



Completion Report

Project Number: 45273-002
Technical Assistance Number: 8197
April 2021

Bangladesh: Supporting Brick Sector Development Program

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TECHNICAL ASSISTANCE COMPLETION REPORT

TA Number, Country, and Name: TA 8197-BAN: Supporting Brick Sector Development Program		Amount Approved: \$750,000.00	
		Revised Amount: \$750,000.00	
Executing Agency: Ministry of Environment, Forest, and Climate Change	Source of Funding: Clean Energy Fund under the Clean Energy Financing Partnership Facility	Amount Undisbursed: \$19,638.00	Amount Used: \$730,362.00
TA Approval Date: 22 October 2012	TA Signing Date: 31 March 2013	TA Completion Date	
		Original Date: 31 December 2014	Latest Revised Date: 30 June 2018
		Financial Closing Date: 3 October 2018	Number of Extensions: 4
TA Type: Capacity development TA		TA Arrangement: Not applicable	

Description

In 2010, there were 4,880 brickfields throughout Bangladesh,¹ contributing to about 1% of gross domestic product (GDP) of the country.² Ninety-two percent of these brickfields, from among 6 available technologies, were using the highly polluting fixed chimney kilns (FCKs) technology (footnote 1). Energy-efficient and improved kilns were limited due to a poorly regulated brick sector and the absence of a comprehensive sector roadmap or development plan. Among the serious challenges in the sector were the (i) low level of awareness on modern technologies among brick manufacturers; (ii) poor compliance with labor standards among unskilled small businesses operating with outmoded technologies; (iii) lack of technological and operational capacity; (iv) high investment needs for establishing auto-brick manufacturing unit; and (v) lack of financial assistance and attractive lending terms from local financial institutions.

The shift towards modern and environment-friendly brick technologies was challenging despite the policy and regulatory measures in place. The Government of Bangladesh supported energy efficiency and conservation in the National Strategy for Accelerated Poverty Reduction II, 2009–2011.³ The government emphasized the promotion of energy efficiency, and 'green brick' in the Seventh Five Year Plan (FY2016–FY2020), as well as the strict enforcement of the Brick Kiln Act 2013 towards phasing out of traditional brick kilns.⁴

On 10 May 2012, ADB approved the Financing Brick Kiln Efficiency Improvement Project to support the construction of more energy-efficient and environmentally superior brick kilns.⁵ To complement the investment project, the government requested ADB for a capacity development technical assistance (TA) to support the creation of a long-term brick sector development program.⁶ Specifically, the TA was to (i) address the brick sector development constraints in policy and regulatory formulation; (ii) promote awareness on new technologies; (iii) provide technical and business support to prospective sub-borrowers; (iv) support research and development on alternative materials; and (v) support the development of alternative livelihood opportunities.

¹ World Bank. 2011. *Introducing Energy-efficient Clean Technologies in the Brick Sector of Bangladesh*. Washington, DC.

² ADB. 2011. The GDP figure is based on a purchasing power parity measure: *Key Indicators*. Manila (p. 161).

³ Government of People's Republic of Bangladesh, Planning Commission. 2008. *Moving Ahead: National Strategy for Accelerated Poverty Reduction II (FY2009–2011)*. Dhaka.

⁴ Government of People's Republic of Bangladesh, Planning Commission. 2015. *7th Five-Year Plan, FY2016–FY2020: Accelerating Growth, Empowering Citizens*. Dhaka.

⁵ ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Loans to the People's Republic of Bangladesh for the Financing Brick Kiln Efficiency Improvement Project*. Manila (Loan 2865/2866-BAN).

⁶ The TA is not attached to the loan. TA approval in Bangladesh is subject to the government's technical project proforma process, which is time consuming, while the financial intermediary loans are not subject to such a process. In order to conclude the loan negotiations before 1 April 2012 and to avoid ADB maturity-based pricing, the government requested ADB to separate the loans and the TA processing. Since the TA is not attached to the loan, a standalone TCR was prepared.

