



ASIAN DEVELOPMENT FUND (ADF)
ADF XI REPLENISHMENT MEETING
8–9 September 2011 Manila, Philippines

Asian Development Fund Operations and Food Security

Asian Development Bank

August 2011

ABBREVIATIONS

ADB	–	Asian Development Bank
ADF	–	Asian Development Fund
ARD	–	agriculture research and development
DMC	–	developing member country
FAO	–	Food and Agriculture Organization of the United Nations
GDP	–	gross domestic product
IFAD	–	International Fund for Agricultural Development
OECD	–	Organisation of Economic Co-operation and Development
PPP	–	purchasing power parity
PRC	–	People's Republic of China
WFP	–	World Food Programme

NOTE

In this report, "\$" refers to US dollars.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

CONTENTS

	Page
EXECUTIVE SUMMARY	i
I. INTRODUCTION	1
II. FOOD SECURITY IN ADF COUNTRIES: VULNERABILITY AND CONSTRAINTS	1
III. ADB FOOD SECURITY-RELATED OPERATIONS IN ADF COUNTRIES	4
IV. PROPOSED PRIORITY AGENDA FOR ADF XI FOOD SECURITY OPERATIONS	9
V. REQUEST FOR DONOR GUIDANCE	11
APPENDIXES	
1. ADF Countries and Typology of Nature and Extent of Food Insecurity	12
2. Infrastructure Gaps and Perceptions on Business and Governance	14
3. Government Responses to Food Price Volatility	16
4. Climate Change Vulnerability of ADF Countries	17
5. Food Insecurity and Income Status	18
6. ADB's Food Security Investments for Productivity, Connectivity, and Resilience	19
7. Strategic Directions for Food Security in ADF Countries	21
8. Infrastructure Investment Needs of ADF Countries, 2010–2020	23

EXECUTIVE SUMMARY

Asian Development Fund (ADF) countries are highly vulnerable to rising and frequent volatile food prices, posing a threat to national and household food security. Countries that are highly food import dependent and are fragile or in conflict-affected areas are most vulnerable. The poor and the vulnerable suffer most from food deprivation, especially in times of high food inflation.

The underlying food insecurity in ADF countries is due to the structural vulnerability of country-food systems resulting from (i) stagnant to declining productivity, (ii) poor connectivity of farms to markets due to poor logistics and market infrastructure, and (iii) lack of resilience to natural calamities and economic shocks.

In recent years, the Asian Development Bank (ADB) has undertaken swift and responsive actions to assist its developing member countries (DMCs), especially ADF countries, with short-term emergency assistance and medium-term investment financing. The emergency assistance focused on supporting the most affected DMCs to strengthen their social safety programs and to mitigate further deprivation of poor and vulnerable groups. The medium-term investment financing aimed to address structural constraints pertaining to productivity, connectivity, and resilience of their food systems. As part of its response, ADB continued to provide financing for critical agriculture and food security research programs by international and national agricultural research centers. At the same time, ADB actively carried out strategic studies to inform and influence relevant DMC policymaking, and to promote regional collective actions for sustainable food security. In carrying out these financing and advisory services, ADB has worked effectively with the Food and Agriculture Organization of the United Nations, the International Fund for Agricultural Development, the International Food Policy Research Institute, the International Rice Research Institute, and other partners.

Given continued food security concerns in ADF countries, ADB must increase efforts to strengthen and expand food security-related operations. This will be done in the context of its long-term strategic framework, Strategy 2020, and guided by the Operational Plan for Sustainable Food Security in Asia and the Pacific (2010).

Accordingly, under ADF XI, ADB is expected to focus on three priority areas. First, ADB will systematically increase infrastructure investments in water, transport, and energy that are critical to improve productivity, strengthen connectivity, and build resilience of food systems. Those investments will pay close attention to the food–water–energy nexus, with a specific focus on resource efficiency and linking small farmers to big markets. Second, ADB will seek to improve food security safety nets for the poor and vulnerable, and to transform and develop these programs into a national sustainable social protection system. Third, ADB will continue to promote active regional cooperation on food security policies and programs for the benefit of ADF countries. In all this, ADB will continue to pursue strategic partnerships with other development partners to maximize the synergy of operations among partnering agencies.

Donors' guidance is sought on the proposed priority agenda for food security operations in ADF countries.

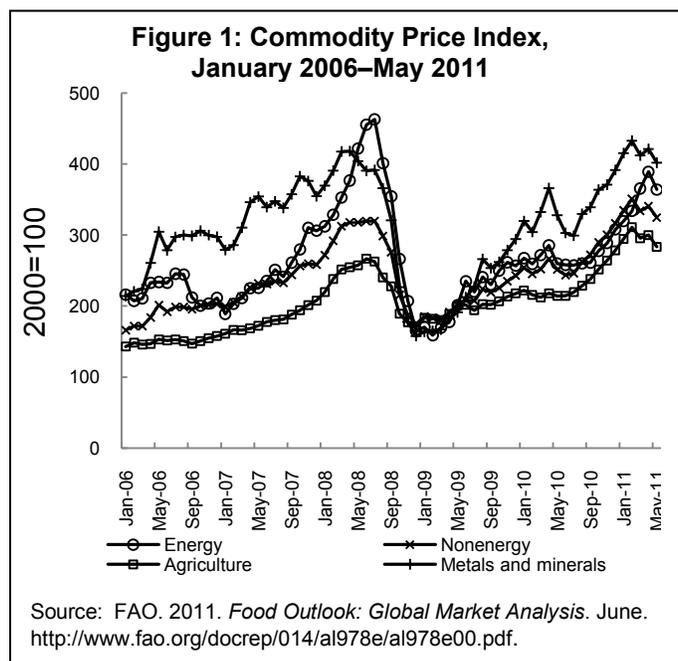
I. INTRODUCTION

1. In the last few years, rising and volatile food prices have severely impacted member countries of the Asian Development Fund (ADF). This paper provides an overall assessment of the food security situation in ADF countries, and explains how the Asian Development Bank (ADB) has been helping developing member countries (DMCs), especially ADF countries, to cope with the impacts of food prices and to formulate and implement medium-term sustainable food security plans in the context of ADB's Strategy 2020¹ and in collaboration with development partners. The paper presents a set of priorities for future food security-related operations in ADF countries, for consideration by ADF deputies.

II. FOOD SECURITY IN ADF COUNTRIES: VULNERABILITY AND CONSTRAINTS

2. **Global food price trends and prospects.** Three years after the 2007–2008 food crisis, food prices registered a new high in the first half of 2011, fuelling new fears about global food insecurity (Figure 1). A broad range of food commodities (sugar, edible oils, and dairy and meat products) contributed to the high and erratic trend. Food prices until 2019 are projected to be on the uptrend and may plateau at about 20% higher than 1990 prices; food price surges are expected to be more frequent.²

3. **Impact.** The impact of higher food prices on ADF countries is an increase in the number of the poor, whose ranks swelled during the 2007–2008 food price hike episode. A further increase in the poverty headcount for low-income countries is estimated to have resulted from the average global food price increase of 46% from June to December 2010.³ Increases in absolute and relative poverty were significant in countries where the sharp global price spikes were matched by commensurate local food price escalation (e.g., Bangladesh, the Kyrgyz Republic, Pakistan, Sri Lanka, and Tajikistan). Food price spikes also resulted in a reduction in calorie intake among the poor in low-income countries, compromising their already limited dietary diversity.⁴ Women, who comprise the bulk of the agricultural labor force in ADF countries, disproportionately shoulder the brunt of the



¹ ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

² Organisation of Economic Co-operation and Development (OECD) and Food and Agriculture Organization of the United Nations (FAO). 2011. *OECD–FAO Agricultural Outlook 2011–2020*. Rome.

³ ADB. 2011. *Global Food Price Inflation and Developing Asia*. Manila; M. Ivanic, W. Martin, and H. Zaman. 2011. Estimating the Short-Run Poverty Impacts of the 2010–11 Surge in Food Prices. *Policy Research Working Paper*. No. 5633. Washington, DC: World Bank.

⁴ E. Skoufias, S. Tiwari, and H. Zaman. 2011. Can We Rely on Cash Transfers to Protect Dietary Diversity during Food Crises? Estimates from Indonesia. *Policy Research Working Paper*. No. 5548. Washington, DC: World Bank.

adverse impacts of sharp food and fuel price increases.⁵ These have adverse long-term negative consequences for infants and children, as poor households tend to reduce the calorie and micronutrient intake of the young.

4. **ADF countries are food insecure.** ADF countries are not resilient to persistently high and frequent food price volatility episodes.⁶ Based on the universally accepted definition of food security,⁷ ADF countries can be classified into three groups (Table) reflecting their status of availability (domestic production and imports), access (connectivity infrastructure and facilities), and utilization (macronutrient consumption) of food within their national boundaries (Appendix 1).

