

ADB



Water Operational Plan

2011–2020

Asian Development Bank



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Abbreviations

ADB	–	Asian Development Bank
CWA	–	country water assessment
DMC	–	developing member country
FoWA	–	Future of Water in Asia Study
IED	–	Independent Evaluation Department
IWRM	–	integrated water resources management
MDG	–	Millennium Development Goal
NRW	–	non-revenue water
PSOD	–	Private Sector Operations Department
RSDD	–	Regional and Sustainable Development Department
WFP	–	Water Financing Program
WFPP	–	Water Financing Partnership Facility

1 Introduction and Background

1.1 Water stress is evident in large parts of Asia and the Pacific region. It affects the region's food and energy production, and its ecological needs, and adversely impacts on the health and livelihoods of its populations. Climate change and associated uncertainty will exacerbate matters.

1.2 Demand for water is increasing because of rapid economic development, increasing urbanization, and the large growth in population and its impacts on food production. Investments in energy, transport, urban, and water infrastructure will require a hitherto unseen attention to the risks posed by water. The availability and use of accessible freshwater will play a dominant role in the sustainable development of the region's poor and emerging economies. The lack of adequate sanitation and robust wastewater management also compounds matters by contributing to the unchecked pollution of accessible freshwater—this adversely affecting the health and welfare of many millions of people in the region.

1.3 The region is clearly at the crossroads with regard to the choices it makes for addressing this water crisis. It is opportune for the Asian Development Bank (ADB) to take stock of its water operations,¹ identify the current and emerging water issues, and determine the best ways in which it can support the investments, knowledge, capacities, and technologies needed by each developing member country (DMC) to address issues to 2020 and beyond. The development of this Water Operational Plan 2011–2020 (“Plan”) incorporates comments and suggestions from a range of stakeholders within and outside ADB. This Plan provides guidance to ADB's regional departments in defining their respective in-country water operations.

Strategy 2020

1.4 ADB established through Strategy 2020² (“Strategy”) three strategic agendas to guide its work up to 2020—inclusive economic growth, environmentally sustainable growth, and regional integration.

¹ ADB's water operations include water for urban, rural, and basin uses, and sanitation and wastewater management.

² ADB. 2008. Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank 2008–2020. Manila.

The availability and use of accessible freshwater will play a dominant role in the sustainable development of the region's poor and emerging economies

Development of the Water Policy considered the linkage of water challenges to poverty reduction, regional development, and the need to manage water both as a resource and as a service

Water³ is common to each of these; in fact, it is central to their attainment. It is also integral to the Strategy's five drivers of change: (i) private sector development and private sector operations, (ii) good governance and capacity development, (iii) gender equity, (iv) knowledge solutions, and (v) partnerships. The Strategy refocuses ADB's operations into five core areas that best support its agenda and reflect ADB's comparative advantages and core competencies. One core area is infrastructure, where water resources management and the delivery of efficient and sustainable irrigation, water supply, sanitation, and wastewater management services are key elements.

ADB's Water Policy

1.5 ADB's Water for All⁴ ("Water Policy"), approved by the Board in 2001, was developed after a series of extensive and substantive stakeholder consultations. The seven key elements of the Water Policy are (i) promoting a national focus on water sector reform (policies, laws, institutional capacity building, information management, and sector coordination); (ii) fostering the integrated management of water resources particularly in river basins; (iii) improving and expanding the delivery of water services (involving the private sector and emphasizing equity in access to water for the poor); (iv) fostering the conservation of water and increasing system efficiencies; (v) promoting regional cooperation and increasing the mutual beneficial use of shared water resources within and between countries; (vi) facilitating the exchange of water sector information and experiences including public-private-community-nongovernmental organization partnerships; and (vii) improving governance and promoting decentralization.

1.6 Development of the Water Policy considered the linkage of water challenges to poverty reduction, regional development, and the need to manage water both as a resource and as a service. Shrinking annual per capita water endowments⁵ in many DMCs were leading to water stress.⁶ The Water Policy recognized that remedies lay in (i) increasing irrigation efficiency; ⁷(ii) aligning urban drinking water and sanitation service efficiencies with urban growth; (iii) reversing the degradation of water resources by agricultural, industrial, and municipal effluents; and (iv) improving the overall allocation and management of available resources in river basins.

3 In the context of this Plan, water variously refers to the wide range of activities associated with ADB's water operations.

4 ADB. 2001. *Water for All: The Water Policy of the Asian Development Bank*. Manila.

5 Annual per capita water endowment (or endowment) is the notional volume of water (in cubic meters) which is available to each resident of a region, country, etc, expressed on an annual basis. It is calculated by defining the volume of accessible/reliable freshwater available each year and is allocated as a notional allowance to each person.

6 Water stress is considered to apply when per capita water endowments are less than 1,700 cubic meters.

7 The International Commission on Irrigation and Drainage defines "overall project efficiency" as the ratio of "crop water use" to "total inflow into supply system." In this Plan, irrigation efficiency refers to maximizing the efficient use of water for agricultural production.

2 The Strategic Approach

Defining the Water Crisis

2.1 **Water Demand-Supply Gap.** Many parts of the region are in a water crisis. Large parts of the continent are under water stress—water stress precedes water scarcity. Annual per capita water endowments have been declining at alarming rates, with some parts of the region already below 1,000 cubic meters per capita per year.⁸

2.2 The gap between demand and supply is widening. At an aggregate level, it is forecast to get steadily worse, indicating increasing water shortages. The 2030 Water Resources Group has estimated the gap will be 40% by 2030.⁹

2.3 The crisis is multidimensional. Accessible freshwater in the region has become scarce for several reasons. The large increase in population is a key factor. It is compounded by rapid urbanization, where more consumers are demanding more water. It is exacerbated because most treated water is lost and does not reach registered customers. The 2030 Water Resources Group also estimates that about 80% of Asia's freshwater is diverted to irrigated agriculture where efficiencies have remained low. While food production in Asia has increased by large margins, ADB estimates that irrigation efficiencies have increased by less than 1% per year since 1990. In most parts of Asia, over the same period, ADB estimates that irrigation efficiencies have ranged from 18% to 58%, with an average of 37%.

2.4 Unregulated abstraction of groundwater poses huge problems in Asia. The depletion of reserves coincides with rising sea levels. This accelerates the problems associated with saline intrusion in the groundwater and/or surface water of estuarine and other coastal areas—often where the most vulnerable live.

2.5 **Water Quality.** While the increase in population, especially Asia's urban population, and the change in its food preferences has meant accelerating

8 This is the definition of water scarcity. This is the point at which accessible freshwater supplies are less than 1,000 cubic meters per capita per year. This is typically indicative of a region subject to a water crisis.

9 2030 Water Resources Group. 2009. *Charting Our Water Future: Economic Frameworks to Inform Decision-Making*. Washington, DC.

Many parts of the region are witnessing a despoliation of freshwater resources with very significant consequences for ecological balance and environmental sustainability

pressure on irrigated agriculture, rapid industrialization, coupled with weak enforcement of legislation, has caused widespread degradation of water quality. In large parts of the region, the volume of untreated wastewater that leaches into accessible fresh or coastal waters is over 80%.

2.6 In many parts of the region surface water sources are being rapidly polluted, often irreparably. Groundwater sources are also subject to serious pollution. In short, many parts of the region are witnessing a despoliation of freshwater resources with very significant consequences for ecological balance and environmental sustainability.

2.7 **Sanitation.** Failure to advance action on access to improved sanitation has also contributed to deteriorating water quality. Much of the region is incurring high coping costs¹⁰ and high downstream costs to remedy contamination of the environment. Unfortunately, according to the Joint World Health Organization and United Nations Children’s Fund Report on the Progress on Drinking Water and Sanitation (2010 Update), out of the 2.6 billion people in the world who do not have access to improved sanitation facilities, by far the greatest number are in Asia—about 1.8 billion. It is unlikely that the proportion of people without access to improved sanitation will be halved by 2015.

