

The logo for the Asian Development Bank (ADB), consisting of the letters 'ADB' in a white serif font inside a black square.

# Technical Assistance Report

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Project Number: 54113-001  
Knowledge and Support Technical Assistance (KSTA)  
July 2020

## Nowcasting and Disasters: Impact-Based Forecasting and Socioeconomic Monitoring

This document is being disclosed to the public in accordance with ADB's Access to Information Policy.

Asian Development Bank



## ABBREVIATIONS

ADB	–	Asian Development Bank
DMC	–	developing member country
COVID-19	–	coronavirus disease
ERCD	–	Economic Research and Regional Cooperation Department
EROD	–	Office of the Chief Economist and Director General
ERMR	–	Macroeconomics Research Division
TA	–	technical assistance

## NOTE

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

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## KNOWLEDGE AND SUPPORT TECHNICAL ASSISTANCE AT A GLANCE

<b>1. Basic Data</b>		<b>Project Number:</b> 54113-001	
<b>Project Name</b>	Nowcasting and Disasters: Impact-Based Forecasting and Socioeconomic Monitoring	<b>Department/Division</b>	ERCD/EROD
<b>Nature of Activity</b>	Capacity Development, Research and Development	<b>Executing Agency</b>	Asian Development Bank
<b>Modality</b>	Regular		
<b>Country</b>	REG (All DMCs)		
<b>2. Sector</b>	<b>Subsector(s)</b>	<b>ADB Financing (\$ million)</b>	
		<b>Total</b>	<b>0.00</b>
<b>3. Operational Priorities</b>		<b>Climate Change Information</b>	
✓ Accelerating progress in gender equality		GHG Reductions (tons per annum)	0
✓ Tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability		Climate Change impact on the Project	Low
✓ Strengthening governance and institutional capacity		<b>ADB Financing</b>	
		Adaptation (\$ million)	0.00
		Mitigation (\$ million)	0.00
		<b>Cofinancing</b>	
		Adaptation (\$ million)	1.00
		Mitigation (\$ million)	0.00
<b>Sustainable Development Goals</b>		<b>Gender Equity and Mainstreaming</b>	
SDG 5.5		Some gender elements (SGE)	✓
SDG 13.a			
SDG 16.6		<b>Poverty Targeting</b>	
		General Intervention on Poverty	✓
<b>4. Risk Categorization</b>	Complex		
<b>5. Safeguard Categorization</b>	Safeguard Policy Statement does not apply		
<b>6. Financing</b>			
<b>Modality and Sources</b>		<b>Amount (\$ million)</b>	
<b>ADB</b>		<b>0.00</b>	
None		0.00	
<b>Cofinancing</b>		<b>2.00</b>	
Japan Fund for Poverty Reduction (Full ADB Administration)		2.00	
<b>Counterpart</b>		<b>0.00</b>	
None		0.00	
<b>Total</b>		<b>2.00</b>	
<b>Currency of ADB Financing:</b> US Dollar			





## I. INTRODUCTION

1. The knowledge and support technical assistance (TA) will establish a monitoring platform to assess in near-real time the economic impacts of disasters, and to trace social, environmental, and other indicators. Under this TA, the Economic Research and Regional Cooperation Department (ERCD), in collaboration with leading experts and data centers, will carry out research and impact assessments. ERCD will share methods and outputs in support of interested Asian Development Bank (ADB) regional members, and widely circulate technical papers, policy notes, research articles, and other knowledge products.

