

SECTOR ASSESSMENT (SUMMARY): AGRICULTURE AND NATURAL RESOURCES¹

Sector Road Map

1. Sector Performance, Problems, and Opportunities

1. Since 2002, Cambodia's economy has grown rapidly as improved macroeconomic stability, reformed public financial management, and the growth of the private sector significantly reduced poverty. Gross domestic product (GDP) expanded by an average of 12% per annum in the 5 years from 2002 to 2006, and by 6% per annum during 2007–2011. Structurally, the economy has not followed the trend of other developing countries, in which agriculture contributes progressively less to the economy. The sector's 31% contribution to GDP in 2002 has held steady, even reaching as high as 32.4% in 2008 but without any obvious trend. The contribution of industry remains at about 25% of GDP and of services about 39%. As agriculture continues to dominate the economy, rice production has expanded rapidly in response to high international prices in 2008 that have largely persisted, albeit with some reduction. The prognosis for the economy remains bright, with GDP growth for 2012 estimated at 6.5% and the medium-term growth projection at 7%–8% per annum.²

2. **Agriculture.** Agriculture provides food as well as raw materials for processing, mostly rice milling; 60% of employment; and the main livelihood of 80% of the population. Sector growth rates have fluctuated from 6.3% in 2004 to 30.6% in 2008, the year of peak rice prices. Average sector growth rates increased by an annual average of 14.7% in the 5 years to 2006, sliding a bit to 13.6% in the subsequent 5 years. The sector is dominated by cropping, that accounted for 41% of agricultural output in 2002 (over half of it generated from paddy), while livestock accounted for 16.8%, fisheries 32.6%, and forestry 9.6%. In 2011, the dominance of rice was more evident, with crops accounting for 56.2% of agricultural output, livestock 13.3%, fisheries 22.3%, and forestry 8.3%. Paddy increased its share of agricultural output dramatically from 21.4% in 2002 to 50% in 2011 through significant investment in irrigation, the introduction of higher-yielding varieties whose photo-insensitivity allows their cultivation at any time of year, and mechanization to counteract the limited availability of farm labor and its high cost.³ Sector growth is conservatively estimated to average 3%–4% in 2009–2013. Expanded rice exports will provide the main impetus for economic growth in the medium term.

3. **Rice.** In 2011, Cambodia had a cultivated area of 3.78 million hectares (ha), or 21% of the total land area, of which 91.2% is planted to paddy. Rice accounted that year for 49% of the value of all agricultural output. The wet season crop covers 2.9 million ha, or 78% of the rice area, which has expanded by an average 3% per annum since 2009. The dry season area has expanded at a faster 5.4% per annum with the recent investment in irrigation infrastructure. Despite severe flooding in 2011, Cambodia produced 8.5 million tons of paddy, a figure that has been growing at an average annual rate of 6.1% since 2009. About 2.2 million tons of wet paddy was exported in 2011 immediately after the harvest to neighboring Thailand and Viet Nam, where it was processed and much of it exported, while 173,000 tons of rice was exported directly to Asia, Europe, and the Russian Federation in that year.

¹ This summary is based on: Asian Development Bank. 2011. *Cambodia: Agriculture, Rural Development and Natural Resources Sector Assessment, Strategy and Roadmap*. Manila. Available on request.

² Asian Development Bank. 2012. *Asian Development Outlook 2012: Confronting Rising Inequality in Asia*. Manila.

³ In 2011, extensive flooding caused the loss of some 230,000 hectares of paddy and damage to a further 165,000 hectares.

4. Paddy yield has gradually increased but remains one of the lowest in Southeast Asia at 2.7 tons per hectare (t/ha) in 2011. This compares unfavorably with Viet Nam's 5.0 t/ha and a world average of 4.0 t/ha in 2010. This low yield profile is apparent with both irrigated and rain-fed crops. Cambodia's low yields have been attributed to (i) the poor quality of seed, (ii) an inability to manage water in paddies to avoid flooding and drought, (iii) the limited use of modern production technologies including mechanization, (iv) incorrect use of chemical inputs, and (v) the tightening availability of rural labor and its rising cost. High-quality fragrant varieties are grown in the wet season and account for less than 30% of rice exports, even though 40% of the 3.45 million ha of the paddy growing area is capable of producing fragrant rice. With the worsening impact of climate change and the risk to wet season production from flooding, many farmers choose to plant short-duration varieties that allow an early wet season crop followed by a late wet season crop. Much of the paddy is sold to local collectors, or agents, and some to traders and millers, usually as wet paddy with a moisture content of 24% or higher immediately after harvest. Prices received depend on the moisture content, the variety and its purity, the proportion of broken grain, and the current state of the market. Because farmers need cash immediately after the harvest to repay their debts, they must take the price offered, despite interventions to introduce contractual arrangements for delivery and price stabilization.

