

Ex post evaluation – El Salvador, Guatemala, Honduras



Sector: Environmental policy, conservation, sustainable use of natural resources (CRS Code: 41010)

Project: Conservation of Tropical Forests and Watershed Management in the Trifinio Region, BMZ No.: 2008 65 493*

Implementing agency: Comisión Trinacional del Plan Trifinio



Ex post evaluation report: 2018

| | | Planned | Actual |
|---------------------------|-------------|---------|--------|
| Investment costs (total) | EUR million | 16.89 | 17.20 |
| Counterpart contribution | EUR million | 4.89 | 5.60 |
| Funding | EUR million | 12.00 | 11.60 |
| of which BMZ budget funds | EUR million | 12.00 | 11.60 |

*) Random sample 2017

Summary: The project supported tropical forest conservation and water catchment area management in the Trifinio Region with EUR 11.6 million. The region is strategically important for the water balance of three large water catchment areas – the Lempa River in El Salvador, the Motagua River in Guatemala and the Ulúa River in Honduras – and is especially affected by the impacts of climate change. The project promoted sustainable management of natural resources in this area through three components: (1) strengthening environmental management in water catchment areas (16% of funds), (2) adapted and sustainable management of soil, water and vegetation resources (44%) and (3) improving the management of selected protected areas (8%). Project management costs (32%) were predominantly covered by the executing agency. The project executing agency was the tri-national Trifinio Commission (CTPT), a sub-organisation of the Central American Integration System (SICA).

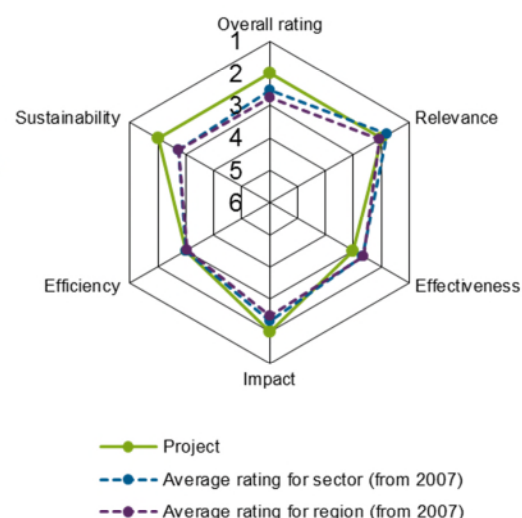
Development objectives: The project objective was to enable residents and administrative bodies of the water catchment areas and protected areas to sustainably manage natural resources (outcome) to contribute to preserving the natural resources' economic, ecological and climate-sensitive roles under the conditions of climate change in the Trifinio Region (higher-level objective).

Target group: Population in the project area (close to 70,000 people) who live in 15 out of a total of 45 communities; and mostly run small and micro-scale family farms. A global benefit is gained from the reduction in CO₂.

Overall rating: 2

Rationale: The project succeeded in bringing about a shift in consciousness among the population regarding water availability, in addition to structurally instilling resource conservation in the local government systems. Furthermore, there was success at the locations visited by the mission in sustainable management of coffee and fruit plantations, as well as intensified livestock farming which involves less extensive land use.

Highlights: Income diversification is helping smallholders to adapt to climate change and, along with forest conservation, promoting water availability in key catchment areas in the region.



Rating according to DAC criteria

Overall rating: 2

Ratings:

| | |
|----------------|---|
| Relevance | 2 |
| Effectiveness | 3 |
| Efficiency | 3 |
| Impact | 2 |
| Sustainability | 2 |