2.8 **Health, Education, and Equity.** Lack of access to water and sanitation, and poor hygiene practices, remain a contributing factor to ill-health, particularly among infants. Water-related diseases are still the most common cause of death and illness among the poor. The lack of safe water and adequate sanitation facilities in schools disproportionately affects girls. This is frequently exacerbated by the burden placed on women and girls for the collection of drinking water, often carried over great distances. Continuing lack of access to safe water and adequate sanitation, and inappropriate hygiene practices among the most vulnerable communities, will remain a major barrier to improving general health and widening access to education. It will neutralize efforts to empower women and to help them use their time more productively. Failure to address these key issues will result in increasing ill-health for infants and the elderly, and growing inequity and further marginalization of the poor and vulnerable, particularly women and girls.

2.9 **Water Governance.** Improving water governance remains a challenge since arrangements are generally fragmented. To improve the management of water as a resource, several countries have moved to separate their oversight function from the agencies that manage irrigation

¹⁰ This is the cost of coping with the effects of illness caused by poor sanitation. Individuals face medical expenses and loss of income/opportunity (through being sick or caring for others), while governments face retarded economic development and high costs for healthcare services.

services. Simultaneously, however, increasing decentralization has complicated a coordinated approach at local level. Typically, multiple public agencies, at different levels, share responsibility for water allocation and its use. Harmonization of sectoral and spatial planning in river basins is required, and the interdependence of water, food, and energy requires greater attention. Additional effort is necessary to more adequately mainstream the principal water stakeholders, i.e., farmers, industry, energy investors and producers, and village and city consumers, into water policy design and/or implementation. Improving the governance of water as a service has had mixed results. The drive to foster a culture of payment for water as a service has suffered from a general unwillingness to charge—limited autonomy for service providers and weak regulation has not helped. Providers, therefore, remain short of capital and face difficulty in providing acceptable standards of service. This is despite evidence confirming that municipal, industrial, and agricultural customers are willing to pay for defined standards of service.

2.10 Water–Food–Energy Nexus. In considering water and energy, it is clear that unconstrained use of free or low priced energy has led to indiscipline in irrigated agriculture. In many parts of the region, farmers have depleted groundwater aquifers. The energy footprint of water use is large because practices are generally inefficient. The thermal power sector currently accounts for up to 85% of the total industrial water demand in Asia but has significant room to improve efficiency in reducing its water footprint. Treated water in urban centers, where energy costs are typically a large part of total operational costs, is lost at approximately 30 billion cubic meters each year. While data for the region is not separately available, the Earth Institute estimates that world demand for biofuels is likely to be 376 billion liters by 2030 or about 5% of the global land fuel transport demand. The International Water Management Institute has estimated that production of biofuels at this level is likely to evaporate between 20% and 100% of all water currently used by world agriculture.

2.11 Asia’s energy demand is growing at an exceptional rate. In addition, estimates produced by Columbia University’s Water Institute for Asia predict a 65% increase in industrial water use, 30% increase in domestic use, and a 5% increase in agriculture use by 2030. This illustrates the growing and acute competition among the principal water consumers—it also indicates the limits on supply options for agriculture.

2.12 The business of securing water, including its access, treatment, and delivery for both industrial and municipal use is energy intensive. Energy remains one of the most expensive inputs in water services—in many cases it is the dominant cost. Technologies to reduce energy intensities in water production and distribution have not changed in decades, but physical and commercial losses of the large majority of urban systems in the region have not improved either. Conservative estimates indicate that each year Asia

Harmonization of sectoral and spatial planning in river basins is required, and the interdependence of water, food, and energy requires greater attention

The interdependence of water, food, and energy is incomplete if not seen in the context of climate change

loses treated water with a commercial value of approximately \$9 billion–\$10 billion. The energy costs of this waste, not forgetting its carbon footprint and lost opportunity costs, are significant.

2.13 The economic growth in the region, particularly over the past few decades, has also led to changes in dietary preferences. The protein demand of the fast urbanizing economies and their growing middle classes will center on meat-based and dairy products. Production of meat and dairy products has much higher water intensities than rice and other more traditional food products. The shift to diets whose food elements require more water in their production, without a corresponding, or better, increase in the rate of water use efficiency and productivity, puts more pressure on rapidly dwindling accessible freshwater resources.

2.14 **Climate Change.** The interdependence of water, food, and energy is incomplete if not seen in the context of climate change. The Intergovernmental Panel on Climate Change has said that about 1.2 billion people could face freshwater shortages by 2020 and crop yields in some parts of the region could drop by as much as 30% by 2050. Coastal cities, including many of the region’s megacities, will not only be subject to water security issues because of growing salinity, but will also be increasingly vulnerable to flood damage from unpredictable weather patterns. Both irrigated and rainfed agriculture will sustain impacts. The inter-annual rainfall variability, including the concentration of precipitation in fewer days in a year and in different locations, will further degrade the operability of many surface irrigation systems. Floods and droughts will occur with new and varied intensities, and diminishing likelihood of predictability. Science has not yet been able to determine the precise impacts of changes in the hydrologic cycle, but there is adequate guidance available to commence prudent responses now. This Plan has developed a range of operational interventions—these are in line with emerging best practice measures to respond to the potential adverse impacts of climate change and associated uncertainty.

2.15 In conclusion, the cumulative impact of these factors will exacerbate an already worsening situation. Improvements must be accelerated through the adoption of solutions which can deliver meaningful efficiency savings, productivity enhancements, and sustainable, inclusive results.

Framing Solutions

2.16 While the scale and complexity of the issues are challenging, a range of solutions is possible—ADB, its clients, and partners are actively considering these options. Among these, demand-side measures are likely to yield the best results, at lower costs than supply-side solutions. To enhance water security and ensure equitable access among a range of users, the region will

need to use available water resources more efficiently and improve demand management. A change of mindset is required, as water development to date has favored creating additional supply capacities regardless of use. Bringing additional cultivable areas under irrigation command, rather than improving efficiency and productivity in existing systems was typically the preferred option. Unrestricted use of groundwater, through the subsidized provision of electric power to farmers, was easier and less contentious than licensing and regulation. In many instances, addressing municipal water shortages through development of new water sources, and treatment and distribution capacity, was the favored approach. Most now recognize much of this will have to change to achieve sustainable water security and equitable access.

2.17 A range of solutions is available to DMCs to address the water challenge—the choices include (i) increased efficiencies in water use across the range of users; (ii) expanded wastewater management and reuse, including sanitation; (iii) embedded integrated water resources management, including improved risk management to mitigate floods, droughts, and other water-related disasters; (iv) expanded knowledge and capacity development that uses technology and innovation more directly; and (v) enhanced partnerships with the private sector.

2.18 Water cannot be considered in isolation from the sectors that it relates to most closely—that is food and energy. The water-food-energy security nexus, coupled with climate change impacts, can help to drive the design of transformational water agendas across the region.

2.19 Approaches in small, remote, or fragile areas will continue to require special consideration, but the general solutions identified above will be appropriate. Where critical mass is absent, smaller decentralized approaches will be most appropriate—this applies in equal measure to the delivery of water, sanitation, and wastewater management services to rural communities. Regional cooperation and pooling of resources will provide initial traction and foster sustainability. In addition, as new low-cost technology solutions are developed, these may prove helpful in addressing their unique needs.