Expected Impact, Outcome, and Outputs

The expected impact of the TA was improved environmental conditions in Bangladesh. The expected outcome was an expedited brick sector modernization. The outputs were: (i) government's long-term brick sector policy, strategy, and action plan delivered/adopted, (ii) market awareness for energy-efficient brick kilns and provision of business support to sub-borrowers improved, (iii) effective ADB loan implementation, and (iv) research and development in advanced building materials promoted.

Four output indicators were revised/dropped through a minor change in scope in 2016.⁷

- (i) Integrating output indicator 1b "*A signed memorandum of understanding for setting up a national brick center signed, with committed funding, by participating donors by December 2014*", and output indicator 3b "*DOE's establishment of a technical support desk and publication of brick kiln operation and troubleshooting manuals by December 2014*" into revised output indicator 1b: "*One-stop service/brick center facility established*". During the midterm review in June 2016, it has been agreed that the TA will support DOE in setting up a one-stop-service/brick center by providing the necessary equipment and furniture.
- (ii) Removal of output indicator 3d "*An alternative livelihood scheme is developed by DOE by December 2014*" since the project (loan) has financed new brick fields only (no replacement from FCK to Zigzag kiln) making the livelihood scheme no longer valid.
- (iii) Change in indicator 4(b) from "*At least three alternative construction materials developed by DOE by December 2014*", to "*Prepare a knowledge product on alternative construction materials*". The change was needed as DOE did not have the expertise and mandate to prepare the materials.

Implementation Arrangements

The Ministry of Environment, Forest, and Climate Change (MOEFCC) was the executing agency and the Department of Energy (DOE) under the MOEFCC was the implementing agency. Bangladesh Bank (BB) was part of the implementation arrangement to enhance its capacity in administering ADB-funded projects. DOE coordinated the overall planning and implementation, including: (i) inter-agency coordination among MOEFCC, DOE and other officials on all aspects of brick sector development; (ii) consultation with development partners; (iii) provision of training to the MOEFCC, DOE, BB and other officials; (iv) development of market awareness for energy-efficient brick kilns; (v) creation of business information dissemination portal; and (vi) conduct of research to promote advanced building materials.

The government formed a TA project steering committee (PSC) comprised of BB, DOE, MOEFCC, Financial Institutions Division (FID) of the Ministry of Finance, ADB and other relevant government agencies. The PSC was chaired by Secretary, MOEFCC. The PSC provided strategic and policy advisory guidance for effective and efficient implementation of the TA. A project implementation committee (PIC) headed by Director General, DOE was formed to review the progress of activities, identify problems, and take corrective measures. The PIC included representatives from MOEFCC, BB, Bangladesh Brick Manufacturing Owner Association (BBMOA), and other relevant government agencies. A project management unit (PMU) headed by Director, DOE with members from DOE staff and consultants was also established to manage project implementation. The performance of the PMU was fully satisfactory.

Consultants were mobilized on 3 June 2013, more than 8 months after TA approval due to the delay in the technical assistance project proforma (TAPP) approval. Consequently, the TA was extended for 6 months from 31 December 2014 to 30 June 2015. Delays in the implementation of the investment project led to further requests for extension. The TA was extended (i) 6 months from 30 June 2015 to 31 December 2015 due to delays in outputs 2 and 3 (longer time taken by the project to improve subproject development and screening to minimize rejection rate of subproject proposals); (ii) 12 months from 31 December 2015 to 31 December 2016 to complete the remaining activities under outputs 2 and 4 through individual consultants instead of the consulting firm; and (iii) 18 months from 31 December 2016 to 30 June 2018 to complete the remaining activities under outputs 2, 3 and 4.⁸ The TA was completed within 68 months instead of the originally planned 26 months.

The TA engaged a joint venture firm (Xian Research & Design Institute of Wall & Roof Materials, People's Republic of China and Clean Energy Alternatives Inc., United States) on 3 June 2013. Three international consultants (30 person-months) and 6 national consultants (50 person-months) on an intermittent basis were engaged through the firm, as against planned recruitment of 4 international consultants (36 person-months) and 5 national consultants

⁷ ADB (South Asia Department). 2016. Approval of (i) Minor Change in Scope. Memorandum. 11 September (internal).

