



Concept Paper

Project Number: 51199-001
September 2017

Proposed Policy-Based Loan Mongolia: Ulaanbaatar Air Quality Improvement Program

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 18 September 2017)

Currency unit	–	togrog (MNT)
MNT1.00	=	\$0.000407
\$1.00	=	MNT2,454.00

ABBREVIATIONS

ADB	–	Asian Development Bank
IAP	–	implementation action plan
µg/m ³	–	microgram per cubic meter
PBL	–	policy-based loan
PM _{2.5}	–	particulate matter of less than 2.5 micrometers in diameter
TA	–	technical assistance

NOTE

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

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PROGRAM AT A GLANCE

1. Basic Data		Project Number: 51199-001	
Project Name	Ulaanbaatar Air Quality Improvement Program	Department/Division	EARD/EAER
Country Borrower	Mongolia Government of Mongolia	Executing Agency	Ministry of Finance
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Public sector management	Public administration		20.00
Energy	Energy sector development and institutional reform		60.00
Health	Health sector development and reform		10.00
Transport	Transport policies and institutional development		10.00
Water and other urban infrastructure and services	Urban policy, institutional and capacity development		30.00
	Total		130.00
3. Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Mitigation (\$ million)	22.50
Environmentally sustainable growth (ESG)	Environmental policy and legislation Global and regional transboundary environmental concerns Urban environmental improvement	CO ₂ reduction (tons per annum)	117,000
		Climate Change impact on the Project	High
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Civil society participation Institutional development	Some gender elements (SGE)	✓
5. Poverty and SDG Targeting		Location Impact	
Geographic Targeting	No	Urban	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG3, SDG7, SDG11, SDG13		
6. Risk Categorization:	Complex		
7. Safeguard Categorization	Environment: C Involuntary Resettlement: C Indigenous Peoples: C		
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		130.00	
Sovereign Stand-Alone Policy-Based Lending (Regular Loan): Ordinary capital resources		130.00	
Cofinancing		0.00	
None		0.00	
Counterpart		0.00	
None		0.00	
Total		130.00	

I. THE PROPOSAL

1. The Government of Mongolia requested financial assistance from the Asian Development Bank (ADB) to support Ulaanbaatar, its capital city, to address the severe air pollution problem that constrains its sustainable and inclusive economic development. This policy-based loan (PBL) proposal is included in ADB's country operations business plan for Mongolia, 2017–2019.¹

2. ADB is proposing a two-tranche, stand-alone PBL to reduce Ulaanbaatar's air pollution and greenhouse gas emissions under the National Program for Reducing Air and Environment Pollution, 2017–2025 framework, by helping the government deliver on its Implementation Action Plan (IAP) commitments, prioritized based on cost-effectiveness.

II. PROGRAM AND RATIONALE

A. Background and Development Constraints

3. Ulaanbaatar is home to 1.3 million people, about half of the nation's population. The city is the world's coldest capital, with temperatures regularly dropping below –20 degrees Celsius in winter months (October–March). Global climate change is leading to more frequent natural disasters in the vast countryside, hastening migration to the city as nomadic herders lose their livelihoods. Lacking other income sources, these herders seek refuge in the city and settle in *ger* areas, which lack adequate public services such as water, sanitation, heat supply, and public transport, partly because of budget gaps.²

4. Ulaanbaatar is experiencing some of the highest levels of air pollution registered in the world, especially in winter, and these pose serious public health risks. Estimates suggest that 10% of deaths in Ulaanbaatar in 2013 resulted from air pollution complications.³ Children are particularly vulnerable to pollution impacts such as reduced fetal growth, preterm birth, pneumonia, impaired brain development, and reduced lung function leading to acute and chronic respiratory diseases.⁴ The negative impacts of air pollution—including medical costs, lost productivity, chronic illnesses, and shorter life expectancy—greatly contribute to poor health and living standards, especially for low-income families who cannot afford proper nutrition (and hence are less immune to diseases) and medical care. The annual health cost of air pollution was estimated at \$463 million in 2009.⁵ Studies concluded that the economic impact of air pollution is 18%–28% of Ulaanbaatar's gross domestic product and 8%–13% of Mongolia's gross domestic product.⁶