2.20 **Increased Efficiency in Water Use.** Efficiency gains and last resort supply-side measures can make a difference, and will increasingly become the principal objectives of water agendas in the region. This has been demonstrated in the municipal water sector—it is also increasingly recognized as an appropriate response in the agricultural, energy, and industrial sectors. Correctly managed, these approaches can release the pressure on freshwater resources and provide for enhanced environmental allocations and groundwater recharge. Using available water efficiently (as in countries outside the region that are perennially and dangerously short of water) will be the default option. The region will have to adopt policies that dramatically improve efficiency of water use.

To enhance water security and ensure equitable access among a range of users, the region will need to use available water resources more efficiently and improve demand management

Reducing water loss and minimizing inefficient use of water can defer the major investments required for the development of new water sources, and irrigation schemes and networks

2.21 Efficient use of water, fair and balanced water allocation, and adequate measurement will assist in making water available for widely competing uses, including ecosystem services. Reducing water loss and minimizing inefficient use of water can defer the major investments required for the development of new water sources, and irrigation schemes and networks.

2.22 Expanded Wastewater Management and Reuse, including Sanitation. The cleanup and rehabilitation of polluted freshwater resources will be a major area of concentration for rapidly industrializing countries. These interventions are capital intensive and require sustained efforts, supported by economic incentives. In parallel, tougher pollution control policies and enforcement regimes will have to be established. Implementing a tough regulatory regime for water quality management will complement investments in wastewater management. It requires a direct link with the practice of pricing water services more closely to environmental costs, working under the “polluter pays” principle. In parallel, it will be necessary for DMCs to expand wastewater reuse as a means of mitigating water scarcities. There are a variety of options for collection, conveyance, treatment, and disposal and/or reuse of waste. Increasingly, there is acknowledgement that the reuse of treated wastewater and conditioned sludge byproducts is a viable business opportunity, and a sound response to water conservation.

2.23 Sanitation must remain an urgent priority for many governments in the region. Sanitation is not only a matter of personal dignity for individuals, especially for women, girls, the elderly, and those with special needs, but it is also a huge economic benefit in terms of improved public health and enhanced use of productive resources. While improved sanitation, based on the MDG definition, means access to latrines, governments should be encouraged to go further with the provision of even more hygienic, environmentally sound, and dignified technologies, wherever possible. The expansion of sanitation and wastewater management services has a clear link to poverty reduction. The high coping costs of illnesses resulting from poor sanitation and limited wastewater management services particularly affect poor, marginalized, and vulnerable people.

2.24 Embedded Integrated Water Resources Management. Across the region, many governments have adopted the principles of integrated water resources management (IWRM). ADB and its development partners have supported the introduction of IWRM as an adaptive management process in river basins. Given the region’s water challenges, this work must be intensified. It will require embedment into all aspects of the management of the subsector. This will allow DMCs to increase water security and balance economic, social, and environmental goals through a comprehensive and participatory approach involving a range of stakeholders in sustainable water management.

2.25 Further assessments of changing water demand and supply in river basins will guide cross-sectoral planning, allocation, and judicious usage of water resources under conditions of increased uncertainty. Social equity, economic efficiency, and ecosystem services as a triple bottom line of the IWRM process need consideration in each river basin (and for cities within the basin). This requires a further evolution of water governance frameworks in each country, supported by legislation, and with local implementation facilitated by river basin organizations. Several countries in the region are demonstrating some progress.

2.26 The simplistic notion that efficiency is merely a matter of good management will have to give way to the reality that water has an economic value and its efficient use is a function of both sensible regulation and tradability. Establishing rights in water and enabling water markets to develop will highlight the right price “signals” for efficiency. In several developed countries, the water reforms of the past two decades are a useful guide to demonstrate how public-private partnerships in water have managed the resource with efficiency.

2.27 A full adaptation of IWRM principles will also enable communities to establish the right frameworks for water governance that respond to and guide the efficient allocation and use of water. It will avoid a multiplicity of agencies, often working at cross-purposes, and will quickly build capacities to maintain and manage the quality aspects demanded by IWRM. This will allow qualitative enhancements in efforts to protect and manage watersheds, and monitor water quality. It will also encourage improvements in the distributional efficiencies of basin water managers.

2.28 Increasingly, dwindling freshwater endowments are highlighting a need for better trans-boundary water management, both within and among countries. The Water Policy states that ADB will only work in this area if requested by all riparian countries. However, it will be helpful for ADB to review the issues to determine the best ways to foster partnership in the intergovernmental management of shared river resources. This could be undertaken independently, or in partnership with another agency or institution. Such public service would be appropriate in the context of water security, climate change adaptation, and disaster risk management.

2.29 Two of the urgent challenges to be addressed in the IWRM process are (i) flood and drought mitigation (as part of disaster risk management); and (ii) the water–food–energy security nexus.

Social equity, economic efficiency, and ecosystem services as a triple bottom line of the Integrated Water Resources Management process need consideration in each river basin (and for cities within the basin)

Community-based, disaster risk-reduction strategies will provide resilience in vulnerable communities—it will also reduce damage, limit loss of lives, and minimize livelihood impacts

1) Flood and Drought Mitigation, and Other Water-Related Disasters

2.30 The region already suffers adversely from water-related disasters. It is anticipated that the impact of climate change will increase the frequency and magnitude of extreme weather events, and associated disaster risk.¹¹ The effects of growing uncertainty can be mitigated by better governance and more robust non-structural measures. Such non structural measures will include forecasting and early warning systems, increased storage capacities and better management of wetlands. There will be a requirement for additional large-scale storage facilities and these will be expensive. Community-level storage facilities have already demonstrated their value in the region, and together with rainwater harvesting, there is scope to achieve yet more with these approaches. Creating these storages and managing wetlands will be a necessary part of any flood, drought, and other water-related disaster mitigation strategy. Such a comprehensive bottom-up approach will also be integral to effective water resource management. Better groundwater management will contribute to an improvement in a country's capacity to cope with frequent and persistent periods of drought. Community-based, disaster risk-reduction strategies will provide resilience in vulnerable communities—it will also reduce damage, limit loss of lives, and minimize livelihood impacts.

2) Water–Food–Energy Security Nexus

2.31 In responding to climate change, reviewing how changes in water, food, and energy security intersect in each river basin will deliver significant benefits. Adjustments in policies for food self-sufficiency and reliance on hydropower and biofuels as sources of renewable energy will have major consequences for the IWRM process in river basins. To address the water-food security nexus, policy and technological change in irrigated agriculture is required to deliver measurable increases in efficient water use. “Growing more food with less water”¹² will increasingly be a priority. Private sector and farmer participation must increase substantially. Waste in food production and its supply chain must be minimized, if not eliminated. Action plans require design and implementation arrangements to address the increased demand for food, supported by effective global partnerships in knowledge, innovation, policy research, and capital. Formulation of public policy is required in ways that help decision makers allocate and rationally manage water use across the food, energy, industrial, and municipal spectrum.

11 ADB's approach to water-related disaster risk management emphasizes that, where possible, prevention, mitigation, and preparedness should be incorporated into a country's development process.

12 “Growing more food with less water” is the ongoing process of water use efficiency and productivity gains, which drives the goal of growing more food with less water (and other inputs including land and chemicals). It will be evident in efficient agricultural practices and enhanced water management. It includes measures to improve the performance of existing irrigation systems.

2.32 Expanded Knowledge and Capacity Development. The role of technology and innovation in managing demand, expanding supply, and

ensuring water quality will be vital. “More crop per drop”¹³ should not be a slogan but a central feature of managing irrigation services. Likewise, improved germplasm for both irrigated and rainfed areas, integrated plant stress management, aerobic rice cultivation, conjunctive groundwater use, and local knowledge in rainwater harvesting and management of check dams are examples of the kinds of technological investments that must be forthcoming. Future advancements in desalination technology for water supply will reduce costs and there is potential for its use in some parts of the region as part of a balanced and cost-effective approach to water supply, and maintenance of appropriate levels of water security. Membrane technology in wastewater treatment and reuse, and the ability to offset energy consumption by using micro-turbines in city water networks to generate power, are further examples of innovation that will sustain the new water management regime. ADB should help assemble, synthesize, and disseminate advances in technology.