⁸ ADB (South Asia Department). 2017. Approval of Minor Change in Implementation Arrangements (Post-Facto Extension of Closing Dates). Memorandum. 31 July (internal).

(44 person-months). The quality of inputs of the consultants was satisfactory. However, there were delays in the start-up activities of the firm as a result of delayed consultant mobilization. By 31 June 2015, the actual inputs were only 17.8 person-months from 3 international consultants, and 29.4 person-months from 4 national consultants. The closing of the firm's contract was settled on 31 August 2016.

To provide continuous support to TA implementation, 4 individual consultants (one international and 3 national) were engaged intermittently (150 working days for international and 495 working days for 3 national) from March to 31 December 2016. The total contracted amount for the 4 consultants was \$76,000 (footnote 7). Later, the TA also recruited 3 national consultants for 180 working days to prepare the technical verification reports and the environment and social due diligence reports (footnote 8). The performance of the consultants was satisfactory.

The TA procured various equipment to establish an emission monitoring laboratory at the DOE to monitor carbon dioxide emissions. The equipment was handed over to the DOE before TA closure. The TA also supported logistics such as venue cost, food and conference materials for organizing conferences and workshops.

The government provided counterpart support in the form of office accommodation and staff from various ministries and departments involved in the TA activities. At completion, the TA utilized \$730,362 or 97.4% of the total budget (Appendix 2).

Conduct of Activities

The outcome was achieved. With the government's prohibition on the operation of new FCKs, 64% FCKs have converted to improved Zigzag kilns as of February 2017.⁹ FCKs declined by 16% from 2013 to 2017 – meeting the target of at least 15% annual decline in FCKs from 2013 to 2014. Meanwhile, the target construction of more energy efficient Hybrid Hoffman Kilns (HHKs) and tunnel kilns was also met with 19 HHKs and tunnel kilns financed under the project (i.e., 7 HHKs and 12 tunnel kilns). The following activities were conducted:

Output 1. Government delivers a long-term brick sector policy, strategy, and action plan for adoption. The output was achieved. DOE adopted the (i) brick sector roadmap, and (ii) long-term brick sector policy, strategy, and action plan in May 2017. A single report was prepared by synchronizing the brick sector road map and long-term brick sector policy, strategy, and action plan. A one-stop service center was also setup in DOE to provide technical support and advisory services to the brick kiln owners on how to convert traditional FCKs to environment friendly kilns. Instead of brick kiln operation and troubleshooting manuals, DOE published a brochure where the detailed application process for environmental clearance for brick kilns is provided.

Output 2. Market awareness for energy-efficient brick kilns and provision of business support to sub-borrowers improved: The output was achieved. The TA was to help raise critically needed product awareness on cleaner technologies' environmental, technical, and commercial benefits, thereby enticing market demand for funds. Against the target of 20% and 30% disbursement during the first 2 years of project implementation, 66% (\$33 million) was disbursed to the imprest account, of which \$15.8 million (31.6%) was liquidated for 9 subprojects. The target was achieved despite project startup delays due to weak implementation capacities of participatory financial intermediaries (PFIs) and the implementing agency. The following were also delivered (i) 3 awareness raising workshops organized for 350 participants from BB, PFIs and Bangladesh Brick Manufacturing Owner Association (BBMOA); (ii) brick sector website (www.bricksectorbd.org) developed as an information dissemination portal;¹⁰ and (iii) business support to sub-borrowers (e.g., advise on environmental assessment and preparation of environmental due diligence report according to ADB guidelines). The market awareness activities of the TA contributed to the disbursement of the full \$50 million loan to 19 subprojects.

