SUMMARY OF INDONESIA'S AGRICULTURE, NATURAL RESOURCES, AND ENVIRONMENT SECTOR ASSESSMENT

Eric Quincieu

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6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines
Tel +63 2 632 4444; Fax +63 2 636 2444
www.adb.org; openaccess.adb.org

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AGRICULTURE, NATURAL RESOURCES, AND ENVIRONMENT[1]SECTOR ASSESSMENT (SUMMARY)

Sector Road Map

A. Sector Performance, Problems, and Opportunities

1. Indonesia is the largest archipelago in the world.[2] The nation's total land area is around 190 million hectares (ha), of which some 55 million ha are agricultural, and 129 million ha are forest. Of the agricultural land, 24 million ha consist of arable land, with 20 million ha under permanent crops. Some 7 million ha, or 30% of the total arable land, are irrigated. Indonesia is the world's fourth most populous country. The population is estimated to increase from about 245 million in 2013 to 288 million in 2050.[3] Around 58% of the people live on the island of Java.

2. **Food security.** Indonesia is a net importer of grains, horticulture and livestock produce. The instability of food prices since 2008 has led to a renewed emphasis on food security. The crisis was particularly significant for Indonesia's poor, who on average spend about two-thirds of their income on food, especially rice. In spite of a decline of its share of GDP over the last 50 years, agriculture still accounted for 14% of GDP in 2014.[4] Agriculture is the main source of employment in rural areas, where poverty is most prevalent.[5] In 2014, agriculture employed around 40.12 million people, equal to 33% of the total Indonesian labor force. It is estimated that a 7% per annum increase in smallholder productivity could result in a $50 billion increase in agriculture revenues by 2030. The average annual growth of women entering the labor market is higher than men, but women continue to face higher unemployment rates, less skilled work and lower wages, and limited access to agriculture, forestry, and fisheries resources.

3. Despite increasing food crop production, food security is challenged in the medium term by declining irrigation and logistics chain infrastructure.[6] Food security would also be enhanced through an increase of higher value cropping, greater commercialization, and allowing land leasing to gain economies of scale in farm sizes, and facilitating re-investment by small farmers. Within national and local governments, technical and administrative capacity constraints hamper effective planning and management District, provincial, and central government roles and fund flows need to be clearer and better coordinated, and different agencies' program, policy, and management responsibilities harmonized.

4. Another reliable source of protein is fish. The marine area of 580 million hectares has the potential to provide a yearly harvest of 9 million tons of high value produce such as tuna, shrimp, seaweed, and pearl. However, some 70% of the nation's coral reefs are moderately to

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1 This summary draws on ADB. 2015. *Indonesia: Food Security and Water Security Assessment Strategy and Roadmap*. Manila.

2 The total number of islands is more than 17,000 according to the Indonesian Naval Hydro-Oceanographic office. The country straddles the equator over a distance of 5,000 kilometers between Aceh in the Indian Ocean and the eastern border of the province of Papua. The five main islands are: Sumatra, about 473,606 km^2 in size; the most fertile and densely populated islands, Java/Madura, 132,107 km^2; Kalimantan, which comprises two-thirds of the island of Borneo and measures 539,460 km^2; Sulawesi, 189,216 km^2; and Irian Jaya, 421,981 km^2.

3 ADBI. 2011. *Asia 2050: Realizing the Asian Century.*

4 World Bank. 2012.

5 Poverty in Indonesia is still a predominantly rural and agricultural phenomenon: in 2010 over 60% of those earning less than $1.25 per day lived and worked in agriculture.

6 In 2014, only 55% of the total irrigated area was considered in good condition. Ministry of Public Works and Housing. 2014

severely damaged and are threatened by destructive fishing practices. The highest volume of marine capture fisheries production was recorded 2013 at 5.7 million tons, while that of inland open water capture fisheries production in 2013 was 0.40 million for a total of 6.1 million tons.[7] Despite an abundance of coastal resources, more than 53% of coastal families are living below the poverty line. Many coastal regions are already over-exploited, their mangrove forests are degraded, and the fish catch has exceeded sustainable levels.

5. The impact of climate change on food security could affect the positive trends in terms of production and productivity due to rising temperatures[8] and sea levels, altered precipitation patterns leading to reductions in arable land area,[9] increasing wildfires leading to forest loss, and increasing ocean temperatures and acidification leading to loss of fisheries. The probability of experiencing a harmful delay in monsoon rains could more than double in some of the most important rice-growing regions in Indonesia; and investments in water storage, development of drought tolerant crops, and crop diversification are seen as critical for climate-proofing rice and agriculture production.[10] Climate change could result in a 9%–25% reduction in farm level net revenue in Indonesia in the future.

6. **Water Security.** Environmental and natural resources sustainability is a key challenge to the country's inclusive and sustainable economic growth agenda. The expanding population needs more water for drinking, hygiene, and food production. The expanding economy requires an increased energy supply, which in turn relies on access to more water; and most of the industries require reliable supplies of fresh water in some part of their process. It is estimated that dam storage capacity is only 54 m^3/capita, far below the 1,975 m^3/capita as targeted in the 2005–2025 National Long-Term Development Plan (RPJPN). More widespread shortages are predicted due to temperature increase and changes in rainfall patterns, as a result of a changing climate.[11] Flooding is a growing annual occurrence throughout most of the country, imposing heavy economic losses, as much as $430 million per year.[12] From 2003 to 2013, average annual flood damages included: (i) 1.58 million affected persons; (ii) 350 deaths and 13,640 injured; (iii) 223,000 homes fully or partly damaged; and (iv) 168,000 hectares of crops inundated.[13] The floods sever vital transport arteries and often disrupt access to ports and airports, restricting the transfer of goods and services. The water quality of the Indonesian rivers and lakes is far from good, due to a combination of untreated domestic sewage, solid waste disposal, and industrial effluents. This threatens both medium– and long-term water security and socio-economic development.

