



Validation Report

Reference Number: PVR-185
Project Number: 29257
Loan Number: 1753
November 2012

Cambodia: Stung Chinit Irrigation and Rural Infrastructure Project

Independent Evaluation Department
Asian Development Bank

ABBREVIATIONS

ADB	–	Asian Development Bank
FWUC	–	farmer water user community
MOWRAM	–	Ministry of Water Resources and Meteorology
MRD	–	Ministry of Rural Development
O&M	–	operation and maintenance
PCR	–	project completion report
SDR	–	special drawing right
TA	–	technical assistance

NOTE

In this report, “\$” refers to US dollars.

Key Words

adb, asian development bank, farmer user community, fwuc, ministry of rural development, ministry of water resources and meteorology, mowram, mrd

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PROJECT BASIC DATA

Project Number:	29257	PCR Circulation Date:	29 Dec 2009	
Loan Number:	1753	PCR Validation Date:	Nov 2012	
Project Name:	Stung Chinit Irrigation and Rural Infrastructure Project			
Country:	Cambodia		Approved (\$ million)	Actual (\$ million)
Sector:	Agriculture and natural resources	Total Project Costs:	23.90	25.59
ADB Financing: (\$ million)	ADF: 16.00	Loan:	16.00	14.74
	OCR: 0.00	Borrower:	4.80	8.15
		Beneficiaries:	0.40	0.00
		Others:	0.00	0.00
Cofinancier:	Agence Française de Développement	Total Cofinancing:	2.70	2.70
Approval Date:	5 Sep 2000	Effectiveness Date:	10 Jan 2001	28 Feb 2001
Signing Date:	12 Oct 2000	Closing Date:	30 Jun 2007	4 Dec 2008
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ADB = Asian Development Bank, ADF = Asian Development Fund, IED1/2 = Independent Evaluation Department (Division 1/2), OCR = ordinary capital resources, PCR = project completion report.

I. PROJECT DESCRIPTION

A. Rationale

1. Poverty reduction through growth of the rural economy was a high priority in Cambodia. The Asian Development Bank (ADB) country operational strategy for Cambodia¹ supported this thrust through investments in the populous and poor rural areas of the plains and Tonle Sap region. Agriculture, the backbone of the rural economy, was constrained by lack of irrigation facilities, poor roads and market facilities, and limited access to improved farming technology. Inhabitants of the project area in Kampong Thom Province relied on semi-subsistence farming, characterized by a single low-yield rain-fed rice crop per year. Most of the land was barren and fallow in the dry season due to lack of irrigation.

2. Provision of irrigation and drainage facilities, agriculture extension, and rural roads was envisaged to have an important impact on agricultural productivity and poverty. Reliable irrigation water was to ensure crop survival during periods of dry spell. Combined with the

¹ ADB. 1995. *Country Operational Strategy Study for the Kingdom of Cambodia: Developing the Capacity for Reconstruction and Development*. Manila.

introduction of modern rice varieties, supplemental wet season irrigation was envisaged to permit double cropping intensity. Improved roads were expected to provide greater access to markets while improved market facilities was expected to reduce spoilage of yields.

B. Expected Impact

3. The project's envisaged impact was reduced poverty through sustained socioeconomic growth in Kampong Thom Province. Targeted impact indicators were as follows: (i) increased farmer incomes and economic activity in Baray and Santuk districts; (ii) increased wet season paddy production, established dry season paddy production, and established diversified dry season crops; and (iii) reduced production, transport, and marketing costs.

4. The construction and rehabilitation of irrigation works, roads, and markets was expected to provide substantial direct employment for people living in the project area. Improved access to markets were envisaged to result in lower spoilage rates, better connections between buyers and sellers, reduced margins to intermediaries, and the creation of local markets for cash crops. Benefits from road improvements included lower transport costs, enhanced access to agricultural extension, health, and education services, and improved access to agricultural inputs. Formalization of land titles was to provide a major, but unquantified benefit in the project area. These benefits were expected to stimulate economic growth, thereby reducing poverty in the project area.