5. Millers fall into four groups: (i) very small custom mills with a capacity of up to 200 kg per hour operating in local communities, which process half of the crop retained by farmers; (ii) small, inefficient commercial mills with a capacity of less than 2 tons per hour using antiquated equipment, which are operated by traders where market opportunities exist; (iii) medium-sized commercial mills with a capacity of 2–6 tons per hour using electric-powered equipment, which are typically family businesses without modern management systems and account for 80% of Cambodia's commercial milling capacity; and (iv) a small number of larger commercial mills with a capacity of more than 6 tons per hour, often new mills with the latest technology and management systems. Whereas large millers have storage, warehousing, and packaging facilities, small traders and millers usually do not. Millers process paddy to the quality demanded by the market, domestic or foreign, dealing through wholesalers and/or retailers and exporters.

6. While there has recently been significant investment to upgrade mills and their equipment, only the large modern mills are able to produce rice good enough for the premium export market. These mills have equipment for drying rice and to sort it by grain size and color. Cambodia exports mostly mixed white rice, often with high percentages of broken grain that destines it for the lower-priced markets. As power from the national grid is relatively expensive, most mills generate their own power using either diesel or, more recently, gasifier-powered generators. The export of wet paddy to Thailand and Viet Nam reflects infrastructure constraints on drying and milling prior to export. Road and rail capacity needs to be sufficient to handle increasing productivity from higher yields and expanded production area, peaks in farmers' delivery of paddy, and limited milling capacity, all of which create additional pressure on limited transport facilities and associated infrastructure.

7. **Environmental and natural resource sustainability and resilience under climate change.** Agricultural land in many areas of Cambodia has only low to modest fertility because of thin topsoil, sandy and mixed sandy soils, soil erosion, and lowland flooding, as well as some areas of water logging and soil salinity in coastal areas. Declining soil fertility resulting mainly from topsoil loss or damage considerably constrains the productivity and stability of rice lands and is especially apparent in rain-fed lowland rice systems. Siltation has adversely affected the irrigation network. Soil salinity can be caused by the use of certain fertilizers, contaminated or groundwater for irrigation, and salt water intrusion in coastal areas exacerbated by the loss of mangroves.

8. The absence of land-use zoning and a difficult environment for enforcing any such zoning system allows rice production to creep into flooded forests and other environmentally sensitive areas. Fertilizer application in pursuit of higher yields is degrading the soil through hardening and acidity that, in the longer term, will create environmental impacts on the Tonle Sap. There are limited options for retaining water in upper catchments, and smaller-scale on-farm storage structures are inefficient and occupy valuable productive land. While promoting rice production, natural resources must be carefully managed. This is made difficult by (i) limited capacity to analyze or manage risk; (ii) poor management of resources in upper watersheds, forests, and river basins; (iii) inadequate capacity to plan, implement, enforce, monitor, or evaluate natural resource management laws and regulations; (iv) heightened vulnerability to natural disasters and climate change; (v) limited knowledge and awareness of conservation farming techniques; and (vi) lack of knowledge on climate change risk and vulnerability, which constrains measures to mitigate and adapt to climate change.

