

# Report and Recommendation of the President to the Board of Directors

Project Number: 48096-002 August 2019

Proposed Grant and Administration of Grant Islamic Republic of Afghanistan: Arghandab Integrated Water Resources Development Project

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Asian Development Bank

## **CURRENCY EQUIVALENTS**

(as of 14 July 2019)

Currency unit	-	afghani (AF)
AF1.00	=	\$0.0124545099
\$1.00	=	AF80.2922

#### **ABBREVIATIONS**

ADB	_	Asian Development Bank
ADF	_	Asian Development Fund
AIS	_	Arghandab Irrigation System
ASBA	_	Arghandab Sub-Basin Agency
EIA	_	environmental impact assessment
FCAS	_	fragile and conflict-affected situations
GAP	_	gender action plan
GDP	_	gross domestic product
ha	_	hectare
IFAD	_	International Fund for Agricultural Development
LAR	_	land acquisition and resettlement
LARF	_	land acquisition and resettlement framework
LARP	_	land acquisition and resettlement plan
MAIL	_	Ministry of Agriculture, Irrigation and Livestock
MCM	_	million cubic meters
MEW	_	Ministry of Energy and Water
MOF	_	Ministry of Finance
O&M	_	operation and maintenance
PAM	_	project administration manual
SPV	-	special purpose vehicle
ТА	-	technical assistance

#### NOTE

In this report, "\$" refers to United States dollars.

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## **PROJECT AT A GLANCE**

1	Basic Data		Projec	ct Number: 48096	3-002
••	Project Name	Arghandab Integrated Water Resources Development	Department	CWRD/CWER	002
		Project	/Division		
	Country	Afghanistan, Islamic Republic of	Executing Agency	Ministry of Finar	nce
	Borrower	Afghanistan, Islamic Republic of			
	Country Economic	https://www.adb.org/Documents/LinkedDocs/?id=4809			
	Indicators	6-002-CEI			
	Portfolio at a Glance	https://www.adb.org/Documents/LinkedDocs/?id=4809			
		6-002-PortAtaGlance			
2	Saatar	Subsector(s)		noing (¢ million)	
۷.	Agriculture natural	Agricultural production	ADD FIIId	48 45	
	resources and rural	Irrigation		25.97	
	development	Water-based natural resources management		274.36	
		Water based hatara resources management	Total	2/ 4.00	
			lotai	540.70	
3.	Operational Priorities		Climate Change Infor	mation	
	Addressing remaining p	poverty and reducing inequalities	Climate Change impac	t on the	High
	Accelerating progress in the second secon	n gender equality	Project		
	Tackling climate change	e, building climate and disaster resilience, and	ADB Financing		
	enhancing environmental	sustainability	Adaptation (\$ million)		131.74
	Promoting rural develor	oment and food security			
	Ctrong thening governor		Cofinancing		
	<ul> <li>Strengthening governation</li> </ul>	nce and institutional capacity	Adaptation (\$ million)		18.13
	Sustainable Developmen	t Coolo	Condor Equity and M	ainatrooming	
	SUStamable Developmen	il Goals	Effective gender main	streaming (EGM)	
	SDG 2.4		Enective gender main		•
	SDG 5.b				
	SDG 6.4, 6.5		Poverty Targeting		
	SDG 10.1		Geographic Targeting		1
	SDG 13.a				
1	Rick Categorization:	Complex			
4.					
5.	Safeguard Categorizatio	n Environment: A involuntary Resettlem	ent: A Indigenous Pe	opies: C	
6.	Financing				
	Modality and Sources		Amount (\$ million)	1	
	ADB			348.78	
	Sovereign Grant proje	ects: Asian Development Fund		348.78	
	Cofinancing			40.00	
	IFAD Grants - Grant r	projects (Partial ADB Administration)		40.00	
	World Bank Grant (no	t ADB-administered)		230.00	
1				230.00	
	Counterpart			14.26	
	Beneticiaries			10.00	
	Government			4.26	
	Total (excl	uding World Bank cofinancing)		403.04	
	Currency of ADB Financ	ing: US Dollar			



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## I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed grant to the Islamic Republic of Afghanistan for the Arghandab Integrated Water Resources Development Project. The report also describes the proposed administration of a grant to be provided by the International Fund for Agricultural Development (IFAD) for the Arghandab Integrated Water Resources Development Project, and if the Board approves the proposed grant, I, acting under the authority delegated to me by the Board, approve the administration of the IFAD grant.

2. Water availability in Afghanistan is highly seasonal and erratic, with frequent and worsening droughts affecting agriculture, living standards, and the local economy. Improved reliability of irrigated water supply is crucial to enable the expansion of high value cropping enterprises and associated activities. The project will improve the availability and management of water resources in the Arghandab basin in Kandahar province by (i) increasing the storage capacity of the Dahla Dam by raising its height, (ii) increasing the reliability of irrigation water supplies downstream of the dam, (iii) improving agriculture water productivity by providing onfarm support to farmers to improve crop production, and (iv) strengthening institutions in water resource management. Additional benefits associated with raising the dam include hydropower generation, to be undertaken by the private sector; and urban and industrial water supply to Kandahar City and its surroundings, to be undertaken by World Bank.

### II. THE PROJECT

### A. Rationale

3. Afghanistan is a conflict-affected state and one of the least-developed countries in the world. In 2016, its poverty rate was 55%, while 44.6% of its inhabitants were considered food insecure.<sup>1</sup> In 2018, the average per capita gross domestic product (GDP) was estimated at \$1,951 in current US dollars, ranking 202<sup>nd</sup> out of 217 economies in terms of GDP according to the World Bank.<sup>2</sup> Agriculture is Afghanistan's major source of livelihood, employing 62.2% of the national workforce of 10.9 million people in 2017 and contributing 21.1% of national GDP, with sector value addition of \$4.1 billion in 2016.<sup>3</sup> However, crop yields are below the world average; the average wheat yield in 2017 was 2.0 tons per hectare (ha), compared with a world average of 3.5 tons per ha.<sup>4</sup> Within agriculture, horticulture accounts for 34% of sector GDP. The diverse geographical and climatic conditions of Kandahar Province enable a wide range of crops to be produced at different times of the year, including apricots, pomegranates, grapes and cereal crops such as wheat. While horticulture provides a comparative advantage in terms of revenue for farmers, it requires sufficient availability and reliability of irrigation water.

4. **Water resources.** Afghanistan is a dry country with low precipitation: the average annual precipitation in Kandahar is 176 millimeters. Limited access to reliable irrigation water is a key constraint to agricultural productivity, besides low-quality inputs and traditional agricultural practices. High summer temperatures, low humidity, and lack of rainfall between April and November mean that without irrigation, few crops can produce profitable yields. The Dahla Dam,

<sup>&</sup>lt;sup>1</sup> Government of Afghanistan, Central Statistics Organization. 2017. *Afghanistan Living Conditions Survey (2016–2017*). Kabul.

<sup>&</sup>lt;sup>2</sup> World Bank. <u>World Development Indicators</u> (accessed 2 April 2019).

<sup>&</sup>lt;sup>3</sup> The Global Economy.com. <u>Afghanistan: GDP Share of Agriculture</u> (accessed 2 April 2019).

