



OFFICE OF INSPECTOR GENERAL
U.S. Agency for International Development

Pakistan's Gomal Zam Dam Has Not Generated the Electricity Anticipated Despite Millions in USAID Investments

AUDIT REPORT 5-391-18-001-P
FEBRUARY 12, 2018

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MEMORANDUM

DATE: February 12, 2018

TO: USAID/Pakistan, Mission Director, Jerry P Bisson

FROM: Regional Inspector General/Manila, Matthew Rathgeber /s/

SUBJECT: Pakistan's Gomal Zam Dam Has Not Generated the Electricity Anticipated Despite Millions in USAID Investments (5-391-18-001-P)

This memorandum transmits the final report on our audit of USAID/Pakistan's Gomal Zam Multipurpose Dam Project. Our audit objectives were to determine if (1) USAID/Pakistan addressed prior OIG work and helped ensure that the hydroelectric component of the Gomal Zam Multipurpose Dam Project was completed and generating the anticipated electricity, (2) the Gomal Zam Irrigation Project was on track to complete the infrastructure required to support the overarching Gomal Zam Multipurpose Dam Project, and (3) USAID/Pakistan and its implementing partner complied with selected USAID guidance and agreement terms. In finalizing the report, we considered your comments on the draft and included them in their entirety, excluding attachments, in appendix B.

The report contains three recommendations to improve USAID/Pakistan's management of the Gomal Zam Multipurpose Dam Project. After reviewing information you provided in response to the draft report, we consider all three recommendations resolved but open pending completion of planned activities by June 30, 2018, for recommendation 3 and by December 31, 2018, for recommendations 1 and 2.

For all three recommendations, please provide evidence of final action to the Audit Performance and Compliance Division.

We appreciate the assistance you and your staff extended to us during this audit.

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INTRODUCTION

In 2010, the U.S. Secretary of State announced programs to address problems with electricity shortages and water scarcity in Pakistan. In response, USAID/Pakistan signed an agreement with the Government of Pakistan in January 2011 for the Gomal Zam Multipurpose Dam Project, designed to add 17.4 megawatts of generation capacity to the national electric grid, provide drinking water, and help with flood control in the strategically important areas of South Waziristan, Tank, and Dera Ismail Khan. USAID followed up by funding the Gomal Zam Irrigation Project (GZIP) to boost food production by bringing water to 191,000 acres of agricultural land. As of September 2016, USAID had committed \$117 million for the two signature projects and related dam and irrigation works.

The Office of Inspector General (OIG) conducted this audit to determine whether USAID/Pakistan implemented key elements of these signature projects. Specifically, we assessed whether (1) the hydroelectric component of the Gomal Zam Multipurpose Dam Project was completed and generating the anticipated electricity, (2) GZIP was on track to complete infrastructure required to support the overarching Gomal Zam Multipurpose Dam Project, and (3) USAID/Pakistan and its implementing partner complied with selected USAID requirements and agreement terms.

To conduct our work, we interviewed stakeholders and responsible USAID/Pakistan officials, Pakistani Government officials, project contractors, subcontractors, and beneficiaries. We reviewed key documents including independent engineering assessment reports, project memorandums, and third-party cost verification reports. Appendix A presents our scope and methodology.

SUMMARY

The hydroelectric component of the project was not generating the anticipated amount of electricity. The Gomal Zam Multipurpose Dam was completed and handed over to the Government of Pakistan in June 2013. According to Pakistani Government officials, the dam's hydroelectric component has since operated only sporadically and, even then, not always at full capacity. In October 2016, a protective system failed, and both rotors at the powerhouse were damaged. Electricity generation ceased and has not yet been restored.