5. The largest source of air pollution is raw coal burning (or waste, by the poorest) for heat and cooking in households and small heat-only boilers in the *ger* areas. This contributes to an estimated 80% of ambient concentrations of inhalable particulate matter of less than 2.5

¹ The project is included in ADB. 2017. *Country Operations Business Plan: Mongolia, 2017–2019*. Manila. An initial draft of the design and monitoring framework is in Appendix 1. Transaction technical assistance will be provided for program preparation (accessible from the list of linked documents in Appendix 3).

² *Gers* are traditional portable round tents covered with skins or felt and used as a dwelling by nomads in the steppes of East Asia. *Ger* areas comprise traditional *gers* and houses often constructed with poorly insulating materials.

³ R. Allen and D. Tam. 2011. *Air Pollution Killing Ulaanbaatar (Mongolia) Residents*. Burnaby, Canada: Simon Fraser University.

⁴ United Nations Children's Fund (UNICEF). 2016. *Understanding and Addressing the Impact of Air Pollution on Children's Health in Mongolia*. Ulaanbaatar.

⁵ The World Bank. 2014. *Air Quality Analysis of Ulaanbaatar: Improving Air Quality to Reduce Health Impacts*. Washington, DC.

⁶ National Secretariat for the Second Compact Agreement between the Government of Mongolia and the Millennium Challenge Corporation of the United States. 2016. *Mongolia Constraints Analysis*. Ulaanbaatar.

micrometers in diameter (PM_{2.5}). An increasing number of private vehicles and highly polluting public transport buses are thought to be responsible for 10% of ambient PM_{2.5}. Coal burning in the combined heat and power plants contributes to an additional 5%–6%, and resuspension of unpaved *ger* roads dust and of fly ashes to the remaining 4%–5%.⁷ These sources produce dangerous levels of PM_{2.5}, which have recently triggered an unprecedented civil society response.⁸

B. Policy Reforms and ADB's Value Addition

6. Several policies had been piloted to curb emissions from the energy and transport sectors, such as provision of cleaner coal, incentives to buy cleaner cookstoves, insulated construction materials, and cleaner vehicles and transport fuels. However, the policies were issued by different agencies without scientific analysis, coordination, or continuity, and have often resulted in wasted financial resources (subsidies).

7. In November 2016, the government renewed the composition (following the new cabinet) of the National Committee for Reduction of Air Pollution, and commissioned a National Program for Reducing Air and Environment Pollution, 2017–2025 and its IAP.⁹ The National Program, approved by the cabinet on 20 March 2017, aims to update urban planning and increase the quality of urban infrastructure (footnote 7). The IAP, by specifying accountable institutions, time frames, and costs, signals the government's commitment to tackle the air pollution problem. However, there is an opportunity to rationalize the IAP by prioritizing actions that are cost-effective, coordinated among agencies, and financially and economically viable and sustainable. These actions need to be supported by a robust and comprehensive policy framework: Mongolia's ambitious environmental regulations lack details and enforcement provisions for their implementation, and are not supported by public awareness and participation.

8. It is a social and political imperative to implement measures to curb air emissions from key sectors and protect the most vulnerable groups (through interventions such as providing child vaccinations against pneumonia and filtering systems in hospitals, schools, and kindergartens). Such measures could prevent yet another highly polluted winter and ensure that those most in need of social welfare will be protected despite the overall fiscal consolidation.

9. From a long-term perspective, urban and energy planning need to be integrated for more efficient and sustainable redevelopment of *ger* areas. In fact, due to uncoordinated urban and energy master plans, the city's combined heat and power plants cannot supply heat and electricity to the *ger* areas because of either insufficient capacity or incomplete transmission networks. Expanding the district heating transmission network to the *ger* areas will also enable the dismantling of highly polluting and inefficient heat-only boilers.