<sup>&</sup>lt;sup>4</sup> Food and Agriculture Organization of the United Nations. <u>Food and Agriculture Data</u> (accessed 5 June 2019).

constructed in 1952, is the second largest dam in Afghanistan with a height of 55 meters and a crest length of 535 meters.<sup>5</sup> It is in the Shah Wali Kot District of Kandahar Province in Afghanistan, about 40 kilometers north east of the provincial capital Kandahar. Its design capacity of 478 million cubic meters (MCM) of water provides irrigation water to the downstream Arghandab Irrigation System (AIS), which delivers water to 55 community irrigation schemes, and 65 riparian community irrigation schemes, covering five districts of Kandahar Province including Kandahar City. Dahla Dam does not supply water to downstream urban communities, and its hydropower potential has not been developed.

5. The Dahla Dam reservoir stores and controls irregular and short duration snowmelt flow from the Hindu Kush mountains. However, the reservoir has lost 40% of its storage capacity because of siltation, and its ability to provide regulated downstream flow has been seriously constrained. This has resulted in (i) reduction in cropped area, with only 47% of the command area being regularly irrigated; (ii) expansion constraints for high value cropping; (iii) increased reliance on groundwater for more reliable irrigation water supplies impacting the water table and the cost of pumping which is borne by farmers; and (iv) cropping patterns which are biased to winter and forage crops of lower value cereal to reduce risk from water shortage. Lack of water storage regulation also increases the risk of flood events.

6. The AIS has also suffered deterioration, reducing water conveyance efficiency and losing water distribution control. Among farmers, there is limited awareness and low adoption of water-efficient on-farm technologies such as laser levelling and drip irrigation, contributing to low yields and unproductive use of limited water resources. Current yields of irrigated crops in the project area average 30% of good agricultural practice.

7. **Climate change impacts.** Current climate change models indicate significant warming across Afghan provinces, and decreased precipitation, particularly spring rainfall.<sup>6</sup> Increased drought frequency, extreme weather events, and a raise in the ambient Afghanistan climatic temperature by 4°C - 6°C are predicted by 2070, further highlighting the need for improved water resources management, including improving storage capacities.<sup>7</sup> Among Afghanistan's key climate change adaptation priorities are: (a) rehabilitating small- to large-scale water resources infrastructure, (b) increasing irrigated agricultural land area, (c) strengthening hydrological and meteorological monitoring networks, and (d) improving watershed management.<sup>8</sup> Ahead of project formulation, the Asian Development Bank (ADB) undertook a climate change assessment for agriculture and water resources, and consulted with key government stakeholders including the Ministry of Energy and Water (MEW) and the Ministry of Agriculture, Irrigation and Livestock (MAIL) on adaptation investment needs. ADB identified multi-purpose dams with climate-resilient irrigation, hydropower, and water resources management as priority project investments to mitigate risks associated with a changing climate (e.g. drought and floods).<sup>9</sup>

8. The Arghandab Sub-Basin Agency (ASBA) under MEW handles the management of river flows and operation of the Dahla Dam, and management of the AIS main canal system. Community irrigation schemes are managed by *mirabs* (community-assigned water bailiffs) for

<sup>&</sup>lt;sup>5</sup> Six saddle dams have been built in the periphery of the dam, which together measure 2,040 meters.

<sup>&</sup>lt;sup>6</sup> M. Savage et al. 2009. *Socio-Economic Impacts of Climate Change in Afghanistan.* Stockholm: Stockholm Environment Institute.

<sup>&</sup>lt;sup>7</sup> Climate Risk and Vulnerability Assessment (accessible from the list of linked documents in Appendix 2).

<sup>&</sup>lt;sup>8</sup> Government of Afghanistan. 2015. Intended Nationally Determined Contribution. Submission to the United Nations Framework Convention on Climate Change. Kabul.

<sup>&</sup>lt;sup>9</sup> ADB. 2016. *Economics of Climate Change in Central and West Asia – Adaptation Component: Final Report.* Consultant's Report. Manila (TA 8119-REG).

the various subdivisions and individual farms within the community irrigation schemes. The government recognizes the need for effective operating capacity for the Dahla Dam and the AIS. To improve AIS management, it intends to establish two special purpose vehicles (SPVs) for water delivery services and revenue collection, one for Dahla Dam operations and the other for AIS operations, to be developed by the project for implementation by MEW. This requires restructuring support and capacity building, including provision of suitable equipment for infrastructure maintenance. MEW also has limited capacity to forecast water availability and coordinate delivery to meet irrigation demand. Strengthening capacity and regulatory development will enable improved management of the AIS and increased reliability of irrigation water to farmers' fields.

9. By increasing the storage capacity of the Dahla Dam and improving its operations, combined with modernization and improved management of the AIS and farmers' stronger capacity and skills for more productive agriculture, the area under irrigation is expected to expand from an average of 54,000 ha to 65,000–81,300 ha, with a maximum of 115,00 ha, by 2026, depending on the dam storage and associated flow releases.<sup>10</sup> Increased storage capacity will also provide water for municipal supply to Kandahar City, hydropower and environmental flows for the Arghandab River.

10. About two-thirds of employed women in Afghanistan are engaged in agriculture, mainly in horticulture, livestock raising, and agro-processing activities. Cultural restrictions limit women's mobility, and sex segregation curbs access to inputs and agriculture extension services. Very few women own land or have water rights, which further impedes their ability to contribute to improved land and water management. The project will build the capacity of female agriculture extension workers to access female farmers, provide scholarships to female government officers for master of science degrees in integrated water resources management, and provide female farmers with grants for improving agricultural productivity and economic opportunities.

11. **Enabling policy environment.** The High Council for Land and Water is responsible for coordinating water-related tasks of national institutions, recommending development plans and strategies for cabinet approval; recommending drafted legislation and regulations for approval; monitoring the implementation of plans by line ministries; resolving water-related disputes between ministries; and ensuring compliance with the Water Law, 2009 by relevant ministries and agencies. The Water Law states that "water is free," which has constrained progression to implement water delivery service charges and, therefore, a sustainable budget for operation and maintenance (O&M). Not contradicting this principle, amendments to the Water Law explicitly allowing for the charging of water delivery services has been agreed by the Office of the President, and legislative changes are in motion.

12. **Government strategies.** Government policy for productive water resources is outlined in the Strategic Policy Framework for the Water Sector, which provides directions for the water sector in Afghanistan.<sup>11</sup> The Afghanistan National Peace and Development Framework, 2017–2021 supports increased jobs and GDP growth through improved management and use of water resources.<sup>12</sup> Other key policies are the National Comprehensive Agricultural Development Priority

<sup>&</sup>lt;sup>10</sup> The agricultural (and urban) demand is highest in the months of June to August, and irrigation flow varies according to availability and crop water demands.

<sup>&</sup>lt;sup>11</sup> Government of Afghanistan. 2004. A Strategic Policy Framework for the Water Sector. Kabul.

<sup>&</sup>lt;sup>12</sup> Government of Afghanistan. 2016. Afghanistan National Peace and Development Framework (ANDPF), 2017 to 2021. Kabul.

Program<sup>13</sup> and the draft National Irrigation Policy.<sup>14</sup> These highlight critical issues for the sector, including (i) land and water productivity in irrigated agriculture not reaching its potential; (ii) weak irrigation management institutions (government and community-based); (iii) constrained public and private stakeholder capacity; and (iv) legal framework governing irrigation requiring updates to further clarify mandates, functions, and responsibilities.

13. The \$1.1 billion National Water and Natural Resources Development Program (2010–2013, but continuing) targets to improve access to irrigation, and to establish and strengthen water basin agencies. The National Irrigation Program (2016–2025), with an investment requirement estimated at \$1.5 billion, aims to improve and rehabilitate irrigation services, enhance agricultural extension services, and improve on-farm water management and O&M.

