during the rainy season. Unpaved bush roads were only passable with off-road vehicles, which most people in the project region could not afford. In addition, the population, which mainly travelled on foot, had no way of reaching the above-mentioned facilities by road during the rainy season, when there was widespread flooding and the water levels in the oshanas/lishanas were too high and dangerous, especially for children (see *general conditions and classification of the project*).

This resulted in poor educational opportunities, poorer health care and, due to the difficult access to labour and sales markets, low monetary income. This also affected the target regions of the project. According to the programme proposal (2011), the central northern regions of Namibia (Omusati, Oshana, Ohangwena and Oshikoto) had a high proportion of poor households (between 38 and 56 per cent) and high unemployment (between 69 and 79 per cent). In a nationwide comparison, the regions of Ohangwena, Omusati, Oshana and Oshikoto had the highest number of people living without road access in absolute terms. The core problem was correctly identified, even from today's perspective. The project therefore addressed the flood-resilient expansion of rural roads with the aim of ensuring year-round access to schools, health stations, administrative facilities and sales and procurement markets in order to strengthen the socio-economic development and living conditions of the target group.

The selection of roads followed the priorities set out in national and regional road development plans. Within each region, a two-stage process was used to prioritise road projects, taking equal account of economic and social criteria. The plans provided for higher budget allocations for regions with greater access problems. The approach and the use of national systems are also considered appropriate from today's perspective.

Beyond the positive effects of access to schools, health centres, administrative facilities and markets for the entire population, the programme proposal assumed that women in particular would benefit from the district roads in the form of time savings and cost-effective access to education, health and markets. It was also envisaged that, within the framework of labour-based road construction (see 3. *Appropriateness of design*), women would be given appropriate consideration in terms of access to employment opportunities, as in the previous phases of the programme. Direct employment promotion within the framework of the project and the resulting income effects were primarily limited to the duration of the project. Further potential gender impacts through a different conceptual design are not apparent, even ex post.

3. Appropriateness of design

The following impact logic formed the basis for the review of the project: Financing (input) and construction of district roads (output) -> use of road infrastructure -> reduction in transport costs and times -> improved transport and marketing opportunities for agricultural products and year-round access to employment and income opportunities as well as to public services, education and health -> improvement in socio-economic living conditions (income, poverty reduction, education and health). These impact relationships follow a holistic approach to sustainability, as they take into account not only economic but also social development. The intended flood-resilient construction method (see below) also took into account the increasing challenges posed by climate change for the rural road network. The impact assumptions were illustrated transparently during the appraisal.

The chain of effects outlined above and its impact assumptions were fundamentally plausible at the time of the appraisal and the ex-post evaluation. In retrospect, the ex-post evaluation showed that, in some respects, the impact logic did not materialise in the Namibian context and that changes frequently occurring in similar contexts were not observed in the project's catchment area, or only to a limited extent (see *14th contribution to overarching (intended)/ (unintended) developmental changes*).

The target system was designed to be comprehensible and verifiable in principle. However, from today's perspective and taking into account the requirements of the currently valid BMZ procedural information "Quality Standards for the Impact Matrix" (VI083), the target formulations, indicators and value assignments were only partially appropriate. The formulations were adjusted in line with the aforementioned requirements as part of the ex-post evaluation. The programme proposal used the poverty rate as an indicator at the impact level. The programme proposal correctly points out that the project's influence on regional poverty rates cannot be isolated. Regardless of this, no separate survey was planned at the locations. Against this background, the indicators commonly used for rural road construction projects (*attendance at schools and health facilities and the Rural Access Indicator³*) are shifted from the outcome to the impact level in order to use them as proxies for the appraisal of the improvement in the economic and social situation of the target group and the reduction in poverty.

In retrospect, it is clear that the school attendance indicator has limited significance in the Namibian context: as the schools were generally attended by pupils even before the roads were built, a sharp increase in school attendance was only to be expected to a limited extent. It should also be noted that, given the 360-degree catchment area of the schools, only part of the catchment area can be directly connected by roads. With regard to schools, the roads primarily affect the reliability of teaching provision by ensuring that schools are accessible to teachers all year round. However, this is not reflected in the indicator for the number of pupils.

The situation is different for healthcare facilities. Similar to schools, they have a 360-degree catchment area, which can only be partially connected by (new) roads. At the time of the appraisal, however, medicines were not delivered or were delivered less frequently, especially during the rainy season, and patients generally found it difficult to visit the facilities and, regardless of medical necessity, received poorer care or were not transported to hospitals. Improved access means that healthcare services (including vaccinations) and treatments (including antiretroviral therapy for HIV and malaria) are likely to be offered more widely and taken up more frequently. Year-round accessibility for the transport of patients, medicines and blood samples, together with the above-mentioned healthcare services, makes a direct, fundamental difference to the lives and health of the population in the catchment area. However, this is not captured by the indicator 'number of patients'.

Then as now, there are no specific standards for climate-resilient road design in Namibia. However, road design should take into account the recommendations of a study conducted in 2009 after the second consecutive severe flood in the central north of the country, which recommended improved construction standards such as additional culverts and bridges for crossing periodic watercourses, based on the observed flood damage and updated hydrological data. The flood-resilient design of the roads also included a higher/raised road profile to ensure that the road surface remains above water throughout the year and can withstand severe/more severe flooding of the Cuvelai drainage system and extreme weather events caused by climate change.

The construction of the roads was to be based on the labour-based road construction approach already established in several previous projects. The aim of this approach was to contribute to the sustainability of Namibian SMEs in the construction sector, to further develop qualified SMEs through on-the-job training in labour-based road construction projects, and to promote employment opportunities for the local population. This development or professionalisation of the Namibian construction industry was to be achieved through the cooperation of established, experienced construction companies equipped with construction machinery with small and medium-sized construction companies, as specified in the tender conditions. Only companies that had previously successfully participated in training courses ("mentorship programmes") organised by the sponsor were eligible. For activities that could be carried out manually, the construction companies were to hire local people as so-called *task workers*, thereby generating direct, albeit temporary, employment effects. Given the high unemployment rate and few local employment opportunities outside agriculture, this was a suitable approach.

The Roads Authority was designated as the sponsor for the project. This is a privately organised, state-owned company that emerged from the sector reform carried out at the end of the 1990s. Its tasks include planning, tendering and monitoring road

³ The Rural Access Indicator (RAI) is an internationally recognised indicator that measures the accessibility of rural areas by determining the percentage of the population living within a certain distance (2 km in the Namibian context) of a road that is passable all year round.

construction and maintenance work. The capacities of the project partners were realistically assessed and taken into account appropriately in the design.

