PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE

Report No.:AB6849

Project Name	Sustainable Management of Agricultural Research and Technology Dissemination Project
Region	EAST ASIA AND PACIFIC
Sector	Agricultural Research and Extension (100%)
Project ID	P117243
Borrower(s)	THE GOVERNMENT OF INDONESIA
Implementing Agency	Indonesian Agency for Agricultural Research and Development (IAARD)
Environment Category	[] A [] B [X] C [ ] FI [ ] TBD (to be determined)
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1. Country and Sector Background

Agriculture plays an important role in Indonesia's economy, providing employment to over 40 percent of the workforce and income to two-thirds of the country's poor. Increases in agricultural productivity are credited with reducing poverty in Indonesia during the 1970s and 1980s, and even now continue to be the key livelihood for many and a key source of poverty alleviation. Spending on the agricultural sector accounted for less than 5 percent of the total national budget in 2008. As a percentage of value added, Indonesia spends considerably less than other regional and middle-income countries. In 2004, public spending as a percent of value added in Thailand or Malaysia was four times greater than in Indonesia.

While public spending on agriculture has increased recently in real terms this has failed to increase agricultural productivity. In 2001-08, national spending on agriculture[1] increased from Rp 11 trillion to Rp 53 trillion, an average of 11 percent per year in real terms. The agriculture share of total government spending doubled from 3 percent in 2001 to 6 percent by 2008, reaching 1 percent of GDP because of increasing spending on agriculture subsidies. MoA allocates a large and increasing share of resources to input subsidies in an effort to increase the production of food crops. Agriculture subsidies account for 60% of all agriculture spending in Indonesia (2008). Fertilizer subsidies are about 50% of all subsidy spending ($1.6bn) at 0.3% of GDP.

Over the past three decades, Indonesia significantly boosted its capacity in agricultural R&D, but remains low. Public spending on R&D was only 0.22 percent of the agriculture output in 2003. By 2007, spending on R&D was still only half that on the seed subsidy. After adding in private

[1] For the purpose of this analysis, national agriculture expenditure includes expenditure by MoA, sub-national government spending on agriculture and irrigation, irrigation expenditure under the Ministry of Public Works and central government subsidies closely related to agriculture (e.g. fertilizers), but excludes expenditure on fisheries and forestry and rural roads.

sector agricultural R&D investments, the intensity with which Indonesia invested in agricultural research,[2] at 0.27 percent was at the level of Laos (0.24 percent), and much lower than Malaysia (1.92 percent) or the Philippines (0.46 percent).

The public research and extension systems are facing severe challenges to remain viable under pressure from staff and budget decentralization, demands for greater client-orientation, and increasing need accommodate commercial pressures. Broad-based growth in agriculture needs effective systems for generating, adapting and disseminating technology relevant to farmers and rural producers. Without new efforts to increase productivity in agriculture, Indonesia's goal of using agricultural growth to generate broad-based rural development and further reduce poverty may be undermined. High-quality agricultural research and extension systems will be critical to getting productivity onto a higher growth path. There is an urgent need for greater investment in agricultural research and technology dissemination – but this should take a demand driven approach and seek greater involvement of the private sector rather than relying on the old supply driven model.

2. Objectives

The PDO of SMARTD is to improve the institutional capacity and performance of IAARD in developing and disseminating innovative technologies that are relevant to the producers and to the agri-food system. It is expected that the proposed project will enhance the performance and effectiveness of the Indonesian Agency for Agricultural Research and Development (IAARD) in the development and dissemination of farmer and market demand-driven technologies. It will strengthen the capacity of IAARD to develop, adapt, and disseminate appropriate agro-technologies that can suit local agro-ecological and socio-economic conditions and capitalize on emerging market demands (domestic and international) requiring improved agricultural productivity, profitability and sustainability. Today IAARD is composed of 14 research centres, 19 research institutes, 2 supervisory institutes, 32 assessment institutes, and several research stations and research farms, spread across the country.

The project will be implemented over a period of five years (2012-2016). SMARTD will entail the implementation of an innovative program to both upgrade public sector R&D capacities (human resource development, facilities and mobility improvement) and improve research quality and relevance through improving linkages to the private sector, universities, and NGOs as well as with its extension services and farmer communities. It will also develop models that improve the effectiveness and financial sustainability of the technology dissemination system with greater accountability to, and participation by, the farming communities.

