Ex post evaluation – China

Sector: Agricultural water resources (CRS code: 31140)
Project: Poverty Alleviation Xinjiang (BMZ no. 2002 65 728)*
Implementing agency: Water Resource Bureau of the Xinjiang Uyghur Autonomous Region

Ex post evaluation report: 2019

All figures in EUR million	(Planned)	(Actual)
Investment costs (total)	13.40	10.65
Counterpart contribution	5.40	4.77
Funding	8.00	5.88
of which BMZ budget funds	8.00	5.88

*) Random sample 2018.

Brief description: Between 2006 and 2014 the FC project "Poverty Alleviation Xinjiang" was implemented in the Kashgar region of the Xinjiang Uyghur Autonomous Region in the extreme northwest of China. With planned overall financing of EUR 13.4 million, the aim was to implement measures to increase the agricultural productivity of the target group and to use scarce water resources more efficiently. Three phases were originally planned for the FC project. Due to considerable operating problems, a "consolidation phase" was carried out after the second phase instead of the third phase to ensure the functionality of the irrigation systems and to create conditions for sustainable operation.

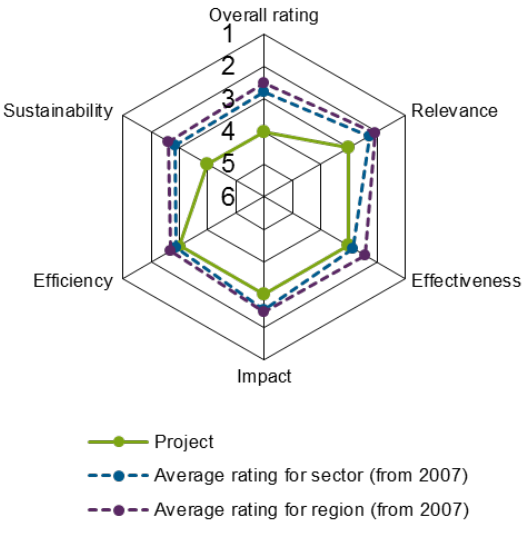
Objectives: The developmental objective of the FC project at impact level was to alleviate the poverty of the smallholder population and to contribute to conserving natural resources. At outcome level, the aim was to increase agricultural productivity by means of higher-value crops and improved irrigation methods and to make fallow land usable through suitable irrigation methods for the expansion of agricultural production.

Target group: The FC project, which was designed to be an "open programme", sought to reach approximately 7,000 poor smallholder households with about 30,000 people in the project region, the vast majority of whom belong to the Muslim Uyghur ethnic group.

Overall rating: 4

Rationale: The specific objectives of the FC project were achieved on a much smaller scale than planned. The project was effective in terms of developmental achievements, but its sustainability is at considerable risk. The logically stringent impact chain that served as a basis for project planning was only partially compatible with the development strategy of the Chinese central government, which had fundamentally changed over the project term, namely the establishment of the Kashgar Special Economic Zone and the expansion of the New Silk Road for Xinjiang.

Highlights: The newly introduced irrigation technologies introduced in Kashgar and the lessons learned can be transferred to other regions with similar climate and geomorphological conditions. Particular importance was attached to measures designed to protect the scarce resources of soil and water. This was also an attempt to account for the anticipated impacts of climate change. It proved unfeasible to establish democratically organized, self-governing water user groups at local level given the general political conditions.



Rating according to DAC criteria

Overall rating: 4

Ratings:

Relevance	3
Effectiveness	3
Efficiency	3
Impact	3
Sustainability	4

General conditions and classification of the project

The FC project “Poverty Alleviation Xinjiang” was implemented in the Kashgar Administrative District of the Xinjiang Uyghur Autonomous Region under challenging political conditions. Muslim Uyghurs constitute the largest group among the multi-ethnic population of the region. Since 2007, unrest in Xinjiang along ethnic-religious lines of conflict has intensified. In the context of a systematic policy of “sinicisation” by the Chinese central government and a visit by the President of the Republic to Xinjiang in 2014, the state administration responded to the unrest by launching an anti-terror campaign. Security measures in the region were stepped up and arrests were being made more frequently at the time of the evaluation. People of Uyghur descent are particularly affected.