10. **Program justification.** Ulaanbaatar is experiencing an unprecedented air pollution level that (i) harms citizens' public health, disproportionately children and poor people; and (ii) results in

⁷ Government of Mongolia. 2017. *Mongolia National Program for Reducing Air and Environment Pollution*. Ulaanbaatar.

⁸ In 2016 in Ulaanbaatar, the annual average of ambient PM_{2.5} concentration was 80 micrograms per cubic meter (µg/m³), i.e., eight times the World Health Organization's recommended standard of 10 µg/m³, and about three times the Mongolian air quality standard (25 µg/m³). In January 2017, peaks of PM_{2.5} as high as 1,017 µg/m³ were recorded in the Bayankhoshuu *ger* area.

⁹ The National Committee is led by the Prime Minister and co-led by the Minister for Environment and Tourism, and comprises vice ministers and other agency directors. Its composition was expanded to include civil society organization representation. It has oversight of a technical working group led by the Ministry of Environment and Tourism and comprising 32 members from line ministries, academia, and civil society organizations.

significant health and economic costs, a long-term burden on the already weak national economy. The problem can only be controlled by a multisector approach for strengthening environmental governance; short- to medium-term gap-filling policies for curbing emissions from key sectors and for health protection measures; and long-term, integrated urban and energy plans. The proposed program aligns with and strengthens ADB's ongoing urban development, health, and energy programs.¹⁰ The first tranche will be allocated to the most urgent policy actions; the second tranche, while enabling monitoring of the first tranche implementation, will lay the foundation for long-term policies.

11. **Government linkages.** The program is aligned with the National Program and its IAP. The program is also (i) aligned with ADB's country partnership strategy for Mongolia, 2017–2020;¹¹ and (ii) consistent with ADB's environment, energy, and health operational directions.¹²

C. Impacts of the Reform

12. The country's overarching objective will be public health and living standards through reduced air pollution in Ulaanbaatar improved. The outcome will be effective air pollution control measures implemented. Outputs will include (i) IAP rationalization and air pollution control regulatory framework improved, (ii) measures on air pollution reduction and health protection implemented, and (iii) environmentally sound and integrated urban and energy plans developed and approved.¹³

D. Development Financing Needs and Budget Support

13. **Development partners.** The program's objectives were shared with and well received by the World Bank, Government of Japan through the Japan International Cooperation Agency, Swiss Agency for Development and Cooperation, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), as well as United Nations agencies. The program will support the implementation of consulted development partners' initiatives.

14. The government requested a regular loan of \$130 million from ADB's ordinary capital resources. The loan will have a 15-year term, including a 3-year grace period; an annual interest rate determined following ADB's London interbank offered rate-based lending facility; and a commitment charge of 0.15% per year (Table 1). The average maturity and maturity premium will be calculated based on the government's request on repayment method.

Table 1: Tentative Financing Plan

Source	Amount (\$ million)	Share of Total (%)
Asian Development Bank		
Ordinary capital resources (regular loan)	130.0	100.0
Total	130.0	100.0

Source: Asian Development Bank.

¹⁰ ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranchise Financing Facility to Mongolia for the Ulaanbaatar Urban Services and Ger Areas Development Investment Program*. Manila; and ADB. 2017. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Mongolia for the Strengthening Electricity and Heat Supply Network in Ulaanbaatar*. Manila.

¹¹ ADB. 2017. *Country Partnership Strategy: Mongolia, 2017–2020*. Manila.

¹² ADB. 2013. *Environment Operational Directions, 2013–2020*. Manila; ADB. 2009. *Energy Policy*. Manila; and ADB. 2015. *Operational Plan for Health, 2015–2020*. Manila.

¹³ Performance indicators detailed in the design and monitoring framework (Appendix 1) offer examples of the types of actions that support each output.