In addition, while key GZIP infrastructure was completed, the irrigation infrastructure was delayed by more than 30 months.¹ USAID's implementer, the Government of Pakistan's Water and Power Development Authority (WAPDA), contributed to the delay by not making timely payments to its subcontractor, the Frontier Works Organization (FWO). Also, security problems hindered the project's progress. Despite

¹ The original estimated date of completion was September 30, 2013.

these delays, the third-party engineering firm monitoring the project reported that the critical GZIP infrastructure was completed in July 2016.²

During implementation, USAID added funding to the fixed-amount reimbursable agreement (FARA) it had with the Pakistani Government for GZIP, increasing the ceiling from \$40 million to \$51.5 million and defeating the cost-control purpose of the FARA.³

The mission also did not ensure that its implementer, WAPDA, complied with environmental protection steps. The mission did not verify that its implementer mitigated environmental risks outlined in GZIP's environmental assessment plan. USAID/Pakistan's contracted third-party monitor reported that not all borrow sites—sites from which construction material, such as sand or gravel, is taken for use as fill at another location excavated during the construction of the canals—were fully remediated. According to a WAPDA official, this work was delayed because WAPDA did not have the funds to pay FWO. In addition, some landowners reportedly wanted to retain the pits created at the borrow sites for storing water and other uses.

Though this project is near completion, the mission has other ongoing and planned projects with WAPDA. Therefore, we made three recommendations to assist the mission with restoring power generation, recovering funds from WAPDA in excess of the fixed-amount reimbursable agreement, and complying with environmental requirements. USAID/Pakistan agreed with all three recommendations.

BACKGROUND

The Gomal Zam Multipurpose Dam Project has four major components: (1) a hydropower dam capable of generating 17.4 megawatts of electricity, (2) GZIP irrigation canals and a drainage system to provide water for 191,000 acres of agricultural production, (3) the Waran Canal, and (4) the Command Area Development Project for efficient water management, which is under a separate agreement. Photos of the GZIP dam and canals appear on the next page.

USAID/Pakistan signed a \$40 million FARA on January 7, 2011, with the Government of Pakistan through WAPDA to complete the Gomal Zam Dam Hydropower and Line Transmission Project. In 2013 USAID increased the agreement amount for the dam and hydropower components to \$45 million. On October 15, 2011, the Gomal Zam Multipurpose Dam Project was amended to add \$40 million for GZIP.

² This does not include the Waran Canal or the Command Area Development Project.

³ According to USAID's Automated Directives System (ADS) 317, "Procurement under Fixed Amount Reimbursement Agreement (FARA)," the grantee is reimbursed a fixed amount for the successful completion of specified activities in accordance with agreed upon specifications or standards. The amount of reimbursement is fixed in advance, based on reasonable cost estimates reviewed and approved by USAID. The grantee is responsible for any and all costs in excess of the fixed amount.



The barrage at the mouth of the dam diverts water to the main canal.



The main canal carries water to the surrounding areas.

Photos: OIG (November 25, 2015)

The following table shows the funding activity for the Gomal Zam Dam and Irrigation Project.

Initial Funding and Key Modifications for Gomal Zam Dam and Irrigation Project

No.	Date	Action	Amount (millions)
1	January 7, 2011	Fund completion of Gomal Zam Dam	\$40
2	October 15, 2011	Fund GZIP	40
3	July 30, 2012	Fund Waran Canal	12
4	September 12, 2012	Correct Waran Canal execution date	0
5	March 15, 2013	Provide more funding for Gomal Zam Dam	5
6	September 12, 2013	Extend GZIP end date to 6/30/2014	0
7	June 24, 2014	Extend GZIP end date to 12/31/14	0
8	June 8, 2015	Provide more funding for GZIP and extend end date to 3/31/16	11.52
9	September 21, 2015	Provide more funding for Waran Canal and extend end date to 12/31/16	8.16
Total			116.68

Source: Project implementation modification letters and reports from USAID’s accounting system.

GOMAL ZAM DAM DID NOT GENERATE ELECTRICITY AS ANTICIPATED, AND ELECTRICITY GENERATION CEASED

According to the project agreement, the project was to help Pakistan meet demand for electricity by adding 17.4 megawatts of generation capacity to the national power grid to produce 91 gigawatt hours of electricity annually. USAID’s total investment in the dam was \$45 million.

However, after the dam was completed and handed over to the Government of Pakistan in June 2013,⁴ Pakistani Government officials told us the dam’s hydroelectric component operated only sporadically and, even then, not always at full capacity. In October 2016, a protective system failed, and both rotors at the powerhouses were damaged (one of them shown on the next page). Electricity generation ceased at that time and had not been restored as of September 2017.