General conditions and classification of the project

The Trifinio Project is a regional water resource conservation project in the border area between El Salvador, Guatemala and Honduras. The Lempa River (*Río Lempa*) rises in Guatemala, flowing from Esquipulas through the border region of Honduras, crossing El Salvador and emptying into the Pacific. The Motagua River (*Río Motagua*) in Guatemala and Ulúa River (*Río Ulúa*) in Honduras are also fed by tributaries in the region. The importance of the Trifinio water catchment area was recognised back in the 1990s, around which time the tri-national organisation “Plan Trifinio” was founded (it celebrated its 30-year anniversary in 2017). Over the last seven years, the cooperation between the three countries in the Trifinio Region has been supported by German Financial Cooperation (FC) and Technical Cooperation (TC) projects, as have the especially poor border areas. The relationship between conservation (forests, environment) and stabilisation of the water balance – as well as between this and the economic development of the population living in the protected areas – was central in this regard. The border region is densely populated, and the land is privately owned for the most part. This being the case, it made sense for the project to take the approach to implement conservation in cooperation and involvement of affected local communities and to raise their awareness.

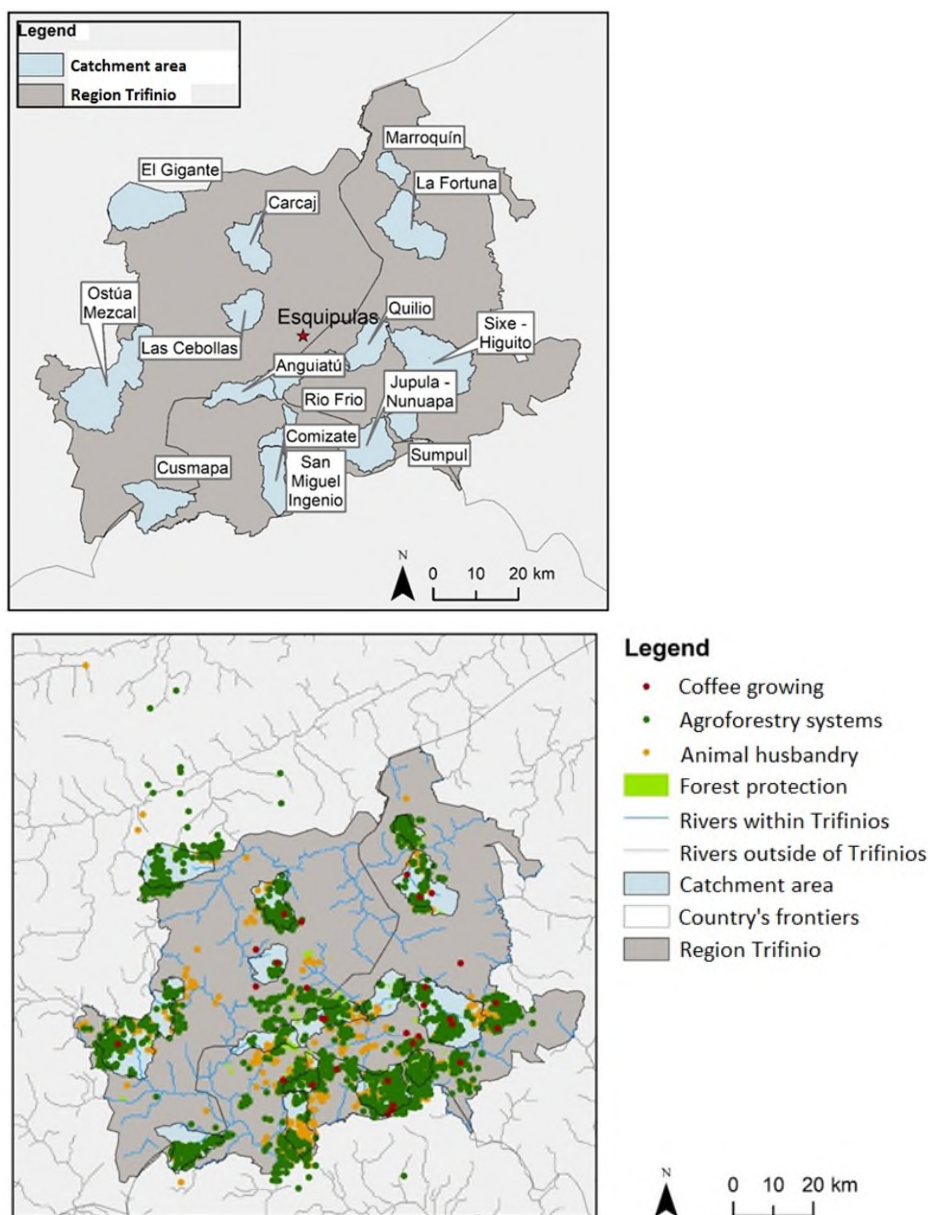
Relevance

The project was suitably designed in the context of a densely populated, strategically important water catchment area (see map of water catchment areas and project locations). The aim was for the Trifinio Region’s headwater area (which is key to the water balance of the three countries) to be protected, while simultaneously creating diversified income opportunities for households in the three countries’ poor border regions, which are especially affected by the impacts of climate change (dry spells and heavy rainfall). In addition, erosion control was relevant, since the region has been severely affected by erosion due to deforestation on many hilltops and agricultural use on steep slopes. In this regard, the project locations were very well selected for livestock farming and the forest conservation areas (with 78% of measures carried out in places with a high risk of erosion and 88% in places with a very high risk). The selection was not yet ideal for the agroforestry systems (with 63% of locations only experiencing a medium or low risk of erosion).

The results framework was coherent, given that the measures financed with the project’s funds would help to promote sustainable management of the natural resources on the part of the inhabitants and administrative bodies of the water catchment areas and protected areas (outcome) to preserve the natural resources’ economic, ecological and climate-sensitive roles (impact). These measures would include smaller infrastructure investments to adapt to climate change, such as bridges, sustainable pasture management and coffee production, compensation payments for forest conservation and improving management in seven protected areas.