C. Objectives or Expected Outcomes

5. The expected outcome was increased incomes and improved quality of life in Kampong Thom province through provision of sustainable irrigation, agricultural extension, and rural infrastructure (roads and markets). The following outcome indicators were envisaged: (i) farmer incomes increased by 10%–40% by 2007, depending on access to dry season water; (ii) wet season paddy yields increased from 1.3 to 3.0 tons per hectare (t/ha) by 2007; dry season paddy production developed over 1,500 hectares (ha) by end 2003; diversified dry season crops developed over at least 500 ha by mid-2005; (iii) farmer operation and maintenance (O&M) of secondary canals and drains; and (iv) average farm-to-market transport costs reduced by 40% by 2004.

6. To achieve these objectives, water user groups were to be formed and trained to operate and maintain the irrigation facilities. Cost recovery measures were to be applied for roads and irrigation works. Government staff members at the central and provincial level were to be strengthened, and benefit monitoring and evaluation were to be introduced. In addition, the project was to assist farmers in obtaining legal title to their lands.

D. Components and Outputs

7. The project had two major components:

- (i) **Part A: Integrated Agriculture Development** consisted of the following subcomponents:
 - (a) Farmer Community Organization and Extension Services. This involved investing in human resource development, community organization and training, and applied research and extension through (i) land ownership

survey and documentation for land registration and titling, (ii) water user groups, and (iii) agriculture extension services and research.

- (b) Irrigation Infrastructure. This was envisaged to provide irrigation, drainage, and associated infrastructure and services for 7,000 ha.
 - (c) Irrigation System Management. This subcomponent was to establish the Stung Chinit irrigation committee responsible for overall management of the system, and develop a farmer-managed O&M and cost recovery system through water user groups and water user communities.
- (ii) **Part B: Rural Infrastructure** envisaged to improve around 150 kilometers (km) of roads in and around the project area to reduce the cost of transporting inputs and harvested crops. In addition, the project was to upgrade local markets that lacked permanent roofing, drainage, access to clean water, truck loading facilities, and sanitation facilities.

E. Provision of Inputs

8. At appraisal, the total project cost was estimated at \$23.8 million. Actual cost was \$26 million due to the increased government commitment of \$3 million following the change in scope. ADB provided a loan of \$16 million equivalent (SDR12,183,000). The distribution of cost was shifted mainly to irrigation infrastructure and away from roads and markets construction. Disbursement schedule was affected by the need to revise the project scope. After 3 years of loan implementation, only 26% of the loan was disbursed. On closing date, disbursement was just under 90%. The undisbursed amount of \$2.92 million equivalent (SDR1.97 million) was canceled in 2008.

F. Implementation Arrangements

9. The executing agencies for the project were the Ministry of Water Resources and Meteorology (MOWRAM) and the Ministry of Rural Development (MRD). Implementation arrangements were followed. Project management offices and project implementation units were established. Overall, the national steering committee provided project coordination. However, establishing the appropriate implementation arrangements given the revised project scope and realities of farmers' situation proved to be difficult. The complexities involved in organizing farmers into a body (i.e., farmer water user community [FWUC]) to assume overall management responsibility of the irrigation scheme was not adequately assessed. Furthermore, the technical and institutional aspects of farmers' interaction with state agencies for system management did not evolve as anticipated.

10. Overall, compliance with loan covenants was *satisfactory*. Most of the conditions and covenants of the loan were complied with. There was late compliance regarding the establishment of an irrigation system management committee, while the provincial coordination committee did not function as planned with regard to the frequency of meetings or their ability to effectively coordinate technical work plans.

11. Performance of consultants was generally *satisfactory*. Engineering quality of completed major civil works was excellent. Consultants showed flexibility as the project changed in scope and implementation schedule underwent major changes. Performance of local contractors on

the whole was *less than satisfactory* for both parts A and B. The expected specifications for rural roads subprojects were not always attained. The construction and supervision of rural road subprojects were of poor quality and low standard.² Moreover, there was lack of coordination in the field between MOWRAM and the MRD resulting in detrimental interferences between rural road and irrigation infrastructure works.