State of Food Insecurity of ADF Countries

Food Insecurity Status	ADF Countries		
Severely Food Insecure	Afghanistan Bangladesh	Kiribati Papua New Guinea	Tajikistan Timor-Leste
Moderately Food Insecure			
Upper bound	Cambodia Lao People's Democratic Republic Marshall Islands	Micronesia Mongolia Nepal Pakistan	Samoa Solomon Islands Tuvalu
Lower bound	Armenia Bhutan Georgia Kyrgyz Republic Palau	Maldives Nauru Sri Lanka Tonga	Uzbekistan Vanuatu Viet Nam
Food Insecure and/or Vulnerable			

ADF = Asian Development Fund.

Source: Calculations of Agriculture, Rural Development and Food Security Unit Staff, Regional and Sustainable Development Department, Asian Development Bank, using a composite of indicators.

5. **Vulnerable food systems.** Structural vulnerability of food systems is a key concern in many ADF countries. Although most countries have the potential to produce some of their cereal needs⁸ or even to export cereals,⁹ they suffer from critical structural weaknesses that make their food systems vulnerable. These include (i) stagnant to declining productivity, (ii) poor connectivity of farms to markets due to poor logistics and market infrastructure, and (iii) lack of resilience to natural calamities and economic shocks.

⁵ Farm-based women workers are engaged in low farm productivity, and subsistence activities are not remunerated. They have no safety nets to rely on when shocks occur, except to engage in coping strategies like fewer meals a day and less nutritious food intake (International Labour Organization [ILO] and ADB. 2011. *Women and Labour Markets in Asia: Rebalancing Towards Gender Equality in Labour Markets in Asia*. Bangkok: ILO.).

⁶ ADB. 2008. *Soaring Food Prices: Response to the Crisis*. <http://www.adb.org/Documents/Papers/soaring-food-prices/soaring-food-prices.pdf>; ADB. 2011. *Global Food Price Inflation and Developing Asia*. <http://www.adb.org/documents/reports/global-food-price-inflation/food-price-inflation.pdf>; ADB. 2011. *ADB and Food Security: Resilience to Natural and Economic Shocks*. <http://www.adb.org/food-security/resilience.asp>

⁷ "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs, and food preferences for an active and healthy life..." (World Food Summit 1996).

⁸ These would include the net food import dependent economies such as Armenia, Georgia, Kyrgyz Republic, Mongolia, and Tajikistan. Pacific island economies import most of their food requirements, although they used to produce root crops and traditional cereals.

⁹ Those that have potential to export include Bangladesh, Cambodia, Lao People's Democratic Republic, Nepal, Pakistan, Sri Lanka, Uzbekistan, and Viet Nam.

6. **Low productivity.** The average yield of food grains in ADF cereal-producing countries remains low as the agriculture and food sectors receive little capital investment. Productivity improvement has also been constrained by policies that discourage efficient use of land and water resources, as well as effective integration of smallholders into food systems and value chains. Growth of the average annual yield for rice in Asia since 2000 has tapered to just 0.8%,¹⁰ and for wheat to 1.2%.¹¹ In particular, water use efficiency is a critical concern for improving productivity. To grow more food with less water, efficient and sustainable management of water needs to be substantially improved through investments that modernize irrigation infrastructure, through price signals that reflect the true opportunity cost of water, and by strengthening institutions and capacity for managing scarce resources.

7. Apart from water use efficiency-related investment and policies, lack of investment in other areas has contributed to stagnant productivity. For example, close to 50% of rural areas in several ADF countries are still without electricity. Access to finance continues to be constrained by high perceived production risks, and high transactions costs involved in administering financing to the numerous and dispersed small-scale farmers. Notwithstanding the long-established fact that agricultural research and development (ARD) has a high rate of economic return,¹² international organization and national government support for ARD has waned, averaging less than 0.6% of the agricultural gross domestic product of less-developed economies, compared with 2.4% in developed economies.

8. **Weak connectivity.** Food supply chains in ADF countries are weakly integrated, resulting in huge postharvest losses and low incomes for food producers. For example, among South Asian ADF countries, the average postharvest losses for traditional rice supply chains are 1%–5% for cutting and handling, 1%–5% for manual threshing, 3%–5% for sun drying, 5%–10% for open storage, 20%–30% for village milling, and 15%–20% for transport.¹³ Quality losses due to poor market infrastructure range from 10% to 30% of the retail price per kilogram of rice. Key constraints are low investment in rural roads, logistics and services like cold storage and distribution centers, and market information systems (Appendix 2).

9. Trade logistics are critical to food import dependent and landlocked ADF countries to facilitate access and distribution of essential food items. Equally significant are open food trade policies. During the recent increases in food prices, governments, including those from ADF countries, enforced food export restrictions, import tariff reductions, and other nontariff barriers (Appendix 3). They also introduced consumer and producer subsidies, as well as food price controls. The enforcement of food policies that distort terms of trade has only exacerbated global food price volatility. Rising food prices have substantially increased the import bills of ADF food import-dependent economies, amplifying their current account deficits,¹⁴ and

¹⁰ International Rice Research Institute. Rice Today. <http://irri.org/ricetoday>.

¹¹ Food and Agriculture Organization of the United Nations. 2011. *Asia Pacific Food Situation Update*. July. http://www.foodsecuritylink.net/index.php?option=com_remository&Itemid=27&func=startdown&id=154

¹² In 2000, an ADB evaluation study found that ADB investments in a selected group of projects provided high rates of return, averaging 83% for International Rice Research Institute projects, 45% for International Crops Research Institute for the Semi-Arid Tropics projects, and 91% for Asian Vegetable Research and Development Center projects. Research on genetic improvement of fish by the International Center for Living Aquatic Resources Management also showed high rates of return. ADB. 2000. *Special Evaluation Study: Policy Implementation and Impact of Agriculture and Natural Resources Research*. Manila.

¹³ ADB. 2010. *Addressing the Pre- and Postharvest Challenges of the Rice Supply Chain* (TA 7493-REG, January). Manila.

¹⁴ These include Armenia, Bhutan, Kyrgyz Republic, Mongolia, Pakistan, Papua New Guinea, Sri Lanka, and Tajikistan.

crowding out other essential imports and infrastructure investments. Exacerbating the problem of food import dependent countries is the slowing of food production growth rates of traditional sources of food imports (footnote 2). These countries therefore need to urgently diversify their food sources, possibly by strengthening subregional links and south–south cooperation.

10. **Poor resilience.** The prospects of farmers in developing countries being unable to meet the ever-rising demand for food are becoming more acute in the face of climate change and the associated increase in disaster risks. Agriculture is most vulnerable, both in terms of food production and as a livelihood source, particularly for the poor and smallholders. All ADF countries are vulnerable to extreme weather conditions due to climate change (Appendix 4). ADF countries in South Asia and Southeast Asia are likely to face the highest reductions in agricultural potential due to climate change, with significant impacts on food crop production and food security,¹⁵ hence the imperative of implementing effective and sustainable climate change-related adaptation measures.

11. At the same time, Asia is a major greenhouse gas emitter, accounting for 37% of total world emissions from agricultural production. Although ADF countries are still low gas emitters, they will need to implement mitigation measures. Timely and effective mitigation would reduce the cost of required adaptation in the rural sector, while producing benefits especially in terms of improved soil and water quality, and leveraging available investment funding for mitigation.

12. **Weak governance.** Achieving food security is a greater challenge in ADF countries that have fragile and conflict-ridden environments. Weak governance impedes efficient and effective implementation of food safety net programs for the poor and the vulnerable. By increasing the cost of doing business, weak governance discourages needed private investments for developing food supply chains that can effectively link smallholders to markets. More fundamentally, poor governance and weak institutions stifle economic dynamism and entrepreneurship that drives structural changes and generates employment and income opportunities in nonfarm and off-farm sectors.

13. **Slow and uneven growth.** The nature and pattern of growth matter for long-term sustainable food security; food insecurity is largely a reflection of the low-income status of countries (Appendix 5). Indeed, food insecurity is inextricably linked to a country's economic development.¹⁶ High and sustained growth is essential to increase livelihood opportunities for all. Increased incomes will reduce sensitivity to food price volatility, and enable the economic access to quality and diversified food products.

III. ADB FOOD SECURITY-RELATED OPERATIONS IN ADF COUNTRIES

14. ADB's food security-related operations are guided by its long-term strategic framework, Strategy 2020, which recognizes that food security is a crucial element for attaining sustainable inclusive growth and for freeing the region of poverty. ADB's Operational Plan for Sustainable

¹⁵ ADB and International Food Policy Research Institute. 2009. *Building Climate Resilience in the Agriculture Sector of Asia and the Pacific*. Manila: ADB.

¹⁶ ADB. 2011. *Basic Statistics 2011*. Manila; International Fund for Agricultural Development. 2011. *Agriculture—Pathways to Prosperity in Asia and the Pacific*. Rome; International Food Policy Research Institute. 2011. The Population and Income Growth 'Double Whammy'. *Latest News*. 27 January. <http://www.ifpri.org/blog/population-and-income-growth-double-whammy>; World Bank. 2011. *Global Economic Prospects June 2011: Maintaining Progress Amid Turmoil*. Washington, DC: World Bank.