From today’s perspective, the project is still growing in relevance, as shifts related to climate change – particularly water scarcity – make it more urgent to conserve nature and diversify the population’s income opportunities.

Water catchment areas, project locations and measures



Own internal analysis and preparation. Data source: Geoportal del Plan Trifinio. Available at <http://www.geoportaltrifinio.net>

The approach to empower the local population and administration as actors working for environmental protection was crucial, because the future availability of water depends on the local landowners' ability to protect and maintain the existing forested areas and plantations. However, it is necessary to note that landowners were predominantly the ones supported, whereas landless people in the region did not receive any payments for forest conservation, nor any fruit or coffee plants. Nonetheless, they did benefit from the infrastructure measures (16% of the project funds), which protected the region from the impacts of natural disasters and improved access to markets (bridges and streets). The significance of this for the results framework is that climate change adaptation, not poverty assistance, was in the foreground during this project.

Additionally, the project was in line with Plan Trifinio's regional development strategy (which is currently valid for 2014-2018 and undergoing updates) and with the "Climate Change – Time to Act" strategy (set out in 2016 by the German Federal Ministry for Economic Cooperation and Development – "BMZ"). Environmental and resource conservation in Honduras, and climate protection and environmental conserva-

tion in El Salvador and Guatemala are focus areas of the German cooperation. The link with the BMZ's water sector strategy paper was established during the appraisal.

Relevance rating: 2

Effectiveness

The project objective was to enable the inhabitants and administrative bodies of the water catchment areas and protected areas in receipt of support to manage the natural resources sustainably.

In total, around 600 individual measures were financed. However, these are not sufficient to stabilise the entire region. A representative selection of the locations and a spontaneous, unannounced visit were undertaken. The random sample of the locations visited amounted to around 4% (or 23) of around 600 measures in the three countries. These do not yield reliable conclusions about the 600 measures, even though the small selection of locations visited are not likely to have given a distorted impression. Even so, it was possible to supplement the evaluation mission's observations with an excellent monitoring system, which recorded every member of the target group in a publicly accessible database with names and georeferenced property data.