Electricity generation stopped because the powerhouse was damaged, reportedly by a power surge from the electrical switching station that the powerhouse feeds. The 132-kilovolt line between the powerhouse and this station frequently experiences voltage

⁴ In our “Audit of USAID/Pakistan’s Gomal Zam Multipurpose Dam Project,” G-391-12-008-P, August 24, 2012, we found that WAPDA’s work on the dam was delayed by 3 months. The mission took action on our recommendation addressing the delay, leading to this completion date.

fluctuations, and while mission officials indicated that the powerhouse did have a control to mitigate damage from fluctuations, this control failed and powerhouse components were damaged.

According to WAPDA officials, the current problems are related to defective works in the turbine generator units and the powerhouse of the dam. They contend these issues should have been addressed by Sino-Hydro (the subcontractor responsible for building the dam) before WAPDA assumed control of it. On the other hand, according to FWO, WAPDA did not assign properly qualified staff to operate the dam, reportedly because it had difficulty recruiting workers to the remote and insecure region where the dam is located.

While mission officials told us that these issues are internal to WAPDA and arose after completion of the USAID project agreement, they nonetheless deployed a monitoring contractor to assess the situation.

Considering USAID's significant prior investment in the dam and the reputational issues to the United States that are at stake, additional actions are warranted to define expectations for USAID engagement and advance the project's original goals. Specifically, USAID has not worked with WAPDA to develop and implement a plan to restore electricity generation and identify safeguards to prevent similar damage in the future.



This rotor from unit 2 is not operational. Photo: USAID monitoring and evaluation contractor AA Associates (October 2016 report)

AFTER A SIGNIFICANT DELAY, ALL FOUR IRRIGATION COMPONENTS WERE COMPLETED

After significant delays, GZIP components were certified complete by Halcrow Ltd., the engineering firm serving as the mission's third-party monitor for this project. The GZIP infrastructure components were (1) a diversion barrage, (2) a main distribution canal and secondary canals, (3) protection works to counter floods, and (4) drains to help reduce damage from floods. These projects were originally scheduled to be completed by September 30, 2013, but the target date was extended to March 31, 2016. The delays arose because of security problems in the area (including attempted kidnapping, firefights between extremists and security personnel, and the killing of staff working on the irrigation system) and because of WAPDA's failure to make timely payments to FWO, its subcontractor.

USAID DID NOT COMPLY WITH SELECTED AGREEMENT TERMS OR ENSURE REMEDIATION OF ALL ENVIRONMENTAL HAZARDS

The mission did not comply with the funding limit in the award agreement. It violated the intent of the award by adding \$11.5 million to the contract with WAPDA. In addition, according to the independent monitoring firm's report, neither the mission nor its implementing partner complied with the project's environmental mitigation and monitoring plan, which required remediation of environmental hazards posed by borrow sites.

USAID VIOLATED THE INTENT OF THE FARA BY ADDING \$11.5 MILLION TO THE AGREEMENT

The implementing mechanism that USAID used for GZIP was a FARA. Under a FARA, USAID reimburses the grantee on completion of an activity, a subactivity, or a quantifiable element of an activity. The amount of reimbursement is fixed in advance and based on cost estimates reviewed and approved by USAID.⁵ The grantee is responsible for any and all costs in excess of the fixed amount. This tool mitigates some of the risk USAID faces when utilizing host-government entities to implement activities. While FARAs sometimes have provisions allowing subsequent increases due to uncertainty, the FARA for GZIP did not. Nonetheless, the mission agreed to increase project funding to facilitate WAPDA's completion of the project and was unable to provide us documentation of earlier efforts to compel WAPDA to provide its required cost share.⁶

⁵ ADS 317.6.

⁶According to ADS 303.3.10, cost share refers to the resources a recipient contributes to the total cost of an agreement.

According to the mission, it added funding because WAPDA provided only \$3.66 million out of \$15.18 million that it had agreed to contribute as a cost share. Reportedly, WAPDA contributed less because it had already covered increased costs in other areas. These costs were outside the scope of its agreement with USAID, and included both security and labor and material price escalation. USAID/Pakistan added \$11.5 million to GZIP funding through an amendment to the agreement, bringing the total from \$40 million to \$51.5 million. The mission justified this increase to allow WAPDA to complete the overall project, thereby safeguarding the Agency's already substantial investment in the irrigation system, without further delay. However, the \$11.5 million increase violates the intent of the FARA. Moreover, published financial statements show WAPDA could have covered the increased cost: it reported profits of more than \$100 million in both fiscal year (FY) 2012 and FY 2013, \$200 million in FY 2014, and \$300 million in FY 2015.