Food Security in Asia and the Pacific¹⁷ lays out the approach for improving availability of and access to adequate and safe food in a sustainable manner. The plan stresses that the region's long-term food security is at risk because of the high vulnerability of the global and regional food supply and market systems. Accordingly, it seeks to address three critical constraints that contribute to such vulnerability: stagnating food productivity and production, poor connectivity, and lack of resilience due to threat of climate change and volatility of food prices.

15. ADB is well positioned to address these binding constraints through its five core areas (infrastructure, finance, environment, regional cooperation, and education) and three other areas (agriculture, health, and disaster and emergency assistance). The operational plan provides a road map to increase the impacts of ADB's multisector approach for food security, particularly for the poor and vulnerable, through greater synergy and value addition. ADB will leverage its food security-related investments to expand and deepen partnerships with the development community and specialized organizations, civil society organizations, and the private sector.

16. From 2009 to mid-2011, ADB's food security-related measures for ADF countries comprised (i) emergency assistance; (ii) food security-related investments through loans and grants; (iii) knowledge products, including agriculture research and development; (iv) regional cooperation; and (v) food security partnerships. These measures are responding to the need to address short-term concerns of increasing food inflation and its adverse effect on poverty, and long-term structural concerns on the vulnerability of food systems. All the measures include built-in mechanisms to improve the governance structure for providing and delivering essential food security-related investments in an efficient and effective manner.

17. **Emergency assistance.** During the 2007–2008 food price crisis, ADB approved \$700 million of immediate support for Bangladesh, Cambodia, Mongolia, and Pakistan (Box). For the first three countries, food safety net measures and immediate emergency food assistance were established to target the poor in a transparent and accountable manner and protect them from food deprivation. For Pakistan, a program loan was approved that included policy reforms on wheat procurement and marketing policies, which enabled private sector engagement in the marketing and distribution of wheat on a limited scale.

¹⁷ ADB. 2010. *Operational Plan for Sustainable Food Security in Asia and the Pacific*. Manila.

Food Safety Net Measures in Response to Increased Food Prices during 2007–2008

Bangladesh: Emergency Assistance for Food Security Project (Loan 2430 for \$170 million). Approved in July 2008 and completed in June 2010, this assistance enabled the government to implement more targeted public food distribution safety nets for about 5 million poor and vulnerable people and give them better access to food through open market sales of food grains, and enhanced food entitlements for the ultra poor to survive short-term food deficits. A food security monitoring system was also established.

Cambodia: Emergency Food Assistance Project (Grant 0116 and Loan 2455 for \$17.5 million each, a total of \$35 million). Approved in October 2008, the project financed the government's expanded compensatory safety net programs for the consumption and production of food for about 90,000 targeted poor and vulnerable households in selected rural areas in the Tonle Sap Basin and selected urban slums of Phnom Penh.

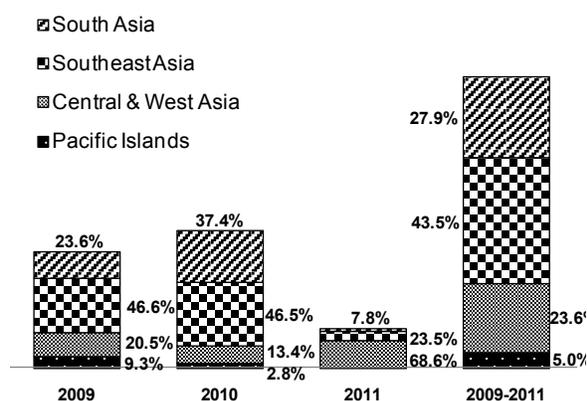
Mongolia: Food and Nutrition Social Welfare Program (Grant 0137/0138 for \$12 million). Approved in December 2008, the project assisted the government in designing and implementing an innovative food stamp program for at least 100,000 poor and vulnerable households that faced the risk of malnutrition; it was to prevent them from sliding deeper into poverty. The program improved the targeting mechanism; strengthened the social welfare delivery systems and technical capacities; and established early detection, mitigation, and rapid response mechanisms for food crises and similar emergencies.

Pakistan: Accelerating Economic Transformation, Subprogram 1 (Loans 2446 and 2447 for \$500 million). Approved in September 2008, the program provided budget support for improving the government's public food distribution system through a more effective targeted approach to reach at least 5 million poor households. Its implementation was tied to greater private sector participation in the access and marketing of wheat destined for public sector outlets, less reliance on the price regulation of wheat, and removal of restrictions on interprovincial wheat trade. Implementation of the latter two faced political difficulties, but increased private sector participation partly eased the supply and logistics constraints.

Sources: ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Technical Assistance Grant for the Emergency Assistance for Food Security Project in Bangladesh*. Manila; ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Asian Development Fund Grant for the Emergency Food Assistance Project in Cambodia*. Manila; ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Asian Development Fund Grants for the Food and Nutrition Social Welfare Program and Project in Mongolia*. Manila; and ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Program Cluster and Loans for Subprogram 1 of the Accelerating Economic Transformation Program in Pakistan*. Manila.

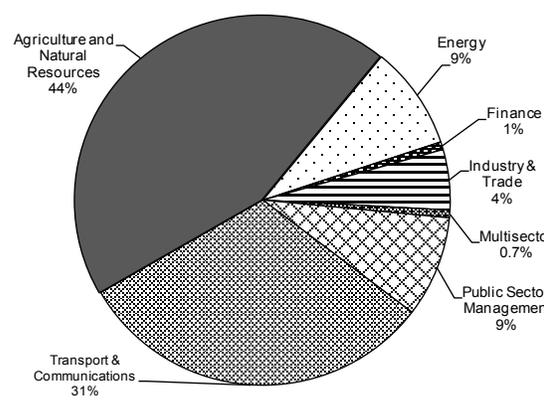
18. **Food security-related investments.** Total ADF-financed food security investments for 2009–June 2011 amounted to \$2.3 billion. This was 40% of the total food security-related investments of ADB, and 46% of total ADF investments. Geographically, more than three-fourths of the ADF-funded food security-related investments were in Southeast Asia and South Asia (Figure 2). In terms of sector composition, the investments focused essentially on infrastructure for agriculture and natural resources (44%) and transportation and communications (31%) (Figures 3, 4, and 5). These investments aimed to increase productivity through irrigation and water resources management; improve connectivity via rural road build up and market infrastructure, such as storage facilities; and enhance the resiliency of agriculture and natural resources through climate change proofing of investments and mitigation measures.

Figure 2: Food Security Investments in ADF Countries by Subregion, 2009–June 2011



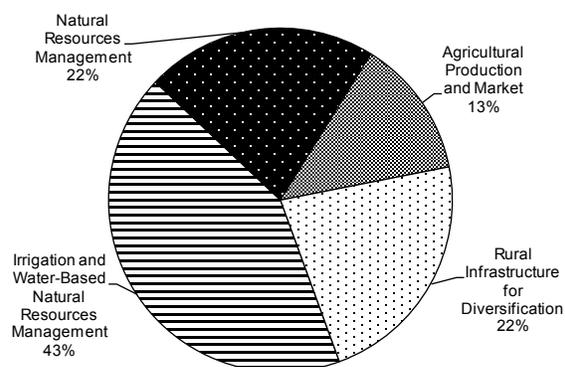
ADF = Asian Development Fund
 Source: Calculations of Agriculture, Rural Development and Food Security Unit Staff, Regional and Sustainable Development Department, Asian Development Bank.

Figure 3: Food Security Investments in ADF Countries by Sector, 2009–June 2011



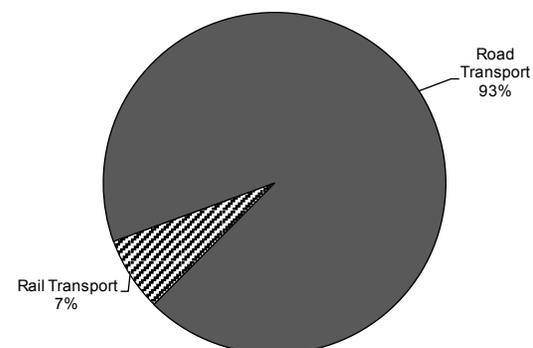
ADF = Asian Development Fund
 Source: Calculations of Agriculture, Rural Development and Food Security Unit Staff, Regional and Sustainable Development Department, Asian Development Bank.

Figure 4: Agriculture and Natural Resources Investments in ADF Countries by Sector, 2009–June 2011



ADF = Asian Development Fund
 Source: Calculations of Agriculture, Rural Development and Food Security Unit Staff, Regional and Sustainable Development Department, Asian Development Bank.

Figure 5: Transport and Communications Investments in ADF Countries by Sector, 2009–June 2011



ADF = Asian Development Fund
 Source: Calculations of Agriculture, Rural Development and Food Security Unit Staff, Regional and Sustainable Development Department, Asian Development Bank.