The attainment of the project objectives defined at the project appraisal can be summarised as follows:

| Indicator | Status/target value at project appraisal (PA) | Ex post evaluation (EPE) |
|--|---|---|
| (1) Sustainable management of the natural resources is coordinated between the institutions responsible in 70% of the water catchment areas supported. | 70% / 70% | Partially achieved. At the highest level, the coordination meetings were not held as often as planned in the past. Regular meetings are held at the lower levels, with the national coordinators meeting monthly (2017). |
| (2) 70% of agricultural producers who are involved in the project in the prioritised water catchment areas implement measures to adapt to climate change (especially changes in rainfall). | 70% / 70% | Achieved. The producers visited by the evaluation mission are continuing to conserve forest areas, even a year on from when the compensation payments ended, and are renovating the protective forest corridors before the dry season arrives. Others are producing coffee, avocados and fruits that are certified as organic, while replacing chemicals with organic fertilisers and pesticides, and treating and reclaiming the water used for coffee production. Another group of producers practises intensified livestock farming, which helps to promote infiltration and erosion control. ¹ Bridges financed by the project facilitate access to the plantations and to markets all year round, as it is also possible to drive on the roads during heavy rainfall, which supports adaptation to climate |

¹ Intensified livestock farming involves only grazing in certain areas, while other areas are left fallow to regenerate. Infiltration is supported by the planting of long grasses, which measurably increase the infiltration rate. The enclosure of the pastures helps to protect slopes and forests from losing their young plants to grazing, thereby protecting them from erosion.

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| | | change. Monitoring reporting indicates that this applies to 70% of the measures financed by the project. |
| (3) 30% of the project's beneficiaries are women. | 40% / 30% | Achieved. Monitoring reporting indicates that the average level of female participation for the three countries was 40%, or 27,715 people. During the evaluation mission, the participation of women in Guatemala appeared to be lower than in the other two countries, though this may be due to the selection of locations (honey marketing, coffee roasting and technical consulting on organic certification of a cooperative of 49 families in Honduras). |
| (4) 100% of the protected areas included in the programme a) apply their management plans and b) regularly update these. | 57% / 100% | Achieved. Overall, seven protected areas were supported. Monitoring reporting indicates that the rate of application of the management plans was 100% in 2016. Güisayote Biological Reserve in Honduras developed a management plan for 2014-2025 as part of the project, which is currently being updated. The plan is being implemented to the extent possible with the limited staff available. In Guatemala, the management plan for the Montecristo nature conservation area, developed as part of the project, has ended and is currently being updated. At the moment, a single person is responsible for managing the core area of 4,000 ha. The management plan is being implemented effectively in El Salvador's San Diego y San Felipe las Barras protected area, with the forest receiving successful protection from fires. |
| (5) 70% of the target groups continue to make use of income-generating models. | 77% / 70% | Achieved. The producers visited by the evaluation mission continue to make use of the agroforestry models that were introduced in order to diversify their income sources and, in turn, adapt to climate change. Monitoring reporting from 2016 indicates that 77% of the 1,550 producers maintained the agroforestry plantations, 42% spread the practices to other plantations and 57% told other producers about the advantages of the new practices. |

Four of the five indicators were achieved (compensation payments and agroforestry models), while the other indicators (coordination meetings, women’s participation, and the application and updating of management plans) were partially achieved. The effectiveness is assessed as satisfactory.

Effectiveness rating: 3

Efficiency

The production efficiency is rated as satisfactory. The project funds were used to implement 600 individual measures in three components and eight different activity categories. 16% of the project funds were directed towards infrastructure measures for disaster control; 44% were invested in the adapted and sustainable natural resource management of soil, water and vegetation; and 8% of funds went on strengthening the protected areas’ management. Costs for farmers’ project management and consulting amounted to 32%. Coffee plants and fruit trees had a survival rate of around 90 percent according to target group members, which is very high. One exception was the residents in San Nicolas in the Montecristo protected area in Guatemala, where the rate of survival for fruit trees stood at 25-75%.² In the cooperation between FC and TC, TC developed agroforestry models with intense technical support, which were then expanded with FC funding.