With the intended flood-resilient design of the district roads, the available funds and the Roads Authority as the implementing agency, the concept of the measure, including its technical, organisational and financial design, is considered overall to be suitable, both from a contemporary and a current perspective, for contributing to the solution of the core problem described.

In accordance with the concept, the project was fundamentally suitable for contributing to the achievement of the development cooperation programme's objectives.

4. Adaptability – response to change

The project was not subject to any changes in the framework conditions that would have required it to be adapted.

Rating summary of relevance: **successful (2)**

The project addressed a key bottleneck and was conceptually suitable for contributing to the solution of the core problem. It was in line with the policies and priorities of both the Namibian and German governments and took appropriate account of the capacities and potential of the partner.

Coherence

5. Internal coherence

The project fitted seamlessly into the transport development cooperation programme and the FC's involvement in the Namibian road sector at the time, which focused on repairing key sections of the main road network and the labour-based construction of district roads in northern Namibia (see *general conditions and classification of the project*).

The involvement of TC and FC in more than 30 years of German-Namibian cooperation was holistic and complementary, combining capacity building and road infrastructure development. As part of the SWAp approach, TC/FC supported the consolidation of sector reform. Furthermore, FC's involvement in the road sector was complemented by, among other things, advisory services for the Ministry of Transport and support for improving engineering education through TC. With regard to the latter, TC supported Namibia in expanding higher education in the fields relevant to road construction. On the FC side, this was complemented by the financing of a university building for engineering departments.

The project is consistent with the MDGs at the time (see 1. *Alignment with policies and priorities*), the SDGs of the current Agenda 2030 (see *Contributions to Agenda 2030*) and the Paris Climate Agreement, to which German development cooperation is committed. The focus on poverty reduction should be emphasised here. The project also contributes to adaptation to climate change through its flood-resilient design, thereby contributing to the Paris Climate Agreement. At the same time, the expansion of roads for motorised private transport (in the local context usually with combustion engines), from which the intended positive impacts are derived, conflicts with international efforts to reduce greenhouse gas emissions. Increasing traffic volumes are accompanied by rising greenhouse gas emissions. In the context of the project, it should be noted that the increase in traffic volume on district roads is relatively low. Furthermore, the construction of the roads contributes to reducing emissions, which should offset the emissions caused by increasing traffic, by enabling vehicles to travel at emission-efficient speeds (between approx. 50 and 80 km/h)⁴ and normal cars instead of off-road vehicles, as well as by shortening journey times and significantly reducing road unevenness. There was no reasonable alternative for providing the rural population with year-round access to socio-economic infrastructure and the resulting intended improvement in their living conditions (see 12. *Allocation efficiency*). Therefore, this aspect is not evaluated.

6. External coherence

The project supported the Namibian government's own efforts to expand the rural road network. These efforts are also reflected in the partner country's own contribution of just over 50% of the investment costs (see *breakdown of total costs* and 11. *Production efficiency*).

The Roads Authority as the implementing agency and the selection of roads based on the priorities of national and regional road development plans drew on existing national systems and structures.

There were no other donors in the field of rural road construction.

⁴ <https://theconversation.com/climate-explained-does-your-driving-speed-make-any-difference-to-your-cars-emissions-140246>

Rating summary of coherence: **successful (2)**

The project fitted seamlessly into the German FC's involvement in the Namibian road sector at the time. The commitment of TC and FC was holistic and complementary, consistent with international norms and standards and the partner country's own efforts. Furthermore, existing national systems and structures were utilised. Both internal and external coherence were successful and provide the rationale for the overall successful coherence.

Effectiveness

7. Achievement of objectives

The outcome-level objective underlying the ex-post evaluation was for the predominantly poor rural population to have year-round access to health, education and administrative facilities, as well as to labour, sales and procurement markets.

The following indicators were used to measure the outcome objective:

Indicator	Status at time of appraisal	Target value	Actual value at PCR	Actual value at EPE
(1) Road usage	DR3624: Baseline 140	DR3624: 224 (+60%)	DR3624: 211	DR3624: Ø 300 (from 125 to 850)
	DR3683: Baseline 50	DR3683: 80 (+60%)	DR3683: n/a	DR3683: Ø 150 (from 80 to 190)
	DR3681: Baseline: 150	DR3681: 240 (+60%)	DR3681: n/a	DR3681: Ø 200 (from 110 to 270)
				Target values achieved
(2) Road conditions	-	>70% of road kilometres in acceptable condition ⁵	>70% of road kilometres in acceptable condition	95% in acceptable condition Target value achieved

Table2 : Outcome target achievement

Source: Indicator 1: "Status at time of appraisal" and "Target values" Regional Master Plan Revision 2008/2014; "Actual values at PCR" Survey by the implementation consultant; "Actual values at EPE" Own calculations based on a traffic count conducted by UNAM (September 2025)

Indicator 2: "Actual values at PCR" Assessment based on the Project completion report/final inspection and own calculations; "Actual values at EPE" Own survey (2025)

8. Contribution to the achievement of objectives

Three district roads (DR3624, DR3681 and DR3683) with a total length of approximately 150 km and approximately 40 km of access roads were constructed. There are 29 schools and 8 health facilities along or near these roads. Not all facilities not directly located on the district roads were connected to them by an access road (*last mile*) as part of the project. Regardless of this, the district roads improve accessibility to the 29 schools and 8 health facilities located along or near the district roads.

Construction was labour-based (see 3. *Appropriateness of design*). SMEs were generally responsible for the earthworks necessary to raise the road profile and for the construction of culverts. According to the final inspection, SMEs accounted for between 30% and 50% of the contract values.

The roads have a carriageway width of 7.5 m and consist of a 15 cm thick wearing course. The roads run through scrubland, mostly at an elevated level to protect against flooding. To prevent water from stagnating and to allow it to drain away, larger culverts were installed at recognisable larger watercourses and additional culverts were built to improve road protection. The scope of drainage structures implemented, as well as the length of access roads and their design, is insufficiently documented. Site visits show that a simplified design standard with a narrower width was applied to the access roads branching off from the, which corresponds to the standard of other access roads implemented during the same period.

In the case of the DR3624, which runs parallel to a paved road, it was found that the access roads to the facilities located between the DR3624 and the paved road have the character of connecting roads. The sections from the facilities to the paved road were not part of the project. In retrospect, their use as connecting roads and the associated higher traffic volume and wear and tear are obvious. Implementation as complete connecting roads beyond the facilities would have had the potential to divert traffic flow from the first/last 20 km of the D3624 to the middle sections as well. This would have allowed for a better distribution of traffic flow over the entire length of the road, which would also have had a positive effect on road wear.