Output 3. Effective ADB loan implementation: This output was partly achieved. Three out of 4 indicators were achieved (1 was dropped). The TA was to strengthen the capacities of the ADB loans' implementing agency, BB, and participating financial intermediaries to ensure smooth project implementation. All 19 subprojects complied with safeguard measures – achieving the target of 100% compliance. The TA conducted a training on compliance with ADB environmental and social safeguards, gender action plan, core labor standards, procurement guidelines, and prohibited investment activities for 34 staff from BB and PFIs. Against the target of at least 30 sub-borrowers trained on operating new brickfields, a total of 120 brick entrepreneurs were trained on financing modern brick technology in 2016. The training included (i) technical backstopping for entrepreneurs and on-the job training on energy-efficient brick kilns; and (ii) for DOE staff – verification of brick kiln design standards submitted by sub-borrowers to BB. The alternative livelihood scheme was dropped as no replacement from FCKs to Zigzag kiln took place under ADB

⁹ The conversion was not financed under the ADB loan.

¹⁰ The website is currently inactive. The site was developed to provide information to brick kiln owners.

financing (footnote 7). As noted earlier, the establishment of the technical support desk and publication of brick kiln operation and troubleshooting manuals was integrated under output 1.

Output 4. Research and development in advanced building materials promoted: The output was achieved. As targeted, the government adopted perforated or hollow bricks as construction standards. The MOEFCC issued a circular on 24 November 2019 to start using block/hollow bricks in all government construction, with the target of 10% in FY2020 and gradually increasing to 100% by FY2025. The workshop and knowledge exchange visit to the People's Republic of China on improving technologies for brick making and productive use of energy was conducted for participants/officials from DOE (2), BB (2) and PFIs (2). The exchange visit enhanced the knowledge of DOE officials on development of advanced, cleaner building techniques to replace energy-intensive bricks and develop standards for perforated and hollow bricks. Lastly, the knowledge product on alternative construction materials other than bricks entitled: *Alternative Building Materials: Brick Making Technologies for Bangladesh* was submitted to DOE.

Technical Assistance Assessment Ratings

Criterion	Assessment	Rating
Relevance	<p>The TA outcome was fully aligned with the Sixth Five Year Plan (FY2011–FY2015) for promoting energy efficiency and environmental sustainability, and ADB's country partnership strategy for Bangladesh 2011–2015, by supporting environmentally sustainable development.</p> <p>The TA rationale was well articulated and the results chain and the design components in the DMF were appropriate. The minor changes in the output indicators were justified to maintain the relevance of the outputs without affecting outcome achievement (refer to earlier discussion).</p> <p>The TA supported the preparation of a comprehensive brick sector development program in Bangladesh. The TA supported the disbursement of the \$50 million ADB loan. Through its market awareness activities, the TA helped accelerate disbursements for promoting energy efficient brick manufacturing and supported the enforcement of the <i>Brick Manufacturing and Brick Kiln Establishment Act 2013</i> for phasing out of traditional brick kilns. The TA created continuous demand for ADB funds by disseminating/promoting technically and commercially viable pilot projects. The knowledge product on alternative construction materials was a significant solution to promote the use of perforated and hollow bricks and other alternative building materials towards the construction of modern and energy-efficient brick kilns. Overall, the TA is rated <i>relevant</i>.</p>	<i>Relevant</i>
Effectiveness	<p>All planned activities leading to the project outcome and outputs were largely achieved. FCKs have declined in favor of more energy efficient Zigzag kilns, HHKs and tunnel kilns. Out of 9 output indicators, 8 were achieved, and 1 was dropped since it was no longer relevant.</p> <p>Under output 1, the TA supported the formulation of a brick sector policy, strategy, and action plan and establishment of a one-stop service center in DOE to provide technical support and advisory services to the brick kiln owners and established technical support desk, and instead of publishing of brick kiln operation and troubleshooting manuals, DOE published brochure where detailed application process for environmental clearance for brick kilns has been provided. Through the awareness raising activities under output 2, the TA was able to enhance market demand for funds and helped achieve the loan disbursement targets. Under output 3, the TA strengthened capacities for project implementation by ensuring compliance of project implementing agencies with ADB environmental and social safeguards. Under output 4, the TA promoted the use of alternative construction materials for bricks through support for the preparation of a knowledge product and the issuance of a government circular. Overall, the TA is rated <i>effective</i>.</p>	<i>Effective</i>
Efficiency	The TA experienced implementation delays of over 42 months mainly due to challenges associated with the investment project. Despite these delays,	<i>Less than Efficient</i>