9. **Key sector issues.** Constraints on farmers include (i) the limited availability and poor quality of seed; (ii) poor water availability and management in both the wet and the dry season, (iii) limited technical extension services, (iv) limited and expensive credit, (v) the limited availability of rural labor and its high cost, (vi) fluctuations in farm gate prices, and (vii) an inadequate network of farm-to-market roads. For collectors and traders, the main constraints relate to (i) the variable quality of paddy, (ii) the inefficient use of bags in bulk handling to move paddy along the value chain, (iii) insecure supply contracts, (iv) limited warehouse capacity that forces compromised marketing decisions, and (v) limited and costly finance. For millers and exporters, the main constraints are (i) the poor quality of paddy delivered for processing, (ii) limited access to development capital and operational finance to secure a flow of product into plants, (iii) the lack of business management skills, (iv) limited capacity in most storage and milling facilities, (v) a tarnished reputation on international markets because of inconsistent quality standards, (vi) complex procedures for processing export documentation and unofficial payments to expedite their completion, (vii) limited capacity and handling facilities in the ports of Phnom Penh and Sihanoukville, (viii) the limited availability of bonded warehouses to facilitate trade financing, (ix) relatively underdeveloped transport infrastructure, (x) the high cost of power, and (xi) the general dependence of the sector on foreign countries for fertilizer, pesticide, technical extension services, the seed of varieties demanded on international markets, efficient milling facilities, and access to international buyers, as Cambodian rice is known to be exported labeled as Thai or Vietnamese.

10. **Paddy storage, processing, and export constraints.** The greatest single constraint on processing is the poor quality of paddy. The delivery of mixed varieties with varying moisture content and many impurities adds significantly to millers' costs. Increasingly mechanized harvesting and farmers' preference for selling wet paddy means that limited storage capacity between the farm gate and millers forces down prices. A general lack of grading standards frustrates any price incentive to improve the quality of paddy, such that even wet paddy can attract a price similar to that of dry. While supply contracts have been attempted to ensure the quality of supplies for processing, the legal framework for enforcing such contracts remains incomplete. Much mill equipment is obsolete, particularly in medium-sized and smaller mills, which renders them uncompetitive in export markets. Mill operators lack business management skills, many having evolved from family businesses with minimum financial records or stock control. Access to finance for purchasing paddy continues to challenge millers, as significant sums are needed over a short period of time. Significant structural adjustment is occurring in the milling industry, particularly with the introduction of larger mills. The high cost of electricity from the national grid makes local power generation a good alternative, especially if generated from

digested husks. Exporters are confounded by the lack of product standards that would instill in buyers confidence to repeat orders without inspection. Meanwhile, export documentation is troubled by unofficial charges that make export documentation costly compared with neighboring competitors.

2. Government's Sector Strategy

11. The Government of Cambodia formulated the Rectangular Strategy to serve as a roadmap for socioeconomic development, with alleviating poverty and enhancing economic growth the priorities. The National Strategic Development Plan, 2009–2013⁴ operationalized this strategy and identified the need to develop the Strategy on Agriculture and Water.⁵ The stated goal of the strategy is "to contribute to poverty reduction, food security and economic growth through enhancing agricultural productivity and diversification and improving water resources development and management." To provide further focus, the government has developed the Policy on the Promotion of Paddy Production and Rice Export, setting as targets for 2015 (i) a rice paddy surplus of more than 4 million tons to supply processed rice exports of at least 1 million tons and (ii) Cambodia becoming internationally recognized as a rice-exporting country. In implementing this initiative, the government will (i) adopt market principles by encouraging competition, (ii) support the participation of farmers and their organizations, (iii) promote cooperation among stakeholders, (iv) enhance the efficient coordination of ministries and agencies, and (v) promote the domestic processing of paddy.