2. The TA aligns with ADB's Strategy 2030 operational priority 3 (tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability), and with operational priority 6 (strengthening governance and institutional capacity), by improving the capacity of the developing member countries (DMCs) to assess disaster impacts and socioeconomic performance, for example, by using satellite imagery or other digital technology for impact-based forecasting.<sup>1</sup> The TA also helps implement operational priority 2: accelerating progress in gender equality.<sup>2</sup> It aligns with the principles adopted at the 2019 G20 Meeting in Osaka, Japan, especially promoting resilience against disasters triggered by natural hazards and increasing support for actions and cooperation in climate adaptation and disaster risk reduction.<sup>3</sup> The proposed TA is in ERCD's annual work program.<sup>4</sup>

## II. ISSUES

3. Analysts and policy makers who want to assess the socioeconomic impacts of disasters, economic crises, and other extreme events, typically lack access to timely, current information. For example, the dearth of current data on the coronavirus disease (COVID-19) pandemic during the first weeks and months after its appearance—other than the recorded numbers of clinically confirmed cases and fatalities—limited the ability to assess the pandemic's impact. This increased uncertainty and the outbreak's socioeconomic costs stunted the effectiveness of early policy responses. The same is true of the lack of timely data on other disasters triggered by natural hazards, such as floods, droughts, and earthquakes, whose impacts are usually not assessed until long after the event, or remain entirely unknown. In normal times, ADB's DMCs often have limited capacity to monitor current economic activity because of underlying root problems (i) delayed or unavailable impact measures and macroeconomic and social indicators; (ii) impaired access to relevant sources of contemporaneous information about impacts, including satellite imagery and big data; and (iii) limited ability to adequately process and combine available sources and modeling techniques. Combined, these three problems exacerbate the core problem of insufficient current data, which limits DMCs' capacity to assess disaster impacts and socioeconomic performance in real time.

4. ADB has actively explored “nowcasting” solutions that facilitate timely policy interventions, especially for countries where gross domestic product and other core economic indicators

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<sup>1</sup> ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*. Manila; ADB. 2019. *Strategy 2030 Operational Plan for Priority 3: Tackling Climate Change, Building Climate and Disaster Resilience, and Enhancing Environmental Sustainability, 2019–2024*. Manila; and ADB. 2019. *Strategy 2030 Operational Plan for Priority 6: Strengthening Governance and Institutional Capacity, 2019–2024*. Manila.

<sup>2</sup> ADB. 2019. *Strategy 2030 Operational Plan for Priority 2: Accelerating Progress in Gender Equality*. Manila.

<sup>3</sup> G20. 2019. *G20 Principles for Quality Infrastructure Investment*. Annex Paper 1 to the G20 Osaka Leaders' Declaration. G20 Summit, Osaka, 28–29 June.

<sup>4</sup> [https://www.mofa.go.jp/policy/economy/g20\\_summit/osaka19/pdf/documents/en/annex\\_01.pdf](https://www.mofa.go.jp/policy/economy/g20_summit/osaka19/pdf/documents/en/annex_01.pdf)

<sup>4</sup> The TA first appeared in the business opportunities section of ADB's website on 20 April 2020.

become available only on a yearly basis. For example, ERCD's TA for Data for Development (Phase 2) aims to strengthen DMCs' national statistics offices capacity to produce official statistics with the use of innovative data sources; the TA for Deepening Understanding of Macroeconomic Fluctuations in DMCs for Improved Economic Assessment uses nowcasting tools to analyze business cycles and potential risks; and the TA for Supporting Knowledge Solutions in Central and West Asian Countries seeks to improve near-term forecasting in Central and West Asia Department countries, in collaboration with ERCD.<sup>5</sup> While ERCD applied previous and ongoing efforts to a few select countries only, they constitute a valuable basis for this TA to build on. The TA team will achieve such broader application by establishing a systematic data collection and monitoring platform to enable nowcasting during normal times and impact-based assessments and forecasting during and after disasters. In addition, the TA team will set up analytical frameworks to more accurately measure disaster impacts retrospectively, both as an added value by itself and to integrate the information available for contemporaneous impact assessment solutions. Finally, to jumpstart its capacities and activities toward assessing the risks and impacts of epidemics, the TA team will assimilate the findings by the TA for Regional Support to Address the Outbreak of Coronavirus Disease 2019 and Potential Outbreaks of Other Communicable Diseases, led by the Sustainable Development and Climate Change Department.<sup>6</sup> To absorb this and other such initiatives across ADB, the TA team will reach out during its initial stocktaking phase to all stakeholders through meetings and consultations, and will secure opportunities for cooperation and coordination.