The mission's provision of additional funds provides a disincentive for partners with a FARA to control costs. It sends the message that a fixed-cost agreement is not really fixed. Accordingly, USAID should send a strong message by recovering the \$11.5 million from WAPDA. Though this project is near completion, the mission has ongoing and planned projects with WAPDA.

USAID DID NOT ENSURE REMEDIATION OF ALL ENVIRONMENTAL HAZARDS

The GZIP agreement includes an environmental mitigation and monitoring plan, which was intended to mitigate known environmental risks related to soil erosion, loss of top soil, and improper disposal of excess soil. The mitigation measures for these risks included the leveling and recontouring of borrow sites. For example, leveling would require filling the pits with earth to stop soil erosion and prevent water and mud from accumulating in them, which can create traps hazardous to the local population. Remediation of these sites was included on the list of items to be completed by the end of the project.

However, neither the mission nor the implementing partner ensured that remediation was finished at all borrow sites as required by the environmental mitigation and monitoring plan. According to Halcrow's August 2016 monitoring report, remediation had not been completed at 123 borrow sites.

There were several reasons for borrow sites not being remediated in accordance with the plan. According to a WAPDA official, WAPDA was not making timely payments to its subcontractor, FWO, which was responsible for the construction of the main irrigation system. As a result FWO slowed work on the sites and did not remediate the open borrow pits promptly. Also according to the third-party monitoring report and mission officials, some landowners reportedly wanted to retain the pits created at the borrow sites for storing water (as shown on the next page) and doing other things, such as using it as a fish pond.



An untreated borrow pit poses a community hazard. Photo: USAID monitoring and evaluation contractor NESPAK (October 2013 report)

CONCLUSION

While USAID completed significant components of the overarching Gomal Zam Multipurpose Dam Project, the consistent generation of additional electricity is not happening. In addition, the mission's increase of the amount of a FARA for GZIP negates one of the critical aspects of such agreements: that a fixed investment is just that. Unfortunately, USAID is connected with the nonfunctioning hydroelectric dam. Until USAID exercises all management controls available to it to restore electricity generation and remediate the borrow pits, Pakistanis will not reap the benefits of the U.S. investment in these projects, USAID's reputation may be at risk, and the intended national security benefits of a working dam may be unrealized.

RECOMMENDATIONS

We recommend that USAID/Pakistan take the following actions:

1. Implement a plan to work with executive management at the Water and Power Development Authority to expeditiously resolve the critical issues limiting power generation by the Gomal Zam Dam.
2. Recover from the Water and Power Development Authority the \$11.5 million increase in the fixed-amount reimbursable agreement for the Gomal Zam Irrigation Project.
3. Require the Water and Power Development Authority to remediate borrow sites as required by the project environmental mitigation and monitoring plan.

OIG RESPONSE TO AGENCY COMMENTS

We provided our draft report to USAID on November 2, 2017, and on December 20, 2017, received its response, which is included as appendix B.

The report included three recommendations. We acknowledge management decisions on all of them. We consider all three recommendations resolved but open pending completion of planned activities by June 30, 2018, for recommendation 3 and by December 31, 2018, for recommendations 1 and 2.

APPENDIX A. SCOPE AND METHODOLOGY

We conducted our work from September 2015 through November 2017, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The objectives of the audit were to assess whether (1) the hydroelectric component of the Gomal Zam Multipurpose Dam Project was completed and generating the anticipated electricity, (2) GZIP was on track to complete infrastructure required to support the overarching Gomal Zam Multipurpose Dam Project, and (3) USAID/Pakistan and its implementing partner complied with selected USAID requirements and agreement terms.

The audit did not include testing implementation of the Waran Canal and the Gomal Zam Command Area Development Project, which are both key parts of the Gomal Zam Multipurpose Dam Project. USAID and the Provincial Government of Khyber Pakhtunkhwa signed the activity agreement on March 18, 2015, and the Command Area Development Project was scheduled to be completed in late 2017.