2.33 At a broader level, a superior, coordinated knowledge base will be required to drive the new set of water reform measures. Establishing an Asian Water Information System with an accessible and updated body of knowledge for the range of water stakeholders should be a priority for ADB. It should incorporate

arrangements for thinking outside the “water box.” For instance, solutions to reduce the demand on water for food production can lie outside the agricultural process and its supply chain. Estimates suggest that 40% to 50% of food produced is lost between production and consumption. Losses in the field may be between 20% and 40%, and processing, transport, and storage losses may be between 10% and 15%. Eliminating as much of this waste as possible would help reduce the draw on water significantly and enhance food security. ADB’s strengths in agriculture, rural development, and food security should be at the forefront of this approach.

2.34 Enhanced Partnerships with the Private Sector. Partnerships have to become more strategic and demonstrate their value addition. Significantly increasing the private sector’s participation in water (for urban, rural, and basin uses), and sanitation and wastewater management services will be critical—governments cannot risk waiting for investments to happen, or technological and managerial expertise to be secured only from within their own resources. The entire business of water management will require a collaborative approach between the public and private sectors, and within

The entire business of water management will require a collaborative approach between the public and private sectors, and within the different levels of government from central to local levels. Private capital and private expertise are essential ingredients in closing the water gap

13 “More crop per drop” defines the objective of decreasing water intensity in irrigated agriculture by securing more food with less water. Generally, gaining “more crop per drop” can be achieved through the introduction of new technologies, e.g., drip and sprinkler irrigation in place of surface techniques, or through transformation of irrigation systems and on-farm management.

the different levels of government from central to local levels. Private capital and private expertise are essential ingredients in closing the water gap.

2.35 **A Water-Smart Future.** Across the region, governments will increasingly adopt water-related policies and regulatory measures that manage demand to higher standards—supply-side options are not only limited, but also much more expensive. Water service fees need to be subject to increases and regulation by independent, credible bodies. Water services will need to be priced more universally, and explicitly, as an economic good. The physical use of water will need robust governance from markets and regulators who will ensure the right balance between competing uses, including social and ecosystem requirements. Robustly addressing water quality measures and wastewater management, including reuse, will be required through the application of more rigorous standards. Development of capacities in water resources management will be required more rapidly than previously envisaged. Knowledge, technology, and innovation will play a central role in driving efficiencies and in keeping costs low. Increasingly, governments will seek significant improvements to governance arrangements to deliver more robust water security.

3 The Operational Plan

3.1 This Plan provides guidelines and establishes basic principles. The Water Policy will remain the bedrock of ADB water operations. Synergies will be pursued with the programs of other multilateral and bilateral organizations.

3.2 During 2011–2020, the continuation of the Water Financing Program (WFP) will allow for operationalization of the objectives of this Plan. The first phase of the WFP, implemented from 2006–2010, achieved the target of doubling ADB’s water investment in urban, rural, and basin water to over \$10 billion in 5 years.

3.3 The continuation of the WFP during the period 2011–2020 will sustain ADB’s water investments to \$2 billion–\$2.5 billion annually or a total of \$20 billion–\$25 billion over the 10-year period. Implementation will be guided by a set of solutions prioritized by this Plan, which will be adopted, as appropriate, through the following responses by ADB: (i) expanding and deepening knowledge and analytical work; (ii) advancing inclusive water policy reforms; and (iii) strengthening support to programs and projects in priority areas.

Expanding and Deepening Knowledge and Analytical Work

3.4 ADB will undertake expanded and enhanced analytical work to determine the best measures for governments and communities to adopt as they seek to improve water use practices. This will also inform how ADB operations can assist in this process. This will enable ADB and its clients to secure a deeper and sharper understanding of water issues and solutions at both regional and affected-country levels. A key objective will be to determine the best mix of measures to enable a country to close its water demand and supply gap at costs it can afford, and thereafter sustain the water balance. This approach will be helpful for all countries currently not subject to water scarcity. It is a future-proofing response to a range of challenges including population growth, migration, urbanization, industrialization, and economic development. It will equip DMCs to develop strategies to counter the impacts of declining water availability, climate change, and general uncertainty. This will help in managing the tradeoffs necessary to achieve sustainable water security. Action now by those DMCs not subject to water stress and scarcity is a prudent investment in the future. For other DMCs in the grip of water stress or scarcity, it is the first step in a coherent and structured response to addressing long-term sustainability.

The Water Policy will remain the bedrock of ADB water operations. Synergies will be pursued with the programs of other multilateral and bilateral organizations

A new breed of assessments will be initiated to look across sectors with a more integrated approach

3.5 A 20-year horizon will allow a better foundation for developing long-term operational, capacity development, and knowledge creation plans. Such analytical work will consist mainly of (i) a study on the “Future of Water in Asia” (“FoWA Study”); and (ii) a series of improved country water assessments (CWAs), which will offer more attention to cross-sectoral issues. Other knowledge work will continue and will inform the development of the FoWA Study and CWAs.

3.6 Future of Water in Asia Study. It will be critically important to understand current water issues and emerging trends and solutions as thoroughly as possible. Current sector knowledge is both patchy and splintered. To this end, ADB will undertake a 15–18 month the FoWA Study. This will comprise a macro-view of the availability of accessible freshwater over the next 20 years. It should be subject to review every 3 to 5 years—it should be published as a seminal knowledge offering. It will assist in forecasting the impact of water use policies and practices on food and energy production, as well as industrial growth and domestic use, particularly in light of climate change imposed uncertainties. It will provide a clear description of the economic, social, and environmental values of these impacts on growth and development. Additionally, it will consider issues of water governance, including how to raise the profile of the private sector and farm communities in policy formulation and regulation. Furthermore, it will help in identifying solutions for demand-side management including the role of science and technology in maximizing efficiencies. Finally, it will assist in the identification of corporate models for public and private investment and management, and allow facilitation of effective intergovernmental collaboration for managing transboundary water resources. To the extent possible, opportunities for collaboration with partners will be maximized, particularly those who have the comparative advantage in doing particular analytical work.

3.7 Country Water Assessments. A new breed of assessments will be initiated to look across sectors with a more integrated approach. They will take into account the water-food-energy security nexus, and the projected impacts of climate change on water management. CWAs will assist governments and ADB in securing a fact-based understanding of the water issues and prospects. These assessments should cut across the food, energy, industry, and domestic sectors and examine water issues and solutions from integrated perspectives of economic value-addition.

3.8 Periodic updates of CWAs should be done within the framework of the FoWA Study and this Plan, and other plans (and/or relevant documents) modified accordingly. CWAs are vital for increasing awareness of the crisis affecting many parts of the region in developing knowledge and understanding to address challenges and opportunities in a robust and comprehensive way, and in mapping out potential solutions. It will inform ADB and decision

makers on a range of issues with a focus on new technology, innovation, and best practice. Securing buy-in from DMCs and knowledge partnerships will be vital.