5. Beyond ADB's own activities, the TA team will seek to study, assimilate, and cooperate with relevant nowcasting and disaster impact assessment methodologies and initiatives such as the post-disaster needs assessment championed by the World Bank, United Nations, and the European Union. Recent technological and methodological advances in weather and flood forecasting support nowcasting after the occurrence of specific natural hazards. Examples are early warning systems by countries' meteorological services, rapid impact mapping, and impact-based forecasting, such as the European Union Joint Research Center's European Flood Alert System, and the Harvard Humanitarian Initiative, which monitors human displacement and the broader social and humanitarian impacts of disasters. Also relevant are the systemic risk modeling approaches developed by the International Institute for Applied Systems Analysis, which apply a contagion model to study the cascading impacts of disasters triggered by natural hazards or financial stressors. Further examples are propagation studies of economic shocks from natural hazards through supply chain networks at Waseda University; risk and impact evaluation studies, especially in relation to disasters, by the ADB Institute; and the broad array of activities and international knowledge transfers in disaster risk monitoring and reduction by the Japan International Cooperation Agency. Beyond those mentioned, the TA team will engage with and build on all initiatives it finds suitable for adaptation and transfer to DMCs.

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<sup>5</sup> ADB. 2018. [Technical Assistance for Data for Development \(Phase 2\)](#). Manila.

ADB. 2018. [Technical Assistance for Deepening Understanding of Macroeconomic Fluctuations in DMCs for Improved Economic Assessment](#). Manila.

ADB. 2018. [Supporting Knowledge Solutions in Central and West Asian Countries](#). Manila.

<sup>6</sup> ADB. 2020. [Regional Support to Address the Outbreak of Coronavirus Disease 2019 and Potential Outbreaks of Other Communicable Diseases](#). Manila.

### III. THE TECHNICAL ASSISTANCE

#### A. Impact and Outcome

6. The TA is aligned with the following impact: climate and disaster resilience, economic and social monitoring, and policy formulation in ADB's DMCs improved.<sup>7</sup> The TA will have the following outcome: disaster impact assessments and socioeconomic monitoring capacity in ADB's DMCs strengthened.<sup>8</sup>

#### B. Outputs, Methods, and Activities

7. **Output 1: State-of-the-art data collection and nowcasting technologies for contemporaneous impact assessments consolidated.** This output will involve identifying key categories of high frequency data, key assessment and monitoring contexts, and the methods for collecting and maintaining that data. The TA team will take full stock of the relevant initiatives, both in ADB and elsewhere, identifying experiences and lessons learned, areas and partners for cooperation, and overlaps. For example, it will assess the latest data collection and monitoring technologies to track near-contemporaneous gross domestic product and other headline economic indicators, as well as broader social, environmental, and spatial impact variables. Data preparedness will involve ensuring ready access to key sources such as real-time night and daytime satellite imagery; container shipments, air freight, and other granular flight data; mobile phone records and crowd-sourced internet data evaluated through artificial intelligence technologies; and, where available, daily data on local carbon dioxide readings, wind speed, rainfall, electric power absorption from national grid data, real-time traffic data from roadway sensors and live operations centers, and point of sale consumer transaction data. Besides tackling data identification and acquisition, the TA team will put considerable effort into data processing such as formatting, reducing, and decomposing big data, and making satellite imagery suitable for immediate use by systematically eliminating clouds and other meteorological influence factors. The TA team will also use more structured business network data in combination with ADB's unique multiregional input–output tables to capture the whole economic network structure in Asia and the Pacific. The TA team will use high-level technology by introducing innovation in processes, methods, and techniques; addressing climate mitigation, adaptation, and resilience to disaster risks; and reducing environmental and/or social costs.<sup>9</sup> The TA team will secure the continuity and sustainability of TA knowledge solutions by effectively absorbing them into ADB's knowledge hubs and data repositories, such as ERCD's Statistics and Data Innovation Unit and the Sustainable Development and Climate Change Department's capacity and support structures for the project Regional Support to Address the Outbreak of Coronavirus Disease 2019 and Potential Outbreaks of Other Communicable Diseases (footnote 6). In consultation with the ADB stakeholders, the TA team will seek to secure future funding for the data sources identified as most crucial to continuing nowcasting and establishing impact assessment systems. The TA team will also aim to make the outputs effectively replicable for other DMCs at sustainable costs and beyond TA completion, based on the lessons learned from the three or more TA pilot cases. To do so, the team will identify modalities for efficient and timely sharing of tailored data on a continuing basis for nowcasting activities or temporarily in the case of disaster impact assessment and monitoring purposes. Finally, ERCD will continue to cement its partnerships with development partners such as the ADB Institute and Japan International Cooperation Agency, as well as with