During the appraisal, the traffic volume on the project roads was estimated at between 80 and 240 vehicles per day, depending on the road. At the time of the ex-post evaluation (2025), the average traffic volume was between 150 and 300 vehicles per day, depending on the road. Traffic volume on the DR3624 already exceeded the target values at the time of the final inspection and

⁵ What constitutes an "acceptable" road condition was not defined during the project appraisal or final inspection. In the ex-post evaluation, road conditions are considered acceptable if they are passable at an average annual speed of 50 km/h.

has continued to increase to date. The target value for road use was also achieved for the DR3681 and DR3683. It should be noted that pedestrians account for between 20% and 50% of road users on the project roads. There is no local public transport. According to interviews, private transport providers and, similarly, private cars generally charge per-person prices based on distance travelled. In addition to off-road vehicles, the roads are also passable by normal cars, albeit more slowly than off-road vehicles. In principle, all intended beneficiaries have equal access to the roads and can use them. The proportion of women in traffic volume varied greatly between the individual district roads in the one-day road traffic counts, ranging from 31% to 48%.

The target value for an acceptable road condition (>70%) measured using the International Roughness Indicator (IRI)⁶ has been achieved. 5% are in poor or very poor condition. These sections are the ones with the highest traffic volumes. The roads are at a tipping point. Without periodic maintenance (reapplication of the road wearing course by means of so-called "regraveling"), the condition will deteriorate significantly in the near future.

The material of the road surface layer has now been largely worn away. When wet, this makes the roads slippery and correspondingly more difficult to drive on. Nevertheless, the district roads are usable all year round. However, access to facilities along district roads for which no access road has been built, or to access roads implemented with simplified design standards, can sometimes be difficult during the rainy season. Regardless of the potentially difficult access on the access roads/paths (*last mile*), the district roads improve the basic access of the population living in the catchment area to health, education and administrative facilities as well as to labour, sales and procurement markets. The latter are usually found in larger settlements, which can be reached more easily via the district roads.

9. Quality of implementation

The ex-post evaluation appraises the quality of management and implementation by the implementing agencies and consultants as generally goal-oriented, based on the contribution made, which was higher than originally planned, and the construction work inspected. However, weaknesses are apparent in the reporting and documentation of the measures implemented and the standards applied, as well as in the timely provision of own funds (see 8. *Contribution to the achievement of objectives*).

10. Unintended effects (positive or negative)

Anecdotal evidence from interviews and site visits conducted as part of the ex-post evaluation points to dust pollution. This is to be expected when unsealed roads are upgraded. The road surface, which has not yet been renewed, is corrugated, which, together with dust or softened road surfaces and inappropriate speeds, can lead to accidents. The project itself has only limited influence on this, as road maintenance, including signage and raising public awareness of road safety, goes beyond the time frame of the project and its sphere of influence.

As envisaged in the programme proposal, HIV/AIDS awareness campaigns for construction workers and the affected population were organised during the construction phases in accordance with the final inspection.

Rating summary of effectiveness: **successful (2)**

The roads are used intensively and are in acceptable condition. Both outcome indicators have therefore been met. The population living in the road catchment area has year-round access to schools and health facilities and can reach administrative institutions as well as labour, sales and procurement markets via the district roads. These aspects are decisive for the appraisal of effectiveness as 'successful'.

Efficiency

11. Production efficiency

At the time of the appraisal, the total cost of the project was estimated at NAD 230.50 million (EUR 23.05 million), to be financed by an FC grant of NAD 100.00 million (EUR 10.00 million) and Namibia's own contribution of NAD 130.05 million (EUR 13.05 million). The final total cost was NAD 306.24 million (EUR 19.75 million), of which NAD 152.01 million (EUR 9.80 million) was financed from the FC grant and NAD 154.23 million (EUR 9.95 million) from the own contribution.

The fact that the final total investment costs in EUR are lower than originally estimated is due to the depreciation of the NAD against the EUR. The final total cost of the project in NAD (all contracts were concluded in NAD) significantly exceeds the original estimate in NAD.

For two of the three district roads, the construction costs after tendering were 40% and 89% higher than the costs estimated during the appraisal. The increased construction costs are related to the scope of work being underestimated during the appraisal, the delayed tendering and awarding of contracts, and inflation between the appraisal (2011) and the conclusion of the contract (2014/2015). In addition, the contract value for one of the two district roads increased by a further 20% during

⁶ The International Roughness Indicator (IRI) is an internationally used standard for appraisal of road condition. It measures the roughness of the road surface based on the vertical movement of a vehicle's suspension. The lower the IRI value, the smoother the road.

implementation. This was mainly due to additional work (earthworks and culverts). In two contracts, the final costs remained slightly below the contract volumes. Two-thirds of the additional costs in NAD were offset by the FC grant in EUR in view of the devaluation of the NAD, and one-third was covered by the increased Namibian contribution. Although the Namibian contribution in EUR fell due to exchange rate fluctuations, in absolute terms it rose by around NAD 24 million compared with the original contribution.

In line with the funding approach for labour-based road construction (see 3. *Appropriateness of design*), the construction work was put out to tender nationally and in smaller construction lots. Any additional costs that may arise as a result are considered acceptable in view of the intended promotion of employment, the contribution to poverty reduction and the intended professionalisation of the construction industry and the resulting long-term effects on competition and quality. Against this background, the costs for construction work are considered reasonable.

The consulting services were put out to international tender. The final costs were below the estimated value in the programme proposal. The share of the final consulting costs in the construction costs was 7.4%. The consulting costs and their share of the construction costs are considered appropriate for the context.

The planned 150 km of district roads were implemented as planned. In addition, a further 40 km of access roads were built. It is unclear to what extent these were included in the original concept (see 8. *Contribution to the achievement of objectives*).

The specific costs for the project were estimated at NAD 1.4 million/km during the appraisal. After implementation, they amount to NAD 1.6 million/km. The specific costs for comparable district roads built during the same period were approximately NAD 2.0 million/km. The specific costs of the project were therefore lower and are considered reasonable.