The audit covered the period from the project's inception, October 15, 2011, through December 31, 2015. We conducted the audit fieldwork from September 29, 2015, to December 16, 2016, at USAID/Pakistan's office in Islamabad. We conducted site visits in November 2015 in Waziristan and met with local stakeholders including WAPDA, FWO, FWO's subcontractor (Areaa), and local farmers.

In planning and performing the audit, the audit team assessed the significant internal controls used by the mission to manage the project and ensure adequate oversight of activities. Specifically, to assess the mission's monitoring of project activities, including the accuracy of its reporting on project progress, we reviewed the following:

- Activity agreement and subsequent amendments between USAID and WAPDA
- Schedules for milestones or benchmarks completed
- USAID/Pakistan's own portfolio review
- Third-party monitoring reports
- Program managers' site visits and quarterly reports
- USAID/Pakistan's Federal Manager's Financial Integrity Act of 1982 reports for 2013 to 2015
- Certifications and Management Control Review Committee reports regarding the mission's self-identified weaknesses for FYs 2014 to 2015

We obtained and reviewed additional types of evidence. This included original documents from mission files, electronic documents provided by the mission and from the accounting system, oral and written responses to auditor questions, and other pertinent reports and information related to the Gomal Zam Multipurpose Dam's hydroelectricity and irrigation components.

To answer the audit objective, we obtained an understanding of the project by reviewing program documents and interviewing officials from the mission, WAPDA, and the subcontractors. Using our understanding, we assessed risks and identified controls designed and implemented to ensure that the program meets its objectives. We reviewed controls over information systems used by the mission to collect and process program data. In addition, we assessed internal controls and audit risk.

In answering the audit objective, we considered, but did not rely extensively on, computer-processed data. We relied instead on evidence from interviews, document reviews, questionnaires, and site visits. Since we judgmentally selected sites, the results are limited to selected sites and cannot be projected to all of the project's target communities. However, we believe our substantive testing was sufficient to support the audit's findings.

To determine the actual progress toward the completion of irrigation component activities specified in the agreement, we verified the underlying data presented in the progress reports and relied on by the mission. We also conducted fieldwork at WAPDA's office in Dera Ismail Khan and performed a site visit to GZIP's Command Area to determine whether the irrigation component work had progressed in accordance with the milestones listed in the agreement. During fieldwork we confirmed reported progress, compared actual achievements to what was planned, and identified possible challenges to project objectives. The data collected during fieldwork was analyzed to draw an overall conclusion and answer the audit objective.

We also reviewed the measures put in place by the mission to provide reasonable assurance that a project meets its objectives, while considering cost-effectiveness and efficiency. This included a review of the independent engineering assessment reports; USAID/Pakistan's cost realism memo on cost escalation; and the third-party cost verification report.

APPENDIX B. AGENCY COMMENTS



USAID
FROM THE AMERICAN PEOPLE

PAKISTAN

MEMORANDUM

Date	December 5, 2017
To	Matthew Rathgeber - OIG Director (RIG/Manila)
From	Jerry P. Bisson - Mission Director, USAID/Pakistan /s/
Subject	Management Decision made in the Audit of USAID/Pakistan's Gomal Zam Multipurpose Dam Project
Reference	Audit Report No. G-391-18-001-P dated 11/02/2017

Please find below management decisions on the three recommendations made in the subject audit report.

Recommendation No. 1

Implement a plan to work with executive management at the Water and Power Development Authority (WAPDA) to expeditiously resolve the critical issues limiting power generation by the Gomal Zam Dam.

Mission management concurs with the recommendation.

Management Decision

The Mission will engage with WAPDA to advocate for the need to resolve issues limiting power generation at the Gomal Zam Dam as soon as possible. The Mission will strive to reach agreement with WAPDA on a plan to resolve power generation issues by March 31, 2018, to be implemented by December 31, 2018.

The Mission notes that the following OIG statement on page 5 of the report is misleading: "While mission officials told us these [power generation] issues are internal to WAPDA and arose after completion of the USAID project agreement, they nonetheless opened the door to renewed USAID engagement by deploying a monitoring contractor to assess the situation."