19. ADB has financed similar projects that have been shown to generate positive outcomes in terms of improving food production and productivity, and integrating farms to markets (Appendix 6). These projects resulted in increased yields in food staples, farm incomes, women's participation, and poverty reduction. In addition to these economic and social benefits, food security-related infrastructure investments have generated measurable environmental benefits, through innovative project designs that take account of climate change mitigation and adaptation potential of agriculture and food security-related investments.¹⁸

20. **Knowledge products.** ADB continues to finance ARD in partnership with international

¹⁸ ADB. 2011. *Operations for Climate Change Adaptation and Mitigation*. Paper prepared for the first ADF XI replenishment meeting, Manila, 8–9 September 2011.

and national agriculture centers (e.g., Consultative Group for International Agricultural Research). Key areas of ARD focus on reducing pre- and postharvest losses for rice, water conservation and climate change adaptation technologies, agronomic management practices, and food product certification and quality control. Funds for ARD increased from an average of \$1 million–\$2 million per year during 2000–2009 to \$4 million in 2010. ADB investments in ARD, while modest, have resulted in increased productivity, increased farm incomes, reduced emissions of greenhouse gases, and reduced poverty (Appendix 6).

21. In addition to its support for ARD, ADB supports research work on key thematic issues that have a significant bearing on regional food security. These include a comprehensive study of climate change impacts on agriculture (footnote 15); the monitoring of food and fuel commodities and financial markets;¹⁹ and country food sector assessments.²⁰ ADB is planning to provide regional capacity-building technical assistance for DMC agricultural and rural statistics offices to improve their collection of key agriculture and food security data.

22. **Regional cooperation.** ADB provides support for implementation of the Integrated Food Security Program of the Association of Southeast Asian Nations. The program aims to set up a regional rice reserve system to address production shortfalls due to natural and human-made disasters especially in low-income countries; facilitate rice trade by establishing a rice trade forum for coordinated regional policy responses; and develop a region-based market information system on rice and other basic commodities. In the Greater Mekong Subregion, ADB has provided support for trade facilitation, common food safety standards, and transboundary animal disease control. It has also been supporting food security programs of member countries of the South Asia Association for Regional Cooperation.

23. **Partnerships for food security.** The daunting work to ensure sustainable food security requires collaboration among various stakeholders and development partners. ADB recognizes this and is increasing efforts to seek partners to resolve complex food security issues. Together with the Food and Agriculture Organization of the United Nations (FAO), the International Fund for Agricultural Development (IFAD), the World Food Programme (WFP), and the International Center for Agricultural Research in the Dry Areas, ADB is implementing the Asia and Pacific Regional Food Security Partnership Framework, which was signed in July 2010 to resolve project-related bottlenecks and facilitate the timely delivery of food security-related outputs and outcomes. In this endeavor, ADB will build on complementing its core competencies, such as the development of hard infrastructure, by partnering with bilateral and multilateral partners that are working on the soft infrastructure side (e.g., FAO and IFAD on capacity development and database sharing on food security-related information). Bangladesh, Cambodia, the Lao People's Democratic Republic, and Nepal are the proposed key areas to be covered under this joint program.²¹ Along with promoting collective activities and mobilizing additional financing

¹⁹ ADB. 2011. Finance, Food, and Fuel Monitor. <http://lpweb7.asiandevbank.org:8090/3F/index.jsp?reloaded=true> (accessed 1 August 2011).

²⁰ ADB. 2009. *Sector Assistance Program Evaluation: Agriculture and Rural Development Sector in Cambodia*. Manila. Very recently, the Cambodia government received a grant from the multitrust Global Assistance for Food Security Program to implement its food security program. The government selected ADB as its supervising entity to oversee use of the fund.

²¹ Pending final agreement among the concerned parties in the food security partnership (FAO, IFAD, WFP, and International Center for Agricultural Research in the Dry Areas), the potential areas for collaboration are the pipeline projects for the Agricultural Commercialization and Resource Conservation Sector Development Program, Productivity Enhancement in Irrigated Areas in the Lao People's Democratic Republic, and the ongoing support to the Greater Mekong Subregion Working Group on Agriculture.

support (e.g., the Global Agriculture and Food Security Program for eligible ADF countries) is the establishment of focused action plans by ADB together with other multilateral development banks, such as the food and water security action plan that will be presented at the G20 meeting before the end of 2011. ADB is spearheading the food and water security plan for Asia and the Pacific, with focus on the needs of ADF countries.

24. **Good governance.** ADB gives priority to governance activities that improve efficiency in public service delivery through national implementation of public sector management and administration reform programs, decentralization, and anticorruption measures. These good governance measures are incorporated in the country partnership strategy, e.g., the 2011–2013 country partnership strategy for Cambodia. Specifically, ADB provides capacity and institutional development on public financial management to government and executing and project implementing agencies such as rural development, water, and transport ministries. The skills mix includes technical capacity to ensure the accountability and transparency of public expenditures, such as improved accounting, financial management, internal control systems, and procurement; and strengthened internal and external audit capacities. Monitoring and evaluation procedures are likewise included in all food security-related investments. ADB also supports, through technical assistance, the capacity development of government officials in economic policy analysis and management, change management, and leadership.

IV. PROPOSED PRIORITY AGENDA FOR ADF XI FOOD SECURITY OPERATIONS

25. ADB has provided its DMCs, especially ADF countries, with a range of food security-related assistance. Emergency financing assistance to those most affected by the food price crisis has been swift and responsive. ADB has gone further to address key structural constraints underlying food system vulnerability in many ADF countries. In view of continued food security concerns, ADB will need to build on what it has done in the recent past and to increase food security-related investments especially in ADF countries that are severely or moderately food insecure. Food security-related investments in these countries should be an integral component of country strategies for inclusive and sustainable growth.

26. Moving ahead, ADB will focus on three priority areas to step up its operations in ADF countries: (i) infrastructure investments that improve production and productivity, connectivity, and resilience of food systems and markets; (ii) targeted safety nets for the poor, vulnerable, and smallholders in the short term, as well as investments that transform these palliative measures to more sustainable social protection- and income-enhancing reforms; and (iii) greater engagement on coordinated food security policies for south–south cooperation and integrated value chain development. Several strategic and operating concerns need to be considered under each priority area (paras. 27–33). The linkages between the priority areas and the nature and extent of food insecurity in ADF countries are shown in Appendix 7.

27. **Boost infrastructure investments for food security.** ADB's food security investments in ADF countries will focus on building up infrastructure that improves the productivity, connectivity, and resilience of food systems and markets.²² Country-specific investments in each of the three areas will differ depending on a country's potential to enhance food export

²² Indicative investment needs for ADF countries for 2010–2020 are estimated at about \$60 billion, assuming an average of 15% gross domestic share of the food subsector (Appendix 8). The investment deficits will be mainly in energy, transport, market information and telecommunications, and water and sanitation. These are also major infrastructure gaps for food security.

capability or increase food self-sufficiency, and if it is a highly food import dependent or fragile economy.²³ ADB will seek to improve productivity through infrastructure investments for efficient use of water and energy, through investments in technologies and practices to reduce pre- and postharvest losses in the value chain, and through focused ARD to reduce yield gaps.

28. Access to markets is limited for smallholders in many ADF countries. Transport and logistics infrastructure will be a major investment area for improving connectivity and linking farmers to markets. This includes rural roads; rail, sea, and airports; and market information and communication facilities. In addition to financing investments in physical connectivity, ADB will assist ADF countries in improving policies and regulatory measures that will enable the private sector to establish food processing, warehouse and cold storage facilities, wholesale and retail centers and ancillary services, as well innovative institutional arrangements like contract farming.

29. For the heavily food import dependent economies such as Armenia, Georgia, Kiribati, the Maldives, Nauru, Samoa, Sri Lanka, Tajikistan, Tonga, and Tuvalu, the emphasis will be on shifting their reliance from traditional food sources (e.g., the Russian Federation, in the case of many Central and West Asian countries) to subregional country neighbors. Enhanced south-south food trade investments and policy measures will be critical in this respect. More open food trade will also be an important mechanism to mitigate climate change risks (footnote 15).

30. Because of increased uncertainty of food supplies due to climate change and volatile food prices, innovative risk-mitigating instruments will be needed for smallholders and entrepreneurs with small- and medium-sized food-based businesses. These may include financing instruments like futures contract arrangements, weather-based index insurance schemes, warehouse receipts, and early warning systems. Climate-proofing food security-related infrastructure and facilities, and adaptation and mitigation measures for climate change are essential for all ADF countries.