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<sup>7</sup> ADB. 2018. [Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific](#). Manila.

<sup>8</sup> The design and monitoring framework is in Appendix 1.

<sup>9</sup> ADB (Office of the President). 2016. Use of High-Level Technology in Projects. Memorandum. 21 April (internal).

DMC institutions, to guarantee the effective transfer of TA outputs and their broadest applicability and sustainability well into the future.

**8. Output 2: Data and methods combined and calibrated for ready application to the specific circumstances of the developing member countries.** The TA team will identify minimum data requirements for nowcasting socioeconomic baseline and disaster-specific impact indicators and categorize DMCs with similar characteristics. For each category, the TA team will identify and develop suitable nowcasting techniques, machine learning algorithms, systemic risk modeling, and other suitable approaches, after thoroughly reviewing and assimilating current methods and practices such as multi-hazard risk assessments, early warning systems, and rapid mapping approaches. The TA team will combine these methods with available information from sources such as remote-sensing data or big data from mobile phone records and social media platforms in order to establish monitoring and impact assessment modules, which will then be readied for calibration to country- and disaster-specific circumstances. The TA team will undertake pilot studies involving at least three DMCs to demonstrate these modules' applicability to both normal (non-event) and disaster episodes. The TA team will assess the outputs for their ability to provide reliable, actionable information that significantly improves DMCs' current nowcasting and impact monitoring capacity. The TA team will focus on producing nowcasts and other leading indicators for core economic variables that DMCs regularly use. The TA team will use the assessment findings to inform policies on climate adaptation. The TA team will also coordinate and share relevant information and methods with DMC governments and their agencies by building capacity and conducting training workshops in at least three DMCs. DMC involvement in capacity building and training activities will depend on their needs and absorptive capacity, including the recipients' analytical capabilities and readiness to implement disaster nowcasting and impact assessments more generally. A key determining factor will be whether a country's circumstances are optimally suited to the application and transfer of the specific TA analytical modules as they become ready for the pilot phase. Targeting will also depend on particular events: for example, in response to a major disaster, the TA could readily transfer impact monitoring technology and capacity. The TA team will try to target countries at different stages of development with custom-tailored solutions and in as many different Asia and the Pacific subregions as suitable. The TA team will consider gender in data collection and capacity building. To the extent applicable, TA activities will identify and reflect the specific needs of most vulnerable groups, including women, those with disabilities, minorities, caste groups, and other groups likely to be disproportionately affected during disasters and socioeconomic shocks.

**9. Output 3: Retrospective impact assessments and studies accomplished.** The TA team will prepare at least five retrospective studies to systemically assess the impacts of past disasters and socioeconomic shocks. For example, the COVID-19 pandemic, the 2015 Nepal earthquake, and a range of other episodes offer opportunities for analysis to more rigorously benchmark and nowcast the socioeconomic impacts of future such events. For example, a wind speed model, combined with predictive meteorological tracing to project a typhoon's intensity and damage in near-real time, could integrate the information concurrently emerging from the TA's nowcasting approach. While improving the TA's nowcasting models, such insights will also provide clues about the effectiveness of disaster early warning systems, with useful policy implications. The TA team will prepare studies in collaboration with leading scholars and practitioners, and ADB will publish them as widely accessible technical and working papers, journal articles, and policy notes. The TA team will disclose free electronic versions of these studies to the public and, where applicable, disseminate a limited number of printed copies to key stakeholders.<sup>10</sup> The TA team will transfer and share the most salient technical aspects of this

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<sup>10</sup> Copies will be made available on demand from a limited stock between 50 and 200 copies.

component with the stakeholders during capacity building and training activities, and in research seminars and international conferences. The targeting of TA individual recipients and participants will include gender and attain minimum quotas.