The programme proposal estimated the project duration at four years, with one year for the planning and tendering phase, two years for construction and one year for the warranty period. The FC agreements with Namibia were signed in 2012, which meant that the project should have been completed on schedule in 2016. However, the tendering process was delayed by one year and did not take place until 2014, with the award process being completed in 2014 and 2015 respectively. The implementation of the roads also took longer than planned. Two of the three roads were completed in 2017, one year behind schedule, and the third was not completed until 2018 due to delays in demining work. The warranty therefore ran until 2018 and 2019 respectively. From the planning phase to the end of the guarantee, the project ultimately lasted seven years, three years longer than originally planned. Due to Covid, the final on-site inspection was not completed until 2022. In addition to the aforementioned delays in tendering, awarding contracts and demining, the failure to provide Namibian own funds on time also contributed to the significantly longer duration.

12. Allocation efficiency

Both the district roads and the access roads leading to the facilities play a central role in connecting the rural population to socio-economic infrastructure. Even in the case of facilities along district roads that are not directly connected to the district road by an access road (*last mile*), beneficiaries living in the catchment area benefit from the improved year-round accessibility of the facilities and connection to the higher-level road network provided by the district roads. Transaction costs (transport times and vehicle operating costs) have fallen (see 13. *Overarching (intended) developmental changes*) and the socio-economic situation of the target group has improved (see 14. *Contribution to overarching intended developmental changes*). The individual benefits for road users are considered to be high.

In order to achieve the intended year-round access to socio-economic infrastructure and the intended socio-economic effects, there was no alternative to the construction of rural roads. There was no sensible and more cost-effective alternative transport technology (e.g. rail transport) to achieve the desired effects. The roads were selected in a multi-stage process (see 2. *Alignment with the needs and capacities of the beneficiaries and stakeholders*) that took socioeconomic aspects into account in order to identify the roads with the highest benefit-cost ratio.

The internal rate of return for the individual roads estimated during the appraisal of the project varied between 30% and 60%. As part of the ex-post evaluation, a cost-benefit analysis was carried out using the Highway Development and Management Version 4 Models (HMD4). This shows indicatively that all district roads implemented are clearly economically viable.

Rating summary of efficiency: **successful (2)**

The specific costs were reasonable and, despite the increase in total costs in NAD, provide the rationale for the Production efficiency, which was appraised as successful. Allocation efficiency is also appraised as successful in view of the high individual benefits for beneficiaries living in the road's catchment area and the high internal rate of return for the economy as a whole. Overall, efficiency is therefore appraised as successful.

Impact

13. Overarching developmental changes

The impact-level objective underlying the ex-post evaluation was to improve the socio-economic situation of the target group in the central northern regions of Namibia (Omusati, Oshana, Ohangwena and Oshikoto) and to reduce poverty.

According to the 2023 census, the central northern regions of Namibia (Omusati, Oshana, Ohangwena and Oshikoto) remain among the most populous and densely populated regions in Namibia. The 15-34 age cohort accounts for the largest share of the population in these regions, ranging between 30% and 35%.

According to the 2023 census, the rural population in the four regions has declined slightly in percentage terms compared to the 2011 census, but still accounts for 82% to 89% of the population in each region. The exception is Oshana, where the rural population accounts for only 47%, as the population is heavily concentrated in and around the towns of Oshikoto, Ondangwa and Ongwediva, as well as along the road connecting the towns, especially in the north of the Oshana region, the most important urban area in northern Namibia.

The regions continue to have a high proportion of poor households and high unemployment. In 2021, multidimensional poverty in Ohangwena, Omusati and Oshikoto ranged between 50% and 57% (with Oshana being the exception at 33%). Unemployment in these regions ranged from 38% to 47% in 2023, with youth unemployment rates ranging from 42% to 51%. According to the 2023 census, pension payments are the second most important source of income in all four regions after wages and salaries. Agriculture ranks third in most regions and fourth in Oshana, with its highly urbanised north. Nevertheless, the proportion of households engaged in agriculture in the regions is between 50% and 60%. The focus of agriculture (especially on *communal land*⁷) is on self-sufficiency in grain and traditional livestock farming, supplemented by seasonal fishing during the rainy season and floods.

Trade and services account for the majority of economic activity in the regions and are largely carried out by micro-enterprises in rural areas. The informal sector also plays an important role here.

More schools have been added in the regions in recent years. The proportion of the population that has never attended school has declined slightly in the regions compared to the 2011 census, with the exception of Ohangwena, where the proportion has increased slightly. Despite the decline in the population that has never attended school, the literacy rate in the four regions has fallen slightly compared to the 2011 census and now stands between 84% and 85%. The exception here is the Oshana region, where the higher literacy rate of 92% is likely to be related to the higher proportion of the population living in urban areas.

In 2023, the proportion of the population living within a 10 km radius of a health facility ranged between 75% and 90% in the regions and 96% in Oshana. The latter is related to the above-mentioned population concentration in the northern part of the Oshana region. Compared to 2014, there were more lower-level healthcare facilities (*health clinics/centres*) in the four regions in 2024. This plays an important role, particularly in view of the high HIV prevalence in Namibia. In 2017, HIV prevalence in the regions ranged from around 16% to 18%, making it one of the highest in Namibia. Whereas in 2014 only state hospitals distributed antiretroviral drugs, this is now also being done by lower-level healthcare facilities.

The road network in the regions was further expanded between 2015 and 2024. Depending on the region, the increase in road kilometres ranged between 12% and 44% and is reflected in the Rural Access Indicator (RAI) (see Indicator 1 below). The roads implemented as part of the project also contributed substantially to this. Their share of the increase ranged between 9% and 24%.

The following indicators were used to measure the impact target:

Indicator	Status at time of PA	Target value at PA	Actual value at PCR	Actual value at EPE
(1) Rural Access Indicator (RAI)	Ohangwena: 57% Omusati: 56.8% Oshikoto: 52.1%	Ohangwena: 65.2% Omusati: 58.8% Oshikoto: 55%	...	Ohangwena: 64.6% (programme) / 82.3% (total) Omusati: 58.8% (programme) / 80.3% (total) Oshikoto: 54.9% (programme) / 69.4% (overall) Target value achieved

⁷ Communal land is owned by the state. Customary land rights are granted by traditional authorities and under the supervision of communal land councils for residential and agricultural purposes. They can be inherited but cannot be sold. Large areas of communal land are used as communal grazing land.