3. ADB Sector Experience and Assistance Program

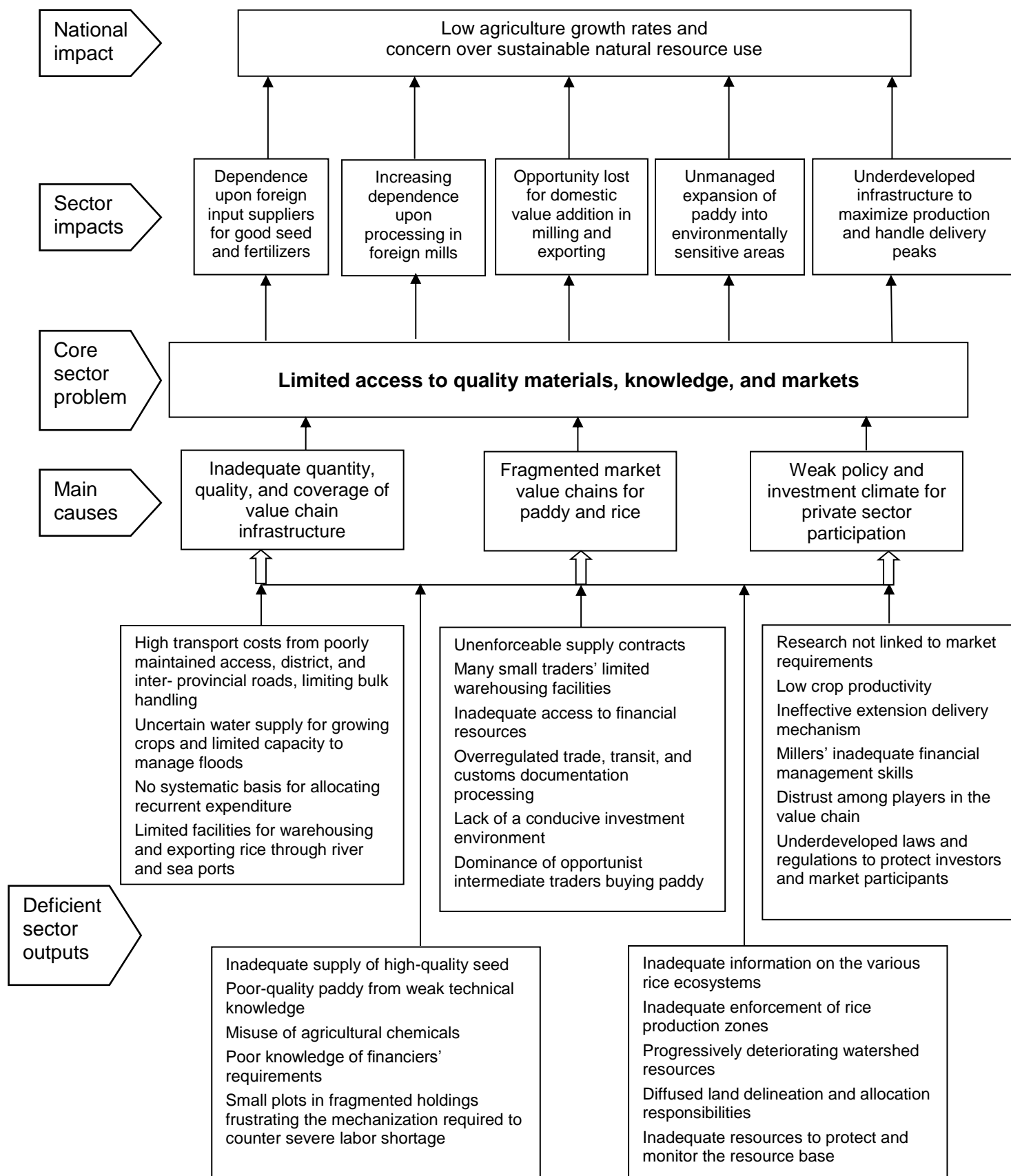
12. Since 2008, ADB operations in Cambodia have been designed to (i) undertake policy and institutional reform to improve agricultural productivity and water resource management and irrigation; (ii) reduce poverty through community-based development; (iii) form emergency responses to the 2008 food price crisis and 2011 flood impact; (iv) provide assistance for water resource management; (v) undertake pilot technology demonstrations; (vi) assist emergency flood rehabilitation; and (vii) rehabilitate and develop infrastructure for small and medium-scale irrigation schemes and rural roads and ensure their sustainable operation and maintenance. Within the agriculture and natural resources sector, ADB's country partnership strategy, 2011-2013 is to (i) support sustainable natural resource use and management; (ii) stimulate the growth of competitive farms and rural enterprises to create significant job opportunities; (iii) build sustainable rural infrastructure, including for irrigation, to promote productivity increases, market connectivity, and competitiveness; and (iv) improve food security and climate resilience in agricultural production.⁶

⁴ Government of Cambodia. 2009. *National Strategic Development Plan Update 2009–2013: For Growth, Employment, Equity and Efficiency to Reach Cambodia's Millennium Development Goals*. Phnom Penh.

⁵ Technical Working Group on Agriculture and Water. 2007. *Strategy on Agriculture and Water 2006–2010*. Phnom Penh.

⁶ Asian Development Bank. 2010. *Country Partnership Strategy for Cambodia, 2011–2013*. Manila.