### C. Cost and Financing

10. The TA is estimated to cost \$2,000,000, which will be financed on a grant basis by the Japan Fund for Poverty Reduction and administered by ADB. The key expenditure items are listed in Appendix 2.

11. The following are ineligible items under the Japan Fund for Poverty Reduction: (i) purchase of vehicles, (ii) salaries for civil servants, (iii) foreign travel, (iv) scholarships or long internships, (v) detailed engineering design, (vi) civil works and other related expenses, and (vii) those under ADB's List of Ineligible Items (or Negative List) and Prohibited Investment Activities List.<sup>11</sup>

### D. Implementation Arrangements

12. ADB will administer the TA. ERCD will be responsible for supervising and managing consultants, procurement, accomplishment, and evaluation of the outputs. For optimal coordination and synergy as One ADB, ERCD will collaborate with ADB's other departments and resident missions, especially on capacity building. In particular, regional departments will help identify suitable DMC recipients and facilitate capacity building in coordination with country authorities. For possible research collaboration, joint conferences, and dissemination activities, the TA team will identify and partner with reputable regional or global research institutions.

13. The implementation arrangements are summarized in the table.

<b>Implementation Arrangements</b>			
<b>Aspects</b>	<b>Arrangements</b>		
Indicative implementation period	July 2020–June 2023		
Executing agency	ADB		
Implementing agencies	Economic Research and Regional Cooperation Department, Office of the Chief Economist and Director General and Macroeconomics Research Division		
Consultants <sup>a</sup>	To be selected and engaged by ADB		
	Firm: CQS and direct contracting (single-source selection)	Impact-based forecasting and socioeconomic monitoring (12 person-months)	\$500,000
	Individual: Framework agreement or individual selection	International expertise (10 person-months)	\$388,500
	Individual: Framework agreement or individual selection	National expertise (40 person-months)	\$137,250
Procurement <sup>b</sup>	To be procured by ADB		
	Request for quotation	6 contracts	\$20,000

<sup>11</sup> Foreign travel is ineligible "except in the case of a TA project where participation of recipient countries, including civil servants, in international workshops, conferences, mentoring visits, or study tours is fully justified in the original proposal with detailed description, objectives and budget, and approved by the Government of Japan." Refer to the Japan Fund for Poverty Reduction 2018 Policy Guidelines for Technical Assistance Grant.

Aspects	Arrangements
Disbursement	The TA resources will be disbursed following ADB's <i>Technical Assistance Disbursement Handbook</i> (2010, as amended from time to time).
Asset turnover or disposal arrangement upon TA completion	After the TA is completed, any procured equipment will be disposed of in compliance with Administering Grant-Financed Technical Assistance Projects in the Project Administration Instructions. <sup>c</sup>

ADB = Asian Development Bank, CQS = consultant's qualification selection, TA = technical assistance.

<sup>a</sup> ADB will consider lump-sum payments, output-based contracts, and framework contracts for individual consulting services.

<sup>b</sup> Procurement Plan (accessible from the list of linked documents in Appendix 3).

<sup>c</sup> ADB. 2018. Administering Grant-Financed Technical Assistance Projects. *Project Administration Instructions*. PAI 5.09. Manila.

Source: ADB.