In the project region, which suffers from water poverty, the income poverty of the smallholder population was still widespread, despite the Chinese government's successful poverty alleviation strategy in other parts of the country. The FC project “Poverty Alleviation Xinjiang” agreed between the Chinese and German Governments in 2003 aimed to help China achieve Millennium Development Goals (MDG) 1 (eradicating poverty) and 7 (natural resource management and conservation) in disadvantaged parts of the country. The project aimed to increase the incomes of the target group of mainly Uyghur smallholders by changing crops and improving irrigation methods to boost agricultural productivity. Starting in 2008 at the latest, this concept was at odds with the policy of the Chinese central government, which declared Kashgar a special economic zone, where industrialisation and urbanisation went hand in hand with the “sinicisation” of the economy and state administration. As a result of the growing demand for land by industry and urbanisation as well as increasing opportunities for wage labour in the industrial sector, the additional use of fallow land for agricultural production by the target group through irrigation, as planned in the FC project, became largely obsolete. Although three phases were originally planned, the project was completed after a delay of several years at the end of 2014 after the second phase. The FC grant was scaled back by EUR 2.1 million, from EUR 8.0 million to EUR 5.9 million.

Breakdown of total costs

		(Planned)	(Actual)
Investment costs	EUR million	13.40	10.65
Counterpart contributionin	EUR million	5.40	4.77
Funding	EUR million	8.00	5.88
of which BMZ budget funds	EUR million	8.00	5.88

*) Not including unpaid work performed by the target group in the irrigation perimeters.

Relevance

The Kashgar project region in the Xinjiang Uyghur Autonomous Region is one of the driest areas in the world and has been suffering from increasingly extreme water shortages for many decades. The water shortage in the region is caused by its geographical location in the extreme northwest of China and the prevailing climate conditions there, with rainfall of less than 50 mm per year. The scarcity of water resources was exacerbated not only by the low water use efficiency of the traditional irrigation systems in local farming, but also by the relatively high demographic growth in Xinjiang province. In addition, industrialisation and urbanisation measures were promoted by the government with the expansion of the New Silk Road and the establishment of the Kashgar Special Economic Zone.

An effort was made to counter the problem of low water use efficiency in Xinjiang province by introducing water-saving irrigation techniques such as drip irrigation. The implementation of drip irrigation systems, particularly on fallow, degraded soils, was also one of the core measures of the FC project. The FC project also included the conversion of existing farmland to higher-value fruit and nut tree crops in order to increase agricultural productivity through higher yields. These measures were intended to help reduce the income poverty of the poor smallholder population in the project region of Kashgar.

Based on the current “state-of-the-art”, the existing problems were correctly identified, such as a lack of technical solutions for the efficient use of water, inadequate financial capacities to convert to more productive and higher-yield fruit and nut crops and plots of farmland which are too small to generate enough income. From today's perspective, the project was also important in terms of addressing the expected impacts of climate change in the Kashgar region. Measures for the efficient use of water resources, as envisioned in the FC project, are therefore still urgently needed and relevant to development, also in light of the demographic growth and the structural economic change in Xinjiang province.

In this context, the project measures aimed at increasing household incomes by expanding the area of land available for farming are assessed as less significant, as the construction, industrial and agricultural sectors were already competing for land resources in the region before the project began and much of the soil was unusable due to the high soil salinity. Moreover, the project planning did not account for the fact that the target group, in addition to its low level of education, had considerable deficiencies in administrative and technical skills, which would have been absolutely necessary for the planned decentralised organisation and management of the irrigation projects. We therefore rate the relevance of the FC project as only satisfactory, particularly due to conceptual shortcomings in planning.

Relevance rating: 3

Effectiveness

In the 2004 programme proposal, the FC project aimed to benefit roughly 7,000 smallholder households (with an estimated 30,000 people); the actual coverage rate in relation to the target group was only 36 % (roughly 2,500 households). The same is true with regard to the goal of supplying new irrigation technology to an area of 60,000 mu (4,000 ha) to increase water use efficiency; only about one third of the target was achieved. It was only possible to include 3 % of the planned new land in irrigated agriculture in the project areas; the planned fallow land had been used for other purposes in the meantime and alternative locations were ruled out for farming due to excessive salinity. For this reason, the target of increasing the per capita cropland area by at least 1 mu (0.07 ha) was achieved at only one of the twelve project locations.

In eleven of the twelve project locations, the objective of converting to higher-value fruit and nut tree crops (walnut, almond, plum and Chinese date trees) was achieved, which reached the yield phase when the project was completed. On the project areas, however, the smallholder households continued to plant mixed crops in order to compensate for income losses resulting from the temporary conversion to permanent crops. Many of the participating households lived from subsistence farming and were dependent on growing intermediate crops for their own needs in the new fruit plantations. One of the successes of the FC project can be attributed to the introduction of innovative irrigation methods that considerably improved water use efficiency as outlined in the final review in 2015, from about 52 % for traditional surface irriga-

tion via open channels to 75-85 % for pipe irrigation with hoses and to 90 % for drip irrigation. These figures relate to the results of comparable projects to increase water use efficiency.[1]

At outcome level, it proved difficult to implement the objective of having the irrigation projects managed and operated by water user groups (Water Users' Association/WUA) so that they fully cover costs. The reasons were insufficient technical knowledge and a lack of entrepreneurial skills on the part of smallholders and WUA, as well as a lack of experience in organising independent, self-governing institutions as a result of the comprehensive control and steering requirements of the state bodies in China. Particularly since the ethnic-religious unrest in Xinjiang province starting in 2007 and the attacks by Uyghurs also outside the province, the project executing agency has shown clear resistance to supporting the democratically structured, self-governing water user groups agreed in the project. As the WUA were seen as a potential focus of political resistance, the project executing agency increasingly prevented the necessary training measures for the WUA and smallholders, which would have been absolutely necessary for the management and operation of the irrigation systems.