The proposed PDO Level Indicators are the following: (i) effective adoption of technologies by end users, (ii) research results published, and (iii) diversification of research funding.

The above indicators are both qualitative and quantitative targets, and should reflect an improved standing of Indonesia's agricultural research in Asia as a result of the project. Most data for monitoring would be available from public or project records.

[2] R&D expenditure as a share of total agriculture output.

3. Rationale for Bank's Involvement

Agriculture remains a key development priority despite the challenges faced by the sector. The President of Indonesia has taken a strong leadership role in developing an agenda for the revitalization of the agriculture, fisheries, and forestry sector (*Revitalisasi Pertanian Perikanan dan Kehutanan/RPPK*) that was formally presented in June 2005. The RPPK focuses on the development of human resource capacity and participatory empowerment of farmers through improved information systems, training in community agribusiness development, increasing funding for long-term technological research and development to improve agricultural competitiveness. This is also reflected in the Government of Indonesia (GOI) Medium Term Plan, 2005-2009 (RPJM) which calls for revitalizing agriculture through the development of agribusiness linkages to improve farmers' incomes and for greater diversification.

The Bank has supported GOI in the development of innovation in its agricultural research services since 1975 and its extension services, agricultural education and training since the late 1960s. Most recently, the extension projects DAFEP and FEATI have developed participatory extension aimed at agricultural commercialization. SMARTD along with FEATI and other bilateral projects offers an opportunity to reshape the delivery of agricultural services (research and extension) towards a dynamic multi-provider system that is needed to increase the competitiveness of the Indonesian agricultural sector in international markets.

The Bank's comparative advantage lies in its global and regional expertise, its participatory and inclusive approaches to development and the quality of its economic and sector work. The Bank, in collaboration with IAARD, prepared a Strategic Framework for Research Management (2008) that will underpin the scope and design of the proposed project. Currently, the Bank is also engaged in the preparation of a public expenditure review of the agriculture (APER) sector (including a stand-alone policy note on expenditures in agricultural R&D) in collaboration with Ministry of Finance, Bappenas and Ministry of Agriculture. Analytical inputs derived from the APER are being provided to GoI towards the preparation of the next RPJM and would support project implementation.

The Bank can bring in experiences from other agricultural services projects financed by the World Bank in other parts of the world such as Colombia, Brazil, China, and India, to yield lessons learned in addressing institutional reforms – in particular with respect to the sustainability of funding for research and technology transfer, allocation of funding on a competitive basis, empowerment of local communities and increased private sector participation. By helping strengthen the capacity of the Indonesian research establishment, the World Bank would prepare these public institutions to be reliable partners with the private sector through strategic public/private partnerships.

The proposed project is fully consistent with the World Bank's *Country Partnership Strategy (CPS)* with its theme of "investing in Indonesia's institutions". The project would meet key objectives of the CPS which emphasizes the "institutional lens" for supporting the national economy, and which focuses on strengthening the public administration system of the country. The CPS aims to provide support for improving service delivery systems, i.a., of agricultural services. It is also in-line with and supports Core Engagement 5 – Environment Sustainability and Disaster Mitigation, where Indonesia can benefit from investments "designed to scale-up

funding to help [with] their effort to address climate change and to undertake appropriate mitigation and adaptation programs".

4. Description

The Government of Indonesia has requested a loan from the World Bank to support agricultural research management in the country with a focus on institutional and human resource development. The designated implementing agency is the Indonesian Agency for Agricultural Research and Development (IAARD) of the Ministry of Agriculture.

The project will address the following weaknesses in the Indonesian agricultural technology development and dissemination system: inadequate adoption of sound research management principles; poor selection and clear identification of research problems or gaps; limited external linkages of national agricultural research centers both in and outside the country; limited linkage between research and technology dissemination to increase the speed and rate of adoption; need to foster procedures in IAARD that enhance the relevance of research; and lack of scientific rigor and quality of research due to: ineffective scientific networking, lack of external reviews and linkages and non-competitive funding; and weak intellectual property rights for agricultural technologies.