Criterion	Assessment	Rating
	targets were achieved within budget with fund utilization reaching 97.4%. Government provided in kind support in the form of office accommodation and human resources for smooth TA implementation. Overall, the TA is rated <i>less than efficient</i> on account of the implementation delays.	
Overall Assessment	Despite the DMF requiring some minor changes, the design was sound and fully aligned with the government's priorities and ADB's strategies. The minor changes in the TA design were made in outputs 1 and 3, which were replaced with more effective and sustainable outputs. The TA achieved the outcome, and 8 of 9 output indicators. Due to delays in the implementation of the investment project, the TA had to be extended to align with project implementation. Overall, the TA is rated <i>successful</i> .	<i>Successful</i>
Sustainability	The TA benefits are <i>most likely sustainable</i> as evidenced by the high degree of support from the government in terms of the policies and strategies in place, i.e., (i) national strategy for sustainable brick production in Bangladesh developed by DOE in May 2017; (ii) national environment policy 2018 developed by MOEFCC focusing on environment friendly and hollow brick production; and (iii) MOEFCC-issued circular on 24 November 2019 to start using block/hollow bricks in all government construction with target of 10% in FY2020 and gradually increasing to 100% by FY2025. The TA's study findings and awareness building activities contributed to the gradual shift of the brick sector towards environment friendly and energy-efficient brick kilns.	<i>Most likely sustainable</i>

Lessons Learned and Recommendations

Design and/or planning	For a TA which closely relates to a loan project, it is important to harmonize the schedules to the extent possible. Also, BB could have been included as one of the implementing agencies as the intended objective of the TA was to support Loan 2865/2866-BAN which was implemented by BB. The DMF outputs and activities could have been defined better to highlight BB's role in the TA.
Implementation and/or delivery	Better coordination between DOE and BB would have been helpful to accelerate loan/project implementation. Also, the TA could have been approved prior to the loan for better project readiness and to accelerate loan disbursement. The TA could have been implemented prior to designing the loan project to understand the requirements and readiness of the subprojects.
Knowledge building	The TA could have focused on knowledge building at the grassroots level for brick kiln entrepreneurs in the different districts of Bangladesh through audio-visual trainings and offering business development services on modern energy efficient brick kilns and hollow bricks. The TA could have involved the Housing and Building Research Institute (HBRI) under the Ministry of Housing and Public Works for knowledge building on modern energy efficient brick kilns. In future, implementing agencies may be identified based on their experience and activities relative to expected outputs.
Stakeholder participation	The TA could have involved more stakeholders such as HBRI and the Public Works Department (PWD) under the Ministry of Housing and Public Works. HBRI focuses on knowledge building on modern energy efficient brick kilns, and PWD is responsible for government building construction, and promotion of energy efficient green bricks in government construction. The involvement of relevant stakeholders needs to be defined more strategically in future TA projects.
Partnership {and cofinancing}	The TA could have included other key partners working in environment such as the United Nations Environment Program (UNEP) and Kreditanstalt für Wiederaufbau (KfW). The organizations working in the relevant areas could be invited for partnership and cofinancing in the design of future TA projects.
Post-TA financial resource	DOE has completed the implementation of the Clean Air & Sustainable Environment (CASE) project funded by the World Bank and the Government of Bangladesh. The CASE project

	focuses on capacity building for air quality management and brick kilns emissions management by promoting adoption of cleaner technologies and practices with the brick enterprises through stakeholder institutions. ¹¹ ADB may consider complementing the CASE project in future. ADB could provide technical assistance on investment financing towards clay-fired brick manufacturing and installation of block and hollow bricks industries to improve air quality. Besides, the TA could be started before loan effectiveness which would be helpful to increase awareness on energy efficient brick manufacturing among the PFIs and brick kiln owners.
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Follow-up Actions

ADB could explore for second phase of the project on Financing Brick Kiln Efficiency Improvement Project by expanding its scope and including a technical assistance to support the ongoing initiatives of DOE and complementing the CASE project as well as ongoing initiatives of BB. In the proposed project, along with DOE, BB could be involved as an implementing agency by defining its role in achieving the outputs.
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¹¹ DOE, Clean Air & Sustainable Environment (CASE) Project, can be accessed at:
http://case.doe.gov.bd/index.php?option=com_content&view=article&id=7&Itemid=6.