14. Since 1966, ADB has invested about \$545 million in water resources, mainly for irrigation. ADB operations have resulted in 140,000 ha of improved irrigated land, with more than 225,000 ha under development. Key areas of assistance in ADB's country operations business plan, 2019–2021 for Afghanistan are irrigation and water resources, agriculture market infrastructure, value chain development, integrated water resources management, institutional strengthening and reforms, and increased participation of women in agriculture.<sup>15</sup>

15. ADB has financed the Western Basins Water Resources Management Project,<sup>16</sup> the Agriculture Market Infrastructure Project,<sup>17</sup> the Water Resources Development Investment Program,<sup>18</sup> the Community-Based Irrigation Rehabilitation and Development,<sup>19</sup> the Northern Flood-Damaged Infrastructure Emergency Rehabilitation Project,<sup>20</sup> the Panj-Amu River Basin Sector Project,<sup>21</sup> the Horticulture Value Chain Development Sector Project,<sup>22</sup> and regional technical assistance (TA) for Strengthening Integrated Water Resources Management in Mountainous River Basins.<sup>23</sup> Lessons from these interventions highlight the need to integrate approaches to water resources allocation between competing users, increase water productivity, adapt to climate change and disaster risk impacts, strengthen and develop agricultural value chains for inclusive and equitable development impact, use national contractors to the extent possible, and conduct diligent ADB supervision of safeguards compliance.

<sup>&</sup>lt;sup>13</sup> Government of Afghanistan, MAIL. 2009. *National Comprehensive Agriculture Development Priority Program, 2016-2021*. Kabul.

<sup>&</sup>lt;sup>14</sup> Government of Afghanistan, MAIL. 2017. *National Irrigation Policy, 2017-2030* (draft). Kabul.

<sup>&</sup>lt;sup>15</sup> ADB. 2018. Country Operations Business Plan: Afghanistan, 2019–2021. Manila.

<sup>&</sup>lt;sup>16</sup> ADB. 2005. Report and Recommendation of the President to the Board of Directors: Proposed Loan and Asian Development Fund Grant to the Islamic Republic of Afghanistan for the Western Basins Water Resources Management Project. Manila.

<sup>&</sup>lt;sup>17</sup> ADB. 2008. Report and Recommendation of the President to the Board of Directors: Proposed Asian Development Fund Grant to the Islamic Republic of Afghanistan for the Agriculture Market Infrastructure Project. Manila.

<sup>&</sup>lt;sup>18</sup> ADB. 2009. Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Administration of Grant and Cofinancing to the Islamic Republic of Afghanistan for the Water Resources Development Investment Program. Manila.

<sup>&</sup>lt;sup>19</sup> ADB. 2012. Grant Assistance Report: Proposed Grant Assistance to the Islamic Republic of Afghanistan for Community-Based Irrigation Rehabilitation and Development. Manila.

<sup>&</sup>lt;sup>20</sup> ADB. 2014. Report and Recommendation of the President to the Board of Directors: Proposed Grants and Administration of Grant to the Islamic Republic of Afghanistan for the Northern Flood-Damaged Infrastructure Emergency Rehabilitation Recovery Project. Manila.

<sup>&</sup>lt;sup>21</sup> ADB. 2016. Report and Recommendation of the President to the Board of Directors: Proposed Grant and Administration of Grant to the Islamic Republic of Afghanistan for the Panj-Amu River Basin Sector Project. Manila.

<sup>&</sup>lt;sup>22</sup> ADB. 2018. Report and Recommendation of the President to the Board of Directors: Proposed Grant to the Islamic Republic of Afghanistan for the Horticulture Value Chain Development Sector Project. Manila.

<sup>&</sup>lt;sup>23</sup> ADB. <u>Regional: Strengthening Integrated Water Resources Management in Mountainous River Basins.</u>

16. Development partners have contributed to water resources and agriculture development and management, with irrigation and horticulture the main beneficiaries. The Arghandab Irrigation Rehabilitation Project (2008–2012, financed by the Canadian International Development Agency)<sup>24</sup> improved irrigation in about 30,000 ha, and cleared mines around the Dahla Dam.<sup>25</sup> Ongoing relevant projects include the Support to National Priority Programme 2,<sup>26</sup> and Community Livestock and Agriculture Project,<sup>27</sup> both financed by IFAD, and the National Horticulture and Livestock Productivity Project financed by the World Bank.<sup>28</sup>

17. The project is consistent with ADB's country partnership strategy, 2017–2021,<sup>29</sup> as it will develop agriculture and water resources in support of the government's strategic priorities, and is included in ADB's country operations business plan, 2019–2021 (footnote 15). The project is aligned with the objectives of ADB's Strategy 2030 through the operational priority on promoting rural development and food security, and the guiding principles of promoting innovative technology and delivering integrated solutions.<sup>30</sup> It is also aligned with ADB's Operational Plan for Agriculture and Natural Resources, 2015–2020<sup>31</sup> and Water Operational Plan, 2011–2020.<sup>32</sup>

18. **Fragile and Conflict Affected Situations**. Project preparation adopted an approach that is sensitive to fragile and conflict-affected situations (FCAS). During design planning, it was essential to (i) conduct meaningful local consultations to the extent permitted by prevailing security restrictions, to ensure that local voices were heard and considered; and (ii) take an integrated approach to water resources development so that conflicts over water would be minimized and all segments of the community would, to the extent possible, benefit. Implementation arrangements needed to (i) place high priority on achieving fair and equitable resettlement of affected persons; (ii) design civil works contract packages to maximize opportunities for national, and preferably local contractors, in line with the Enhanced Project Delivery Approach Paper;<sup>33</sup> (iii) ensure extensive empowerment of farmer beneficiaries through community contracting and grant matching programs; and (iv) place significant efforts on effective communication by each implementing agency.

#### B. Project Description

19. The project is aligned with the following impact: jobs and GDP growth increased (footnote 12). The project will have the following outcome: management and use of water resources in the Arghandab River basin improved.<sup>34</sup> The project has four outputs.

## 20. **Output 1: Dahla Dam capacity increased.** This will be delivered through (i) civil works

<sup>&</sup>lt;sup>24</sup> In 2013, the Canadian International Development Agency merged with the Canadian Department of Foreign Affairs, Trade and Development.

<sup>&</sup>lt;sup>25</sup> Government of Canada. <u>Executive Summary - Arghandab Irrigation Rehabilitation Project</u> (accessed 2 April 2019).

<sup>&</sup>lt;sup>26</sup> IFAD. 2015. President's Report: Proposed Grant to the Islamic Republic of Afghanistan for the Support to National Priority Programme 2. Rome.

<sup>&</sup>lt;sup>27</sup> IFAD. 2012. President's Report: Proposed Grant to the Islamic Republic of Afghanistan for the Community Livestock and Agriculture Project. Rome.

<sup>&</sup>lt;sup>28</sup> World Bank. <u>Afghanistan: National Horticulture and Productivity Project</u> (accessed 2 April 2019).

<sup>&</sup>lt;sup>29</sup> ADB. 2017. Country Partnership Strategy: Afghanistan, 2017–2021. — Achieving Inclusive Growth in a Fragile and Conflict-Affected Situation. Manila.

<sup>&</sup>lt;sup>30</sup> ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific.* Manila.