31. **Measures to protect the poor and vulnerable.** With continuing rising and volatile food prices, improving safety nets to protect the poor and vulnerable from food insecurity will need to be given greater attention. While all ADF countries need to include this kind of support in their priority agenda, it will be most critical for the severely food insecure group that has sizeable portions of population suffering from low income, high poverty, and daily food intake much lower than the recommended dietary level. For other ADF countries, a more-targeted mechanism can be employed, covering the most vulnerable. Medium- to long-term support will include providing productive safety nets (e.g., food-for-work schemes) and social protection programs (e.g., conditional cash transfers) that focus not on mere income transfers but on providing employment opportunities and investing in human capital for long-term economic growth. Effective risk management and risk-financing support is needed for smallholders and

²³ ADF countries like Cambodia, Lao People's Democratic Republic, Pakistan, and Uzbekistan; and South Asian countries can improve their food export potential through improved irrigation and water resource management as well as road, rail transport, seaport, and airport infrastructure for connectivity and resilience. Countries like the Kyrgyz Republic and Tajikistan can increase their food self-sufficiency ratios by improving farm yields by implementing irrigation rehabilitation measures, reducing pre- and postharvest losses, building roads that link farms to markets, reducing cross-border transactions costs, and employing adaptation measures like integrated soil fertility management and climate-proofing roads from landslides and flooding. For the Pacific island economies, efforts to increase yields of traditional food crops can help strengthen their traditional support system, which has been effective in overcoming threats to food security.

entrepreneurs with small- and medium-sized food businesses.²⁴

32. To complement food safety net measures, ADB investments will also need to focus on safe water supply, improved sewerage and sanitation measures, and food safety trade facilitation measures. ADB's food safety-related investments will be instrumental but will not be sufficient to ensure food security for all. Hence, ADB will need to ensure strategic leveraging of its resources with other development partners, including the private sector and civil society organizations. For example, ADB through its partnership with FAO, WFP, and IFAD will focus on the physical infrastructure, while FAO and WFP will provide support for vulnerability assessments and productive food safety nets, and IFAD will support rural livelihood measures.

33. **Coordinated policy dialogue for food security.** Food trade suffered a major setback during the 2007–2008 food crisis, as DMCs blamed trade for the high and volatile food prices. ADB is in a strategic position to play the role of honest broker to rebuild confidence in food trade through greater south–south and subregional cooperation. ADB may need to organize forums for coordinated and concerted national and subregional food policy actions. Examples include high-level policy dialogue between major food exporters (e.g., India, Kazakhstan, the Russian Federation, and Ukraine) and the concerned ADF countries to find sustainable alternative options other than the use of export bans. ADB will also step up its support for the Association of Southeast Asian Nations in ensuring a more sustainable and market-based approach to reserve management, and developing a coordinated policy response to food trade through market intelligence and more transparent rice market information. These initiatives would substantially benefit ADF countries that cannot impact food trade policies on their own, and yet are the most severely affected by restricted food trade. Additionally, with its solid reputation in the Asia and Pacific region, ADB can take a leadership role in initiating national high-level policy dialogue on sustainable and inclusive food trade, specifically looking at the food–energy–water–environment–nutrition nexus. Finally, the greater participation of the private sector in the development process can be facilitated through assistance with structural and market reforms that would create the necessary environment to do business.

V. REQUEST FOR DONOR GUIDANCE

34. The challenges to achieving sustainable and inclusive food security in ADF countries are daunting. Yet, solutions are not simple or straightforward because of the increasing complexity of development problems that impact food security. ADB's Strategy 2020 and its medium-term sustainable food security plan provide the framework and road map for increased but focused support in response to the major food security challenges facing ADF countries.

35. The proposed priority agenda for food security in ADF countries builds on the experiences of ADB in food security-related work in the Asia and Pacific region, where it has a comparative edge.

36. Donors' guidance is sought on the proposed priority agenda for food security.

²⁴ At the 44th Annual Meeting of the ADB Board of Governors held in Hanoi, Viet Nam, 3–6 May 2011, ADB President Kuroda outlined ADB's climate change strategic priorities, including building climate resilience in the water and agriculture sectors; and providing technical assistance to strengthen institutional and human capacities, governance, and risk management policies to address climate change.

ADF COUNTRIES AND TYPOLOGY OF NATURE AND EXTENT OF FOOD INSECURITY

Country	Availability [1] (0.33)			Access [2] (0.33)		Utilization [3] (0.34)	Extent of Food Insecurity		
	Food Supply (kcal/capita/ day)	% Food Imports to Total Consumption	% Food Aid to Total Consumption	Annual Rate of Change of Average Energy Consumption	Per Capita Income (\$/ year)	Poverty Incidence (National)	Global Hunger Index	Score	Category
	2007 (0.25)	2005–2007 (0.25)	2004–2006 (0.25)	2000–2002 to 2005–2007 (0.25)	2010 (0.50)	Latest Year (0.5)	2010 (1.0)		
Afghanistan	5	...	...	4	5	4	4	4.33	Severe
Armenia	4	4	1	4	3	2	2	2.58	Moderate (Lower)
Bangladesh	4	1	1	4	5	4	4	3.67	Severe
Bhutan	3	...	...	3	3	2	2	2.50	Moderate (Lower)
Cambodia	4	1	1	4	5	3	4	3.51	Moderate (Upper)
Georgia	4	4	1	3	4	2	2	2.66	Moderate (Lower)
Kiribati	3	4	...	4	5	4	4	4.06	Severe
Kyrgyz Republic	3	2	1	3	5	4	2	2.57	Moderate (Upper)*
Lao PDR	4	1	1	4	5	3	3	3.17	Moderate (Upper)
Maldives	3	4	3	4	3	1	3	2.84	Moderate (Lower)
Marshall Islands	3	3	3	3	5	2	4	3.51	Moderate (Upper)
Micronesia	4	4	3	4	4	4	3	3.58	Moderate (Upper)
Mongolia	4	3	2	5	4	3	3	3.33	Moderate (Upper)
Nauru	4	3	3	4	4	4	1	2.82	Moderate (Lower)
Nepal	4	1	1	4	5	3	3	3.17	Moderate (Upper)
Pakistan	4	1	1	5	5	2	4	3.42	Moderate (Upper)
Palau	3	2	1	3	1	2	3	2.26	Insecure, Vulnerable
Papua New Guinea	3	...	...	3	5	4	4	3.84	Severe
Samoa	3	3	1	4	4	2	3	2.92	Moderate (Lower)
Solomon Islands	4	2	1	4	4	2	3	2.92	Moderate (Lower)
Sri Lanka	4	4	2	3	3	1	3	2.75	Moderate (Lower)
Tajikistan	4	3	2	3	5	5	3	3.66	Severe
Timor-Leste	5	2	1	5	5	5	5	4.42	Severe
Tonga	1	3	3	3	4	2	3	2.84	Moderate (Lower)
Tuvalu	3	3	3	3	5	2	3	3.17	Moderate (Upper)
Uzbekistan	3	1	1	3	4	2	2	2.33	Moderate (Lower)

Country	Availability [1] (0.33)			Access [2] (0.33)		Utilization [3] (0.34)	Extent of Food Insecurity		
	Food Supply (kcal/capita/ day)	% Food Imports to Total Consumption	% Food Aid to Total Consumption	Annual Rate of Change of Average Energy Consumption	Per Capita Income (\$/ year)	Poverty Incidence (National)	Global Hunger Index	Score	Category
	2007 (0.25)	2005–2007 (0.25)	2004–2006 (0.25)	2000–2002 to 2005–2007 (0.25)	2010 (0.50)	Latest Year (0.5)	2010 (1.0)		
Vanuatu	3	2	1	4	3	1	4	2.85	Moderate (Lower)
Viet Nam	4	1	1	3	4	1	3	2.59	Moderate (Lower)

... = data not available, ADF = Asian Development Fund, kcal = kilocalorie, Lao PDR = Lao People's Democratic Republic.

Notes:

Scoring by indicator is based on 1 to 5 scale, 5 indicating the worst situation:

(i) Food supply	(ii) % of food aid to total consumption	(iii) % change of dietary consumption	(iv) GDP per capita in PPP	(v) Global hunger index
5: < = 2,022	5: > = 21.36	5: < = 0.260	5: < = \$2,678	5: > 30.0 Extremely alarming
4: 2,033–2,459	4: 16.03–21.36	4: 0.26–1.42	4: \$2,679 to \$5,021	4: 20.0–29.9 Alarming
3: 2,460–2,896	3: 10.69–16.02	3: 1.43–2.58	3: \$5,022 to \$7,364	3: 10.0–19.9 Serious
2: 2,897–3,333	2: 5.35–10.68	2: 2.59–3.74	2: \$7,365 to \$9,707	2: 5.0–9.9 Moderate
1: > 3,333	1: < 5.34	1: > 3.74	1: > \$9,707	1: < 4.9 Low

GDP = gross domestic product, PPP = purchasing power parity.

The score for the % of food imports to total consumption indicator is taken from Food and Agriculture Organization of the United Nations Food Security Indicators

Food insecurity score is estimated as the weighted sum of the scores of indicators given equal weights. Values in parentheses are the weights.

Food insecurity category is based on the following ranges of food insecurity scores and characteristics:

- (i) Food insecure (1.00–2.32): Countries with relatively high per capita income but food-import dependent and, hence, susceptible to threats from shocks (e.g., economic, financial, natural [e.g., climate change]) that affect food supply.
- (ii) Moderately food insecure–lower bound (2.33–2.99): Countries with relatively high per capita income and food intake above recommended level but very vulnerable to food security deterioration because of their heavy dependence on food imports, and current problems related to rising food import bills.
- (iii) Moderately food insecure–upper bound (3.00–3.65): Countries that are capable of producing their food and exporting some, but are faced with problems of accessing food supply and utilizing food intake because of low incomes and high incidence of poverty and malnutrition.
- (iv) Severe or highly food insecure (3.66–5.00): Countries with internal conflicts or just recovering from such problems, with fragile institutions to effect even slight improvement in their food security status because of slow economic recovery, reconstruction, and social reconciliation. The Kyrgyz Republic is categorized as upper bound moderately food insecure as its food security improvement is beset primarily by internal conflicts.