E. Implementation Arrangements

15. The Ministry of Finance is the program's executing agency. Implementing agencies will be confirmed during the final dialogue with the government on policy actions. Implementation will be from 1 March 2017 to 31 December 2018. The loan proceeds will be disbursed following ADB's simplification of disbursement procedures and related requirements for PBLs, upon the satisfactory completion of the policy actions agreed between ADB and the government.¹⁴

III. DUE DILIGENCE REQUIRED

16. A proposed transaction technical assistance estimated to cost \$300,000, of which \$250,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF 6), to be processed and approved with the concept paper, will assist the implementing agencies in fulfilling policy commitments.¹⁵ Terms of reference for the TA are outlined in the transaction TA report.¹⁶

17. The required due diligence includes a sector assessment, justification of PBL amount, and summary poverty reduction and social strategy. Direct or indirect impacts of the policy actions on environment, involuntary resettlement, and indigenous peoples will be evaluated. A matrix of each policy action's potential impact, with appropriate mitigation measures and a qualitative indication of likely order of magnitude, will be prepared.

IV. PROCESSING PLAN

A. Risk Categorization

18. The program is classified as *complex*, as it exceeds \$50 million.

B. Resource Requirements

19. Program processing is estimated to require 10 person-months of staff time and 5 person-months of consultant time.¹⁷

C. Processing Schedule

20. The proposed processing schedule is in Table 2.

¹⁴ ADB. 1998. *Simplification of Disbursement Procedures and Related Requirements for Program Loans*. Manila.

¹⁵ With \$0.25 million funding from ADB's Technical Assistance Special Fund (TASF 6).

¹⁶ Technical Assistance for Program Preparation (accessible from the list of linked documents in Appendix 3).

¹⁷ Funded under ADB. 2015. *Technical Assistance for Promoting Sustainable Energy for All in Asia and the Pacific*. Manila.

Table 2: Proposed Processing Schedule

Milestones	Expected Completion Date
Concept paper approval	September 2017
Loan fact-finding mission	September–October 2017
Informal Board seminar	October 2017
Management review meeting	November 2017
Loan negotiations	November 2017
Board consideration	January 2018
Loan effectiveness	March 2018

Source: Asian Development Bank.

V. KEY ISSUES

21. Close coordination is required with the executing and implementing agencies to monitor the progress of the National Program. Within ADB, support from the Economic Research and Regional Cooperation Department and the Sustainable Development and Climate Change Department will ensure adequate analysis in support of required due diligence.

DESIGN AND MONITORING FRAMEWORK
(Initial Draft)

Country's Overarching Development Objective			
Public health and living standards through reduced air pollution in Ulaanbaatar improved (National Program for Reducing Air and Environment Pollution, 2017–2025) ^a			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Effect of the Reform Effective air pollution control measures implemented	By 2019: Budget allocated to air pollution reduction measures increased to \$xx million (2016 baseline: \$XX million)	Annual government budget reports	Climate disaster-induced rural-to-urban migration outpaces implementation of policy actions.
Reform Areas 1. IAP rationalization and air pollution control regulatory framework improved	Indicative Policy Actions By 2018: 1.1 The IAP of the National Program for Reducing Air and Environment Pollution, 2017–2025 approved by the cabinet (2016 baseline: not approved) 1.2 Government progress reports on the National Program IAP issued regularly (at least one by November 2017 and one by November 2018) (2016 baseline: not issued) 1.3 National Committee meetings held regularly, at least bimonthly until December 2018, to discuss the IAP's progress (2016 baseline: 0) 1.4 Parliament hearing held on the progress reports of the IAP and on the Air Pollution Outlook Report prepared annually by MET (2016 baseline: 0) 1.5 Education and outreach program to increase awareness on air pollution—including connections between air quality and health, and fuel use and air pollution—developed and implemented by MET in 2017, targeting X persons in schools, public offices, and utilities, including 50% female staff (2016 baseline: 0) 1.6 Inventory of innovative, low-carbon technologies for space heating and green buildings, with a	1.1 Issued IAP 1.2 National Committee report 1.3 National Committee report 1.4 Parliament records 1.5 Evaluation survey confirming effectiveness of training compiled on XX-XX-2017 1.6 MET and MCUD annual reports	Reforms are discontinued because of changes in political priorities.