It is expected that the proposed project will enhance the performance and effectiveness of the Indonesian Agency for Agricultural Research and Development (IAARD) in the development and dissemination of farmer and market demand-driven technologies. SMARTD will manage an innovative program to both upgrade public sector R&D institutions (human resource development, facilities and mobility improvement) and improve research quality and relevance through improving linkages to the private sector, universities, and NGOs as well as with its traditional extension and farmer partners. It will also develop models that improve the effectiveness and financial sustainability of the technology dissemination system with greater accountability to, and participation by, the farming communities.

5. Tentative Financing

Source:	($m.)
Borrower	20
International Bank for Reconstruction and Development	80
	Total 100

6. Implementation

The Ministry of Agriculture (MoA) will be the implementing agency of the SMARTD Project. The executing agency will be the Indonesian Agency for Agriculture Research and Development (IAARD). A Steering Committee (SC) will be established at the national level and will be headed by the Director General of IAARD/Secretary General of MoA, and comprise the following members: (a) Director of Debt Management, Ministry of Finance (MoF), (b) Director of Food and Agriculture, *Badan Perencanaan Pembangunan Nasional (BAPPENAS),* (c) Director of Technical Cooperation, Secretary of Cabinet, (d) Director of Bureau of Planning,

(MoA), (e) Inspector IV of General Inspectorate (MoA), Director of International Cooperation Center (MoA), and four Directors of Research Center (IAARD). The SC will be responsible in the formulation of national policies and plans, and coordination work arrangements required among inter-government agencies to effectively implement the SMARTD project at the national and provincial.

The Director General of IAARD will appoint a Director of the Project Coordination and Management Unit (PCMU) at the Secretariat of IAARD. Staff will be formally appointed to coordinate the overall project implementation and to carry out the activities under the project. Project Implementation Units (PIUs), if necessary, will be established at selected national research centers/research institutes (NRIs), and Assessment Institute of Agricultural Technologies (AIATs). The PCMU will be the central unit responsible in coordinating with the PIUs for the necessary activities as well as collection, monitoring, evaluation and consolidation of required data and information to prepare and submit reports for World Bank and Government of Indonesia purposes.

7. Sustainability

The Government's commitment to increasing and using improved STI capacity to reach national goals of accelerated economic growth and improved competitiveness is crucial to ensure the institutional sustainability of the project. This commitment is first evidenced through a series of policy measures aimed at increasing the role of STI in national development agenda. During a high level meeting between the President and Governors across the country on "national economic growth acceleration and improvement program", human resources and technological innovations are clearly identified as key factors for accelerating economic growth. Within this context, a few policy proposals were put forward for the strengthening of the National Innovation System (SINAS). The key steps in the proposed action plan include: to establish a National Innovation Commission to build synergy among the government, business and academics; to prepare a National Innovation Policy Blueprint (led by KIN); to develop a strategic program and a long-term research agenda to improve Indonesia's competitiveness; to focus on maritime continents and other natural resources, human resources, biotechnology and renewable energy as part of the Green Economy; to establish national clusters to revitalize strategic industry; to implement strategic and prime research programs in seven priority areas (food security; health and pharmaceutical technology; energy; transport technology and management; information and communication technology; defense and security technology; and advanced materials); to develop science and technology parks; to increase government budget for innovation development; and to provide tax incentives for research and development activities.

In June 2010, KIN was formally appointed by the President through President Decree No. 32/2010. KIN is responsible for: assisting the President to strengthen the national innovation system and develop a culture of innovation nationally; providing input and consideration of priority programs and action plans, including funding allocations and facilities to strengthen the national innovation system and to produce innovative products; carrying out monitoring and evaluation of the implementation of policy and system-strengthening of national innovation programs. KIN performs its duties in consultation, coordination, and cooperation with governmental and non-governmental agencies, representatives of community groups, as well as

scientific communities and universities, technology experts, and innovators in the framework of strengthening an integrated national innovation system.

The sustainability of the advanced training program can only be achieved through the development and expansion of the domestic advanced education and training programs. This has been identified as one of the priorities of the higher education strategy as emphasized by the Minister of Education in Indonesia. With increasingly large public resource envelop for education sector development (20 percent of the public budget as stipulated by the Constitution), the sustainability of supplying advanced human resources should be able to be achieved with better allocation of public budget within the education sector, together with improving the public spending efficiency on basic education, which absorbed the largest share of public spending within the sector.