DESIGN AND MONITORING FRAMEWORK

Impact Improved environmental conditions in Bangladesh.		
Results Chain	Performance Indicators with Targets and Baselines	Achievements
Outcome Expedited brick sector modernization	By 2015: a. At least 15% annual decline in FCKs from 2013 to 2014 (2011 Baseline: 4,490) b. At least 10 additional HHKs and tunnel kilns being constructed annually from 2013 to 2014. (2012 Baseline: 0)	Achieved. a. Government bans the operation and establishment of new FCKs. As of February 2017, 64% FCKs have converted to improved Zigzag kilns with average annual decline rate of 16% in FCKs from 2013 to 2017. b. Total 19 HHKs and Tunnel Kilns were financed by the loan, which includes 7 HHKs and 12 Tunnel Kilns.
Outputs 1. Government delivers a long-term brick sector policy, strategy, and action plan for adoption	1a. Proposed brick sector policy, strategy, and action plan adopted by relevant bodies by December 2014 1b. One-stop service/brick center facility and technical support desk established, and brick kiln operation and troubleshooting manuals published.	1a. Achieved. Brick sector policy, strategy, and action plan adopted by DOE in May 2017 through development of a national strategy for sustainable brick production in Bangladesh. 1b. Achieved. DOE opened a one-stop service center in its new building and instead of brick kiln operation and troubleshooting manuals, DOE published a brochure where detailed application process for environmental clearance for brick kilns has been provided.
2. Market awareness for energy-efficient brick kilns and provision of business support to sub-borrowers improved	2a. Disbursement of ADB loans of at least 20% and 30% during the first 2 years of implementation	2a. Achieved. Disbursement of ADB loans as imprest advance in the first 2 years of implementation was (i) Year 1 - 46% (\$22.97 million) and (ii) Year 2 - 20% (\$10 million), of which \$15.8 million (31.6%) was liquidated for 9 subprojects.
3. Effective ADB loan implementation	3a. 100% compliance with sub-loan environmental, social, gender, labor, and other safeguard measures during 2013–2014 3b. DOE's establishment of a technical support desk and publication of brick kiln operation and troubleshooting manuals by December 2014 3c. At least 30 sub-borrowers benefit from the training on operating new brickfields by December 2014 (2011 Baseline: 0) 3d. An alternative livelihood scheme is developed by DOE by December 2014	3a. Achieved. All 19 subprojects financed under the project complied fully (100%) with all safeguard measures. 3b. Achieved. Integrated with output 1 and achievements reported under output indicator 1b. 3c. Achieved. Total 120 brick entrepreneurs benefited from the training on 'Financing Modern Brick Technology' organized in 2016. 3d. Dropped. Target dropped as the project financed new brick fields only (no replacement from FCK to Zigzag kiln), making the livelihood output irrelevant.