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	<p>focus on technologies appropriate for Ulaanbaatar, established by MET and MCUD (2016 baseline: 0)</p> <p>1.7 Energy efficiency standards for electric stoves and heaters issued by MOE (2016 baseline: not issued)</p> <p>1.8 Green building standard, including a rating system for green buildings performance, approved by MCUD by 2018 (2016 baseline: not approved)</p> <p>1.9 Budget plan to upgrade city air quality and emission compliance monitoring network developed by Ulaanbaatar Municipality (2016 baseline: 0)</p>	<p>1.7 Issued standard</p> <p>1.8 Approved green building standard and issued rating system</p> <p>1.9 Budget plan</p>	
2. Measures on air pollution reduction and health protection implemented	<p>2.1 Resolution issued by MOE and Ulaanbaatar Municipality to provide x tons of semi-coke briquettes or lower-emitting fuel, and distribute to XX,XXX <i>ger</i>^b areas households in district x (2016 baseline: not issued)</p> <p>2.2 Amendment to the excise tax law to promote greater usage of higher-quality transportation fuel submitted to Parliament by the government (2016 baseline: not submitted)</p> <p>2.3 Ban on imported private and public transport vehicles not compliant with the equivalent of Euro IV emission standard approved by cabinet (2016 baseline: not approved)</p> <p>2.4 Resolution requiring insulation and air filtration systems in new kindergartens, schools, and hospitals in Ulaanbaatar approved by Cabinet (2016 baseline: not approved)</p> <p>2.5 Decree for mandatory vaccination with pneumococcal</p>	<p>2.1 Resolution issued by MOE (for production) and ordinance issued by Ulaanbaatar Municipality (for distribution)</p> <p>2.2 Submitted amendment</p> <p>2.3 Cabinet resolution</p> <p>2.4 Cabinet resolution</p> <p>2.5 National decree</p>	

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	conjugate vaccine for children from 0 to 5 years old in Ulaanbaatar's highest-polluted areas (district x and y) approved by the government, including adequate budget allocation for vaccine management (storage, distribution) per UNICEF standards (2016 baseline: not approved)		
3. Environmentally sound and integrated urban and energy plans developed and approved	<p>3.1 Urban and Energy Master Plans integrated and master plans implemented by Ulaanbaatar Municipality with coherent land-use policies (expanding district heating to <i>ger</i> areas to enable dismantling of heat-only boilers) (2016 baseline: not integrated)</p> <p>3.2 Resolution requiring all new government-owned and government-run buildings to apply energy efficiency standards and prohibiting use of on-site coal-fired boilers in Ulaanbaatar approved by the cabinet (2016 baseline: not approved)</p> <p>3.3 x additional demonstrations of renewable energy sources piloted by Ulaanbaatar Municipality and MCUD to complement or replace existing heating systems by December 2018 (2016 baseline: N/A)</p> <p>3.4 Sustainable financing strategy developed by the government for long-term policies on energy efficiency (lowering the cost of needed financing) (2016 baseline: 0)</p>	<p>3.1 Revised Urban and Energy Master Plans</p> <p>3.2 Cabinet resolution</p> <p>3.3 Ulaanbaatar Municipality and MCUD annual reports</p> <p>3.4 Annual reports</p>	
Budget Support ADB (ordinary capital resources) \$130,000,000 ADB (TASF 6 and CDIA) \$500,000			