II. EVALUATION OF PERFORMANCE AND RATINGS

A. Relevance of Design and Formulation

12. The PCR rated the project partly relevant. This validation agrees with the PCR and rates it *less than relevant*. The project was consistent with the 1995 ADB country operational strategy that recognized the key role of agricultural and rural development to pro-poor sustainable economic growth in Cambodia.³ It was also in line with the government's thrust for poverty reduction and economic recovery focusing on rural development.⁴

13. In 1997, ADB financed a project preparatory technical assistance (TA) to assess the feasibility of rehabilitating the Stung irrigation system in Kampong Thom Province.⁵ However, the TA was interrupted by the deteriorating security situation, which made inspection of the site and condition of the irrigation structures impossible.⁶ The TA suggested full development of the system, including an upstream dam and storage to provide wet and dry season irrigation over 12,000 ha. In 1999, a follow-up TA was initiated to reassess the proposed project.⁷ In this TA, it was recommended that the scale of the irrigation development be reduced and components on rural roads and market infrastructure be added in the project design. ADB and the government agreed to proceed based on the recommendations of this TA study while keeping themselves open to the option for future development of a dam and storage reservoir.⁸

14. The studies conducted in the two TA projects were not able to fully appreciate important realities in the project area. The dilapidated state of existing irrigation infrastructure was beyond repair and required complete reconstruction. Also, irrigation design was based on flawed topographic analysis, which altered dramatically the costs associated with reservoir construction, and accordingly, the feasibility of the project.⁹ Moreover, social complexities of farming operations were not taken into consideration at appraisal. The failure to account for these realities laid the critically flawed foundation of the project design that significantly affected implementation and impact.

² These were observed in ADB review missions and reported in the back-to-office-reports (BTORs), e.g., BTORs of 12 April 2006 and 9 July 2007. However, Cambodia Resident Mission provided additional information that following ADB review missions' recommendations subsequent action had been taken to improve the construction quality, resulting in good final outputs.

³ Footnote 1.

⁴ Royal Government of Cambodia. 1997. *First Five-Year Socioeconomic Development Plan: 1996-2000*. Phnom Penh.

⁵ ADB. 1996. *Technical Assistance to the Kingdom of Cambodia for the Stung Chinit Water Resource Development Project*. Manila (TA 2592-CAM).

⁶ Cambodia was still in post-conflict situation after 30 years of civil war.

⁷ ADB. 1999. *Small-Scale Technical Assistance to the Kingdom of Cambodia for the Study for Stung Chinit Water Resources Development*. Manila (TA 3275-CAM, for \$150,000, approved on 13 October 1999).

⁸ ADB. 2000. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Kingdom of Cambodia for the Stung Chinit Irrigation and Rural Infrastructure Project*. Manila. para. 3.

⁹ During project implementation it was also found that, many types of local soils were sandy, characterized by low organic content and high permeability.

15. During implementation, the MOWRAM reported that the structural damage to the weirs of Stung Chinit and Stung Tang Krasang was so extensive that demolition or abandonment of the existing structures, and their replacement by a combination of “spillweir” and riparian outlet at each river was more economical than repairing the original structures and supplementing them with flood spillways.¹⁰ In December 2003, a major change of project scope was approved within the original loan amount. Investment in rural infrastructure was oriented to irrigation reconstruction rather than rehabilitation. The revised design configuration was to provide primary, secondary, tertiary, and quaternary infrastructure for irrigation, drainage, and rural access in a priority area of 2,960 ha compared with 7,000 ha envisaged at loan appraisal.

16. However, the farmers’ social characteristics were not adequately taken into account. Organizing farmers into a body to assume responsibility for irrigation system management was complex and more difficult than anticipated.¹¹ The change in scope did not recognize farmers’ organizational situation and involvement with nonfarming activities. For example, farmers had other demands on their time such that their willingness and ability to participate in village and farmer meetings were constrained. Furthermore, scheme boundaries, administrative boundaries, and farmers’ plot distributions did not necessarily coincide, hence any single block (bounded by secondary and tertiary canals) did not have enough social cohesion upon which to build sustainable irrigation management capacity. The original approach to block-based farmer organization was inappropriate. Eventually, the FWUC organization evolved into village-based in its composition and representation.