Sources of basic data: Food and Agriculture Organization of the United Nations. 2011. *Asia Pacific Food Situation Update*. July. http://www.foodsecuritylink.net/index.php?option=com_remository&Itemid=27&func=startdown&id=154; FAOStat. <http://faostat.fao.org/site/354/default.aspx> (accessed 10 July 2011); World Bank. 2011. *World Development Indicators*. <http://data.worldbank.org/data-catalog/world-development-indicators> (accessed 10 July 2011); International Food Policy Research Institute. *2010 Global Hunger Index*. <http://www.ifpri.org/publication/2010-global-hunger-index> (accessed 10 July 2011).

INFRASTRUCTURE GAPS AND PERCEPTIONS ON BUSINESS AND GOVERNANCE

Country	State of Food Insecurity (1)	Income Inequality (Gini Index) (2)	Political Stability and Governance			State of Infrastructure			
			State of Political Security (3)	Ease of Doing Business (4)	Corruption Perception Index (5)	Logistics Performance Index (6)	Mobile Subscription per 100 Population (7)	Internet Users per 100 Population (8)	Road Density (9)
Afghanistan	Severe	29.0 (17)	Politically unstable	167	1.40 (1)	2.2	42.63	3.55	6
Armenia	Moderate	40.6 (7)	Fragile, border with Azerbaijan and Turkey closed	48	2.60 (9)	2.5	84.98	6.75	26
Bangladesh	Severe	39.1 (9)	Fragile, recovery	107	2.40 (7)	2.7	32.22	0.38	...
Bhutan	Moderate	47.5 (2)	...	142	5.70 (17)	2.4	48.6	7.17	...
Cambodia	Moderate	42.9 (5)	...	147	2.10 (4)	2.4	42.34	0.53	...
Georgia	Moderate	39.6 (8)	Fragile, recovery	12	3.80 (15)	2.6	66.59	30.51	29
Kiribati	Severe	...	...	93	3.20 (12)	...	1.02	8	...
Kyrgyz Republic	Moderate	38.1 (11)	Fragile, recovery	44	2.00 (3)	2.6	81.85	40.03	17
Lao PDR	Moderate	34.5 (14)	...	171	2.10 (4)	2.5	51.18	6	15
Maldives	Moderate	44.3 (3)	...	85	2.30 (6)	2.4	147.94	27.93	...
Marshall Islands	Moderate	...	...	...	...	...	4.84	3.55	...
Micronesia	Moderate	...	...	141	...	...	34.32	15.35	...
Mongolia	Moderate	33.8 (15)	...	73	2.70 (10)	2.3	84.2	12.49	...
Nauru	Moderate	...	...	...	...	...	14.94	2.99	...
Nepal	Moderate	48.5 (1)	Fragile, postconflict transition, law and order problems	116	2.20 (5)	2.2	19.09	1.97	12
Pakistan	Moderate	33.0 (16)	Politically unstable	83	2.30 (6)	2.5	52.18	11.3	33
Palau	Insecure, vulnerable	...	...	...	...	...	64.31	26.97	...
Samoa	Moderate	...	...	61	4.10 (16)	...	84.43	5.03	...
Sri Lanka	Moderate	43.8 (4)	Fragile after decades of civil war, peace dividends, recovery	91	3.20 (12)	2.3	69.65	8.78	...

Country	State of Food Insecurity (1)	Income Inequality (Gini Index) (2)	Political Stability and Governance			State of Infrastructure			
			State of Political Security (3)	Ease of Doing Business (4)	Corruption Perception Index (5)	Logistics Performance Index (6)	Mobile Subscription per 100 Population (7)	Internet Users per 100 Population (8)	Road Density (9)
Tajikistan	Severe	33.0 (16)	...	139	2.10 (4)	2.4	70.48	10.07	...
Tuvalu	Moderate	...	...	...	...	...	20.14	10.43	...
Uzbekistan	Moderate	36.4 (16)	...	172	1.60 (2)	2.8	59.73	17.06	...
Vanuatu	Moderate	...	...	60	3.60 (14)	...	52.73	7.09	...
Viet Nam	Moderate	38.3 (10)	...	116	2.70 (10)	3	111.53	26.55	48

... = data not available.

Notes:

1. Based on Table 1 and Appendix 1.
2. Gini index measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution. A score of 0 represents perfect equality, while an index of 100 implies perfect inequality. Values in parentheses are ranks of countries from most inequality (1) to least inequality (18) (ADF countries)
3. Ease of doing business index ranks economies from 1 (best) to 183 (worst). A high ranking means that the regulatory environment is conducive to business operation.
4. Corruption perception index relates to the degree to which corruption is perceived to exist among public officials and politicians by business people and country analysts. Scores range from zero (highly corrupt) to 10 (highly clean). Values in parentheses are ranks of countries from most corrupt (1) to least corrupt (17) (ADF countries).
5. The logistics performance index is based on a worldwide survey of operators on the ground (global freight forwarders and express carriers) providing feedback on the logistics "friendliness" of countries in which they operate and those with which they trade. Scores ranges from 1 (worst) to 5 (best).
6. Road density is the ratio of the length of the country's total road network to the country's land area, measured in terms of kilometers of road per 100 square kilometers of land area.

Sources: Asian Development Bank. 2011. *Basic Statistics 2011*. Manila; I. Ortiz and M. Cummins. 2011. Global Inequality: Beyond the Bottom Billion: A Rapid Review of Income Distribution in 141 Countries. *Social and Economic Policy Working Paper*. http://www.unicef.org/socialpolicy/files/Global_Inequality_Beyond_the_Bottom_Billion.pdf; Transparency International. 2010. *Corruption Perceptions Index 2010*. Transparency International's 2010 Corruption Perceptions Index « Task Force on Financial Integrity and Economic Development (accessed 10 July 2011); World Bank. 2010. *Global Monitoring Report: The MDGs After the Crisis*. Washington, DC; World Bank. 2011. *Logistics Performance Index*. <http://www1.worldbank.org/PREM/LPI/tradesurvey/mode1b.asp#> (accessed 23 June 2011); World Bank. 2011. *Economy Rankings*. <http://www.doingbusiness.org/rankings> (accessed 23 June 2011); and World Bank. 2011. *Road Density*. <http://data.worldbank.org/indicator/IS.ROD.DNST.K2/countries/1W?display=default>

GOVERNMENT RESPONSES TO FOOD PRICE VOLATILITY
(as of June 2011)

Region, Country	Trade Measures			Domestic Market (Consumption)			Domestic Market (Production)		Others
	Export	Import	Non-tariff	Safety Nets (cash or conditional)	Reserve stocks and price controls	Food aid, subsidy	Input subsidy	Floor price, marketing	
ADF		√		√	√	√	√	√	
Afghanistan		√				√	√		
Cambodia					√	√	√		
Kyrgyz Republic		√		√	√				
Lao PDR		√			√			√	Land access to foreign agribusiness investors
Mongolia		√			√	√			
Nepal					√		√		
Tajikistan					√				
Blend	√	√		√	√	√	√	√	
Armenia						√	√		
Bangladesh	√	√			√		√		
Georgia					√	√			
Pakistan	√	√			√		√		
Sri Lanka		√			√			√	
Uzbekistan		√			√	√	√		
Viet Nam					√				Land access for construction of new storage facilities for grains and other food items
Others	√	√	√	√	√	√	√	√	
Azerbaijan		√			√				
India	√				√	√			Additional incentives and financial support for private sector investments in rural grain storage
Indonesia		√			√	√		√	
Kazakhstan					√	√			
Republic of Korea		√			√				
Philippines		√		√	√	√			
PRC	√		√ ^a		√	√	√	√	
Russian Federation	√				√				
Thailand					√			√	
Ukraine	√	√							

ADF = Asian Development Fund, PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.

^a The PRC imposed additional labeling requirements on pork imports, which will affect US exporters. The new rules, effective 1 June 2011, require countries shipping to the PRC to weigh and label individual packages of meat. Approximately 20% of current US exports to the PRC are shipped as individually wrapped pieces, according to the senior vice president for trade access for the US Meat Export Federation, which develops foreign markets for beef, pork, veal, and lamb.