14. **Consulting services.** ADB will engage the consultants following the ADB Procurement Policy (2017, as amended from time to time) and its associated project administration instructions and/or staff instructions.<sup>12</sup> ADB may also recruit firms, especially if access to proprietary data platforms or modeling techniques is necessary. ADB will select through either consultant qualification selection or direct contracting method. Because only a few firms have highly specialized expertise in disaster impact assessments and nowcasting using big data, and also because recruitment time is critical during a disaster episode, the proposed selection methods are deemed justified. ADB will engage up to 15 individual international consultants to prepare retrospective studies that systemically assess the impacts of past disasters and socioeconomic shocks. ADB will hire a national consultant to help coordinate data collection and analysis, and will engage two or more individual international consultants to support capacity building on-site activities. ADB will engage experts, which could include ADB staff, as resource persons to produce knowledge products such as technical papers and research articles, and facilitate workshops, training programs, and conferences.

15. **Knowledge partnerships.** TA outputs may require ADB to enter into knowledge partnership agreements with international organizations, academic institutions, and/or think tanks of an intellectual and advisory nature (para. 5 mentions examples of potential knowledge partners). Any knowledge partnerships entered into will follow the Staff Instruction on Business Processes for Knowledge Partnerships under Technical Assistance Operations.<sup>13</sup> The partnership agreements will clearly delineate roles and disbursements.

16. **ADB's procurement.** The purchase of information communication technology-related equipment, supplies, econometric or statistical programs and/or software, will follow the ADB Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time). The TA team will also consult ADB's Information Technology Department and Office of Administrative Services about the purchase of information communication technology hardware and software.<sup>14</sup> Where applicable, the TA team will coordinate with ADB's Procurement, Portfolio, and Financial Management Department and Office of the General Counsel before purchasing datasets and signing data use agreements with DMC statistical agencies and third-party database providers. After the TA is completed, the TA team will dispose of any procured equipment in compliance with the project administration instructions

<sup>12</sup> Terms of Reference for Consultants (accessible from the list of linked documents in Appendix 3).

<sup>13</sup> ADB. 2017. *Staff Instruction on Business Processes for Knowledge Partnerships under Technical Assistance Operations*. Manila.

<sup>14</sup> Procurement Plan (accessible from the list of linked documents in Appendix 3).

on administering grant-financed TA projects.<sup>15</sup> Disbursements under this TA will be made in accordance with ADB's *TA Disbursement Handbook* (2010, as amended from time to time).

#### **IV. THE PRESIDENT'S DECISION**

17. The President, acting under the authority delegated by the Board, has approved the Asian Development Bank administering technical assistance not exceeding the equivalent of \$2,000,000 to be financed on a grant basis by the Japan Fund for Poverty Reduction for Nowcasting and Disasters: Impact-Based Forecasting and Socioeconomic Monitoring, and hereby reports this action to the Board.

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<sup>15</sup> ADB. 2018. Administering Grant-Financed Technical Assistance Projects. *Project Administration Instructions*. PAI 5.09. Manila.

## DESIGN AND MONITORING FRAMEWORK

<b>Impact the TA is Aligned with</b> Climate and disaster resilience, economic and social monitoring, and policy formulation in ADB's DMCs improved <sup>a</sup>			
<b>Results Chain</b>	<b>Performance Indicators with Targets and Baselines</b>	<b>Data Sources and Reporting Mechanisms</b>	<b>Risks</b>
<p><b>Outcome</b> Disaster impact assessments and socioeconomic monitoring capacity in ADB's DMCs strengthened</p>	<p>By 2023:</p> <p>a. TA's monitoring applications and associated technology transferred to at least three DMCs (2019 baseline: NA)</p> <p>b. 95% of participating DMC officials demonstrate effective absorption of and increased capacity in monitoring technology (2019 baseline: NA)</p>	<p>a. MOUs, BTORs, and consultants' progress reports to document recipients' actual transfer and implementation of the monitoring modules</p> <p>b. Attendees' training and support feedback forms; reported interviews with supervising staff in DMC recipients to assess the extent to which training programs have translated into applied knowledge, improving staff's monitoring abilities</p>	<p>A shift in DMCs' policy or capacity building prerogatives, away from disaster impact assessment and socioeconomic monitoring</p>
<p><b>Outputs</b></p> <p>1. State-of-the-art data collection and nowcasting technologies for contemporaneous impact assessments consolidated</p> <p>2. Data and methods combined and calibrated for ready application to the specific circumstances of the DMCs</p>	<p>1. At least five major data sources and providers identified (in consideration also of gender) catalogued, access modalities and costs appraised by 2021 (Indicator: number, type, and access conditions of relevant data sources newly established by the TA) (2019 baseline: NA)</p> <p>2a. At least three monitoring modules established by the TA and applied by DMCs to disaster instances by 2023 (Indicator: count of modules; 2019 baseline: NA)</p> <p>2b. At least three training workshops involving at least 30 participants conducted with at least 75% of participants reporting increase in</p>	<p>1. Invoices, subscriptions, MOUs, access agreements, other communications with data providers</p> <p>2a. Count of modules and applications by countries and cases to be reported in the PCR and documented in BTOR, staff reports, and other project progress documents</p> <p>2b. Count of training workshops, number of trainees (accounting also for female participants), and post-training surveys</p>	<p>Insurmountable access limitations to key data sources, such as exorbitant costs, or outright access preclusion</p>