<sup>&</sup>lt;sup>31</sup> ADB. 2015. Operational Plan for Agriculture and Natural Resources: Promoting Sustainable Food Security in Asia and the Pacific in 2015–2020. Manila.

<sup>&</sup>lt;sup>32</sup> ADB. 2011. Water Operational Plan, 2011–2020. Manila.

<sup>&</sup>lt;sup>33</sup> ADB. 2016. *Afghanistan: Enhanced Project Delivery Approach Paper.* Manila.

<sup>&</sup>lt;sup>34</sup> The design and monitoring framework is in Appendix 1.

to raise the main dam, six saddle dams, spillways and other associated structures, to increase the full reservoir level by 13.6 meters and the storage capacity from 288 to 782 MCM, and to install monitoring equipment; (ii) 9.6 kilometer road realignment to allow alignment above the new full reservoir water level; and (iii) capacity improvement in dam operation and management. During construction, works are planned to have limited or no effect on irrigation water supply. Construction planning will be coordinated by ASBA with contractors to execute as much of the works as possible during August–February, when there is minimum irrigation water demand. A recreational facility for families will be developed by ASBA to provide an area for community participation and women's inclusion. Increased dam capacity will reduce flood risks to downstream areas. Dam operation rules reflecting multiple water use requirements and O&M manuals will be developed under the project. The project will also provide training to dam operators to improve their capacity in timely and appropriate dam operation.

21. **Output 2: Reliability of irrigation water supply increased.** Reliable supply of irrigation water will be increased through irrigation infrastructure modernization, including by upgrading canals and structures, and introducing monitoring and control systems on the AIS and community-managed systems. Improved water ordering will allow water on demand to be introduced on the AIS. There are two key activities: (i) modernization of the AIS infrastructure and procurement of maintenance equipment for the ASBA so that the irrigation operating entity can ensure timely delivery of irrigation services to community systems; and (ii) support for village communities, including women, for improvement of community irrigation infrastructures through community contracting.

22. **Output 3: Agricultural water productivity improved.** The project will strengthen the capacity of farmers to improve farm management and will adopt climate-smart irrigation and agricultural technologies and practices to improve production and sustainability. This will be delivered by demonstrating innovative agricultural practices and investment options, including support for agricultural extension services; conducting on-farm demonstrations; providing training and advisory services to farmers; and conducting a grant-matching scheme to facilitate investment in technologies to improve water productivity.<sup>35</sup> Female farmers will have equitable access to agricultural extension services, training opportunities, technology transfer, and advisory services. Women will be trained as local resource persons, and separate training courses for female farmers will be arranged.

23. **Output 4: Capacity in water resource management and use strengthened.** The project will (i) support the development of policy, legislation, and regulatory options for a system of water entitlements and allocation to allow improved management of water resources and multipurpose dams, as well as the development of regulations and a business structure to charge fees for water delivery services to strengthen financial sustainability and improve water resources management, resulting in improved irrigation productivity; (ii) provide water resources management training to government staff, including women; and (iii) establish a national hydrological modeling platform for integrated water resources policy, planning, operation, and management to strengthen water resources management.

## C. Value Added by ADB

24. The project design has taken an integrated approach to water resources development. During project preparation, ADB conducted comprehensive technical analysis and due diligence

<sup>&</sup>lt;sup>35</sup> The grant-matching scheme is a simplified version of the grant-matching scheme used in the ADB-funded Horticulture Value Chain Development Sector Project currently under implementation (footnote 22).

on (i) the Dahla Dam raise: (ii) irrigation and agriculture development: (iii) urban water supply to Kandahar City and surrounding areas; and (iv) hydropower development, where hydropower is produced as a by-product of water releases. In addition to reliable irrigation water supply and improved agricultural productivities that will be achieved through the project, increasing the storage capacity of the Dahla Dam will allow the development of an urban water supply based on the reservoir, and raising the height of the dam wall will make hydroelectricity production viable to meet suppressed power demand in Kandahar. Given Asian Development Fund (ADF) grant resource limitations, in consultation with the Ministry of Finance (MOF), ADB shared relevant documents with the World Bank, which is now preparing a project to construct water supply infrastructure to urban and peri-urban Kandahar to improve water services, which is possible following the increase in reservoir storage being undertaken by the project.<sup>36</sup> In addition, relevant documents have been shared by the project team with ADB's Office of Public-Private Partnership for the hydropower development for structuring as a public-private partnership transaction.

25. The integrated solution is important to: (i) ensure that the project delivers widespread benefits to the different communities so that, in a dry environment with a fractured society, no community will feel disadvantaged or left out; (ii) deliver important development needs to Kandahar; and (iii) deliver an optimized and rationale economic outcome from the investment in increased water storage capacity. The project design advances the integration of improved water resources management, irrigation system management and water productivity at farm for improved irrigation farm profitability.

#### D. Summary Cost Estimates and Financing Plan

26. The project is estimated to cost \$403.04 million (Table 1). Detailed cost estimates by expenditure category and by financier are included in the project administration manual (PAM).<sup>37</sup> The major expenditure items are civil works, consulting services, and capacity development costs.

219.61
219.61
47.91
55.08
5.51
17.15
345.27
56.98
0.78
403.04
_

#### Table 1: Summary Cost Estimates (\$ million)

Note: Numbers may not sum precisely because of rounding. <sup>a</sup> Includes taxes and duties of \$16.1 million. Such amount does not represent an excessive share of the project cost.

b In mid-2019 prices as of June 2019.

Physical contingencies computed at 9.0% for civil works for output 1 except for design, management and supervision; and 13.4% for outputs 2-4 and project management except grants for on-farm productive technologies. Price contingencies computed at 1.5% for 2019-2020, and 1.6% onwards on foreign exchange costs; and 0.6% for 2019, 3.0% for 2020, and 4.0% for 2021 onwards on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of purchasing power parity exchange rate. The financial charges include 2.0% of administration charges for the grant from the International Fund for Agricultural

Development.

Source: Asian Development Bank estimates.

<sup>&</sup>lt;sup>36</sup> World Bank approval is scheduled for 31 March 2020, for a project amount of \$230 million.

<sup>&</sup>lt;sup>37</sup> Project Administration Manual (accessible from the list of linked documents in Appendix 2).

27. The government has requested a grant not exceeding \$348.78 million from ADB's Special Funds resources (ADF) to help finance the project.<sup>38</sup>

28. The summary financing plan is in Table 2.<sup>39</sup> ADB will finance the expenditures in relation to civil works, consultancies, goods, grant-matching sub-projects, security, non-land-related costs and land acquisition and resettlement plan (LARP) implementation, inclusive of all taxes. IFAD will cofinance, through a \$40.00 million grant, the rehabilitation of community irrigation systems and Kandahar sections of the Tarnak canal (output 2b), demonstration and upscaling of innovative agricultural on-farm practices (3), and water resources regulatory support (4). ADB will partially administer the IFAD funds and ADB and IFAD will finance separate expenditure items. Farmer beneficiaries will finance \$10.00 million of outputs 2 and 3 through cash payment. The government will contribute \$4.26 million in the form of office space and utilities for project implementation.

Table 2: Summary Financing Plan			
Source	Amount (\$ million)	Share of Total (%)	
Asian Development Bank			
Special Funds resources (Asian Development Fund grant)	348.78	86.5	
International Fund for Agricultural Development (grant) <sup>a</sup>	40.00	9.9	
Beneficiaries (farmers)	10.00	2.5	
Government of Afghanistan	4.26	1.1	
Total	403.04	100.0	

<sup>a</sup> The Asian Development Bank will partially administer the International Fund for Agricultural Development cofinancing, which includes administration fees and other charges as may be deducted pursuant to the cofinancing agreement.