4. Research and development in advanced building materials promoted	<p>4a. Government's adoption of perforated or hollow bricks as construction standards by December 2014</p> <p>4b. Prepare a knowledge product on alternative construction materials</p>	<p>4a. Achieved. The government has adopted perforated or hollow bricks as construction standards. The MOEFCC issued a circular on 24 November 2019 to start using block/hollow bricks in all government construction, with the target of 10% in FY2019–FY2020 and gradually increasing to 100% in FY2024–FY2025.</p> <p>4b. Achieved. A knowledge product on alternative construction materials entitled "Alternative Building Materials: Brick Making Technologies for Bangladesh" was prepared and submitted to DOE.</p>
<p>Actual Key Activities with Milestones</p> <p>1. Government delivers a long-term brick sector policy, strategy, and action plan for adoption</p> <p>1.1 Provided training to the MOEF, DOE, and other officials on all aspects of brick sector development (April 2014–June 2014).</p> <p>1.2 Provided training to the MOEF, DOE, and other officials on how to formulate a brick sector policy, strategy, and action plan (April 2015–October 2016).</p> <p>1.3 Established a one-stop-service/brick center facility within DOE providing supports for disseminating brick sector information on technology, government directives, financing and marketing (June 2016–September 2016).</p> <p><i>Note: The activity "Consult with development partners and develop a proposal to establish a national brick center and prepare a joint memorandum of understanding" has been replaced by the above activity.</i></p> <p>1.4 Helped the government to submit the proposed policy, strategy, and action plan for adoption (January 2017–May 2017).</p> <p>2. Market awareness for energy-efficient brick kilns and provision of business support to subborrowers improved</p> <p>2.1 Organized awareness-raising workshops to promote more energy-efficient brick kilns (September 2015–August 2016).</p> <p>2.2 Created information dissemination portal (June 2016–January 2017).</p> <p>2.3. Provided business support to sub-borrowers (September 2015–October 2016).</p> <p>3. Effective ADB loans implementation</p> <p>3.1 Conducted training for Bangladesh Bank and participating financial institutions on compliance with ADB environmental and social safeguards, gender action plan, core labor standards, procurement guidelines, and prohibited investment activities (November 2015–October 2016).</p> <p>3.2 Provided technical backstopping and on-the job training for energy-efficient brick kilns (September 2015–October 2016).</p> <p>3.3 Provided training to DOE staff on verification of brick kiln design standards submitted from sub-borrowers to Bangladesh Bank (April 2015–October 2016).</p> <p>3.4 Supported the DOE's preparation of technical and troubleshooting manuals (June 2015–October 2016).</p> <p>4. Research and development in advanced building materials promoted</p> <p>4.1 Conducted training for the DOE on the development of advanced, cleaner building techniques to replace the energy-intensive bricks (September 2016–February 2017).</p> <p>4.2 Helped the DOE develop standards for perforated and hollow bricks (September 2016–October 2017).</p> <p>4.3 Prepared a knowledge product on alternative construction materials other than bricks (September 2016–October 2017)</p> <p><i>Note: The activity "Assist the DOE in developing at least 3 alternative construction materials other than bricks" has been replaced by the above activity.</i></p>		
<p>Actual Inputs</p> <p>Asian Development Bank: \$730,362.00</p>		

ADB = Asian Development Bank; DOE = Department of Environment; FCK= fixed chimney kiln; HHK= Hybrid Hoffman Kiln; MOEF= Ministry of Environment and Forests; MOEFCC= Ministry of Environment, Forest, and Climate Change; TA = technical assistance.

Source: Asian Development Bank.

TECHNICAL ASSISTANCE COST

Table A2.1: Technical Assistance Cost by Activity
(\$'000)

Item	Amount		
	Original ^a	Revised ^b	Actual
1. Consultants	545.00	587.00	561.84
2. Goods	20.00	50.00	64.79
3. Training, seminars and/or conferences	100.00	90.00	35.52
4. Surveys	0.00	16.00	64.96
5. Miscellaneous TA administration	47.50	6.60	3.25
6. Pilot testing	0.00	0.00	0.00
7. Contingency	37.50	0.40	0.00
Total	750.00	750.00	730.36

^a Original estimated cost in the TA report.

^b Revised budget to reflect realignments in the cost.

Source: Asian Development Bank estimates.

Table A2.2: Technical Assistance Cost by Fund
(Multi Donor Clean Energy Fund under Clean Energy Financing Partnership Facility)
(\$'000)

Item	Amount
1. Original ^a	750.00
2. Revised	0.00
3. Actual	730.36
4. Unused	19.64

^a Original estimated cost in the TA report.

Source: Asian Development Bank estimates.