3.9 CWAs will identify proposals for further analytical work that will be incorporated in the sector roadmaps, and the country programs. Typically, these proposals will cover those subjects where both ADB and the client require greater understanding to inform a policy measure (such as the merits of introducing no-till farming), an institutional reform objective (such as establishing a unified governance arrangement), or an investment decision (choices between competing water infrastructure needs). This might well include (i) processes for establishing river basin management regimes; (ii) strategies for non-revenue water (NRW) reduction; (iii) models for public-private partnership in urban water and wastewater management; (iv) efficiencies in industrial water usage; (v) shrinking energy use in water production and delivery; (vi) local strategies for rainwater harvesting and expanding capture and storage; (vii) matching science with water efficiency processes; (viii) options for improving techniques, efficiencies and productivity; (ix) changes in cropping patterns and land use management to improve productivity; (x) relative cost benefit analyses of alternative tariff regimes; and (xi) issues and options in transboundary water management. On the basis of the key investment, or support areas, identified by ADB in CWAs, the scope of the analytical work will be determined and agreed. Existing sector work will inform these assessments as relevant. The application in each country will require careful development of a final methodology in accordance with the DMC's specific situation, and will include agreement on scope and deliverables.

3.10 These assessments will allow ADB and DMCs to respond to uncertainty and change through better planning and improved approaches to risk management. The approaches defined in this Plan go beyond quantitative responses to dealing with new water cycles and patterns. It requires a more serious consideration of approaches to efficiency. Together with the FoWA study, ADB will deepen its sector knowledge by leveraging knowledge partnerships with key institutions, either by engaging in joint analytical work or through other means, such as secondment of experts from partners.

Advancing Inclusive Water Policy Reforms

3.11 This Plan will continue to support mainstreaming governance and capacity development across ADB operations. Strengthening financial management, including revenue, trading, expenditure, and asset management will be a particular area of focus for water operations across all facets of the sector.

This Plan will continue to support mainstreaming governance and capacity development across ADB operations

**ADB will
continue to
work with client
governments
in advancing
tariff reform
measures**

3.12 ADB will help countries identify the policy reforms that will support the design and implementation of enhanced water agendas, which will suit the specific requirements of each country. The CWAs will analyze and discuss these measures. For instance, in many DMCs the reform areas to be adopted might include (i) securing efficiencies in irrigated agriculture through more rationalized water use and higher productivity; (ii) transforming urban water supply agencies into autonomous and accountable service providers that operate under business principles, providing a superior level of urban water service through a significant drop in water losses, and a widespread use of public-private partnerships; (iii) a surge in the volume of wastewater treated and reused; (iv) establishment of appropriate regulatory regimes and effective enforcement; (v) rehabilitation of groundwater resources; and (vi) introduction of basin-wide IWRM on a phased basis.

3.13 ADB will continue to work with client governments in advancing tariff reform measures, seeking to avoid marginalizing the poor and vulnerable. This will include identifying options for financing connection charges—experience has shown this has been a hindrance in connecting more people, particularly the disadvantaged.

3.14 Policy reform measures cannot be designed in a vacuum. While they may be derived from analyses in CWAs, they need to be owned by broad coalitions of water constituents in-country, and even more at local level. ADB will support the building of such coalitions of partners, including community representatives, academic and research institutions, private sector, civil society organizations, government agencies, and the media. This will help drive the reform process and foster the demand for a higher standard of water service.

3.15 Promoting water reforms will be a multidisciplinary, inclusive process. Governance structures will require review and reform where necessary. Pricing of water services requires much greater attention. As a priority, identification of arrangements that impede, or constrain, inclusiveness at any level of government should result in amendments. The effectiveness of ADB's existing work with apex bodies should also be assessed—this will include an assessment of their ability to promote inclusiveness in the management of water resources and protection of the environment.

3.16 Inclusiveness also requires tightening the link of water to food and energy. The policy reforms will have to approach water management differently. The clear water-food-energy nexus and the emerging global premium on crops will make inclusive and integrated decision making a decisive factor in achieving sustainable and equitable water security across the region. Investing in reduced water loss and in rehabilitating freshwater sources, including protecting and enhancing the environment, should be a

priority. Improving agricultural water efficiency and increasing productivity will significantly improve overall water security. In many DMCs, the majority of least cost solutions to close the water demand-supply gap could come from the agriculture sector. The energy sector must also face the challenge of working with less water to achieve higher productivity. Ensuring there is appropriate focus in addressing the nexus in an integrated and inclusive way will maximize possible gains in efficiency of water use.

Strengthening Support to Programs and Projects in Priority Areas

3.17 Understanding the key water issues that need to be addressed, and based on the choice of solutions, ADB will outline the type of project and program interventions that it should implement in the next 10 years. The central design feature in ADB's future genre of water projects and programs will be efficiency gains. ADB should seek to engage when sustainable efficiency in water use and productivity improvements are clearly demonstrated as the principal outcome of a set of investments or policy measures. The priorities, programs, and projects should be those (i) mainstreaming efficiencies in water use in project design; (ii) supporting increased investments in wastewater management and reuse, including sanitation; and (iii) stimulating private sector participation.

The central design feature in ADB's future genre of water projects and programs will be efficiency gains

1) Mainstreaming Efficiencies in Water Use in Project Design

3.18 It is crucial for ADB to demonstrate adherence to the basic principles of promoting efficiency, performance improvement, water demand management, and arresting the falling rate of per capita water endowments. Increasing the efficient use of water will therefore be a design feature of ADB's water projects and shall be applied to appropriate projects in the urban, rural, and basin contexts. Provision of expert support to project teams in the regional departments will facilitate their access to knowledge and tools that will help them in mainstreaming efficient use of water in project design. Adoption of efficient practices, which conserve water and boost production, is not the sole solution to the problem of water scarcity. However, experience has shown that a reluctance to embrace this approach in ADB's water operations will deliver projects with suboptimal results and unsustainable outcomes.

3.19 Municipal. Emphasis is required on aggressive reduction of NRW together with the development of new sources.¹⁴ Currently, most urban centers in Asia have NRW levels ranging from 30% to 70%; measurement is very rarely possible. Investments will be required to rehabilitate networks

¹⁴ ADB will seek to deliver NRW reduction as the primary means of providing additional water for improving existing water supply service and/or expanding coverage. Typically, the development of new sources of supply will be considered only where the expected volume of water generated from reduced NRW is inadequate to meet the project requirements, and/or changing water security requirements suggest an additional source of supply is necessary.

Urban water and sanitation services succeed where agencies have transformed themselves into corporate entities, or have adopted a corporate approach to their operations

to prevent physical and commercial losses. This will stimulate a strong culture of NRW management, and a thorough grasp of the benefits of rigorous rationalization and sound optimization of existing and proposed assets. Establishing adequate incentives and institutional capacity will assist utility reform processes. The costs of making these investments has been demonstrated to be far lower than the costs of developing new water sources, often at great and growing distances from urban centers. Water conservation plans require alignment with NRW reduction activities to give a stronger linkage to efficiency and performance. This is important to help foster awareness where water scarcity is not recognized. In addition, the delivery of efficient operations and the reduction of NRW are significant steps towards achieving continuous, uninterrupted water supply services. Support for new source development and additional treatment or distribution capacities will be supplemented by demand management and performance improvement initiatives.

3.20 ADB's experience indicates that urban water and sanitation services succeed where agencies have transformed themselves into corporate entities, or have adopted a corporate approach to their operations. Corporatization¹⁵ has happened where decision makers viewed urban water and sanitation services as a long-term business proposition that ensured the financial sustainability of water and sanitation systems and protected the value of water resources over the longer term. Such an approach has also stimulated private sector participation and has brought in external expertise and additional sources of finance. Nevertheless, corporatization is not a precursor to privatization—there are good examples of high-performing utilities that have attained corporate status while remaining wholly owned by government. However, maintenance of flexibility takes into account country-specific circumstances. The alternative approach of managing urban water and sanitation services through agencies that are principally extensions of government departments has been typically unsustainable.