Sources: Asian Development Bank. 2011. *Global Food Price Inflation and Developing Asia*. Manila; Food and Agriculture Organization (FAO). Global Information and Early Warning System (FAO-GIEWS). Country Policy Monitoring, http://www.fao.org/giews/countrybrief/policy_index.jsp, (accessed 17 June 2011); FAO. 2001. *Food Outlook and Global Market Analysis* June. <http://www.fao.org/docrep/014/al978e/al978e00.pdf> (accessed 17 June 2011); and CME Group. <http://www.cmegroup.com/>

CLIMATE CHANGE VULNERABILITY OF ADF COUNTRIES

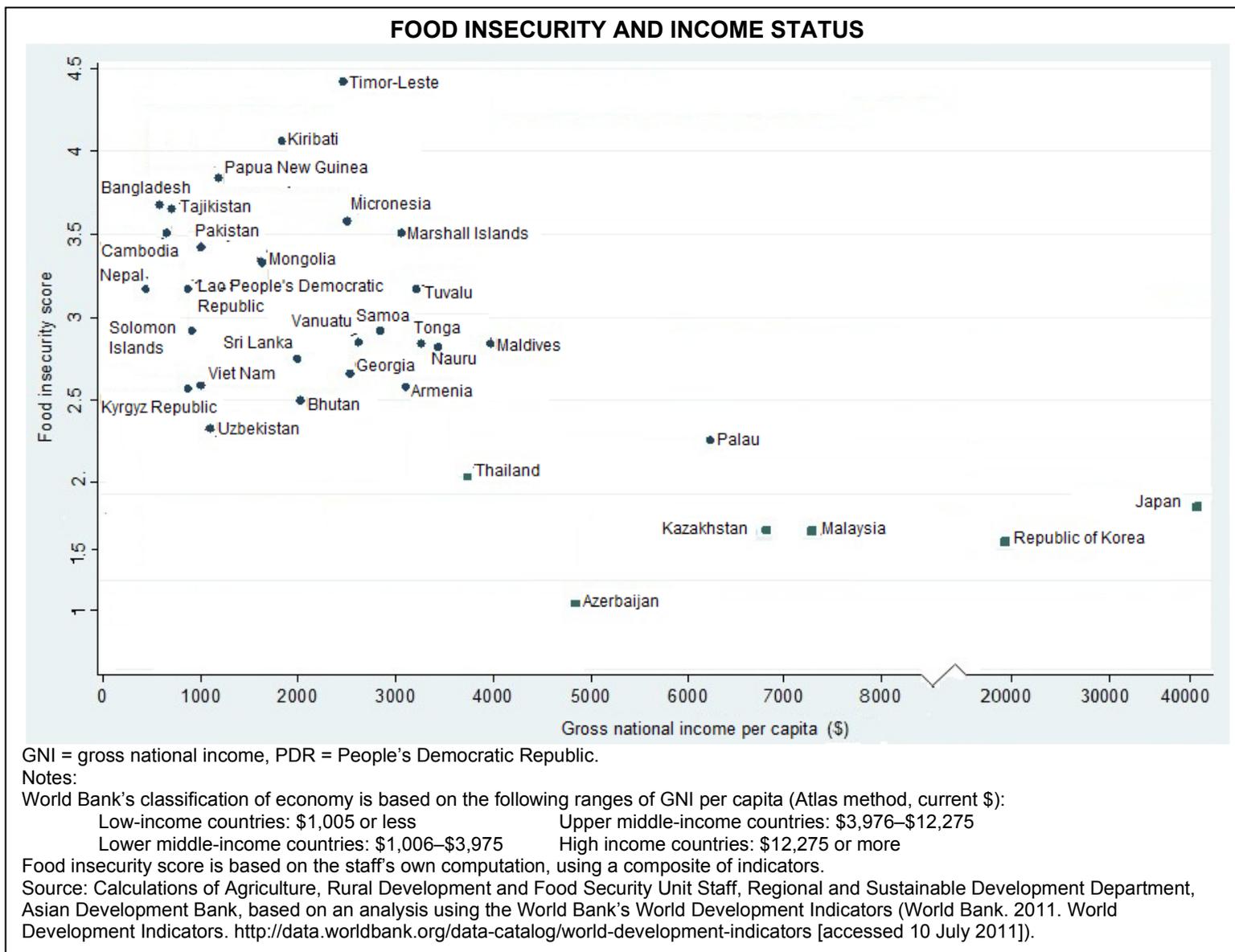
Country	Vulnerability to Climate Change						
	Rise in Sea Level	Floods	Droughts	Storm	High Exposure (1)	Low Adaptive Capacity (2)	High Sensitivity (3)
Afghanistan		x	x	x	x	x	x
Armenia		x	x		x		
Bangladesh	x	x	x	x	x	x	x
Bhutan		x		x	x		x
Cambodia		x	x		x	x	x
Georgia		x	x		x		
Kiribati	x	x	x	x			
Kyrgyz Republic		x		x	x		
Lao PDR		x	x	x	x	x	x
Maldives	x	x		x			
Marshall Islands	x		x	x			
Micronesia	x		x	x			
Mongolia		x	x	x	x		
Nauru	x	...	...	...
Nepal		x	x		x	x	x
Pakistan	x	x	x	x	x		x
Palau	x	...	...	...
Papua New Guinea	x	x	x	x	x		x
Samoa	x	x		x			
Solomon Islands	x			x			
Sri Lanka	x	x	x	x	x		x
Tajikistan		x	x		x		
Timor-Leste	x	x		x		x	x
Tonga	x			x			
Tuvalu		x		x			
Uzbekistan		x	x		x	x	
Vanuatu	x	x		x			
Viet Nam	x	x	x	x	x		x

... = data not available ADF = Asian Development Fund, Lao PDR = Lao People's Democratic Republic.

Notes:

1. Exposure is reflected as the delta change in both temperature and annual precipitation in 2050 compared with current climate (1950–2000). Countries are classified highly exposed if the temperature increases by at least 2°C or if annual precipitation changes by at least 20%.
2. Adaptive capacity is represented by the poverty rate. Countries with poverty rates above 30% are classified as having low adaptive capacity.
3. Sensitivity is represented by share of labor employed in agriculture. Countries with agricultural employment above 40% are considered to be highly sensitive.

Source: Asian Development Bank and International Food Policy Research Institute. 2009. *Building Climate Resilience in the Agriculture Sector in Asia and the Pacific*. Manila: ADB.



ADB's FOOD SECURITY INVESTMENTS FOR PRODUCTIVITY, CONNECTIVITY, AND RESILIENCE

A. Productivity-Related Food Security Investments

1. Various ADB reports.¹ To improve the productivity of agriculture and the natural resource sectors in ADF countries, ADB has focused most of its assistance on irrigation systems. Since the 1970s, ADB has financed more than 200 irrigation projects for a total of more than \$6.0 billion (ADB 2009).² Irrigation and drainage facilities increase agricultural productivity, farm income, and women's participation, as well as reduce poverty. The irrigation and drainage subprojects of the ADB-financed project in Ak Altin almost doubled wheat production (from 2.19 tons per hectare in 2004 to 4.30 tons per hectare in 2010), and increased cotton production by a third (from 1.59 tons per hectare to 2.10 tons per hectare in 2010). Incomes of farmers doubled during the period. Yield improvements and increases in farmer incomes were also observed in the Kyrgyz Republic's Agriculture Area Development Project, and Tajikistan's Agriculture Rehabilitation Project. The projects in the Kyrgyz Republic and Tajikistan noted a reduction in rural poverty in the project sites, and decreases in water logging and salinity. The pilot-scale drip irrigation project involving women and low-caste farmers diversified the backyard farm crops produced and increased the incomes of women and marginal farmers. In an ADB-funded impact study on irrigation (Hussain and Wijerathna 2004),³ results show overall that in Bangladesh, the People's Republic of China, India, Indonesia, Pakistan, and Viet Nam, poverty incidence in irrigated areas was 20%–30% lower than in nonirrigated areas. In terms of environmental and resettlement impacts, no significant adverse effects are associated with the irrigation projects.

2. Special evaluation study update on policy implementation and impact of agriculture and natural resources research.⁴ The evaluation study showed that ADB's regional technical assistance in support of agricultural and natural resources research, despite the relatively modest support, significantly contributed to improving the welfare of smallholders and reducing poverty. Examples include lentil research that generated \$12 million in annual benefits to Bangladesh; zero tillage wheat technology, spearheaded by ADB-funded technical assistance in South Asian countries, that resulted in millions of liters of water and diesel saved, and estimated to have reduced emission of greenhouse gases by about \$40 million equivalent; and coconut technology promoted to poor coconut farmers in the Philippines that effectively doubled farmer incomes and reduced poverty in project communities from 44% to 6%. The projects have yielded good economic returns, like the project for a genetically improved carp strain with an internal rate of return of 17%–53%.

¹ ADB. 2005. *Country Water Action: Nepal—Demonstrating the Promise of Drip*. <http://www.adb.org/water/actions/nep/demonstrating-promise-drip.asp>; ADB. 2010. *Completion Report: Agriculture Rehabilitation Project in Tajikistan*. Manila; ADB. 2010. *Completion Report: Ak Altin Agricultural Development Project in Uzbekistan*. Manila; and ADB. 2011. *Completion Report: Agriculture Area Development Project in the Kyrgyz Republic*. Manila;

² ADB. 2009. *Country Water Action: Asia ADB's current irrigation projects*. <http://www.adb.org/Water/Actions/REG/Irrigation-Projects.asp#Ongoing-Projects>

³ I. Hussain and D. Wijerathna. 2004. *Irrigation and Income-Poverty Alleviation: A Comparative Analysis of Irrigation Systems in Developing Asia*. Sri Lanka: International Water Management Institute. http://www.iwmi.cgiar.org/propoor/files/ADB_Project/Draft%20papers/income%20poverty%20paper.pdf

⁴ ADB. 2008. *Special Evaluation Study Update on Policy Implementation and Impact of Agriculture and Natural Resources Research*. Manila.