<p>3. Retrospective impact assessments and studies accomplished</p>	<p>knowledge, awareness, or gained new skills on nowcasting for disaster impact assessment, by 2023 (Indicator: count of events, share of DMC trainees reporting increase in knowledge; 2019 baseline: NA) and at least 30% female participants (2019 baseline: NA)</p> <p>3a. At least one research seminar and at least one international conference held by 2023 (Indicator: count of events; 2019 baseline: NA) with the active participation of at least 30% female participants (2019 baseline: NA)</p> <p>3b. At least five studies published as technical papers, working papers, journal articles, and policy notes by 2023 (2019 baseline: NA)</p>	<p>3a. Count of research seminars, international conferences, and number of participants, by gender</p> <p>3b. Count of publications by type, based on journal and other media websites, ADB's Economics Working Paper series, and other publications</p>	
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<p><b>Key Activities with Milestones</b></p> <p><b>1. State-of-the-art data collection and nowcasting technologies for contemporaneous impact assessments consolidated</b></p> <p>1.1 Stocktaking of relevant initiatives and projects accomplished; partnership opportunities within ADB and with external organizations explored and established (Q2 2021)</p> <p>1.2 Major data sources and providers identified and catalogued: what data are needed (in consideration also of data sources' suitability to capturing relevant gender aspects), in what context, and how they should be stored, secured, organized, and kept up to date (Q2 2021)</p> <p>1.3 Data access and transfer modalities and related costs negotiated with data providers: securing access (Q2 2021)</p> <p><b>2. Data and methods combined and calibrated for ready application to the specific circumstances of the DMCs</b></p> <p>2.1 Suitable data mining and impact analytical techniques identified and trained on the relevant data sources: establishing an analytical toolbox to match the data (Q4 2021)</p> <p>2.2 Application of the TA nowcasting platform to at least three DMCs and disaster events in coordination with recipients about their current state of capacity, technology, and expectations (Q1 2023)</p> <p>2.3 Transfer of knowledge and training workshops involving at least three DMCs (Q1 2023)</p> <p>2.4 Monitoring and evaluation of at least three DMCs' application of the TA nowcasting platform (Q1 2023)</p> <p><b>3. Retrospective impact assessments and studies accomplished</b></p> <p>3.1 Research seminar held at ADB headquarters on nowcasting and retrospective impact assessment techniques, reaching the gender target of at least 30% female participation rate (Q4 2021)</p> <p>3.2 International conference on nowcasting and impact assessment held at ADB headquarters, presenting the monitoring solutions and discussing draft papers and knowledge products, and reaching the gender target of at least 30% female participation rate (Q4 2022)</p> <p>3.3 Studies (at least five) published as technical papers, working papers, journal articles, or policy notes; knowledge products launched and research findings disseminated (Q1 2023)</p> <p><b>TA Management Activities</b></p> <p>Hire consultants and firms (Q3 2020–Q1 2023)</p> <p>Procure information communication technology equipment, supplies, econometric or statistical programs and/or software, and data subscriptions (Q3 2020–Q1 2023)</p>
<p><b>Inputs</b></p> <p>Japan Fund for Poverty Reduction: \$2,000,000</p>
<p><b>Assumptions for Partner Financing</b></p> <p>Not Applicable</p>

ADB = Asian Development Bank, BTOR = back-to-office report, DMC = developing member country, MOU = memorandum of understanding, NA = not applicable, PCR = project completion report, Q = quarter, TA = technical assistance.