3.21 Based on this experience, ADB will seek to support utilities that are: (i) corporatized; (ii) in the process of corporatization; (iii) committed to pursue corporatization, or autonomous and accountable entity status operating under business principles; and/or (iv) prepared to adopt corporate-based solutions, such as public-private partnerships, management contracts, concession agreements, and/or other similar modalities. This approach offers the best chance of sustainability in the shortest possible time. It is also likely to have high value demonstration impact. In addition, tariff reform linked to improved service delivery will be a key element of the approach to

¹⁵ Corporatization refers to the transformation of existing public water entities into autonomous corporations, with the aim of introducing business management principles and techniques to their administration. The corporations typically remain state-owned, but achieve autonomous status (i.e., state-owned enterprises). It is a change process, which enables existing entities to adopt management structures, and other desirable features and behaviors, employed by successful business-focused, public or private sector corporations. Corporatization is not necessarily a precursor to privatization and does not require creation of new entities.

municipal water. Establishing sound policy and regulatory frameworks will be vital in implementing tariff and other related reforms.

3.22 Agriculture. It is in this sector that the greatest benefits can be achieved. The Food and Agriculture Organization of the United Nations has stated that the “future of water is in a more efficient agriculture.” It is here that ADB must act as an agent of change to improve efficient use of water and productivity in irrigated agriculture. The irrigation subsector constitutes about 80% of the demand for freshwater in Asia. Recent studies have suggested that a variety of measures to improve efficiency and productivity will be possible. All of these have political, social, and economic trade-offs and it is for communities to judge those that would be best suited to their needs. Sound economic analysis will determine at what point investments in efficiency and productivity stop yielding benefits, and when capital works interventions are the most appropriate response. DMCs are already addressing these tradeoffs, in particular targeting irrigation efficiency as a key element of their national sustainable development agendas. ADB has an opportunity to play a part, influencing and informing DMCs as regards best practice and the most effective ways of reflecting this emerging driver in water operations.

ADB will adhere to the principle of improving efficient use of water and productivity enhancement

3.23 The water supply service gap in rural areas is much higher than in urban areas. ADB’s support should help to advance efforts to expand rural water supply services. There are significant challenges in delivering standalone rural water supply projects. However, experience shows they are more workable and sustainable when delivered in combination with irrigation projects and/or water resources development projects.

3.24 For agricultural water management projects, ADB will also adhere to the principle of improving efficient use of water and productivity enhancement. Those projects that demonstrate a clear program of substantially improving efficiency in the use of water and enhancing productivity will be a priority. Typically, there will be support for expanding irrigation areas after demonstration of substantial efficiency gains from existing water use. The design of irrigation projects currently in process or in the pipeline could illustratively consider the following: (i) productivity enhancement through components such as irrigated germplasm improvement, systems of rice (or other crop) intensification, suitability of crop selection based on water intensity, improved fertilizer use, introduction of micro-irrigation, and integrated plant stress management; and/or (ii) infrastructure development including, where appropriate, land-leveling, drainage improvements, small infrastructure development, artificial recharge, no-till farming, and completing last-mile infrastructure. Additionally, community participation in planning, implementation, and management delivers stronger outcomes. A key aim of the overall approach will be improved irrigation service delivery institutions and arrangements, with increased accountability to farmer organizations.

Future water operations will seek to learn from various civil society initiatives, including those driven by farmer groups

3.25 Similarly, there will be support for watershed development or rehabilitation projects when they demonstrate clear gains in restoring the water balance in the watershed, catchment, sub-basin, or basin concerned. Other projects and programs that have clear objectives of optimizing water use, reducing water footprints, and improving water management infrastructure or processes will also be considered.

3.26 Projects to reduce food waste, e.g., post-harvest losses, transportation, and processing losses, etc., and projects to restore or better manage groundwater sources, or advance wastewater management and reuse will constitute some of the new genre of interventions. In the energy sector, higher water use efficiencies will have to come from dry cooling and other water reducing means, including recycling.

3.27 Future water operations will seek to learn from various civil society initiatives, including those driven by farmer groups. This will include their approaches to watershed management, rainwater harvesting, and participatory water management. Promising examples with good outcomes will be widely disseminated. ADB will seek to continue to engage with farmers, water consumers, environmental groups, organic farming associations, and women's rights organizations. In particular, there will need to be careful thought on how to incentivize farmers to change their practices, and in particular, how they can save water.

3.28 Substantial reforms in the energy and water sectors will be required to counter the current, unsustainable rates of groundwater abstraction evident in many parts of the region. New investments in technologies, water resources, and management strategies, together with appropriate incentives and regulation will be required to promote water productivity in all sectors. ADB will work with governments, researchers, civil society, and the private sector to halt, and where possible reverse the decline in water tables.

3.29 Information and Technology. The availability, quality, and accuracy of data and information will be essential to successful implementation. A critical assessment of how these constraints might impact on projects in particular DMCs is required to determine how much uncertainty can be accommodated, e.g., limited asset databases which prevent meaningful NRW reduction programs, and poor quality information on irrigation systems which blunt efforts to improve water productivity. These constraints will require detailed consideration and improved understanding before initiation of projects. ADB will also assist its DMCs in better understanding their options for embracing emerging technology to meet their specific requirements.

3.30 Minimizing Footprints. ADB's water operations must seek to deliver projects that have limited environmental footprints, e.g., those which are

cognizant of their energy and water footprints, and which are financially sustainable. Driving efficiency, preventing pollution, and promoting the delivery of water services as a business are sound approaches to sustainability and reducing adverse impact. Complementary water saving and conservation measures should also be supported.

3.31 In conclusion, supply-side measures for urban, rural, and basin water, including options for development of new water sources, e.g., building storages, environmental protection and enhancements, and completing other infrastructure to augment water supplies, will typically receive support when coupled with efficiency gains elsewhere.

2) Supporting Increased Investments in Wastewater Management and Reuse, including Sanitation

3.32 Wastewater Management. Investments in wastewater management and reuse will have to be expanded significantly and allied with the cleanup of polluted surface water and groundwater. Different standards, treatment levels, and technologies apply to meet different needs. Countries need to start with available infrastructure and technology, and upgrade their assets over time. Installations in new cities and retrofitting of older systems can adopt the cascading, modular system. This involves clean water for potable purposes, cascading down to grey water, filtered for agricultural, urban, and industrial use, and subject to further filtering for potential recycling and/or environmental recharge, etc. Wastewater can also be “harvested” for energy production and/or nutrient capture—also, after further filtering it has potential for agricultural and/or environmental use. Decentralized systems will help facilitate this approach. Appropriate technology, which meets differentiated end needs at costs that attract investments, will be the recommended solution. ADB will help its DMCs determine which option best suits needs, e.g., wastewater recycling, beneficial reuse of sludge byproducts, etc.

3.33 Sanitation. ADB will pursue investments in sanitation infrastructure and services wherever required to secure higher gains to public health, and strengthen the economic competitiveness of cities. The scaling-up of sanitation will be a key activity in the surge to deliver progress against the MDG targets and will be central to the success of future urban and rural water operations. It is not recommended to implement sanitation investments as a small component of larger urban and rural water supply projects. Typically, water supply projects should include a meaningful sanitation component to allow a balanced approach to total water service delivery. Projects should also indicate how to address the incremental wastewater generated from their development. This means responsibly addressing system inputs and outputs, i.e., water and wastewater. There will be support for standalone sanitation investments, where there is a need, and where there is a sound

Investments in wastewater management and reuse will have to be expanded significantly and allied with the cleanup of polluted surface water and groundwater

ADB's approach over 2011–2020 will be to advise when private sector involvement would be appropriate and what best practice solutions are most likely to meet requirements

and sustainable business case. The sequencing requirements of clients may determine early operations in water supply with wastewater and sanitation investments to follow. This applies to circumstances where a client country has requested an official development assistance partner to lead in sanitation, and ADB to lead in water supply.