17. The change in scope expanded the scale of resettlement. The resettlement plan had to incorporate major changes, which involved the following: (i) ensuring that replacement land was available, and (ii) planning and implementing a responsive livelihood restoration program for severely affected people. The government spent about \$3.26 million on resettlement.

18. The envisaged road and market improvements did not link closely with the component on integrated agriculture development. The implementation connection between parts A and B was weak.¹² This validation agrees with the project completion report (PCR) regarding this observation.

19. The project’s main shortcoming was in its design. The original irrigation design covering an area of 7,000 ha was overly ambitious and flawed from the start of the project, largely due to inaccurate data and analyses and the inability to assess the condition of the structures requiring rehabilitation. This seriously affected the project’s cost structure, the extent and complexity of the resettlement plan, and the time required for reassessing operating conditions and develop a change of scope for the irrigation infrastructure component. Also, diagnosis of social issues surrounding farming operations, livelihood interests, and farmer spatial organization was not sufficient.

B. Effectiveness in Achieving Project Outcomes

20. This validation concurs with PCR’s rating on effectiveness. The project was *less than effective* in achieving the expected outcome. Outputs achieved were substantially less than what were envisaged at appraisal. However, with the change in scope, the targets for irrigation

¹⁰ Ministry of Water Resources and Meteorology. 2002. Stung Chinit Irrigation and Rural Infrastructure Project: Loan 1753(SF) Monthly Progress Report. Phnom Penh.

¹¹ ADB. 2009. *Completion Report: Stung Chinit Irrigation and Rural Infrastructure Project in Cambodia*. Manila. Appendix 4, para. 7.

¹² Footnote 8, paras. 12 and 41.

and rural components were achieved, except for rural markets.¹³ Water groups were formed but funds for the farmer O&M of the secondary canals and drains were not assured at project closing. Moreover, there was no systematic data showing that the project had achieved the outcome of increasing farmers' income.

(i) Part A: Integrated Agriculture Development

21. Land titling was achieved for 2,399 ha, covering 6,138 titles. To support the FWUC, farmers were provided with organizational and leadership training as well as technical training and accounting and computing skills.

22. The following irrigation infrastructures were completed: (i) remodeling and repair of the main canal from the northern limit of the irrigated area (south of Stung Tang Krasang) to the control structure south of Stung Chinit; (ii) construction of flood embankments to the north and south of Stung Chinit; (iii) construction of drainage infrastructure to protect low-lying settled and cultivated areas; (iii) construction of drainage for protected areas south of the Stung Chinit; (iv) construction of secondary irrigation and drainage infrastructure, together with associated embankment service roads and crossing points, in the irrigated area between the Stung Tang Krasang and Stung Chinit; and (v) construction of tertiary irrigation and drainage infrastructure north of the Stung Chinit.

23. The project set up an irrigation management system whereby the MOWRAM retained responsibility for the main canal and reservoir structures, while the FWUC managed secondary and tertiary canals. Farmers were responsible for quaternary canal management. The Reservoir Irrigation Committee was established to focus on reservoir and primary and secondary structure management. The FWUC represented farmers' interests in this committee.

(ii) Part B: Rural Infrastructure

24. The project paved 84.7 km of road with the all-weather standard of 5-meter-wide laterite surface. The target at appraisal was 150 km of rural roads. In 2004–2006, routine road maintenance for 175 km of roads was undertaken. Three rural market subprojects were completed as against the target of six rural markets at appraisal. The difference between the expected outputs at appraisal and the actual outputs was due to the project's change in scope that had decreased the irrigation area by over half (from about 7,000 ha to 2,960 ha). Consequently, the scale and distribution of project benefits were significantly affected. The benefits anticipated at appraisal to cropping, fishery, and transport costs were not fully realized.

C. Efficiency of Resource Use in Achieving Outputs and Outcomes

25. This validation concurs with PCR's rating on efficiency and rates the project *less than efficient* in the use of resources. Data were not available to facilitate the conduct of rate of return analysis. However, available information showed that average rice yield productivity increased from 0.8–1.0 tons per ha prior to scheme construction to some 2.2–2.3 tons per ha after the scheme.¹⁴ Yields of 3 t/ha had become common for some farmers. Transport services had increased and local transport costs decreased by more than half due to improved roads.