The project locations were not ideally selected in the case of the agroforestry systems, as relates to the risk of erosion. Nevertheless, the allocation efficiency is still rated as good, since the investments had a measurably positive impact on water availability and environmental conservation by supporting coffee producers and pasture managers, as well as compensating forest owners (see “Impact” section).

The completion of the project was delayed by a year, which can be expected in a complex project such as this. The cost for the implementation consultant was high, making up 25% of the total costs, but was still reasonable in light of the project’s cross-border nature.

Efficiency rating: 3

Impact

The project’s objective at impact level was to contribute to safeguarding the natural resources’ economic, ecological and climate-related roles under conditions of climate change.

| Indicator | Status/target value PA | EPE |
|--|------------------------|---|
| (1) The forest coverage in the water catchment area remains the same. | 32,000 ha / 32,000 ha | Not achieved. According to the evaluation mission’s calculations based on satellite data (as shown in the map), the forest coverage in the regions promoted by the project decreased by close to 1,500 ha between 2010 and 2015. The evaluation mission observed illegal wood removal for cooking purposes and smaller-scale fires. |
| (2) 10% increase in infiltration rates ³ in selected water catchment areas in | 0.3cm/h / +10% | Surpassed. Monitoring reporting indicates that between 2011/2012 and 2014/2015, infiltration at characteristic measurement points in the individual coun- |

² In the case of one producer who had received 2,000 plants worth USD 272 and had personally invested USD 409 in manpower and fertiliser, all the coffee plants were killed by a fungus in their root. Among other coffee producers, the first harvest in 2016 – the fifth year after planting – was significantly below expectations in the wake of a drought which lasted for ten months. However, a good coffee harvest is expected thanks to a rainy winter in 2017, which will have a positive impact on incomes.

³ The infiltration rate indicates the water volume that can enter a body of soil within a given timeframe. The depth of the water that infiltrates into the soil in one hour is measured in centimetres.