Source: Asian Development Bank estimates.

29. Climate change adaptation is estimated to cost \$149.87 million, of which ADB will finance 88%.<sup>40</sup> The project adaptation components comprise (i) increasing the dam's storage capacity, (ii) improving irrigation and drainage services, and (iii) building capacity for climate-smart agriculture and water resources management. The ADF disaster risk reduction fund will support the government in strengthening its capacity to manage climate change-related risks, particularly those related to the management and use of its water resources. The support will complement the project's overall efforts to improve water availability and allocation and reduce water-related risks (e.g., droughts and floods).

#### E. Implementation Arrangements

30. The implementation arrangements are summarized in Table 3 and described in detail in the PAM (footnote 37).

31. The MOF will be the executing agency. MEW will be the implementing agency for (i) the Dahla dam raise and its initial operation under output 1, (ii) implementation of works in the AIS under output 2, and (iii) implementation of output 4 for strengthening capacity in water resources

<sup>&</sup>lt;sup>38</sup> Includes \$5 million from the ADF disaster risk reduction financing mechanism.

<sup>&</sup>lt;sup>39</sup> The World Bank plans to parallel cofinance the Kandahar urban water supply component. The hydropower station will be financed under a public–private partnership structure, with advisory services provided by ADB's Office of Public Private Partnership, with the transmission lines and electrical sub-station to be financed by the energy utility Da Afghanistan Breshna Sherkat using public sector resources. Both infrastructure developments are possible following the investment to project investment to raise Dahla dam full reservoir level and storage capacity.

<sup>&</sup>lt;sup>40</sup> Climate Change Assessment (accessible from the list of linked documents in Appendix 2).

management and use. The Ministry of Rural Rehabilitation and Development will implement (i) the Kandahar-Bamian highway road realignment above the new full reservoir level under output 1; and (ii) works in the community irrigation systems, including canals that pass through Kandahar City. MAIL will implement output 3 for investments to improve water productivity.

Aspects	Arrangements			
Implementation period	December 2019–November 2026			
Estimated completion date	30 November 2026			
Estimated grant closing date	31 May 2027			
Management				
(i) Oversight body	Project steering committee: MO (members)	F (chair), MEW, MAIL, MRRD,	security agencies	
(ii) Executing agency	MOF			
(iii) Key implementing agencies	MEW, MAIL, and MRRD			
(iv) Implementation units	MEW, CPMO in Kabul (24 staff), PIU in Kandahar (43 staff) MAIL, CPMO in Kabul (23 staff), PIU in Kandahar (20 staff) MBBD, regional program in Kabul (23 staff), PIU in Kandahar (37 staff)			
Procurement	Open competitive bidding	17 contracts (including lots)	\$235,470,000	
	Request for quotation (community contracting)	Multiple community contracts	\$65,115,687	
	Request for quotation (others)	Multiple contracts	\$7,101,620	
Consulting services	QCBS 90:10	3 contracts (443 international person- months; 1333 national person months)	\$32,300,000	
	CQS 1 contract (auditor) \$240,000			
	SSS 2 contracts (31 international person- months; 27 national person months			
	ICS 2 contracts (22 \$765,000 international person months)			
Retroactive financing and/or advance contracting	Withdrawal from the grant account may be made to finance eligible expenditures incurred under the project before the effective date, but not earlier than 12 months before the date of the special operations (Asian Development Fund) grant agreement, subject to a maximum amount equivalent to 20% of the grant amount. Advance recruitment actions will begin for three consultant contracts.			
Disbursement	The grant proceeds will be disbursed following ADB's <i>Loan Disbursement Handbook</i> (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB.			

Fable 3: Im	plementation	Arrangements
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ADB = Asian Development Bank; CPMO = central project management office; CQS = consultants' qualification selection; ICS = individual consultants selection; MAIL = Ministry of Agriculture, Irrigation and Livestock; MEW = Ministry of Energy and Water; MOF = Ministry of Finance; MRRD = Ministry of Rural Rehabilitation and Development; PIU = project implementation unit; QCBS = quality- and cost-based selection; SSS = single source selection. Source: ADB estimates.

#### III. DUE DILIGENCE

## A. Technical

32. Extensive due diligence was undertaken of the Dahla Dam structures (including the six saddle dams), reservoir catchment hydrology and reservoir bathymetry, road realignment (impacted by the dam raise), and the AIS and community irrigation infrastructure. The considerable prior design work undertaken by the United States Army Corps of Engineers on the Dahla Dam was carefully reviewed. In addition, a farmer survey to understand community needs

for improved irrigation management and water productivity was undertaken.

33. Various scenarios were modelled for different dam spillway height raise (from 9.1 to 13.6 meters) to assess feasibility and cost-benefits, including future climate change impacts. A 13.6-meter spillway height increase is the basis for the project design and cost estimates. This design addresses climate change impacts including: (i) coping with high, short-duration inflows that are forecast to be more frequent, without unplanned spills that may cause downstream floods; (ii) providing increased water storage and strengthening water resource management capacity to reduce drought impacts; (iii) improving dam safety; and (iv) increasing dam life with sufficient reservoir capacity for siltation effects.

34. Irrigation infrastructure and on-farm irrigation technologies have been designed to reduce conveyance and on-farm application losses. On-farm technologies including drip irrigation which has been pilot-tested under other investments in Afghanistan will be demonstrated and introduced to farmers on a cost-sharing (grant-matching) basis.

## B. Economic and Financial Viability

35. The economic analysis on the overall investment—(i) height raise for the Dahla Dam and six saddle dams (output 1), (ii) irrigation and agriculture development (outputs 2–4), (iii) improved water supply for Kandahar City (footnote 36), and (iv) Dahla Dam hydroelectric power development,<sup>41</sup>—followed ADB's Guidelines for the Economic Analysis of Projects.<sup>42</sup> Hence, the economic analysis included the project investments (i and ii), and the parallel investments (iii and iv). Results show that with a hurdle rate of 9%, the project is economically viable with a 15.7% economic internal rate of return in constant 2019 prices. Without raising Dahla Dam to store more water and investing in modern and climate-smart irrigated agriculture and improved systems for integrated water management, the lack of available water and low productivity from water will remain.

36. The project will enlarge the effective dam storage capacity to 782 MCM, or from 60% to 165% of the 1952 capacity, and 271% of the current effective storage capacity. It will improve irrigation system reliability and efficiency and on-farm water productivity, resulting in an expanded irrigated area, increased cropping intensity and yields, a shift to higher-value crops, higher productivity of scarce water and higher returns to farmers. Incremental crop production will displace imports and increase exports. The economic analysis identified improvement in the gross margins of six crop categories on two farm technological levels. The outputs from the significantly improved service level of the urban-rural water supply and hydropower resulted in an incremental economic benefit valued using the consumer surplus method.<sup>43</sup>

37. The project outputs were categorized as non-revenue generating and revenue generating. The dam and the AIS irrigation canal are presently non-revenue generating outputs. The incremental annual O&M costs of \$1.08 million for the dam, and \$0.55 million for the AIS will be funded through two SPVs for water delivery services and revenue collection, to be developed by the project for implementation by MEW. The incremental O&M costs for the 120 community irrigation systems is minimal and largely funded by farmers while annual O&M costs for on-farm

<sup>&</sup>lt;sup>41</sup> To be financed separately under a public–private partnership.