¹³ Of the four rural markets targeted, three were completed.

¹⁴ Based on small scale, sample crop-cutting exercises in 2007 and 2008 wet seasons organized by Groupe de Recherche et d'Échanges Technologiques (GRET) and the FWUC.

Increased rural market trading and longer market opening periods were observed suggesting increase in overall economic activity.

26. Process inefficiency was experienced during project implementation. The change in scope had the following impact: (i) significant delay in irrigation infrastructure; (ii) the farmer community organization and extension services component were hampered by the absence of irrigation infrastructure to perform trials; and (iii) a new resettlement plan had to be developed, which significantly delayed progress. The time taken to devise and approve the change of scope delayed overall progress. The cost per hectare development of the irrigation infrastructure was much higher than expected at appraisal.¹⁵

27. The change in project scope severely affected the implementation schedule. Implementation slowed down from late 2002 to early 2004 due to the process involved in changing the project scope. Consequently, the irrigation infrastructure was significantly delayed, and farmer community organization and extension services were unable to conduct trials in the absence of the irrigation facilities. The project was extended by 1 year to allow for completion of physical works and to support capacity building of the FWUC and MOWRAM.

D. Preliminary Assessment of Sustainability

28. The PCR rated the project *likely sustainable* since concerned agencies were unlikely to allow the deterioration of the substantial amount of capital invested in the project. It argued that the increase in agricultural productivity and the long-term benefits associated with the irrigation infrastructure provided incentive for maintaining the investment. There remains a concern that the FWUC has limited ability to raise irrigation service fees to cover fully the O&M cost. According to ADB's Cambodia Resident Mission, however, continued support from the following organizations could lead to the sustainability of the Stung Chinit infrastructure: (i) the Agence Française de Développement continued to provide support to build the FWUC's capacity and the O&M until mid-2008; (ii) ADB's current Water Resource Management Sector Development Project is now providing support to the FWUC's capacity and O&M; and (iii) a benefit from its expansion to the south at a marginal cost. Based on the above information, this validation endorses the PCR's *likely sustainable* rating.

E. Impact

29. As regards the goal of reducing poverty through sustained socioeconomic growth in the project area, there was no available data to support this. The project did not conduct any survey for this purpose. The absence of a functioning monitoring and evaluation system constrained any impact assessment of the project. There were indications that show increase in average rice yields of farmers but these were not sufficient to show overall improvement in socioeconomic welfare. In terms of impact on environment, the improvement in water management reduced the need for pesticides. The clearance of unexploded ordnance at the reservoir and construction sites had positive impact on the environment. This validation rates impact as *negligible*.

¹⁵ About \$3,300 per ha, based on irrigation civil works costs of some \$10 million and a present command area of 3,000 ha.

III. OTHER PERFORMANCE ASSESSMENTS

A. Performance of the Borrower and Executing Agency

30. This validation concurs with the PCR's *satisfactory* performance rating of the borrower and executing agencies. The borrower complied satisfactorily with most of the loan covenants. The scale and scope of resettlement was unforeseen and the MOWRAM struggled in complying with the conditions of the resettlement plans. The MRD performed its responsibilities under the project satisfactorily. The MOWRAM and MRD staff were allocated to project operations. In general, financial and contracting processes in-country were timely.

B. Performance of the Asian Development Bank

31. This validation agrees with the PCR's *satisfactory* overall rating of ADB's performance. ADB closely supervised the project. ADB fielded 17 review missions, one of which was a special mission and one was a project completion review. ADB appropriately engaged itself with the irrigation issues and continued with the project when the problems emerged. However, ADB paid insufficient attention to setting up the benefit and monitoring system for the project. At project closing, there was no systematic data and material that could be used for impact assessment. Quarterly reports of consultants and executing agencies were mainly descriptive discussions on project progress and lacked consolidated data on outputs and performance indicators.

C. Others

32. No issues on safeguards, governance, and corruption¹⁶ were identified. Resettlement covenants were complied with; however, these covenants underestimated the scale and complexity of resettlement issues during implementation.