Problem Tree for the Agriculture and Natural Resources Sector



Sector Results Framework (Agriculture and Natural Resources, 2011–2013)

9

Country Sector Outcomes		Country Sector Outputs		ADB Sector Operations	
Sector Outcomes with ADB Contribution	Indicators with Targets and Baselines	Sector Outputs with ADB Contribution	Indicators with Incremental Targets	Planned and Ongoing ADB Interventions	Main Outputs Expected from ADB Interventions
<p>Sustainable natural resource development, management, and conservation</p> <p>Improved agricultural productivity, diversification, and commercialization</p> <p>Improved rural accessibility and infrastructure</p>	<p>Government policies, plans, and laws on water resources operationalized by 2013</p> <p>Inland forest cover maintained (2008 baseline: 59%; 2015 target: 60%)</p> <p>Quality and sustainability of rice exports improved (2009 baseline: 13,000 tons milled rice; 2015 target: 1 million tons milled rice)</p> <p>Increased paddy yields (2012 baseline: 8.0 million tons; 2018 target: 9.5 million tons)</p> <p>Rehabilitated rural roads of 28,000 km</p> <p>Increased irrigated area (2008 baseline: 1,120,000 ha; 2013 target: 1,245,000 ha)</p>	<p>Improved policy, legal, and institutional framework for water resources management</p> <p>Strengthening planning systems for mainstreaming environment</p> <p>Reforestation and biodiversity conservation</p> <p>Agricultural commercialization and natural resources conservation</p> <p>Agricultural extension and support to farmer organizations</p> <p>Rural infrastructure rehabilitation</p> <p>Sustainable rehabilitation of existing small and medium-scale irrigation schemes</p>	<p>Government policies, plans, and laws on water resources operationalized (2010 baseline: sub-decrees drafted; 2013 target sub-decrees approved)</p> <p>Functional inter-ministerial committee on national water resources management operating by 2013</p> <p>Reforestation (2008 baseline: 10,810 ha; 2013 target: 73,000 ha)</p> <p>Increased paddy yields (2008 baseline: 2.74 tons/ha; 2013 target: 3.00 tons/ha)</p> <p>Farmer water-user community human resource capacity strengthened (2010 baseline: 114 groups registered with MOWRAM; 2013 target: 139)</p> <p>Numbers of agribusinesses increased by 10% over 4 years (2009 baseline: TBD; 2013 target: TBD)</p> <p>Rehabilitation of 600 km rural access roads by 2013</p> <p>MOWRAM's rehabilitation of 20,000 ha of wet season and 50,000 ha dry season irrigation (2010 baseline: nil; 2013 target: 80,000 ha wet and 20,000 ha dry season)</p>	<p>Planned key activity areas</p> <p>Sustainable natural resource use and conservation</p> <p>Food security, improved agricultural productivity, diversification, and commercialized rural infrastructure</p> <p>Pipeline projects</p> <p>Agriculture Commercialization and Conservation</p> <p>Flood and Drought (GMS)</p> <p>Irrigation and Water Resources II</p> <p>Climate-Friendly Bio-Energy Project (GMS)</p> <p>Low Carbon/Climate Resilience (GMS)</p> <p>Core Environment Program and Biodiversity Conservation Initiative (GMS)</p> <p>Ongoing projects</p> <p>Tonle Sap projects:</p> <ul style="list-style-type: none"> Environmental Management Sustainable Livelihoods Lowlands Rural Development Poverty Reduction and Smallholder Technology Demonstration for Productivity <p>Other agriculture and natural resource projects:</p> <ul style="list-style-type: none"> Northwest Irrigation Sector Water Resources Management Sector Development Biodiversity Conservation Corridor Project (GMS) 	<p>Coordination of water resources management and integrated water resource management improved (National Water Resources Management Committee operating)</p> <p>Organizational structure and operations of MOWRAM improved</p> <p>5,600 ha of natural forest land rehabilitated</p> <p>35,000 ha of small-scale irrigation schemes rehabilitated</p> <p>Wet and dry season paddy yield increased</p> <p>Cropping intensity increased</p> <p>Diversified farming systems introduced</p> <p>600 km of rural access roads improved</p> <p>Share of household income from rice reduced</p> <p>Marketed farm and off-farm products increased</p>

ADB = Asian Development Bank, GMS = Greater Mekong Subregion, ha = hectare, km = kilometer, MOWRAM = Ministry of Water Resources and Meteorology, TBD = to be determined.

Source: Asian Development Bank