<sup>&</sup>lt;sup>42</sup> ADB. 2017. *Guidelines for the Economic Analysis of Projects*. Manila.

<sup>&</sup>lt;sup>43</sup> Consumer surplus is calculated using the equation  $CS = 0.5[P_E (\Delta Q)^2 / (e_d Q_1)]$  where  $P_E$  is the tariff rate,  $\Delta Q$  is incremental power production at 13.6-meter dam raise,  $e_d$  is the price elasticity of demand and  $Q_1$  is the existing consumption level. P. Choynowski. 2018. *Measuring Welfare Gains from Infrastructure Projects: Power, Road Transport and Water and Sanitation.* Ottawa.

technology investments would be funded by adopting farmers.

## C. Sustainability

38. To improve water resources management at basins, the project will help the government move to a system of water entitlements and allocation and the use of rule curves for the timing and operation of water releases from the Dahla Dam. For the first time in Afghanistan, dedicated environmental allocations and releases will be planned to help deliver environmental outcomes. Sustainable operations of the Dahla Dam and the AIS have been planned through two SPVs for water delivery services and revenue collection, one for Dahla Dam operations and the other for the AIS operations, to be developed by the project for implementation by MEW. Improved levels of qualified human resources have been built into the project, particularly through the funding of 120 part time student positions at the Kabul Polytechnic University for water resource managers to complete a master of science in integrated water resource management. With a project design focus on investments to improve irrigated farm profitability, irrigation farmers will have the financial resources to sustainably maintain community irrigation systems and on-farm technology investments.

## D. Governance

39. Implementation of civil works and other activities will follow relevant government requirements and ADB procedures for financial management and safeguards.<sup>44</sup> Three consultant packages are ready for advanced recruitment actions. An engineering, procurement and construction supervision consultant will take the current designs from the 70% completion stage to design ready and prepare the tender documents.

40. The overall financial management risk is *substantial*. The project management offices have fully functional finance sections with adequate financial management capacity and experience with ADB-funded projects. Their overall capacity continues to improve and the risk at project level is considered moderate. However, the assessments have identified risks related to the country's public financial management system in financial reporting and weak line ministries' internal audit which focus more on financial compliance rather than the adequacy and effectiveness of control environment. An action plan for further improvement is in the PAM (footnote 37).

41. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and the MOF. The specific policy requirements and supplementary measures are described in the PAM (footnote 37).

## E. Poverty, Social, and Gender

42. The project will provide a long-term sustainable solution to the acute shortage of water in the Arghandab sub-basin by increasing Dahla Dam's storage capacity, allowing for significantly improved irrigated agriculture. Separately, an urban water supply will be funded by the World Bank and hydropower will be installed and operated by the private sector. Each development will contribute to economic growth and poverty reduction. The project will also increase the population's resilience to droughts and floods. Irrigation modernization and climate-smart agriculture will stimulate growth of farmers' incomes and increase value addition and marketing

<sup>&</sup>lt;sup>44</sup> Throughout project design preparation, government representatives have been closely consulted and contributed valuable governance measures that have been incorporated in the project design.

activity. In most cases, full irrigation would not be feasible for several years in the absence of the project, causing widespread hardship and hunger and severely limiting agricultural production. In these circumstances, and where substantial areas of land can be brought back into production in 1–2 years, financial returns are likely to be high.

43. The key social issue to be addressed is the inefficient management and use of water resources; the impacts are vulnerability to climate change trends of reduced precipitation and higher temperatures, low agricultural productivity and low farm incomes, inability to generate jobs in agricultural value chains, and food insecurity in rural and urban populations.

44. The project will primarily benefit the population of 830,165 (2018) in Kandahar City and 1.25 million population in seven rural districts in Kandahar Province (as of 2018). Kandahar Province is among the top three provinces with a significant internal migration (6% per year) from three immediately surrounding districts whose residents move in search of security, jobs, and services. The three priority areas of preference of the surveyed population are security, provision of irrigation water, and marketing of agricultural products.

45. A gender action plan (GAP) has been prepared by ADB to include women in project activities and as beneficiaries of project outcomes.<sup>45</sup> The key actions of the GAP include conducting socially inclusive dissemination and consultation workshops with men and women on project scope and benefits; providing recreational areas at the Dahla Dam with gender design features, such as separate rest areas, eateries, and seating arrangements; training at least 21 female farmers as local resource persons; providing 300 farmers (30% women) with improved skills and climate-smart technologies in irrigated agricultural production by 2025; supporting 100 government staff, of whom 30% are women, in completing master of science degrees in integrated water resources management by 2025; and hiring gender specialists to support GAP monitoring and implementation.

46. An FCAS assessment was undertaken using the new FCAS risk management toolkit developed by ADB's Afghanistan Resident Mission.<sup>46</sup> An FCAS action plan, to be actioned during project implementation, is described in the PAM (footnote 37).

## F. Safeguards

47. In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguard categories are as follows.<sup>47</sup>

48. **Environment (category A).** Output 1 is classified *category A* for the environment because of anticipated irreversible, diverse, or unprecedented impacts from raising the full reservoir level by 13.6 meters. Buildings in several villages and several hectares of irrigable land surrounding the reservoir will be affected. Moreover, aquatic environments and habitats may also be affected in case environmental flow conditions are not accounted for at the downstream end. A draft environmental impact assessment (EIA) study was prepared by MEW and disclosed on the ADB website on 2 April 2019. The EIA presented a preliminary review of baseline environmental conditions, impacts, and risks. The project area has pockets of natural habitat. Some protected species of interest were observed during the environmental surveys undertaken in November 2018, but biodiversity screening and a critical habitat assessment are needed to gain sufficient

<sup>&</sup>lt;sup>45</sup> Gender Action Plan (accessible from the list of linked documents in Appendix 2).

<sup>&</sup>lt;sup>46</sup> Fragile and Conflict-Affected Situations Action Plan (accessible from the list of linked documents in Appendix 2).

<sup>&</sup>lt;sup>47</sup> ADB. <u>Safeguard Categories</u>.

information on how these species will be impacted by the project. Introducing water protection zones, including protective measures around the reservoir, is suggested to maintain water quality in the reservoir over the long run. Moreover, the environmental management plan includes monitoring activities to be conducted during construction and operational stage (monitoring of noise, dust, water quality, and ambient air quality). The EIA will be updated upon the completion of the detailed design and other studies on biodiversity, riverine ecology, and environmental flow management to further reinforce the assessment findings and recommended environmental management actions.

49. Outputs 2–3 are classified *category B* for environment. The initial environmental examination study prepared for outputs 2 and 3 assessed and described the environmental impacts. Potential site-specific impacts that may arise during construction include generation of dust from soil excavation and refilling; disturbance to residents and traffic by construction works; water availability; and occupational, community, health, and safety hazards. Some impacts may also arise during operations, including waste dumped in canals resulting in clogging, and water unavailability for downstream farmers. Appropriate avoidance, mitigation, and enhancement measures, and implementation of the environmental management plan, will help minimize the significance of the impacts.