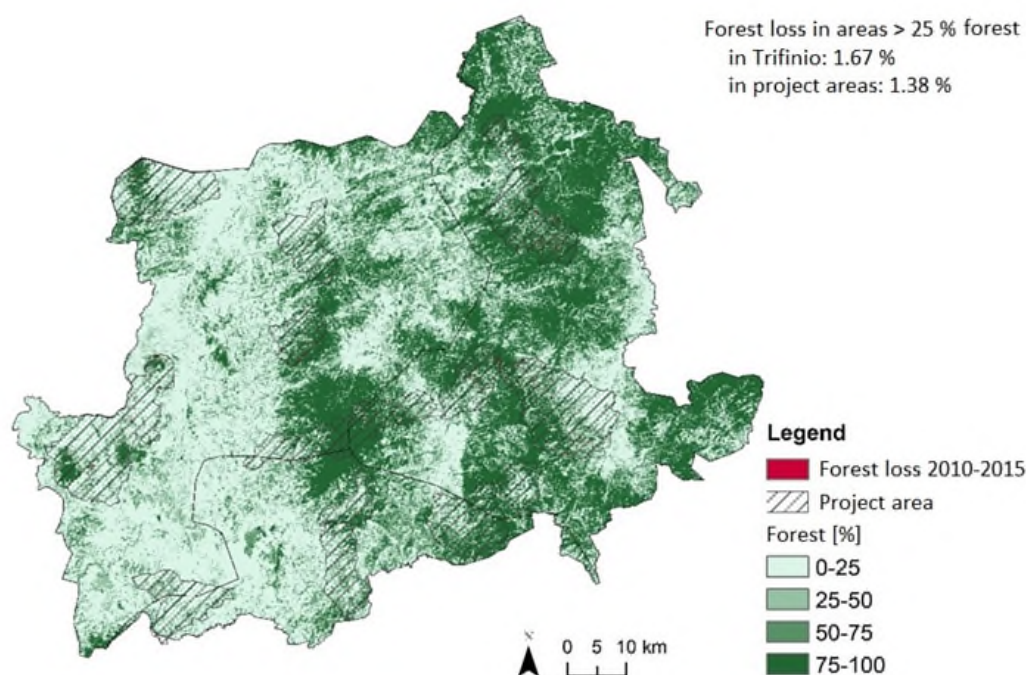
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| the three countries. | | tries increased by 463% in Honduras, 319% in Guatemala and 1,039% in El Salvador. ⁴ The infiltration rate has also increased, according to information from a sub-basin. Infiltration has improved on account of intensified livestock farming, new deep-rooted grass types and rotation of grazing areas. The volume of water from one source quadrupled and a continuous flow of water can now be obtained all year round. |
| (3) 5% increase in endemic or locally adapted tree species in agroforestry or silvopastoral systems. | 33 / +5% | Achieved. The increase in endemic tree species, from 33 species in 2012 to 51 species in 2014, comes to 55%. In total, the project introduced 18 locally adapted tree species, which had a high rate of survival and have since grown into impressive trees bearing fruit. |
| (4) Reduction in the maximum water outflow in three selected water catchment areas. | 68L / 10% | Partially achieved. Monitoring reporting indicates that the maximum water outflow dropped by 17% (from 118L to 101L) in Guatemala and by 25% (from 40L to 32L) El Salvador, while the water outflow in Honduras rose by more than 50% (from 44L to 93L). |
| (5) 10% reduction in soil erosion in three selected water catchment areas. | 235 t/ha / -10% | Surpassed. Monitoring reporting indicates that soil erosion in characteristic locations was reduced by 88% (298 t/ha in 2012 to 36 t/ha in 2015) in Honduras, by 79% in Guatemala (289 t/ha in 2012 to 59 t/ha in 2015), and by 98% in El Salvador (118 t/ha in 2012 to 2 t/ha in 2015). Project beneficiaries confirm the reduction to soil loss due to the application of practices introduced by the project (building terraces; enclosing and compartmentalising pastures; planting protein-rich and deep-rooted grass types that encourage infiltration while also improving nutrition and, in turn, cows' milk production). |
| (6) The number of Curculionidae (a taxonomic family of weevils) remains stable in the forests within the protected areas that were supported. | 15 per m ² / 15 per m ² | Achieved. A 21% increase in Curculionidae was measured at 12 locations between 2012 and 2015, which provides a recognised indicator of a growth in biodiversity. An increase in biodiversity was found in the San Diego y San Felipe las Barras protected area in El Salvador. This is being researched in cooperation with universities, but is not always welcomed by the residents, as the range of pests increases along with increased biodiversity. |
| (7) The proportion of natural forest remains the same in the water catchment areas' forests. | 100% / 100% | Almost achieved. Monitoring reporting indicates that the proportion of natural forest remained almost the same between 2011 and 2016 (99.5%). |

⁴ It is necessary to note that the measurements were only carried out over a three-year period, which is a very short time to draw reliable conclusions. In addition, these are locally restricted measurements which are not applicable to the entire area.

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| (8) Reduced number of fires | | Partially achieved. In spite of a three-year drought, the number of fires in the Trifinio Region decreased during the project term, according to local monitoring. On the other hand, the area affected by fires has expanded. On the whole, this is a sign of better management of small fires, which was also confirmed by target group members. There have not been any forest fires since 2013 in Santa Rosa in El Salvador, owing to the fire protection measures the local authority has taken. |
| (9) Income effects relating to the project | --- / --- | Partially achieved. The improvement in production efficiency led to a clear income rise for smallholdings in which “shade-grown coffee” agroforestry systems, Hass avocados or citrus fruits were introduced with the project’s support. Yet others did not see their incomes increase – for example, because plants that were introduced did not produce enough on account of their young age or the poor climatic conditions in previous years, or because certification and production optimisation processes remain unfinished. |

Overall, two out of nine indicators were surpassed at impact level; five were achieved and one indicator was partially achieved. This represents a good outcome. One indicator was not achieved.