3.34 Rehabilitation. River cleanups are very expensive; however, it is no longer acceptable to delay an expansion of investments in this subsector. There will be a significant future investment demand for river cleanups—the need to conserve water and growing community concerns about the health of their rivers will prompt this. Knowledge and skills developed from work on IWRM, rural water, and irrigation, where appropriate, will inform approaches.

3) Stimulating Private Sector Participation

3.35 The extent to which the private sector is engaged will impact materially on the future of water in the region. To close the aggregate demand-supply gap of 40% by 2030, the investment needs are likely to be so high as to make it impossible for the public sector alone to finance them. Nor would this be desirable. Private finance, and private management and technological expertise, have demonstrated their value addition: it will need to be scaled-up significantly. There is a clear need to scale-up in large numbers a range of initiatives including irrigation service companies, water and wastewater concessions or management contracts, and water user organizations. Using guarantees and other instruments ADB, through the regional departments and PSOD, should aim to leverage technology, innovation, and finance into efficient and profitable water management. To do this, ADB will need to promote water, and wastewater management, and sanitation as a business. ADB will seek to stimulate private sector participation through a discrete set of country-level strategies and roadmaps. New business models, when and where applicable, should be explored, tested, and scaled-up. Programs and projects that mobilize the private sector should receive prioritization over others.

3.36 ADB's approach over 2011–2020 will be to advise when private sector involvement would be appropriate and what best practice solutions are most likely to meet requirements. This will also include advising on the known potential complications of private sector engagement, such as strategic capture, cherry-picking, and locked-in higher costs. This, together with ADB support for efficient water services, will enable water businesses to attract private financing and expertise. The focus will be across all water services, not merely in the urban sector—there needs to a concerted drive to seek innovative ways to involve the private sector in basin and rural water.

Instruments and Modalities

3.37 Using loan and technical assistance instruments, and based on CWAs, program support will typically be provided for (i) discrete sets of policy and institutional reform measures whose principal outcomes are efficiency gains and productivity improvements, or the protection and conservation of water resources; (ii) long-term capacity development; (iii) adoption of measures for transboundary water management; (iv) strengthening regulatory capacity, including enforcement; and (v) other policy, advisory, and capacity building support.

3.38 ADB has demonstrated the successful use of the regional technical assistance instrument for performance improvement of water utilities such as the Water Operators Partnerships Program. This should be extended to other areas of water management through both the program and project modalities, and supported through loan and technical assistance instruments.

Community Participation and Customer Service

3.39 Involvement of the community in planning and implementation of water development and management activities is essential. In municipal water supply, increased customer participation in planning and delivery of water supply and wastewater services will be essential to ensure that services respond to their needs. This will also allow service providers to be held accountable to their customers, and to the wider community. Inputs from civil society are invaluable when considering new policies, strategies, and regulations. Community empowerment and community participation improves governance, innovation, infrastructure quality, cost effectiveness, and the sustainability of projects. Community participation can be enhanced through, for example: (i) education and awareness raising (i.e., capacity building) of communities and individuals on water management issues, seeking to afford closer attention to mainstreaming gender considerations; (ii) improved communication aimed at providing information to all that need it on water resource management and related implementation activities; (iii) implementing measures to facilitate participation of the community in inclusive water planning, management, and operations; and (iv) developing community-based self help programs and specific projects to provide local improvements in water supply, sanitation, irrigation, environment management, and water quality.

Community empowerment and community participation improves governance, innovation, infrastructure quality, cost effectiveness, and the sustainability of projects

The key impact from this Plan is improved governance of water in the region, recognizing water as a resource that must be managed sustainably, and as a service that must be delivered and consumed efficiently

Improving Effectiveness

3.40 This Plan aims to improve effectiveness and enhance the quality of the outcomes of ADB's water operations. The new genre of projects will focus more on core water interventions and less on multisector projects where the water component is limited. The latter projects tend to obscure and diminish impacts in core areas, frequently confuse assessment of the outcomes, and are an unnecessary distraction in the evaluation of development effectiveness.

3.41 It is also necessary to develop a more representative and focused set of performance and effectiveness indicators to inform future special evaluation studies and development effectiveness reviews.

Directional Targets and Results Framework

3.42 Based on the activities identified in this Plan, a results framework has been prepared (see Appendix). It will guide activities over the period 2011–2020 and provide a basis for monitoring performance.

3.43 Impact. The key impact from this Plan is improved governance of water in the region, recognizing water as a resource that must be managed sustainably, and as a service that must be delivered and consumed efficiently, all as envisioned in ADB's Water Policy.

3.44 Outcomes. The key outcomes from this Plan include (i) the acceleration of the reform of policy and institutional arrangements to support improved water use efficiency across all water subsectors; (ii) the adoption of efficiency improvements and productivity enhancement to deliver better water services and raise levels of service; and (iii) the acceleration and expansion of the pace of implementation of IWRM to deliver improved water security and enhanced efficiency and productivity.

3.45 Outputs. The principal outputs from this Plan include (i) achievement of ADB's target investment level; (ii) increasing the volume of ADB investments in sanitation and wastewater management, and river clean-ups; (iii) mainstreaming of efficiency in water use into the design of ADB's projects; (iv) consideration of climate change adaptation, flood and drought mitigation, and the water-food-energy nexus in all integrated water resources management projects; (v) increasing adoption of corporate-style governance models in projects with public water utilities; (vi) broadening and deepening of ADB's partnership with the private sector in the water sector; (vii) promotion of continuing professional development in ADB projects and, where possible, its adoption in DMCs; (viii) generation of awareness in political and public spheres around the water crisis and associated issues,

and an understanding of the water-food-energy security nexus; and (ix) considerable improvement of the development effectiveness of ADB water sector projects.

3.46 Partnerships. These are a key resource, and partnerships will remain central to ADB's work in the sector. ADB will continue to offer its clients opportunities to engage in practitioner networks (e.g., for utilities, river basin organizations, and in the future for regulatory bodies and irrigation service providers), knowledge sharing on priority topics supported by knowledge hubs and other centers of excellence, and networking among water leaders. Regular review is vital to good partnership management—if a partnership is underperforming, or is inactive, it may not be renewed. At the same time, ADB needs to identify new partners, especially those who can give it a better technical and knowledge edge, and who can supplement its local effort through global means. ADB should seek to enter into long-term, effective partnerships to maximize the impact of diverse strengths.

3.47 Effective partnerships will be particularly important in the development of CWAs where there will be scope to adopt the work of other organizations, and/or prepare assessments in collaboration with partners. ADB must engage with partners in matters related to future analytical work where the aim must be not to replicate the work of others, nor undertake tasks beyond areas of ADB core competencies.

Water Financing Partnership Facility

3.48 Technical assistance resources have been fundamental to ADB's water work, particularly for analytical and capacity development work. The WFPF has helped advance inputs on project development, some sector work, and on improving program quality. The WFPF will continue to support the WFP from 2011 to 2020. The WFPF expects to generate additional grant resources, and will make in-kind contributions, e.g., through the secondment of experts. It also needs better ways to sustain itself. ADB will continue its drive to mobilize resources.