50. Involuntary resettlement (category A). Land acquisition and resettlement (LAR) will be significant and extensive. Security constraints prevented resettlement surveys from being completed in the reservoir area, within the resource and time allocation under the transaction TA. High resolution satellite imagery taken in 2018 indicates that the reservoir (output 1) will inundate or partially inundate about 22 communities, physically displacing about 5,800 people from 596 households and permanently affecting their livelihoods. Displacement from this output will only occur following dam completion and subsequent inundation of the reservoir area. Multiple LARPs will be developed by MEW to provide compensation measures for lost assets and, equally important, to implement livelihood restoration and development plans over the life of the project for multiple communities. Comprehensive LARPs for reservoir resettled communities, with complex site selection and livelihood restoration processes, require 1-2 years of planning. A LARF<sup>48</sup> has been prepared by MEW to guide the LARP preparation process during the project implementation, according to the principles of SPS 2009. Irrigation and agriculture development (outputs 2 and 3) is expected to cause LAR impacts on 3,936 people from 492 households. A LARF has been prepared by MEW to guide the LARP preparation process during project implementation, following ADB's Safeguard Policy Statement. About \$27,797 million will be required for involuntary resettlement impact mitigation. Government-owned replacement land will be provided by the government, and non-land related expenditures for LARP implementation will be funded under the project in compliance with applicable requirements under the Operations Manual section on Safeguard Policy Statement and the ADB-approved resettlement planning documents.<sup>49</sup> The PAM (footnote 37) contains details to remind the government of the strict compliance requirements between safeguards and contract award.

51. External monitors will be engaged by the implementing agencies to report on LARP implementation, including livelihood restoration programs and grievances. Capacity building of implementing agencies in LAR will be provided through separate proposed TA.

52. Indigenous peoples (category C). The project is not expected to have impacts on

<sup>&</sup>lt;sup>48</sup> LARFs have been prepared as allowed for consideration in projects in conflict areas under ADB's Safeguards Policy Statement, 2009, Appendix 4, para 11.

<sup>&</sup>lt;sup>49</sup> ADB. 2013. Safeguard Policy Statement. *Operations Manual.* OM F1. Manila.

indigenous peoples. Ethnic groups live across Afghanistan, but none are considered indigenous peoples as defined by ADB's Safeguard Policy Statement for project operation purposes.

53. In line with the operational flexibility provided under ADB's Safeguard Policy Statement for conflict areas, resettlement frameworks have been prepared by MEW, and the EIA has been prepared and developed by MEW to the extent possible, given security limitations.

#### G. Summary of Risk Assessment and Risk Management Plan

54. Significant risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.<sup>50</sup>

Risks	Mitigation Measures
Dam safety is compromised by incorrect design or construction	A panel of experts (including international and national experts of various technical fields) will be recruited by MEW to review the detailed engineering and design and to monitor construction.
Lack of security for contractors and field staff prohibits freedom of movement	Multiple security risk mitigation measures have been considered during project preparation and are built into the project design. The integrated approach to water resources development design is critical, as it allows most communities in the project area to be project beneficiaries. The FCAS risk management tool kit was deployed during project design. As part of inclusive and strategic communication with local communities to increase local residents' ownership of the project, local residents and authorities were well-informed of the project's objectives and design during project processing. Consultation will be continued during project implementation. Resettlement planning has been carefully worked through with the relevant agencies. Contractors will be responsible for their own security arrangements, a measure that has proved successful in other projects. The project and contractors will employ and upskill locals, and community contracting works will be applied to minor civil works. A 7-year implementation period was planned to accommodate potential delays. Finally, project risk managers and security teams will work closely with local police and security senior personnel and community leaders.
Inadequate budget for O&M results in Dahla Dam and AIS asset deterioration	The government has committed to continuing the annual ASBA budget for staff and O&M for the Dahla Dam and the AIS canal network services. The government is also committed to regulatory reform (supported by the project) to enable water supply delivery charges, which will allow for sustainable revenue for O&M. Specific covenants are included in the grant agreement.

 Table 4: Summary of Risks and Mitigating Measures

AIS = Arghandab Irrigation System, ASBA = Arghandab Sub-Basin Agency, FCAS = fragile and conflict-affected situations, O&M = operation and maintenance. Source: Asian Development Bank.

## IV. ASSURANCES AND CONDITIONS

55. The government has assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, financial management, and disbursement as described in detail in the PAM and grant documents. The government has agreed with ADB on certain covenants for the project, which are set forth in the draft grant agreement. Additionally, no withdrawal shall be made for community contracting related to matching grants for investment technologies to improve water productivity until guidelines for evaluating subproject investment proposals have been prepared and are acceptable to ADB, and MAIL have trained the relevant project staff on the guidelines.

<sup>&</sup>lt;sup>50</sup> Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

### V. RECOMMENDATION

56. I am satisfied that the proposed grant would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the grant not exceeding \$348,780,000 to the Islamic Republic of Afghanistan, from ADB's Special Funds resources (Asian Development Fund), for the Arghandab Integrated Water Resources Development Project, on terms and conditions that are substantially in accordance with those set forth in the draft grant agreement presented to the Board.

Takehiko Nakao President

21 August 2019

## **DESIGN AND MONITORING FRAMEWORK**

Impact the Project is Aligned with: Jobs and gross domestic product growth increased (Afghanistan National Peace and Development Framework, 2017–2021). <sup>a</sup>				
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks	
Outcome Management and use of water resources in the Arghandab River basin improved	By 2027: a. Overall irrigation delivery efficiency increased to 36% (2019 baseline: 25%) <sup>b</sup>	a–b. Monitoring reports from DAIL in Kandahar Province	Security conditions affect operations of the dam or farming districts.	
	increased to 4 tons/ha (2019 baseline: 2 tons/ha)			
Outputs	By 2026:			
1. Dahla Dam capacity increased	1a. Dahla Dam spillway crest raised to 1,149.0 masl to increase the full reservoir level by 13.6 meters (2019 baseline: 1135.4 masl)	1a. Independent panel of experts' reviews, completion certificate and completion report	Land acquisition and resettlement issues cause delay to completion of civil works	
	1b. 9.6 km of Kandahar- Bamian highway realigned to be above 1,154 masl (2019 baseline: not applicable)	1b. MRRD PMO quarterly reports		
	1c. ASBA operating the Dahla Dam following the agreed rule curves and operating guidelines 100% of the time (2019 baseline: standard release schedules without rule curves)	1c. ASBA monthly dam operation reports, and ASBA annual planning reports on water storage and release		
2. Reliability of	By 2025:			
irrigation water supply increased	2a. 120 community irrigation systems modernized (2019 baseline: 0)	2a. Completion certificates and MAIL CPMO quarterly		
	2b. 115,000 ha of farmland under water-related infrastructure rehabilitated (2019 baseline: 0), RFI A <sup>c</sup>	2b. MAIL CPMO quarterly reports		
	2c. Water delivered in a timely manner to 95% of farmers 90% of the time (2019 baseline: 95% of farmers 25% of the time)	2c. O&M agreements signed by community councils, and surveys and feedback from farmers	Climate change, severe droughts and/or increased sediment inflows reduces the live storage of the reservoir	