B. Connectivity-Related Food Security Investments

3. Special evaluation study of ADB's contribution to inclusive development through assistance for rural roads.⁵ Over the past decades, rural roads have dominated ADB's rural infrastructure interventions. From 1996 to 2007, ADF resources comprised 79% of the rural road-associated investments, which largely involved rural road improvement. The major impact of the rural road projects was enhanced connectivity, particularly improved access to markets, social services, and economic opportunities. Rural household incomes increased by 40% in rural infrastructure development projects and 21% in rural network development projects. Other specific benefits include transportation costs reduced by 10%–60% and travel time by 20%–80%, and increased crop production and market sales. The rural road intervention contributed to the improvement of social, institutional, and environmental opportunities.

C. Resilience-Related Food Security Investment

4. Technical assistance for capacity building for the efficient utilization of biomass for bioenergy and food security in the Greater Mekong Subregion.⁶ Biomass wastes—such as rice husks and animal manure—are abundant in these countries, but are not efficiently used as a source of clean energy or as fertilizer to increase crop productivity. There is also increasingly large-scale crop production of biofuel in the GMS countries. This poses a threat to food security by reducing food production and forestland. The project will fund pilot investment projects to increase biomass technologies, such as household biogas systems, biochar kilns, and improved cooking stoves. It will also conduct food security assessments, and build human and institutional capacity on biomass investment. To promote cross-border trade among GMS countries and foster trade opportunities, the project will help develop and use internationally certified standards for bioenergy and biomass products.

⁵ ADB. 2009. *Special Evaluation Study: Asian Development Bank's Contribution to Inclusive Development through Assistance for Rural Roads*. Manila.

⁶ ADB. 2011. *Technical Assistance for Capacity Building for the Efficient Utilization of Biomass for Bioenergy and Food Security in the Greater Mekong Subregion*. Manila.

STRATEGIC DIRECTIONS FOR FOOD SECURITY IN ADF COUNTRIES

Food Security Objectives	Time Frame	Severely Food Insecure	Moderately Food Insecure (Upper Bound)	Moderately Food Insecure (Lower Bound)	Food Insecure and/or Vulnerable
Mitigate adverse effects on the poor and vulnerable	Short- and medium-term	Targeted food safety nets Conditional cash transfer applied to majority of population			Targeted food safety nets
	Medium-term	Social protection applied to majority of population Increased income opportunities Risk mitigation financing measures for small-scale farmers and entrepreneurs with small- and medium-sized food businesses		Targeted social protection Targeted increased income opportunities Risk mitigation financing measures for small-scale farmers and entrepreneurs with small- and medium-sized food businesses	Social protection applied to majority of population Increased income opportunities Targeted risk mitigation financing measures for small-scale farmers and entrepreneurs with small- and medium-sized food businesses
Improved productivity	Short-term	Some food production and/or export potential ADF countries: Water-saving technologies and good agronomic practices Technologies and good agronomic practices that reduce pre- and postharvest losses Climate proofing Import dependent and/or fragile ADF countries: South–south trade agreement to facilitate food imports			Targeted client water-saving technologies and good agronomic practices Targeted client technologies and good agronomic practices that reduce pre- and postharvest losses Climate proofing South–south trade agreement to facilitate food imports
	Medium-term	Some food production and/or export potential ADF countries: Irrigation and innovative watersaving and/or -storing technologies Land-saving boosting technologies Water pricing South–south agriculture research and technological development to bridge yield gap; biotechnology South–south for integrated regional food supply chains			Targeted client for irrigation and innovative water-saving and/or -storing technologies Targeted client for land saving boosting technologies Water pricing

Food Security Objectives	Time Frame	Severely Food Insecure	Moderately Food Insecure (Upper Bound)	Moderately Food Insecure (Lower Bound)	Food Insecure and/or Vulnerable
		Import-dependent and/or fragile ADF countries: Regional reserve systems through forward and/or futures contracts and/or swaps South–south for integrated regional food supply chains			South–south agricultural research and technological development to bridge yield gap; biotechnology
Enhanced connectivity	Short- to medium-term	Roads, rural energy, railways, air- and seaports Innovative financing for value chain support Subregional trade forums Trade facilitation for enhanced south–south food trade		Logistics infrastructure and services Market information systems and subregional networks Doha Development Round completion	
Build resilience	Short- to medium-term	Adaptation and mitigation measures Early warning systems		Risk mitigation financial instruments Weather-based insurance schemes, crop insurance, forward contracts	
Enhanced nutrition	Short- to medium-term	Biofortification and food-enriched investments and innovative policies for improved nutrition and micronutrients Transboundary animal and plant diseases Food safety certification measures and cross-border food safety facilities Safe water supply and improved sewerage and sanitation			
Improved governance	Short- and medium-term	High-level policy dialogue on inclusive and sustainable domestic (e.g., food reserve management) and trade food (e.g., trade facilitation) policies, enabling policies for private sector engagement on agribusiness and value chain development			

ADF = Asian Development Fund, swaps = a derivative instrument that enables counterparties to exchange one party's financial instrument with another party's instrument.

Source: Asian Development Bank based on ADB. 2010. *Operational Plan for Sustainable Food Security in Asia and the Pacific*. Manila.

INFRASTRUCTURE INVESTMENT NEEDS OF ADF COUNTRIES, 2010–2020

Country	Investment Needs for 2010–2020 (\$ million)	Total Investment per Year (\$ million)	GDP (\$ million)	Investment as % of Estimated GDP				Investment as % of Total		
				Transport	Electricity	ITC	Water and Sanitation	Total	New Capacity	Maintenance
Afghanistan	26,142	901	10,624.10	6.21	0.00	4.82	0.89	11.92	57	43
Armenia	4,179	1,358	11,916.60	1.20	1.01	0.98	0.27	3.46	41	59
Bangladesh	144,903	13,173	213,627.00	4.92	1.24	4.22	1.19	11.56	54	46
Bhutan	886	81	1,283.40	2.84	0.00	0.87	0.36	4.07	30	70
Cambodia	13,364	1,215	10,354.10	4.43	0.95	2.97	0.36	8.71	51	49
Georgia	4,901	1,268	21,386.50	1.20	1.06	0.69	0.19	3.14	24	76
Kiribati	82	7	234.30	5.17	0.00	0.16	0.32	5.65	...	...
Kyrgyz Republic	8,789	799	5,058.50	3.94	6.24	2.44	0.67	13.29	38	62
Lao PDR	11,375	1,034	5,543.10	10.62	0.00	2.40	0.60	13.61	56	44
Maldives	...	...	1,707.20	...	...	...	...	...	...	...
Marshall Islands	...	...	158.40	...	...	...	...	...	...	...
Micronesia	...	...	257.70	...	...	...	...	...	...	...
Mongolia	10,069	915	9,395.50	12.04	0.00	1.21	0.21	13.45	37	63
Nauru	...	...	...	...	...	...	...	...	...	...
Nepal	14,330	1,303	31,815.00	1.65	0.58	5.14	1.10	8.48	50	50
Pakistan	178,558	16,233	421,657.00	2.65	2.68	2.22	0.73	8.27	53	47
Palau	...	...	133.20	...	...	...	...	...	...	...
Papua New Guinea	4,214	383	8,239.00	3.30	0.00	0.73	0.32	4.35	34	66
Samoa	242	22	523.40	3.33	0.00	1.12	0.26	4.70	13	87
Solomon Islands	336	31	1,334.20	3.50	0.00	0.28	0.35	4.13	33	67
Sri Lanka	37,908	3,446	40,564.70	4.23	1.00	1.39	0.22	6.85	52	48
Tajikistan	11,468	1,043	13,036.50	3.30	9.83	2.57	0.51	16.21	47	53
Timor-Leste	71	6	497.90	0.00	0.00	0.07	0.79	0.86	35	65
Tonga	106	10	397.40	2.29	0.00	1.13	0.29	3.71	13	87
Tuvalu	...	...	...	...	...	...	...	...	...	...
Uzbekistan	41,764	3,797	279,34.00	2.65	4.65	1.94	0.58	9.82	48	52
Vanuatu	306	28	589.60	2.92	0.00	0.92	0.28	4.13	40	60
Viet Nam	109,761	9,978	240,291.90	2.07	3.12	2.38	0.54	8.12	53	47
Total	623,754	57,031	...	3.84^a	1.47^a	1.85^a	0.50^a	7.66^a	41^a	59^a

... = data not available, ADF = Asian Development Fund, GDP = gross domestic product, ITC = information technology and communications, Lao PDR = Lao People's Democratic Republic, ^a = average.

Source: B. Bhattacharyay. 2010. Estimating Demand for Infrastructure in Energy, Transport, Telecommunications, Water and Sanitation in Asia and the Pacific: 2010–2020. *ADB Working Paper Series*. No. 248. Tokyo: Asian Development Bank Institute.

<http://www.adbi.org/files/2010.08.09.wp248.infrastructure.demand.asia.pacific.pdf>