(2) Pupils in affiliated schools	Total: 9,101 DR3624: 5,500 DR3681: 1,648 DR3683: 1,953	Target: +15% ⁸ (10,466) DR3624: 6,325 DR3681: 1,895 DR3683: 2,246	DR3624: 7,434 DR3681 and 3683: No data	Total: 12,246 (+35%; 2.5% p.a.) DR3624: 8,194 (+49%; 3.4% p.a.) DR3681: 2,008 (+27%; 2% p.a.) DR3683: 1,964 (0.6%; 0.05% p.a.) Target value partially achieved
(3) Visits by patients to affiliated healthcare facilities (per year)	Total: 48,574 DR3624: 12,442 DR3681: 6,668 DR3683: 29,464	+15	Total: no data DR3624: 13,850 DR3681 and 3683: No data	Total: 92,657 (+90%; 7.0% p.a.) DR3624: 37,827 (+204%; 11.8% p.a.) DR3681: 10,077 (+51%; 4.2% p.a.) DR3683: 44,753 (+52%; 5.8% p.a.) Target value achieved
(4) Travel time	DR3624: 0 DR3681: 0 DR3683: 0	-50 ⁹	DR3624: -62% DR3681: -61% DR3683: -61%	DR3624: -50% DR3681: -56% DR3683: -55% Target value achieved
(5) Vehicle operating costs (per vehicle ¹⁰ s and km)	DR3624: 7.4 NAD (2015) DR3681: 7.4 NAD (2015) DR3683: 7.4 NAD (2015)	-25 ¹¹	DR3624: 4.7 NAD (-36%) DR3681: 4.6 NAD (-38%) DR3683: 4.6 NAD (-38%)	DR3624: 5 NAD (-32%) DR3681: 4.7 NAD (-36%) DR3683: 4.7 NAD (-36%) Target value achieved

Table 3 : Impact target achievement

Source: Indicator 1: "Status at time of appraisal" of regional RAI based on Master Plan Revision 2014); "Target value at EPE" calculation of final review of project/programme impact; "Actual value at EPE" own calculation based on "Census Dwellings update" (October 2021) and Census 2023

Indicator 2: "Status at appraisal" and "Actual value at EPE" based on MoE; "Actual value at PCR" survey by the consultant

Indicator 3: For DR3681 and 3683, "Status at time of appraisal" and "Actual value at EPE" data from the Ministry of Health; for DR3624, "Status at time of appraisal" and "Actual value at PCR" survey by the consultant

Indicator 4: "Actual value at PCR" and "Actual value at EPE" own HMD4 calculation based on 2023 census, Roads Authority and own IRI survey

Indicator 5: "Status at time of appraisal" and actual values for PCR and EPE own HMD4 calculation based on 2023 census, Roads Authority and own IRI survey

14. Contribution to overarching intended developmental changes

The above indicators are used as proxies (see 3. Appropriateness of design) to conduct an appraisal of the achievement of objectives. Their target values were largely achieved.

The Rural Access Indicator ([Indicator 1](#)), which relates to the change attributable to the district roads implemented as part of the project, is, according to rough calculations, in the order of magnitude of the project-related target values in the project regions and is considered to have been achieved, as the slight shortfall in some cases is negligible in the context of the rough calculation. Due to the further development of the road network in recent years, the RAI is significantly higher in the regions (Omusati: 80.3%, Ohangwena: 82.3% and Oshikoto: 69.4%).¹² The improved RAI from the suggests that the target group's connection to the road network has improved significantly and that the project has contributed significantly to this.

According to the Namibian Ministry of Education, the number of pupils in schools along the implemented district roads ([indicator 2](#)) rose by an aggregate of 35% between 2013 and 2025 for all schools along the implemented district roads. This means that the target value, which envisaged an increase of 15%, would be considered achieved. This also applies to the final inspection, at which point the target value for the only road for which data was available would be considered to have been achieved. However, it should be noted that the target value of a 15% increase should have been achieved just one year after the project was completed. However, due to Covid, the final inspection did not take place one year later, but just over three years later, and the ex-post evaluation took place around seven years after completion of the construction work.

In order to determine whether the growth rates of schoolchildren are related to the roads or to general population growth, the annual growth rates are taken into account. A comparison of the annual growth rates of pupils in schools along the implemented district roads with those of the rural population growth in the respective region shows that the growth in pupil numbers lags behind the rural population growth in the respective region: In schools in the catchment area of the DR3624 (Ohangwena), the number of pupils rose by 3.4% per annum, in the catchment area of the DR3681 (mainly in Omusati) by 2% per annum and in the catchment area of the DR3683 (mainly in Oshikoto) by 0.05% per annum. According to rough estimates, the rural population in the Omusati region grew by 2.7% per annum during this period, while in Ohangwena and Oshikoto it grew by 3.6% per annum. The fact that the annual increase in pupil numbers is actually lagging behind the growth of the rural population suggests that migration to other regions/urban areas is also playing a role.

⁸ The target value should be achieved one year after completion of the project.

⁹ With normal population and traffic density, a reduction of 30% would be appropriate for new construction. Given the specific characteristics of the project roads (low traffic volume and low population density), a higher target value is appropriate to ensure cost-effective use of investment funds.

¹⁰ Cars and pick-up trucks are the most commonly used vehicles on the project roads.

¹¹ The target value of 25% is rather high. Compared to the previous situation, in which off-road vehicles had to be driven cross-country and on unpaved roads, a significant reduction in vehicle operating costs was to be expected and made sense in terms of the efficiency of the project (cost-benefit ratio).

¹² Although shorter sections of two district roads are also located in the Oshana region, no information was provided during the appraisal of the project.

As already explained in section 3, *Appropriateness of design*, the indicator for school attendance has limited significance in the local context. Although the roads do not lead to an increase in the number of pupils, they do have an impact on the reliability of the teaching provision, primarily through the year-round accessibility of the schools. It should be noted that, given the natural conditions of the extensive Cuvelai drainage system (see *general conditions and classification of the project*) and the catchment area of the 360-degree schools, where not all pupils have access via roads, schools must continue to close temporarily when the water level in the natural canals/watercourses (oshanas/iishana) makes the journey to school too dangerous for pupils, especially primary school pupils. However, according to interviews conducted on site, the period of school closures has decreased significantly compared to before. As the connection of schools via district roads near local centres enables commuting, this could potentially attract more highly qualified teachers and also have an impact on the quality of education.

There has been a sharp increase in the number of patients visiting health facilities along the implemented district roads (indicator 3). The annual increase is significantly higher than the annual increase in the rural population in the regions (see above). The exceptionally high increase on the DR3624 could be related to its proximity to Angola, as the health facilities there are also heavily frequented by the Angolan population. Data inconsistency with the data used by PCR for the DR3624 cannot be ruled out either. This could not be conclusively clarified within the scope of the EPE.

The newly built roads ensure year-round accessibility to health facilities. This enables health care services to be offered and utilised. In addition, patients, medicines and blood samples can be transported. These aspects make a direct, fundamental difference to the lives and health of the target group. Women and children in particular benefit from this, as they make up the majority of users of health facilities. As with schools, better connections could also attract more highly qualified staff to healthcare facilities, thereby improving the quality of healthcare.