Results Chain	Performance Indicators with Targets and	Data Sources and Reporting	Risks		
	Baselines	Mechanisms			
productivity improved	Ву 2025:				
	<ul> <li>3a. Number of farmers with improved knowledge who practice climate-smart technologies increased to 300, at least 30% of whom are women (2019 baseline:</li> <li>0) RFI B<sup>d</sup></li> </ul>	3a–b. MAIL CPMO quarterly reports			
	3b. 20 extension staff from MAIL trained to conduct farmer workshops on climate-smart irrigation (2019 baseline: 0)				
	3c. 70% of households reporting an increase in production (2019 baseline: to be determined)	3c. Annual monitoring survey			
4. Capacity in water resource management and use strengthened	4a. Law on water sector regulations proposed to policy makers for amendment by 2025 (2019 baseline: not amended)	4a. Gazette of new regulations	Political resistance delays the amendments.		
	4b. 100 government staff, 30% of whom are women, complete master of science degrees in integrated water resources management by 2026 (2019 baseline: 0)	4b. List of graduates from the Kabul Polytechnic University	Transfer of trained staff, inadequate and/or inefficient organizational structure, and lack of staff incentives lower the number of government staff with		
	4c. National hydrological monitoring and management platform established and used by ASBA to guide reservoir operations by 2021 (2019 baseline: not amended)	4c. MEW quarterly progress reports, training reports, and ASBA annual planning reports on water storage and release	master of science degrees.		
Key Activities with Milestones					
<ul> <li>1. Dahla dam capacity increased</li> <li>1.1 Undertake and complete resettlement (MEW) (Q4 2019–Q3 2024)</li> <li>1.2 Complete detailed design of recreation area, dam and dam safety training (MEW) (Q1 2020–Q4 2021)</li> <li>1.3 Conduct bidding, bid evaluation (MRRD and MEW) (Q2 2020–Q1 2024)</li> <li>1.4 Award contracts (MRRD and MEW) (Q1 2021–Q3 2024)</li> <li>1.5 Construct road realignment (MRRD) (Q1 2022–Q1 2023)</li> <li>1.6 Construct recreation area (MEW) (Q2 2020–Q2 2021)</li> <li>1.7 Raise main dam, intake tower, tunnel lining, trash rack (MEW) (Q1 2022–Q1 2025)</li> <li>1.8 Raise and extend saddle dams (MEW) (Q4 2021–Q3 2024)</li> </ul>					
1.9 Raise spillways (MEW) (Q1 2025–Q3 2026) 1.10 Install electrification along dam (MEW) (Q1 2022–Q3 2024) 1.11 Install instrumentation (MEW) (Q1 2022–Q3 2024)					

2. Reliability of irrigation water supply increased	
2.1 Undertake and complete resettlement on the AIS main canal (MEW) (Q2 2020-Q2 2021)	
2.2 Design and approve community irrigation sub-projects (MRRD) (Q4 2019–Q3 2021)	
2.3 Sign contracts with CDCs (MRRD) (Q1 2020–Q2 2022)	
2.4 CDCs construct irrigation works (MRRD) (Q1 2020-Q1 2023)	
2.5 Design and undertake AIS rehabilitation and modernization works (MEW) (Q3 2020–Q2 2024)	
2.6 Establish and equip the AIS works center (MEW) (Q3 2020–Q1 2021)	
3. Agricultural water productivity improved	
3.1 Design and implement agricultural extension and demonstrations (MAIL) (Q1 2020–Q3 2025)	
3.2 Train extension staff in climate smart agriculture (I	MAIL) (Q1 2020-Q3 2025)
3.3 Establish grant matching scheme administration (MAIL) (Q1–Q3 2020)	
3.4 Approve and implement grant matching sub-projects (MAIL) (Q4 2020–Q2 2026)	
3.5 Undertake feasibility study for pressurized drip irrigation supply (MAIL) (Q4 2020–Q1 2022)	
4. Capacity in water resources management and use strengthened	
4.1 Prepare and submit water regulation reform (MEW) (Q1 2020–Q2 2025)	
4.2 Conduct strategic water resources management training (MEW) (Q1 2020–Q2 2027)	
4.3 Establish national hydrological management platform (MEW) (Q1 2020–Q3 2022)	
Project Management Activities	
Recruit PMO and PMU staff (Q3 2019–Q4 2021)	
Recruit international consultants (Q3 2019–Q1 2020)	
Recruit national supervision consultants (Q3 2019–Q1	2020)
Establish PMPS (Q4 2019–Q1 2020)	
Becruit auditors ( $Q2-Q4\ 2020$ )	
Train village construction supervisors (Q1–Q3 2020)	
Monitor project activities (Q3 2020–Q3 2026)	
Prepare and execute a communication, consultation and participation plan (Q1 2020–Q3 2026)	
Submit PMPS monitoring reports regularly (Q2 2020–Q3 2026)	
Undertake project completion survey ( $Q42026-Q12027$ )	
Prepare project completion report (Q2 2027)	
Inputs	
Asian Development Bank:	\$348 78 million (Asian Development Fund grant)
International Fund for Agricultural Development:	\$40.00 million
Government of Afghanistan:	\$4.26 million
Beneficiaries contributions	\$10.00 million
Assumptions for Partner Financing	
The World Bank plans to parallel cofinance the Kandahar urban water supply component. The hydronower	
station will be financed under a public, private partnership structure with advisory services provided by	
ADB's Office of Public-Private Partnership, with the transmission lines and electrical substation to be	
financed by the energy utility De Afghenisten Breakness Charles and electrical substation to be	
infractuature developmente are pescible following the project investment to roise Dable dam full rescuerier	
Initiastructure developments are possible following the	project investment to raise Dania dam rui reservoir
ADB - Asian Development Bank: AIS - Arghandah Irrigation System: ASBA - Arghandah Sub-Basin Agency: CDC -	
community development council: CPMO – central project management office: DAIL – Department of Agriculture	
Irrigation and Livestock: ha – bectare: km – kilometer: MAIL – Ministry of Agriculture Irrigation and Livestock: masl –	
meter above sea level: MEW = Ministry of Energy and Water: MRRD = Ministry of Rural Rehabilitation and Development:	
O&M = operation and maintenance: PMMS = project monitoring and management system: PMO = project management	
office; PMU = project management unit; Q = quarter; RFI = results framework indicator.	
<sup>a</sup> Government of Afghanistan. 2016. Afghanistan National Peace and Development Framework (ANDPF), 2017–2021.	
Kabul.	
<sup>b</sup> Calculated as follows: 100% from dam; after river transport and diversion 65% x canal conveyance 55% x distribution	
/0% = efficiency to farm gate (25% in 2019)	

- <sup>c</sup> Contribution to the Asian Development Bank Results Framework RFI A: Land improved through irrigation, drainage, and/or flood management. Target 115,000 ha.
- <sup>d</sup> Contribution to the Asian Development Bank Results Framework RFI B: Operations supporting climate change mitigation and/or adaptation.

Source: Asian Development Bank.

### LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=48096-002-2

- 1. Grant Agreement
- 2. Sector Assessment (Summary): Agriculture, Natural Resources, and Rural Development
- 3. Project Administration Manual
- 4. Economic and Financial Analysis
- 5. Summary Poverty Reduction and Social Strategy
- 6. Risk Assessment and Risk Management Plan
- 7. Climate Change Assessment
- 8. Gender Action Plan
- 9. Environmental Impact Assessment
- 10. Initial Environmental Examination
- 11. Land Acquisition and Resettlement Framework: Output 1
- 12. Land Acquisition and Resettlement Framework: Outputs 2 and 3

#### **Supplementary Documents**

- 13. Detailed Economic and Financial Analysis
- 14. Arghandab River Basin Integrated Water Resources Management Study
- 15. Multisector Water Allocation Options Study
- 16. Strategic Procurement Planning
- 17. Climate Risk and Vulnerability Assessment
- 18. Fragile and Conflict-Affected Situations Action Plan