Indicator	Target value project appraisal[1]	Ex post evaluation[2]
Target group coverage rate*	Target value: 7,000 households	2,551 (36 % of the target value)
Total area coverage rate*	Target value: 60,000 mu	20,400 mu (34 %)
New area coverage rate*	Target value: 40,000 mu	1,116 mu (6 %) (Shule Alali)
Administration & operation of the WUA	Target value: 100 %	Not achieved
Farmed area per capita with drip irrigation	Target value: 1 mu	1.6 mu (only in Shule Alali)
Harvest yields	n.a.	Harvest yields have increased[3], reaching the full yield phase
Efficiency of water use (relationship between effective and actual water consumption[2])	n.a.	Has improved from roughly 52 % for traditional open channel irrigation to 75-85 % for pipe or furrow irrigation and to 90% for drip irrigation
Full cost coverage	Target value: 100 %	Only the basic operating costs are covered. User fees are still based on area and not consumption

Comments about the table with the indicators:

1) Values related to status at the project appraisal were not available.

2) Unless otherwise indicated, all data originates from the final review in 2015; more recent data was not available at the time of the EPE; the local PADO offices responsible for collecting data on crop yields etc., subject to a fee during the project term, did not submit any other data. In the meantime, PADO's Foreign Capital Utilization Division responsible for the FC project has been dissolved.

3) For more information, see Kashgar PADO et al. 2014.

*) Indicator added during EPE

[1] See http://www.fao.org/fileadmin/user_upload/agwa/docs/Efficiency_Thematic%20Brief_En.pdf and Perry et al. (2017).

[2] This means the ratio between the amount of water used for agricultural production less technical losses and measured water removal by the irrigation system.

Due to considerable problems in operational management and insufficient maintenance of the irrigation systems, the third phase was cancelled after the first two project phases and replaced by a “consolidation phase”, which became necessary to restore and ensure the functionality of the irrigation systems. In addition, no suitable project locations could be found for the third phase. As a result, the project was far less effective than originally planned and largely fell short of the target figures. We still rate it as satisfactory, however, since positive results in terms of water use efficiency and the conversion to higher-value fruit and nut tree crops were evident when the project was completed.

Effectiveness rating: 3

Efficiency

Regardless of the FC project's shortcomings in terms of effectiveness, we rate the approach from an efficiency point of view to be appropriate in terms of increasing income for the poor target group by expanding the area and partially converting agricultural production to higher-value permanent crops with modern, water-saving technology. With regard to production efficiency, however, since the objective of expanding the area of agricultural production for the target group and equipping it with new irrigation techniques was only partially achieved, the costs per unit of output increased considerably. For example, the costs per hectare (ha) of irrigated land more than doubled from EUR 3,300/ha in the original plan to EUR 7,300/ha during implementation. The pure investment costs rose to EUR 5,000/ha. Although the total project costs and the percentage of investment costs in this amount decreased as a result of the cancellation of the third implementation phase compared with the planned cost estimate of EUR 10.65 million, they cannot be related to the change in agricultural productivity per hectare because time series of the yields in the irrigated permanent crops were not available beyond the end of the project. Although the project's discontinuation is to be rated as positive from an efficiency point of view, it also entailed additional costs for the consolidation phase. After the first two project phases, repairs, replanting, system adjustments and WUA training became necessary. Relatively high consulting costs amounting to roughly 17 % of total costs (compared with the planned 7 %) were incurred due to the extension of the project duration from 6 to 9 years, the extensive search for suitable alternative areas for irrigation farming for the target group and the monitoring of soil salinity in the farmland by external experts.

Efficiency losses were also evident insofar as the targeted full cost coverage could not be achieved through water user fees charged by the WUA. Contrary to the consumption-based water fees stipulated in the project concept, water fees based on area continued to apply, so there was no incentive to use water economically. The reform of water resource management made only slow progress on the partner side. Only in some locations did the small farmers receive the agreed monetary compensation for crop losses during the conversion phase to irrigated permanent crops as a prerequisite for the viability of higher water use fees; the local administrations responsible for these payments lacked the financial means or received them only after a long delay from the higher-level institutions.[3]

In terms of allocation efficiency, the project costs cannot be correlated with the income development from the yields of the new crops due to the lack of systematically collected time series data. If the costs of the FC project are related to the approximately 2,500 households reached, the costs amount to more than EUR 4,000 per household. Since the objectives and impacts achieved were associated with relatively high costs in terms of both production and allocation efficiency, we rate the efficiency as only satisfactory.