8. Lessons Learned from Past Operations in the Country/Sector

The main lessons drawn in the ICR for the Agricultural Management Project (ICR Report No. 16078), prepared in 1996, were as follows:

- Institutional capacity building. The most logical step towards strengthening the R&D system, after investing in basic infrastructure and intensive staff development, is to give priority to developing an improved research management capacity to promote the most productive and cost-effective use of research investments. It takes time to build a national capacity to conduct high quality and relevant research and for institutional changes to take place;
- Decentralization of R&D. To benefit fully from new achievements in research and promote the effective use of available local resources and knowledge, a decentralized R&D system with strong linkages to farmers, community-based organizations and local governments, is required. Continued reliance on commodity-oriented research is not appropriate at the field level. Farming systems research, based on agro-eco-systems and emphasizing location-specific needs and socio-economic conditions would better support resource-based planning and development. Decentralized planning should ensure participation of farmers and other stakeholder in the research process.
- Reforms of research management. Research management procedures and tools adopted by IAARD through ARM 1 need to be further implemented, especially in three areas: (i) further improve the assessment of priorities for R&D using economic efficiency parameters, such as periodic assessments of the economic impacts of technology adoption; (ii) further develop the MIS, IAARD should develop MIS sub-systems for use by researchers and technical staff, in addition to further improving the existing sub-systems already used by research managers and planners; and (iii) the HR resource development plan should be prepared as part of project preparation and refined during early stages of project implementation as a basis for determining training needs and technical assistance requirements.

The main lessons drawn from the ICR of the ARM2 Project (ICR Report No. 25940), published in 2003, are summarized below:

- Regional technology assessments. Technological innovations are more likely to be useful to and adopted by farmers/fishers when they are tested and validated in a participative

manner under local conditions. Farmer-to-farmer exchanges are very effective mechanisms for introducing improved technologies. Any follow-up project should give high priority to promoting farmer-managed assessments and dissemination activities. Better production practices are more widely disseminated among farmers/fishers when the practices are integrated into a small business/enterprise framework, and linked with the private sector.

R&D management: Local governments are only willing to provide funding when they see tangible benefits to farmers/fishers in their province or district. Documenting economic benefits and impact of new technology is critical for convincing local governments and other partners to provide funding for the AIATs Decentralization of R&D activities will yield better outcomes if accompanied by an appropriate decentralization of authority and clear mandates within IAARD.

9. Safeguard Policies (including public consultation)

Safeguard Policies Triggered *)*	**Yes**	**No**
Environmental Assessment (OP/BP 4.01)	X	
Natural Habitats (OP/BP 4.04)		X
Forests (OP/BP 4.36)		X
Pest Management (OP 4.09)		X
Physical Cultural Resources (OP/BP 4.11)		X
Indigenous Peoples (OP/BP 4.10)		X
Involuntary Resettlement (OP/BP 4.12)		X
Safety of Dams (OP/BP 4.37)		X
Projects on International Waterways (OP/BP 7.50)		X
Projects in Disputed Areas (OP/BP 7.60)		X

10. List of Factual Technical Documents

- Final Report: Diagnostic Assessment of communication technology and Information System Management. Collabaoration between IIARD and PT. Central Integrity Advisory – January 2011
- Strategic Assessment of Field Station Requirements by Dr. William H. Winter
- Summary of Strategic Plan of IAARD 2010-2014 – IAARD, 2010
- FAO Support Mission by Messrs. De Meyer Julien, Mboe Saediman, Sumanto, Alihamsyah Trip and Argono
- Policy Support and Research Management Component: Mission Findings and Recommendations by Julien de Meyer and Saediman Mboe – June 2011
- Consultancy Mission on the HRD Component: Assignment Summary Report
- A Model for Strategic Assessment of Infrastructure and Facility Upgrade Requirements by Gavin Dillman, Djoko Santoso and Achmad Hidayat
- Analysis of the Current Role of IAARD Soil Analytical lLboratories in Bogor and Eastern Indonesia

- Project Appraisal Document prepared by IAARD – September 2011
- Complementary Study for Project Preparation (Draft) – IAARD –December 2010
- Mission Findings and Recommendations – by Eduardo J. Trigo – June 2010
- The Effect of Research on Agricultural Productivity in Indonesia (Australian Center for International Agricultural Research) – by Professor Peter Warr - Marcy 2011

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