<sup>a</sup> ADB. 2018. [Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific](#). Manila. Source: Asian Development Bank.

**COST ESTIMATES AND FINANCING PLAN**  
(\$'000)

Item	Amount
<b>Japan Fund for Poverty Reduction<sup>a</sup></b>	
1. Consultants <sup>b</sup>	
a. Remuneration and per diem	
i. Firms	500
ii. International consultants	315
iii. National consultants	126
b. Out-of-pocket expenditures	
i. Training, seminars, and conferences	85
2. Training, seminars, workshops, forum, and conferences	
a. Facilitators <sup>c</sup>	57
b. Travel cost of ADB staff acting as resource person <sup>d</sup>	23
c. Venue rental and related facilities <sup>e</sup>	25
d. Participants <sup>f</sup>	168
e. Representation <sup>g</sup>	109
3. Printed external publications <sup>h</sup>	52
4. Goods <sup>i</sup>	20
5. Surveys <sup>j</sup>	410
5. Miscellaneous administration and support <sup>k</sup>	10
6. Contingencies	100
<b>Total</b>	<b>2,000</b>

ADB = Asian Development Bank.

<sup>a</sup> Administered by ADB. The technical assistance (TA) is estimated to cost \$2,000,000, of which contributions from the Japan Fund for Poverty Reduction are presented in the table.

<sup>b</sup> Lump-sum payments and output-based contracts will be considered for individual consultants.

<sup>c</sup> This covers the honorarium to be given to resource persons participating in workshops and international conferences.

<sup>d</sup> Includes travel costs of ADB staff acting as resource person.

<sup>e</sup> Includes cost for collaterals (signages, brochures, and backdrop with branding design), equipment rental, meals, and other logistical costs for organizing events.

<sup>f</sup> This covers the travel costs of participants to training workshops in three developing member countries (DMCs) (airfare, per diem or allowances, and miscellaneous travel expenses of 60 participants, assuming that three workshops are held for 5 days), and travel cost of participants to a conference to be held in ADB headquarters (airfare, per diem or allowances, and miscellaneous travel expenses of 30 participants to a 3-day conference).

<sup>g</sup> Includes travel costs of resource persons (airfare, per diem or allowances, and miscellaneous travel expenses).

<sup>h</sup> Publication and dissemination costs of research articles, policy notes, technical papers and other such knowledge products based on the TA's research outputs.

<sup>i</sup> Includes purchase of information and communication technology-related equipment, supplies, and econometric or statistical programs, and/or software. ADB will procure the equipment following the ADB Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time). Turnover and/or disposal arrangements for the equipment will follow the provisions on Administering Grant-Financed Technical Assistance Projects. Project Administration Instructions. PAI 5.09 paras. 41 and 42.

<sup>j</sup> Includes purchase of survey and study data such as real-time satellite imagery, container shipments, air freight, and other flight data; mobile phone records and crowd-sourced internet data, daily data on local carbon dioxide readings, wind speed, rainfall, electric power absorption from national grid data, real-time traffic data from roadway sensors and live operations centers, point of sale consumer transaction data, or other data identified as necessary to carry out the mandate of the TA.

<sup>k</sup> Includes payments to service providers and contractors, shipping, moving, logistics, translation, transcription, and other related services; and other administrative support, including ADB staff travel when providing support services in the preparatory works, implementation, and administration of TA events and activities (travel and related costs for secretarial and administrative services).

Source: Asian Development Bank estimates.

**LIST OF LINKED DOCUMENTS**

<http://www.adb.org/Documents/LinkedDocs/?id=54113-001-TARreport>

1. Terms of Reference for Consultants
2. Procurement Plan