The WFPF has helped advance inputs on project development, some sector work, and on improving program quality

Water Operational Plan 2011–2020 Results Framework

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
<p>Impact</p> <p>Water resources managed sustainably and water services delivered efficiently</p>	<p>By 2030:^a</p> <p>Mechanisms (including legislation, policies, regulations, and institutional arrangements) adopted to improve the management of water resources in accordance with the principles of IWRM—addressing competing demands from the agricultural, municipal, industrial, and energy sectors (including maintaining environmental balance), and reflecting water’s inherent economic value</p> <p>The proportion of people with access to sustainable water supply, sanitation, and wastewater management services, and more efficient and productive irrigation and drainage services is significantly increased</p>	<p>Country policy documents, sector monitoring reports, country water assessments, Future of Water in Asia study</p> <p>Benchmarking reports, utility reports, country statistics, irrigation-related reports from IWMI, FAO and ICID, MDG reports, country water assessments, Future of Water in Asia study</p>	<p>Assumptions</p> <ul style="list-style-type: none"> • Governments support process to improve both management of water resources and delivery of water services with appropriate policy and regulatory revisions • The private sector can be mobilized to deliver additional finance to the sector <p>Risks</p> <ul style="list-style-type: none"> • Impacts of climate change may further exacerbate water resource constraints in the region • Economic constraints may limit capacities of governments to sustain investments in the sector • Donors may limit funds available to support similar initiatives in the sector
<p>Outcome</p> <p>Policy and institutional reforms are accelerated to support improved water use efficiency across the range of users</p>	<p>By 2020:</p> <p>Reform agenda in DMCs where ADB has significant water programs include priority thrusts from the Water Operational Plan</p>	<p>Water sector related documents prepared by DMCs, country investments plans, country partnership strategy and roadmaps, country operations business plan</p>	<p>Assumptions</p> <ul style="list-style-type: none"> • Governments and utilities willing to prioritize water use efficiency • Governments are committed to implement required reform measures

^a This aligns with the proposed FoWA Study. This will provide a macro-view of the availability of accessible freshwater over the next 20 years (from a qualitative and quantitative perspective). The adoption of a 20-year horizon for future analytical and knowledge work will deliver improved decision-making and more robust sustainability outcomes.

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
<p>Increased efficiency and productivity in the delivery of water services, delivering improved level of service</p> <p>Accelerated and expanded implementation of IWRM, delivering improved water security and enhanced efficiency and productivity</p>	<p>Irrigation productivity and efficiency improvement implemented in five countries where ADB has major irrigation projects</p> <p>NRW reduced to no more than 30% of total production in ADB water supply projects, if the projects have sufficient scale to impact across entire networks</p> <p>NRW reduced to no more than 30% of total production in ADB water supply projects, if the projects have sufficient scale to impact across entire networks</p> <p>IWRM implementation accelerated to ensure its principles are adopted in no less than 30 river basins</p>	<p>Project documents, PPARs, PCRs, irrigation agency reports</p> <p>ADB reports, Water Financing Program reports, project documents, utility reports</p> <p>ADB reports, Water Financing Program reports, project documents, utility reports</p> <p>NARBO reports, country reports, Water Financing Program reports</p>	<p>Risk</p> <ul style="list-style-type: none"> Reluctance of government to implement reforms and adopt transformational water agendas
<p>Outputs</p> <p>ADB target investment level is achieved</p> <p>Increased ADB investments in sanitation and wastewater management, and river clean-ups</p> <p>Efficiency in water use mainstreamed into the design of ADB's projects</p>	<p>By 2020:</p> <p>ADB's water lending sustained at \$2 billion–\$2.5 billion annually or a total of \$20 billion–\$25 billion</p> <p>Share of investments for sanitation, wastewater management, and river clean-up projects increases to at least 25% of total water lending</p> <p>All ADB's water supply and irrigation projects designed during the period 2012–2020 include increased efficiency and/or productivity as a project output</p>	<p>ADB reports, PPIS, Water Financing Program reports</p> <p>ADB reports, Water Financing</p> <p>Program reports Project documents, PPARs, peer review comments</p>	<p>Assumptions</p> <ul style="list-style-type: none"> Countries continue to borrow from ADB for water resources and water services development Financing partners contribute resources to WFPF and ADB also agrees to allocate its own resources as its counterpart There is strong buy-in from countries for increased investments in sanitation and wastewater management

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
IWRM, river basin development, and irrigation projects address climate change adaptation, flood and drought mitigation, and water–food–energy security nexus	All ADB-supported IWRM projects (designed 2012–2020) address one or more aspects of disaster risk management; and/or the links between water, food and energy	Project documents, PPARs, peer review comments	<ul style="list-style-type: none"> Government remain committed to implementing IWRM Visionary leadership of key agencies and water service providers
Public water utilities increasingly adopt corporate-style governance models	All ADB projects in urban public water (designed 2012–2020) demonstrate the utility is on-track towards corporate governance principles and practices	Project documents, sector reports, utility reports	<p>Risks</p> <ul style="list-style-type: none"> DMCs unwilling to adopt efficient use of water as core project output DMCs continue to under-invest in sanitation and wastewater management
ADB’s partnership with private sector in water sector broadened and deepened	PSP/PPP provide finance greater than \$500 million per year between 2012 and 2020 (excluding hydropower projects)—over and above ADB’s existing target investment of \$2 billion–\$2.5 billion per year	PSOD project reports, sector reports, PPIS, lending reports	<ul style="list-style-type: none"> Private sector participation cannot be stimulated at scale
	Use of technological advancements adopted in the design of ADB’s new breed of investment projects particularly for wastewater management and reuse	ADB reports, Water Financing Program reports	
Continuing professional development is promoted in ADB projects and institutionalized in DMCs	ADB’s investment projects and TAs incorporate capacity development programs designed for sustained CPD by DMC agencies	Project documents, TA papers	
	At least 50 utilities networked for experience sharing	Water Financing Program reports, Water Operators Partnerships Program reports	
	At least 30 river basin organizations strengthened	Water Financing Program reports, NARBO reports	

Design Summary	Performance Targets/ Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
<p>Water crisis information/ awareness, and water-food-energy security nexus raised in the political and public spheres</p> <p>High development effectiveness maintained in ADB's water projects</p>	<p>Country water assessments completed in five countries by early-2013 and up to seven more during 2014</p> <p>At least 80% of ADB-supported water-related projects designed from 2012 onwards are evaluated successful, likely to be sustainable, and efficiently implemented</p>	<p>Country partnership strategy defining scope of water program with attached roadmap</p> <p>Progress report on country water assessment preparation</p> <p>PCRs, IED evaluations, SPD reports</p>	

ADB = Asian Development Bank, CPD = continuous professional development, DMC = developing member country, FAO = Food and Agriculture Organization of the United Nations, ICID = International Commission on Irrigation and Drainage, IED = Independent Evaluation Department, IWMI = International Water Management Institute, IWRM = integrated water resources management, MDG = Millennium Development Goals, NARBO = Network of Asian River Basin Organizations, NRW = non-revenue water, PCR = project completion report, PPIS = Project Processing and Information System, PSOD = Private Sector Operations Department, PSP = private sector participation, PPAR = project performance audit report, PSP = private sector participation, PPP = public-private partnership, TA = technical assistance, WFPF = Water Financing Partnership Facility.

Water Operational Plan 2011–2020

ADB established through Strategy 2020 three strategic agendas to guide its work up to 2020—inclusive economic growth, environmentally sustainable growth, and regional integration. Water is common to each of these and is in fact central to their attainment. The Strategy refocuses ADB’s operations into five core areas that best support its agenda and reflect ADB’s comparative advantages and core competencies. One core area is infrastructure, where water resources management and the delivery of efficient and sustainable irrigation, water supply, sanitation, and wastewater management services are key elements. The Water Operational Plan 2011–2020 provides guidance to ADB’s regional departments in defining their respective in-country water operations in line with Strategy 2020.

About the Asian Development Bank

ADB’s vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region’s many successes, it remains home to two-thirds of the world’s poor: 1.8 billion people who live on less than \$2 a day, with 903 million struggling on less than \$1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

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