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7 Capture Fisheries statistics of Indonesia, 2012, Ministry of Marine Affairs and Fisheries, Directorate General of Capture Fisheries, 2013.

8 Each degree Celsius change in the August Sea Surface Temperature Anomaly reduces rice yield by 1.3 million tons on output and produces a $21/metric ton increase in price.

9 A delay in the wet season and a temperature increase beyond 2.5°C is projected to substantially diminish rice yields and cause a loss in farm-level net revenue of 9%–25% in Indonesia.

10 A study published in *Proceedings of National Academy of Sciences* in 2007, entitled 'Assessing the risks of climate variability and climate change for Indonesian rice agriculture'

11 Areas that are projected to experience water shortages include parts of Sumatra, parts of Sulawesi, and Nusa Tenggara.

12 Centre for Research on the Epidemiology of Disasters (CRED). *EM–DAT: The OFDA/CRED International Disaster Database.* www.emdat.be. (accessed April 2014).

13 National Disaster Management Agency (BNPB*). Indonesian Disaster Information and Data (DIBI).* http://dibi.bnpb.go.id/DesInventar/dashboard.jsp (accessed April 2014).

7. Deforestation and inappropriate agricultural practices, which result in erosion and increased sediment loads in waterways,[14] ultimately reduce the lifetime of storage reservoirs, increase the rate of occurrence of floods and landslides, reduce the availability of water in the dry season, and raise water treatment costs. Associated problems are a lack of comprehensive urban planning and of pro-poor and pro-environment land use planning and management. Urbanization is causing increased water pollution, while increasingly severe seasonal water shortages intensify competition for water and exacerbate the impact of the overexploitation of groundwater, especially in urban areas.[15] Fiscal decentralization has adversely affected the delivery of infrastructure at the local levels, which has not kept pace with the growth in the economy, especially since the 1997 Asian financial crisis.

8. Efforts to enhance water security have been inhibited by weak coordination and policy inconsistencies across government agencies. Integrated water resources management (IWRM) in Indonesia has a strong legal and institutional framework. Notwithstanding, development and management of natural resources is divided over many different sectors including the Ministry of Public Works and Public Housing, the Ministry of Mining, the Ministry of Environment and Forestry, and the Ministry of Agriculture, leading to policy and investment inconsistencies.

9. Improving water security in Indonesia is further constrained by: (i) administrative and fiscal decentralization affecting continuity in water resources planning and management; (ii) lack of an integrated water resources information and communications system for early warning of emergencies; (iii) bottlenecks to private participation which include complex regulations and financing from local governments which is not predictable; (iv) insufficient spatial planning; and (v) degraded watersheds and poor watershed management.

B. Government's Sector Strategy

10. The government of Indonesia's 2015–2019 National Medium-Term Development Plan (RPJMN) highlights two distinct roles of the agriculture sector which are to (i) increase rice production for food security, and (ii) develop higher value cropping to improve rural livelihoods. The 2015–2019 RPJMN promotes: (i) the rehabilitation of 3.2 million ha of irrigated land; (ii) the development of 1.0 million ha of new irrigation systems; (iii) the adoption of sustainable approaches to farming on rehabilitated upland areas; (iv) the development of farm roads; and (iv) increased adoption of environmentally friendly technologies for food crops. Water security is a central pillar of the 2015–2019 plan, which also recommends continuing to implement IWRM through: (i) improved land use planning and management; (ii) the rehabilitation of degraded land; (iii) increased water storage, including the construction of 49 new dams; (iv) reduced flooded area by 200,000 hectares; and (v) the improvement of water quality. The RPJMN 2015–2019 highlights gender as one of its mainstreaming principles for all development activities. Each ministry or agency is required to refer to this policy in its own 5–year strategic plans, and this should be expanded into annual plans with the budgeting process integrating gender into its development programs and activities.

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[14] Degraded land in Indonesia is about 78 million hectares, consists of slightly degraded (48 million ha), degraded (23 million ha), and highly degraded (7 million ha). ADB. 2015. *Indonesia Country Water Assessment.* Manila. (PATA 8432–INO).

[15] Almost half the population lives in urban areas, with an urban growth rate averaging 3.3% per year in 2011. Some 86% of the urban population is found on Java and 20% in the urban conglomerate around Jakarta.

11. Indonesia has a well-defined sector plan for water resources from the Ministry of Public Works and Public Housing and a sector plan for agriculture from the Ministry of Agriculture. These include policy measures and priority investments over a 5–year period. The Sector Plan Water Resources, 2015–2019 calls for an overall investment of $24.68 billion nationwide, including investment for improving irrigation systems and their management; while the sector plan for agriculture prescribes nationwide investment to increase productivity and improve agriculture and aquaculture value chains.

Problem Tree