Calculations based on HDM4 indicate that, following the construction of the roads, there has been a significant reduction in travel times (indicator 4) and vehicle operating costs (indicator 5) compared to the situation without roads. The target values were achieved. The significant reduction in both indicators is due to the fact that, prior to the construction of the district roads, vehicles drove cross-country and on unpaved roads. Both indicators are of great importance for the use and provision of transport services and thus for the mobility of the target group.

At the time of the ex-post evaluation, the reduction in travel times and vehicle operating costs is lower than it would have been if the road surface had been worn down, as was the case after the roads were completed. The lack of road surface wear leads to a further reduction in travel time and vehicle operating cost savings on a seasonal basis, as roads become slippery and more difficult to drive on during the rainy season.

In rural road construction programmes in similar contexts, there is often a reduction in transport costs, an expansion of transport services, a modal shift (change in means of transport), the development from subsistence to commercial agriculture, visits to or holding of markets, direct purchase of agricultural products by traders from farms, and increased settlement density near roads. These effects are usually accompanied by an expansion of economic activities and an increase in income, which have a positive impact on household income and poverty.

Looking at the site visits and interviews conducted as part of the ex-post evaluation as a whole, it is striking that these changes, which frequently occur in similar contexts, were not observed or only to a limited extent in the project's catchment area. However, it should be borne in mind that structural changes take a long time to materialise, significantly longer than the seven years between the completion of the roads and the ex-post evaluation:

- Despite intensive road use (see 7. *Achievement of objectives*), anecdotal evidence from the interviews does not suggest that (commercial) transport services and frequency have increased significantly or that transport prices have fallen in view of lower vehicle operating costs. Journeys are arranged in advance or people are picked up spontaneously along the roads. Whether what has been observed in the target regions is due to the distances involved, the low population density by international standards, the nature of trade and supply (see below), or, in terms of transport costs, insufficient competition in the context of limited transport services or inflation, cannot be conclusively clarified in the ex-post evaluation.
- Whereas previously it was only possible to get through cross-country and on tracks with off-road vehicles, the roads are now passable by car. Apart from the use of cars, no other changes in means of transport, such as the use of bicycles or motorcycles, were observed. Data on the proportion of motorised two- or three-wheelers among registered motor vehicles could not be determined or no statistical information was provided. This suggests that motorised two- or three-wheelers play a minor role in the means of transport typical for Namibia. Traditional usage patterns, the long distances involved and the often sandy nature of unpaved roads and tracks are also likely to contribute to the minor role played by bicycles and motorcycles.
- A shift away from traditional agriculture towards commercial agriculture was not apparent on site. The road locations are entirely in areas of *communal land* where traditional farming and livestock breeding continue to be the primary activities. Whether this is due to traditions, natural conditions and water availability for year-round irrigation, or the long distances and transport costs in the Namibian context could not be conclusively determined in the ex-post evaluation.

- Traders tend to visit rural areas on the day of the monthly pension payment at defined payment points. Markets are also visited around the time of the monthly payment of pensions and wages. Outside of wage and pension payment days, basic supplies in rural areas are primarily provided by small shops.
- No significant concentration of settlements near roads was observed. This is hardly surprising given that the roads are located in areas of (state) *communal land* and the rights of use were generally granted before the roads were built and the land was settled, and cannot be legally sold.

In summary, the socio-economic situation and poverty of the target group at the time of the ex-post evaluation presents a mixed picture: year-round road access and reduced travel times contribute to better connections and accessibility to socio-economic facilities, thereby making an important contribution to improving the living conditions of the target group. With regard to health facilities, their impact on survival is fundamental. In terms of employment and income effects, it should be noted that, in the absence of alternative employment opportunities, the labour-based road construction approach had important temporary employment and income effects, with around one third of women also benefiting directly. However, given the changes described above, which were either non-existent or minimal, the longer-term effects of the project on household income and poverty reduction are obviously less significant than in comparable contexts. Women make up a significant proportion of the road user group (see 8. *Contribution to the achievement of objectives*). Further changes resulting from access to socio-economic facilities and time savings specifically for women cannot be conclusively appraised in the context of the ex-post evaluation carried out as a rapid appraisal. This would require a socio-economic study that also takes into account the temporal dimension of structural changes.

Notwithstanding the changes described above, which have not occurred or have only occurred to a limited extent, and their implications for the income situation of the target group, mobility and connection to an efficient transport infrastructure are a central and irreplaceable key to the socio-economic development of rural areas. Mobility and connection to the higher-level road network are fundamental for the target group in terms of access to both public (utility) facilities and goods and services, while at the same time offering greater choice and, as a rule, lower prices.

15. Contribution to overarching unintended developmental changes

The ex-post evaluation did not identify any contribution to unintended impacts.

Rating summary of impact: **successful (2)**

The indicator targets at impact level were largely achieved. Nevertheless, the socio-economic situation of the population in the target regions remains challenging. Even though the development of economic activities and household incomes appears to have been lower than in comparable rural road construction projects, the roads that have been built contribute to the mobility and access to socio-economic infrastructure that are fundamental to the target group. They are a central and irreplaceable key to rural development. Against this background, the impact of the project is considered successful.

Sustainability

16. Capacities of beneficiaries and stakeholders

For decades, Namibia's road transport sector has been a role model and leading example in Africa for the institutional design, policy, quality and management of its road infrastructure. The Road Management System (RMS) implemented in Namibia is considered *best practice* and provides comprehensive information for rational and objective decisions as well as efficient allocation of resources for the expansion and maintenance of the road network. Over decades, considerable efforts have been made to develop such a comprehensive planning tool that combines international standard models such as HDM4 with specific in-house developments.

The Namibian road network covers around 49,500 km and consists of trunk, main and secondary roads. The Roads Authority is responsible for managing the Namibian road network. The Roads Authority's budget consists of road user charges (fuel tax, vehicle registration and licensing fees, etc.) and government funds (state revenue, loans and grants). Maintenance measures are put out to tender and awarded to private companies, and a fixed proportion is also carried out by the state-owned *Roads Contractor Company* (RCC). The RCC is remunerated for maintenance measures at fixed unit prices, which are potentially higher than the prices offered by private companies competing for maintenance measures. Furthermore, RCC itself subcontracts a substantial proportion of the maintenance work, as its own implementation capacities have been reduced. Both the unit prices and the use of subcontractors can lead to inefficiently high maintenance costs when RCC carries out maintenance work. This is considered inefficient in the context of the already insufficient maintenance funds (see below).