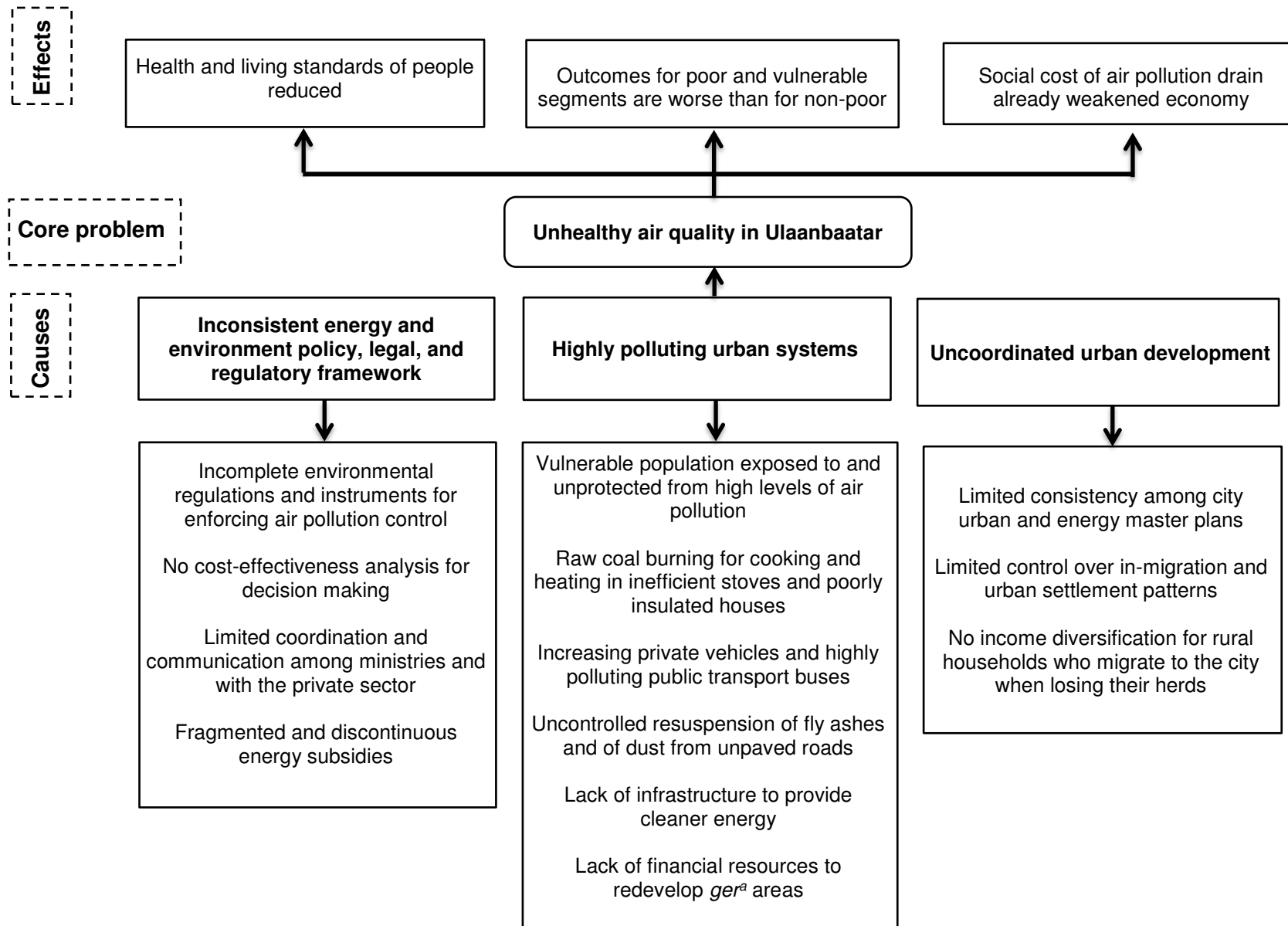
ADB = Asian Development Bank, CDIA = Cities Development Initiative for Asia, IAP = Implementation Action Plan, MCUD = Ministry of Construction and Urban Development, MET = Ministry of Environment and Tourism, MOE = Ministry of Energy, N/A = not applicable, TASF = Technical Assistance Special Fund, UNICEF = United Nations Children's Fund.

^a Government of Mongolia. 2017. *Mongolia National Program for Reducing Air and Environment Pollution*. Ulaanbaatar.

^b *Gers* are traditional portable round tents covered with skins or felt and used as a dwelling by nomads in the steppes of East Asia. *Ger* areas comprise traditional *gers* and houses often constructed with poorly insulating materials.

Source: ADB.

PROBLEM TREE



^a traditional portable round tents covered with skins or felt and used as a dwelling by nomads in the steppes of East Asia
 Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/LinkedDocs/?id=51199-001-ConceptPaper>

1. Initial Poverty and Social Analysis
2. Technical Assistance for Program Preparation