IV. OVERALL ASSESSMENT, LESSONS, AND RECOMMENDATIONS

A. Overall Assessment

33. The project is *less than successful* (see table). The project was *less than relevant* in view of the substantial changes made in the project design. The changes in the scope could certainly imply weaknesses in the project design, among other things such as being ambitious, failing to undertake adequate risk assessments, and over-optimism. It was *less than effective* in achieving outcomes mainly because of the shortfalls in envisaged outputs, which affected the attainment of project outcome. It was *less than efficient* in using resources, which led to significant delays. The project is *likely to be sustainable* in view of the ongoing continued support.

¹⁶ The project was investigated by ADB's Office of Anticorruption and Integrity but the case was closed.

Overall Ratings

Criteria	PCR	IED Review	Reason for Disagreement and/or Comments
Relevance	Partly relevant	Less than relevant	
Effectiveness in achieving outcome	Less effective	Less than effective	
Efficiency in achieving outcome and outputs	Less efficient	Less than efficient	
Preliminary assessment of sustainability	Likely	Likely	
Overall assessment	Partly successful	Less than successful	
Borrower and executing agency	Satisfactory	Satisfactory	
Performance of ADB	Satisfactory	Satisfactory	
Impact	Not rated	Negligible	
Quality of PCR		Satisfactory	

ADB = Asian Development Bank, IED = Independent Evaluation Department, PCR = project completion report.

Note: From May 2012, IED views the PCR's rating terminology of "partly" or "less" as equivalent to "less than" and uses this terminology for its own rating categories to improve clarity.

Source: ADB Independent Evaluation Department.

B. Lessons

34. The choice of an investment project in a specific geographic area was appropriate given the scheme's national importance in a post-conflict environment. However, the underlying technical basis of the original project design was inadequate. Insufficient diagnosis was made in understanding the social issues surrounding farming operations, livelihood interests, and farmer spatial organization. The PCR pointed out that a more intensive design phase should have been required before loan approval and ADB management should have insisted on it, and/or project implementation should have been designed to be more flexible. In essence, the project highlighted the need for a robust technical and economic design that takes into account the social context of beneficiaries. This validation has no disagreement with the lessons drawn by the PCR.

C. Recommendations for Follow-Up

35. This validation agrees with the project-related recommendation that future investments in water resources should include specific measures to promote O&M of irrigation schemes. O&M financial arrangements should be clear among institutions and beneficiaries involved. General recommendations of the PCR for improving future irrigation interventions included the following: (i) focusing on smaller-scale innovations that could be widely replicated; and (ii) building on the benefits of improved physical infrastructure through linked interventions to provide credit and agricultural technology for new and non-rice activities. These would entail more targeted interventions based on clearly identified local needs. Furthermore, the broader social circumstances should be integrated at all stages of the irrigation design and implementation.

V. OTHER CONSIDERATIONS AND FOLLOW-UP

A. Monitoring and Evaluation Design, Implementation, and Utilization

36. The project design envisaged a benefit monitoring and evaluation system that would provide information on the benefits realized and the project's success in reaching the most needy, vulnerable households.¹⁷ Baseline data and consistent follow-up surveys were supposed to have been undertaken at different points of implementation. Unfortunately, a formal benefit monitoring and evaluation system was not established during implementation.

B. Comments on Project Completion Report Quality

37. The quality of the PCR is *satisfactory*. It is clearly written and generally follows Project Administration Instructions 6.07A.¹⁸ The PCR had an in-depth discussion on the design and relevance of the project. The change in project scope was sufficiently discussed. The complex issues on irrigation reconstruction, resettlement, and farmers' socioeconomic conditions were well presented and supported by detailed analyses in the appendixes. Lessons and recommendation were sound and drawn from the analyses and findings.

C. Data Sources for Validation

38. Data sources included the following: quarterly and annual progress reports, PCRs (ADB and the government), report and recommendation to the President, minutes of the staff review committee meeting, minutes of the management review meeting on the project, back-to-office mission reports, and project documents and communications.

D. Recommendation for Independent Evaluation Department Follow-up

39. A project performance evaluation may be considered if a more in-depth study on the project outcome and impact is necessary.

¹⁷ Footnote 6, para. 20.

¹⁸ ADB. 2009. Completion Report. *Project Administration Instructions*. PAI No. 6.07A. Manila.