Mission and Agency practice is that USAID and its monitoring and verification contractors have access to project sites to verify project implementation and effectiveness. As part of a working bilateral relationship with the Government of Pakistan, USAID continued monitoring the results of the Gomal Zam Multipurpose Dam, including the power generation component. Under the bilateral assistance agreement, the Pakistan Enhanced Partnership Agreement (PEPA) Section

B.5. (j), the Mission is provided "*the opportunity at all reasonable times to audit or inspect activities financed under Agreement*". The Mission does not believe that having a monitoring contractor inspect and evaluate the status of USAID activities after completion of an activity constitutes a suggestion of renewed engagement. Such monitoring and follow-up are vital to ensuring the success of USAID activities in Pakistan.

In view of above, we request OIG's acknowledgment that a management decision has been reached.

Recommendation No. 2

Recover from the Water and Power Development Authority the \$11.5 million increase in the fixed-amount reimbursable agreement for the Gomal Zam Irrigation Project.

Mission management concurs with the recommendation.

Management Decision

The original milestone cost share for the Gomal Zam Irrigation Project was fixed at \$40 million and \$15 million for USAID and GOP respectively in the Activity Agreement of 2011. The project was planned to be completed by September 2013 but due to security challenges was extended to July 2016. During this period, the total cost of the project increased from \$55 million to \$96 million. The sub-contractor stopped work in 2014 due to the lack of funding from WAPDA, which prompted a request for additional financial assistance from USAID in January, 2014.

USAID, after thorough internal due diligence and an independent financial verification of the cost escalation of \$41 million, decided to fund only the outstanding GOP's milestone costs of \$11.52 million (28%) while leaving the \$29.48 million (72%) to be borne by WAPDA. The US Ambassador signed a memo to concur with the decision to provide additional funding to the Gomal Zam irrigation project. We accepted that without adding this additional \$11.52 million, USAID's prior investment of \$85 million (\$45m for Gomal Zam dam and \$40m for irrigation component) would be jeopardized and the project would have faced significant delays; depriving the beneficiaries of project benefits in this highly strategic area, bordering the tribal area.

To recover the \$11.52 million, the Mission will seek WAPDA's cooperation for reducing USAID's contribution to another WAPDA implemented project, to which funds have already been committed. In doing so, USAID will endeavor to minimize potential damage to the bilateral relationship and to the project targeted for corrective action. The Mission plans recovery of funds to be completed by December 31, 2018.

In view of above, we request OIG's acknowledgment that a management decision has been reached.

Recommendation No. 3

Require the Water and Power Development Authority to remediate borrow sites as required by the project environmental mitigation and monitoring plan.

Mission management concurs with the recommendation.

Management Decision

USAID's independent monitoring contractor-Halcrow's report of August 5, 2016, confirms that the environmental compliance (technical and social) has been ensured. Section 6.2 of the report states that *"All the remaining borrow areas on main canal and distributaries have been verified by Halcrow and their restoration status was found satisfactory"*.

Halcrow also submitted a list of 123 borrow pits where landowners certified that their borrow pits have been rehabilitated by WAPDA. All these borrow pits are on private lands so their shape cannot be altered without the consent of landowners. Affidavits signed by landowners are the evidence that rehabilitation work has been completed to their satisfaction to avoid any future claims.

Based on this information, USAID believes that all 123 borrow pits were rehabilitated to the satisfaction of landowners.

The Mission is working with WAPDA and Halcrow to provide confirmation and evidence (photos with GPS, where possible, as there are military on-going operations against militants in the project area) to confirm that all borrow pits are remedied or arrangements are in place to ensure that borrow pits are remedied. Mission will complete the action on this recommendation by June 30, 2018.

In view of above, we request OIG's acknowledgment that a management decision has been reached.

APPENDIX C. MAJOR CONTRIBUTORS TO THIS REPORT

The following individuals made major contributions to this report: Matthew Rathgeber, Regional Inspector General/Manila; Nathan Lokos, country director; Van Nguyen, country director; David Clark, audit manager; Richard Moore, audit manager; Christine Nteireho, lead auditor; Andy Nguyen, auditor; and Nofil Ehsan, auditor.