Managing Namibia's road network is challenging because it is extensive and the population density is low. These structural conditions alone make the sustainability of transport infrastructure a major challenge for the country. In addition, funding for network maintenance has declined over the last decade. Road user charges have been increased only very cautiously and insufficiently. In 2015/16, the maintenance budget amounted to NAD 743 million, covering approximately 48% of the (optimal) maintenance requirements. Since then, for political reasons, the focus has shifted from maintaining the network to expanding it, which has led to

insufficient periodic maintenance (renewal of the road wearing course) of district roads. In 2024/25, the maintenance budget amounted to NAD 1.54 billion, covering only 25% of the optimal maintenance requirements. As a result, the maintenance backlog is continuously increasing. The condition of the roads has reached a critical point. Without immediate action and the provision of substantial financial resources for (periodic) maintenance, the road network will continue to deteriorate, resulting in a significant loss of its asset value. In this context, the application of RMS plays an even more important role in ensuring the efficient use of resources. Considering the life cycle costs of roads as early as the project preparation stage would also make it possible to project future financial requirements for maintenance.

A policy directive to connect all socio-economic facilities in rural areas to the road network via access roads (known as *social roads*) will increase the pressure on the maintenance of the existing network without a substantial increase in the maintenance budget. To date, there has been no separate road classification and no differentiated standards for the design and maintenance of *social roads* or (gravel) roads, which are generally very little used, in accordance with their traffic volume and network functionality. The introduction of a separate road classification and differentiated standards for design and maintenance would increase the cost-efficiency of construction and maintenance.

The Roads Authority is fully aware of the critical situation. The Roads Authority's business and financing plan (2025/26-2029/30) provides for a substantial increase in maintenance funding. However, the allocation of funds is dependent on political decisions that are geared towards new construction and do not necessarily follow the priorities set out in the master plans and the RMS. The Roads Authority is endeavouring to raise awareness in the political arena of the urgency of the necessary network maintenance measures.

17. Contribution to supporting sustainable capacities

Long-term cooperation with the Roads Authority in the sector and close support in this project and in previous projects have helped to strengthen the Roads Authority's capacities, which are, however, hampered by staff turnover, among other things.

The application of the labour-based road construction approach already established in several previous projects (see 3. *Appropriateness of design*) promoted capacity building and the professionalisation of the Namibian construction industry. However, the sustainability of these capacities depends largely on the future allocation of Namibia's own funds for the construction and maintenance of gravel roads. Without sufficient funds for the construction and maintenance of gravel roads, it is to be expected that a large proportion of the construction companies that specialise in road construction, particularly due to their machinery, will disappear from the market again and jobs will be lost.

18. Durability of impacts over time

At the time of the ex-post evaluation, i.e. after around seven years of operation, the condition of district roads is acceptable for more than 70% of road kilometres (see 7. *Achievement of objectives*). In retrospect, this suggests that the design was appropriate (see 3. *Appropriateness of design*), the construction quality of the district roads was adequate to withstand the climatic conditions, and a minimum level of maintenance was provided, enabling the roads to remain passable all year round to this day.

Weaknesses that became apparent during implementation were generally remedied during implementation. At the time of the ex-post evaluation, some of the access roads that had been implemented had insufficient road profile heights and culvert sizes that were inadequate for the specific natural conditions, which apparently led to flooding, washouts and erosion in some places. It was also apparent that the culvert protection measures were not implemented uniformly and that there was no systematic and coherent approach (standard layouts) for culvert protection measures.

At the time of the ex-post evaluation, the wearing course of the implemented roads had largely worn away. In addition, *corrugation* (in some sections severe) was observed on all roads, but very few potholes. Maintenance of the implemented roads consists primarily of routine maintenance work (*blading* – levelling/smoothing). *Blading* helps to reduce the occurrence of potholes and corrugations, but also leads to the removal of the wearing course. In order to maintain the roads, the wearing course will need to be renewed (*regraveling*) in the coming years.

As previously illustrated (see 16. *Capacities of the beneficiaries and stakeholders*), the maintenance budget has declined in recent years. However, with the RMS and the network management experience, the Roads Authority has the expertise to make the best possible use of the limited maintenance funds available. It can therefore be assumed that the Roads Authority will continue to do what it has done so far, namely to provide the minimum necessary to maintain the roads.

In conjunction with the design and construction quality of the district roads, which have so far withstood the climatic conditions, it can be assumed that the access to socio-economic facilities and services provided by the roads will remain, but that the use of the roads will be associated with higher transport times and costs than immediately after their construction. This means that the developmental impacts of the project will continue even if road conditions deteriorate, albeit to a lesser extent.

Rating summary of sustainability: **moderately successful (3)**

In principle, the Roads Authority has sufficient expertise and excellent planning tools to maintain Namibia's road network. However, due to insufficient maintenance budgets and a political focus on road construction rather than maintenance, the Roads

Authority's options for adequate maintenance are limited. The Roads Authority's network management experience in the context of tight budgets, combined with the construction quality of district roads, suggests that access to socio-economic facilities and services and the resulting developmental impacts of the project will continue even if road conditions deteriorate, albeit to a lesser extent. Against this background, overall sustainability is assessed as moderately successful.

Overall rating: successful (2)

The project addressed a key bottleneck and was conceptually suitable for contributing to the solution of the core problem. It was in line with Namibian and German policies and priorities, as well as with the German FC's involvement in the Namibian road sector at the time. The involvement of TC and FC was holistic and complementary, consistent with international norms and standards, and with the partner country's own efforts.

The roads are used intensively in the local context and their condition is acceptable. Year-round access to schools and health facilities is available and used by the population living in the road catchment area; this also applies to the administrative facilities, labour markets, sales markets and procurement markets accessible via the district roads.

The specific costs were reasonable and the individual benefits to the beneficiaries and the overall internal rate of return are considered high.

The socio-economic situation of the population in the target regions remains challenging. Even though the development of economic activities and household incomes appears to have been lower than in comparable rural road construction projects in other countries, the roads that have been implemented contribute to the fundamental mobility and access to socio-economic infrastructure of the target group and are a central and irreplaceable key to rural development.

In principle, the Roads Authority has sufficient expertise and excellent planning tools to maintain the Namibian road network. However, due to the inadequate maintenance budget and the political focus on road construction rather than maintenance, the Roads Authority's options for adequate maintenance are limited. The Roads Authority's network management experience in the context of tight budgets, combined with the construction quality of district roads, suggests that access to socio-economic facilities and services and the resulting impacts of the project on development will continue even if road conditions deteriorate, albeit to a lesser extent.