Efficiency rating: 3

Impact

On the basis of a 5 % sample at the twelve irrigation locations, a decline in the number of households below the national poverty line from 50 % in the baseline year 2008 to 17 % five years later was reported at the impact level during the implementation period of the FC project in accordance with the developmental objective of alleviating income poverty. Other sources also point to a sharp decline in poverty in the Kash-

[3] The Poverty Alleviation and Development Office (PADO) of the Xinjiang province and its offices at local level were responsible for data collection.

gar project region.[4] In addition, the sample data collected as part of the project indicate that farmers originally categorised as poor saw relatively higher percentage increases in income than smallholder households, which were classified as better-off based on their average income prior to the project. However, it should be noted that it was only possible to achieve the income increases through higher yields from intermediate crops or rising market prices for agricultural products, or both, as the crops newly planted as part of the conversion were not yet in the yield phase. Income from non-agricultural sources may also have had an impact on the result.

Indicator	Status/target value at project appraisal	Ex post evaluation
Poverty ratio (percentage of the population under the national poverty line) (impact)	50 % (2008); Target value: 30 %	Achieved. 17 % Comment: causal link to the FC project not possible from a methodological point of view

It is not possible to estimate how the income situation of the participating households, most of which were part of the Uyghur ethnic minority, developed after the end of the project as data was no longer available. Nor was there any data available on other forms of poverty among the target group, on the workload of the participating households or on improved income opportunities for women. It is therefore not possible to establish a causal link between the income increases achieved by the participating households and the measures implemented under the FC project. In addition, the analysis must take into account that due to the relatively low development of additional farmland for smallholder households of only 3 % of the planned area, a core component of the income increase had only a very limited impact on poverty alleviation. Moreover, when assessing the income effect, it must be kept in mind that during the observation period 2005-2015 the official consumer price index for Xinjiang province rose by an average of 3.4 percentage points per year.

With regard to developmental impacts, however, it is important to highlight the replicability and broad impact of the implementation of water-saving irrigation technologies in the project region. While drip irrigation systems did not play a role in Xinjiang province in the 1990s, more than three million hectares or about half of the total farmland there is now equipped with this irrigation technology. A causal link between the FC project and the expansion of cropland with drip irrigation cannot be proven or refuted on the basis of the information and data available. Drip irrigation in any case makes an important contribution to the management of natural resources and resource conservation at impact level and takes into account the expected impacts of climate change.[5] For this reason, we rate the overarching developmental impact (impact) of the project as satisfactory.

Impact rating: 3

Sustainability

The decision of the Chinese government to declare the city of Kashgar a Special Economic Zone in 2010 and to promote industrialisation, (foreign) trade and urbanisation there significantly changed the economic and political environment for the FC project. Options for increasing the income of the poor rural population were now considered to be the creation of industrial jobs and state investment in cross-border infrastructure as part of the New Silk Road. As a result, increasing the productivity of smallholder farms through irrigation and expanding the areas for growing fruit varieties intended for the market lost priority for poverty alleviation, as opportunities to generate income outside agriculture arose.

With regard to the water scarcity in the project region, the improvement in water use efficiency through modern irrigation technology at the project locations can be rated as positive from a sustainability perspective. However, the EPE could not establish whether and for how long the irrigation systems installed

[4] See Liu et al. 2017.

[5] See Abudu et al. 2016, p.1.

under the project were still in use through appropriate maintenance and repair investments, also after external support ended.[6] Requests to the project executing agency to provide information on the condition and use of the irrigation infrastructure at the various project locations went unanswered, as did questions on the functioning of the WUA in terms of the intended self-administration with democratised management structures. In any case, this concept was at odds with the government policy of strictly controlling the Uyghur population in the project region. With the Chinese government's changed strategy for Kashgar, measures to reduce the income poverty of smallholder households by increasing agricultural productivity also lost support from the relevant regional and local state authorities.

From today's perspective, the FC project can be classified as having a sustainability rating of 4; the limited developmental effectiveness is unlikely to improve under the conditions created by the Chinese government in the project region.

Sustainability rating: 4

[6] The project was evaluated as a desk evaluation without travelling to the project area. Experts familiar with the FC project have explained in interviews that the current condition of the irrigation systems at the project locations cannot be reliably assessed on the basis of publicly available (relatively low-resolution) satellite images.

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).