Forest loss in the Trifinio Region, 2010-2015



Own internal analysis and preparation. Presented descriptively. Definition of forest cover in the data used here (Hansen et al., 2013): tree above 5m in height and at least 25% tree canopy cover, which is measured at 30m resolution. Data sources: Global Forest Change. Hansen/UMD/Google/USGS/NASA [online]. Available at <https://earthenginepartners.appspot.com/science-2013-global-forest>

Exemplary improvements were made in production, to the tune of 300% (coffee), 250% (corn) and at least 267% (livestock farming), due to the practices introduced by the TC and expanded by the FC. One example of the positive effects from the project's diversification measures was the report from one producer who now also grows bananas and sells them for a profit while his coffee plantation is affected by the coffee rust (*roya*) fungus. This limits the harvest and has made this year's coffee harvest unprofitable. The avocado, mango and citrus trees introduced for income diversification purposes are used and appreciated in the families and communities as a means of supplementing nutrition, though they do not presently produce enough to be able to sell the fruit.

The project helped to establish structure by involving local administrative bodies in the nature conservation and adaptation to climate change. One of the project's most important results was a fundamental shift in consciousness regarding the future impacts of climate change and water availability. The project piloted conservation of the natural resources, especially forests and water, and achieved success in the project locations.

Impact rating: 2

Sustainability

The project's sustainability is rated as good. The development effectiveness of the project (positive to date) is very likely to decline only minimally. Producers have an interest in continuing to grow their coffee plantations in the shade and with organic methods, since the harvest can then be sold as organic coffee in the international market, commanding three times the price of conventionally grown coffee. Forest owners, who were compensated for the forest conservation during the term of the project, also continue to have an interest in it – often purely because of its location on steep slopes or because the owners support the protection of natural resources. Overall, awareness of climate change and the necessity of conserving nature as a means of also safeguarding water resources were ingrained in the local population. The level of importance was emphasised unprompted at every encounter during the mission. The next generation faces a risk if a person's estate is divided between their children, meaning that the existing agricultural areas are no longer sufficient. In this case, the forests currently being conserved may be needed as farmland. Given that taxes are also payable for the property, the lack of a financial incentive is a problem for the longer-term protection of the forest conservation areas. The financial incentive ended with the project.⁵ Climate change presents a further risk. The ideal zone for cultivating certain types of coffee is moving uphill due to increased average temperatures. This puts natural forests at high altitudes in danger of being burned, felled and turned into coffee plantations.

In Guatemala, it is possible to receive a certification for protected forest areas, then receive government subsidies (although this is subject to bureaucratic processes). There is not a comparable programme in Honduras or El Salvador. The nature conservation areas, which are demarcated and assigned management plans, will most likely continue to be conserved in the future. Infrastructure measures implemented on water sources, bridges and access routes in the interest of climate change adaptation have great significance for the communities and transportation of coffee, and are kept maintained. A key factor for the sustainability of the water and nature conservation was the project's innovative approach of involving the local administrative bodies in the project, thereby effecting sustainable changes that establish structure.

The executing agency is financed by contributions from the three countries. These contributions were doubled in 2017, which will allow the executing agency to expand its resource conservation activities in the years ahead and further the degree of integration in the Trifinio Region.

Sustainability rating: 2

⁵ There is a government payment system in Guatemala, to which a number of land owners could be admitted due to the project's support.

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

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

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

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

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

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

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

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

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

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