The successful appraisal of relevance, coherence, effectiveness, efficiency and the overarching developmental impact justifies the overall rating as successful, despite the moderate success in terms of sustainability.

Contribution to Agenda 2030

With the district roads and improved road connections, the project contributes to human well-being and thus to *Sustainable Development Goal 9* (industry, innovation, infrastructure) through the expansion and modernisation of infrastructure. Despite the continuing challenging socio-economic living conditions and poverty of the target group, the project also contributes to the achievement of *SDG 1* (No Poverty), as the roads ensure access to education and health facilities as well as social security systems, and it can be assumed that the situation would be even worse without the road construction. The aforementioned access to health facilities facilitates the transport of medical goods, access to health services and emergency care (*SDG 3: Good Health and Well-being*). The access provided by the roads also enables school attendance and may have an impact on the quality of education (*SDG 4: Quality Education*). In the context of the aspects outlined above, rural roads also make an important contribution to *SDG 5* (gender equality) in particular and enable women to participate more fully in society. In the context of northern Namibia, the project also contributes to *SDG 10* (reduced inequalities) by improving connections to remote regions and reducing regional disparities.

Methodology

Evaluation methodology

The ex-post evaluation follows the methodology of a rapid appraisal, i.e. a data-based, qualitative contribution analysis, and represents an expert opinion. The project's impacts are attributed on the basis of plausibility considerations based on a careful analysis of documents, data, facts and impressions. Where possible, this also includes the use of digital data sources and modern techniques (e.g. satellite data, online surveys, geocoding). The causes of any contradictory information are investigated, attempts are made to resolve them, and the appraisal is based on statements that are confirmed by several sources of information (triangulation), where possible.

The analysis of the effects is based on assumed causal relationships, documented in the impact matrix developed during the project appraisal and updated during the ex-post evaluation, if necessary. The evaluation report sets out arguments as to why certain influencing factors were identified for the effects observed and why the project under review probably made a certain contribution (contribution analysis). The context of the development measure is taken into account in terms of its influence on the results. The conclusions are put into relation to the availability and quality of the data basis. An evaluation concept serves as the reference framework for the evaluation.

The method offers a balanced cost-benefit ratio for project evaluations, on average, with a balance between knowledge gain and evaluation effort, and allows for a systematic appraisal of the effectiveness of FC project across all project evaluations. Individual ex-post evaluations cannot therefore meet the requirements of a scientific assessment in the sense of a clear causal analysis.

The main objective of the evaluations (knowledge interest) is to measure impacts, provide accountability, promote transparency and enable institutional learning.

Type of evaluation:

The evaluation was carried out by means of a trip to the project area.

Key questions of the evaluation according to the evaluation concept:

- What is the condition of the roads around seven years after completion?
- Are the roads being used intensively?
- What contribution do they make in terms of access to schools and health facilities in the context of the natural conditions of the Cuvelai drainage system?
- Are maintenance measures being carried out?
- How has the maintenance budget developed?
- Is the design of the roads appropriate for the natural conditions of the Cuvelai drainage system?
- Have access roads been implemented and to what extent?

Non-public (internal) documents

Internal project documents, sector strategy papers, context, country and sector analyses, comparable evaluations, regional profile reports prepared for the ex-post evaluation, and reports on survey results relating to project indicators

List of public sources

Atlas of Namibia (2022): *Its land, water and life*

German Cooperation (2021): *German-Namibian Cooperation in the Transport Sector – Reflecting on 30 Years of Partnership and Joint Achievements (1991–2021).*

J. Mendelsohn and B. Weber (2011): *The Cuvelai Basin, its water and its people in Angola and Namibia*

Ministry of Education, Innovation, Youth, Sport, Arts and Culture (2025): *Namibia Fifteenth School Day Report 2025[^]*

National Statistics Agency (undated): *Namibia Multidimensional Poverty Index (MPI) Report 2021*

National Statistics Agency (2013): *2011 Namibia Population and Housing Census – Main Report*

National Statistics Agency (2024): *2023 Namibia Population and Housing Census – Main Report*

National Statistics Agency (2024): *2023 Namibia Population and Housing Census – Release of main results*

National Statistics Agency (2024): *National Infrastructure Atlas 2023*

National Statistics Agency (2024): *National Population Proximity Atlas – Health Facilities and Network Coverage*

National Statistics Agency (2025): *Namibia 2023 Population and Housing Census Labour Force Report*

Roads Authority (undated): *Annual Report 2015/16*

Roads Authority (undated): *Annual Report 2016/17*

Roads Authority (undated): *Annual Report 2017/18*

Roads Authority (undated): *Annual Report 2018/19*

Roads Authority (undated): *Annual Report 2019/20*

Roads Authority (undated): *Integrated Strategic Business Plan 2022/23 – 2026/27*

Roads Authority (undated): *Business and Financial Plan 2024/25 – 2028/29*

Roads Authority (undated): *Business and Financial Plan 2025/26 – 2029/30*

Road Fund Administration (2024): *Integrated Annual Report 2024*

Data sources and analysis tools

On-site data collection, monitoring data from the partner and the Ministry of Education, GPS data, satellite images, surveys, digital analysis tools

Project sites visited

All locations were visited.

Interview partners and modality (in person, virtual/by telephone, in writing)

Project executing agency (in writing/in person), target group (in person), educational and health institutions (in person, virtually/by telephone, in writing)

The following aspects limited the evaluation

None.

Assessment methodology

A six-point scale is used to assess the project according to OECD DAC criteria, with the exception of the sustainability criterion. The scale values are as follows:

Level 1 Very successful: results significantly above expectations

Level 2 Successful: results fully in line with expectations, without significant shortcomings

Level 3 Limited success: results below expectations, but positive results predominate

Level 4 rather unsuccessful: significantly below expectations and negative results dominate despite recognisable positive results

Level 5 predominantly unsuccessful: despite some positive partial results, the negative results clearly dominate

Level 6 Completely unsuccessful: the project is useless or the situation has deteriorated

The overall rating on the six-point scale is based on a project-specific rationale for the weighting of the six individual criteria. Levels 1–3 of the overall rating indicate a ‘successful’ project, while levels 4–6 indicate an ‘unsuccessful’ project. It should be noted that a project can generally only be classified as "successful" if both the achievement of objectives at the outcome level (effectiveness) and impact level, as well as sustainability, are appraised at least as "moderately successful" (level 3).

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

Imprint

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